İZMİR KÂTİP ÇELEBİ UNIVERSITY

DRD 2023

International Multidisciplinary Symposium on Drug Research & Development

Organized by
Faculty of Pharmacy, İzmir Katip Çelebi University
&
Society of Researchers in Pharmacy & Medicine (İLARUD)

SPECIAL TOPIC

NEURODEGENERATIVE DISEASES: NEW DEVELOPMENTS IN TREATMENT

May 4-6, 2023

İzmir Katip Çelebi University, Çiğli Main Campus
Prof. Dr. Fuat Sezgin Conference Hall, TÜRKİYE

SELÇUK ÜNİVERSİTESİ ECZACILIK FAKÜLTESİ

www.drd2023.org

CONTENTS

Welcome to İzmir!

Dear Colleagues,

The Faculty of Pharmacy, İzmir Katip Çelebi University, the second pharmacy faculty in both the Aegean region and the province of İzmir, is proud to host the following "**International Multidisciplinary Symposium on Drug Research and Development (DRD) 2023**" on May 4-6, 2023 in İzmir (Türkiye) with the support of thirty-eight pharmacy faculties across the country.

The special topic of the DRD 2023 is "*Neurodegenerative Diseases: New Developments in Treatment*". In this context, participants will gain additional insights into neurodegenerative diseases by looking at the latest developments on this subject. This is an opportunity not to be missed as we delve into the complex and exciting world of neurological discovery, allowing participants to learn, explore, and debate in this crucial area. The content of the symposium is not only limited to neurodegenerative diseases. It will welcome all other ideas, points of view, and discussions in the pharmaceutical field. Moreover, our scientific topics were expanded this year with omic technologies, different vaccine approaches, artificial intelligence, space, and sports pharmacy.

The fifth DRD which has been postponed to 2023 due to global COVID-19 pandemic conditions affecting the whole world, will provide the opportunity to meet face to face by gathering hundreds of participants from various fields of pharmaceutical sciences, representatives and sponsors from global and local pharmaceutical companies, as well as many renowned international plenary and invited speakers from around the world.

We would like to invite you to participate in DRD 2023, and we look forward to greeting you in İzmir, where the advanced medical practices have been applied even in the ancient settlements around it, and at İzmir Katip Çelebi University Faculty of Pharmacy.

Yours sincerely,

Prof. Mutlu AYTEMİR, Ph.D.

Chair of DRD 2023

Dean of the Faculty of Pharmacy, İzmir Katip Çelebi University

Welcome to DRD 2023!

Dear Colleagues,

"The Society of Researchers in Pharmacy and Medicine (ILARUD)" was founded in 2008 to improve the interactions among researchers in medical and pharmaceutical areas and establish a networking platform for academics, professionals and institutions working in this field.

For this purpose, ILARUD organizes a series of international meetings titled "International Multidisciplinary Symposium on Drug Research and Development, DRD", in coordination with the pharmacy faculties in Türkiye every two years. The first DRD was held in Antalya in 2013 in collaboration with Gazi University. This event was followed by further DRD meetings in Eskişehir (2015, Anadolu University), Erzurum (2017, Atatürk University) and Malatya (2019, Inonu University) with the participation of academics, researchers, graduate and undergraduate students from related faculties, professionals of quality control units of private institutions, the drug industry and public institutions from around the region and across the world.İzmir Katip Çelebi University Faculty of Pharmacy will host the DRD 2023 Symposium, which will be held in İzmir on May 4-6, 2023, with the contribution of almost forty pharmacy faculties. On behalf of ILARUD, I welcome all our stakeholders to DRD 2023, including scientists, young researchers, industrial delegates and colleagues from public institutions concerning medical and pharmaceutical areas. We fully anticipate that the Symposium's topics will genuinely reflect current trends, recent advances and new approaches to drug research and development and generate a fruitful discussion platform on this area.

We invite you to participate in the DRD 2023 held in İzmir, Türkiye, on May 4-6, 2023, and we believe that with your participation, DRD 2023 will turn into a memorable event.

With kind regards,

Prof. Gülberk UÇAR, Ph.D.

Co-Chair of DRD 2023

President of ILARUD

Dean of the Faculty of Pharmacy, Hacettepe University

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Honorary President of DRD 2023
&
Rector of İzmir Katip Çelebi University

Prof. Mutlu AYTEMİR, Ph.D.
Chair of DRD 2023
&
Dean of the Faculty of Pharmacy,
İzmir Katip Çelebi University

Prof. Gülberk UÇAR, Ph.D.
Co-Chair of DRD 2023
&
President of the Society of Researchers in Pharmacy and Medicine (İLARUD)

SYMPOSIUM SECRETARIAT

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SCIENTIFIC TOPICS

- Analytical method validation
- Artificial Intelligence
- Bioanalysis
- Bioavailability/ bioequivalence
- Biochemistry
- Bioengineering
- Bioinorganic chemistry
- Biomarkers
- Biopharmaceutics
- Biotechnology
- Biosensors
- Biosimilar medicines
- Biowaiver
- Clinical pharmacy
- Clinical trials
- Cosmetics
- DNA separating/sequencing
- Drug analysis
- Drug cytotoxicity
- Drug design/ molecular modelling
- Drug licensing
- Drug manufacturing and product quality
- Drug metabolism
- Drug regulations
- Drug-receptor interactions
- Drug-drug interactions
- Drug resistance
- Drug synthesis
- Drug targeting
- Drug delivery
- Ethics
- Fluxomics
- Forensic pharmacy
- Food-drug synergies
- Geriatric pharmacy
- Generic medicines
- Genomics
- Herbal medicines
- Industrial pharmacy
- Industrial research management
- Medical devices
- Metabolomics
- Molecular mechanisms of diseases
- Molecular pharmacology
- Multidimensional separations
- Nanomedicine and nanomaterials
- Natural products and medicinal plants
- Neuropeptides and neurotoxicity
- Organic/ inorganic chemistry
- Oxidative stress
- Patents
- Patient safety
- Peptides as drugs
- Peptide-target interaction
- Pharmacogenetics and pharmacogenomics
- Pharmacovigilance
- Pharmaceutical microbiology
- Pharmacoeconomy
- Pharmacokinetics
- Pharmacotherapy
- Pharmacy management
- Phytotherapy
- Pre-formulation and formulation design
- Proteomics and peptidomics
- Quality control and quality assurance
- QbD (Quality by Design) and PAT (Process Analytical Technology)
- Radiopharmaceuticals
- Research and development strategies
- Space pharmacy
- Sports pharmacy
- Stereochemistry in drug action
- Structure-activity relationships
- Therapeutic enzymes, enzyme activators and inhibitors
- Toxicity screening in drug development
- Vaccine researches

SCIENTIFIC PROGRAMME

MAY 4, 2023 Thursday, 1st DAY	
HALL A (FUAT SEZGİN CONFERENCE HALL)	
11:00-13:30	**Welcome-Registration**
13:30-14:00	**OPENING CEREMONY** **Prof. Mutlu AYTEMİR, Ph.D.** (Dean of the Faculty of Pharmacy, İzmir Katip Çelebi University) **Prof. Gülberk UÇAR, Ph.D.** (Dean of the Faculty of Pharmacy, Hacettepe University, President of İLARUD) **Prof. Saffet KÖSE, Ph.D.** (Rector of İzmir Katip Çelebi University)
14:00-14:30	**Beril KOPARAL ERGÜN, M.D. (PL-01)** *(The presentation will be in Turkish)* (Veni Vita Health, Türkiye) *"Cosmetics Have Something About Feeling Good"* "Kozmetiğin İyi Hissetmekle İlgisi Olmalı"
14:30-15:00	**Mehmet MÜDERRİSOĞLU, Pharm. (PL-02)** *(The presentation will be in Turkish)* (Türkiye) *"Past, Present and Tomorrow of Pharmacy"* "Eczacılığın Dünü, Bugünü ve Yarını"
11:00-14:10	**POSTER SESSION**
15:00-16:00	**COFFEE BREAK**
	SESSION I: Medical Session **Special Topic** ***"Neurodegenerative Diseases: New Developments in Treatment"*** ***"Nörodejeneratif Hastalıklar: Tedavide Yeni Gelişmeler"*** *(The presentations will be in Turkish)* **CHAIRS:** **Prof. Nihal OLGAÇ DÜNDAR, Ph.D** (İzmir Katip Çelebi University, Türkiye) **Prof. Ersin Oğuz KOYLU, Ph.D.** (Ege University, Türkiye)
16:00-16:30	**Prof. Müge YEMİŞÇİ ÖZKAN, M.D., Ph.D. (IL-01)** (Hacettepe University, Türkiye) *"Neurovascular contributions to dementia"* *"Demansta Nörovasküler Ünite Fonksiyon Bozukluklari"*

16:30-17:00	**Prof. Uluç YİŞ, M.D., Ph.D (IL-02)** (Dokuz Eylül University,Türkiye) *"Emerging Perspectives on Gene Therapy in Child Neurology"* *"Çocuk Nörolojisinde Gen Tedavisine İlişkin Gelişmekte Olan Perspektifler"*
17:00-17:30	**Prof. Yaprak SEÇİL, M.D., Ph.D (IL-03)** (İzmir Katip Çelebi University, Türkiye) *"Where are we in the treatment of Alzheimer's disease?"* *"Alzheimer Hastalığında Tedavide Neredeyiz?"*
17:30-18:00	**Assist. Prof. Tolga KÖSKÜN, Ph.D.(IL-04)** (Adnan Menderes University, Türkiye) *"Psychological Consequences of Disaster"* *"Afetin Psikolojik Sonuçları*
HALL B (HEKİM HACI PAŞA CONFERENCE HALL)	
	SESSION II: Early Career Management and Development Planning for Students **Öğrenciler İçin Erken Kariyer Yönetimi ve Gelişim Planlaması** *(The presentations will be in Turkish)* **CHAIRS:** **Prof. Canan SEVİMLİ GÜR, Ph.D.** (İzmir Katip Çelebi University, Türkiye) **Prof. Ersin Oğuz Prof. Hatice YILDIRIM SARI** (İzmir Çelebi University, Türkiye)**, Ph.D.** (Ege University, Türkiye)
16:00-16:30	**Erhan GÖLBEY, (IL-05)** (Dev Agency, Türkiye) *"Interview with Dev Adam on his Career Journey"* *"Kariyer Yolculuğunda Dev Adam ile Söyleşi"*
16:30-17:30	**Interactive presentations** **Erdem EREM, Lecturer (IL-06)- Assoc. Prof. Ahmet EGE, Ph.D. (I-07)** (Ege University, Türkiye)- (İzmir Katip Çelebi University, Türkiye) "Opening Doors with Creative Drama" "Yaratıcı Dramayla Kapıları Aralamak"
17:30-18:00	**Nur KARATAŞ, Pharm. (IL-08)** *"Pharmacist coaching"* *"Eczacı Koçluğu"*
18:00-18:30	**Cavide Esra ÖZDAĞ, Pharm. (IL-09)** (Buca Provincial Health Directorate, Türkiye) *"A road story in pharmacy"* *"Eczacılıkta bir yol hikayesi"*
HALL C	

16:00-18.30	**Oral presentations (OPs)**

MAY 5, 2023 Friday, 2nd DAY	
HALL A (FUAT SEZGİN CONFERENCE HALL)	
09:30-10:30	**SESSION III: İLARUD-Prof. Dr. Ünsal Çalış Session** ***In memory of the scientists we lost recently...*** *(The presentations will be in Turkish)* **CHAIRS:** **Prof. Sedef KIR, Ph.D.** (Hacettepe University, Türkiye) **Prof. Selma SARAÇ TARHAN, Ph.D.** (Hacettepe University, Türkiye) **Prof. Mutlu AYTEMİR, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
10:30-11:00	**Assoc. Prof. Esen BELLUR ATICI, Ph.D. (IL-10)** (Deva Holding, Türkiye) *"Synthesis, Analysis, "Risk-Knowledge-Data" Based Process & Impurity Evaluation of Drug Substances"*
11:00-11:20	**Mehmet Ali Yücel, Pharm. (OL-01)** (Erzincan Binali Yıldırım University, Türkiye) *"Investigation of Tetrahydrocannabinol's Activity in Parkinson's Disease via Machine Learning""*
11:20-11:40	**COFFEE BREAK**
	SESSION VI: Analytical Chemistry, Bioanalysis, Biosensors, and Omics **CHAIRS:** **Prof. Dr. Dilşat ARIKSOYSAL, Ph.D.** (Ege University, Türkiye) **Prof. Hakan KARADENİZ, Ph.D.** (Ege University, Türkiye)
11:40-12:05	**Prof. Lars Ove DRAGSTED, Ph.D. (IL-13)** (University of Copenhagen, Denmark) *"Human gut microbial metabolites – a window to gut function and gut-host signalling"*-(Online)
12:05-12:30	**Assist. Prof. Onur PARLAK, Ph.D. (IL-14)** (Karolinska Institute, Sweden) *"Epidermal Sensors for Medical Diagnostics"*-(Online)
12:30-13:00	**Prof. Emirhan NEMUTLU, Ph.D. (IL-15)** (Hacettepe University, Türkiye) *"Mitochondria-Based Targeted Metabolomics Analysis for Neurodegenerative Diseases"*
13:00-13:25	**Arif Engin ÇETİN, Ph.D. (OL-04)** (Izmir Biomedicine and Genome Center, Türkiye)

	"Optical Biosensors for Disease Diagnostics"
13:30-14:30	**LUNCH**
11:40-14:30	**POSTER SESSION**
14:30-17:30	**PANEL** **"Recent Developments and Updates in Drugs and Drug Control in Türkiye"** **Türkiye'de İlaç ve İlaç Denetimi Alanındaki Son Gelişmeler ve Güncellemeler** *(The panel will be in Turkish)* **Moderator:** **Sevil AZAK SUNGUR, Ph.D** (Turkish Drug and Medical Devices Agency (TİTCK), Türkiye) **Panelists**: **Prof. Sevda ŞENEL, Ph.D.** (Health Institutes of Turkey (TÜSEB), Hacettepe University, Türkiye) **Elif İnci ERGÖNÜL, Ph.D.** (TİTCK, Türkiye) **Handan ÖZTUNCA, M.Sci. Pharm.** (TİTCK, Türkiye) **Filiz OZUL, Chemist. Eng.** (TİTCK, Türkiye) **Arman ÜNEY, Pharm.** (Turkish Pharmacists' Association (TEB), Türkiye) **Vedat EĞİLMEZ, MSci. Pharm.** (Pharmaceutical Manufacturers Association of Turkey (İEİS), Türkiye) **Sami TÜRKOĞLU, M.D.** (Turkish Pharmaceutical Manufacturers Association (TİSD), Türkiye) **Nihan BURUL BOZKURT, Ph.D.** (Association of Research-Based Pharmaceutical Companies (AIFD), Türkiye)
HALL B (HEKİM HACI PAŞA CONFERENCE HALL)	
09:30-10:30	**SESSION IV: Natural Drugs and Phytopharmacy** **CHAIRS:** **Prof. Dr. Hüsniye KAYALAR, Ph.D.** (Ege University, Türkiye) **Prof. Tuba MERT GÖNENÇ, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
09:30-10:00	**Prof. Rovshan KHALILOV, Ph.D. (IL-11)** (Baku State University, Azerbaijan) *"Magnetite biomineralization in plants and its biomedical applications"* (Online)
10:00-10:30	**Prof. Fatih DEMİRCİ, Ph.D. (IL-12)** (Anadolu University, Türkiye) *"Essential Oils and Neurodegenerative Diseases"*

10:30-10:55	**Assoc. Prof. Elham AHMADIAN, Ph.D. (OL-02)** (Tabriz University of Medical Sciences, Iran) *"The radiosensitizing effect of herbal active component, betanin, in prostat cancer"*
10:55-11:20	**Assoc. Prof. Tuba AYDIN, Ph.D. (OL-03)** (Ağrı İbrahim Çeçen University, Türkiye) *"Inhibitory Effects of Plantamajoside, The Major Component of Plantago major, on MAO-A, MAO-B, AchE and BChE"*
	SESSION VII: Pharmacoeconomics and Pharmacy Management **CHAIRS:** **Prof. İsmail Hamit HANCI, Ph.D.** (İzmir Katip Çelebi University, Türkiye) **Prof. Sinem Ezgi TURUNÇ ÖZOĞLU, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
11:40-12:05	**Prof. Maarten J. POSTMA, Ph.D. (IL-16)** (Groningen University, Netherlands) *"Health Technology Assessment (HTA) of neurodegenerative diseases; illustrations for cell- and gene-based therapies"*-(Online)
12:05-12:30	**Assoc. Prof. Afonso Miguel CAVACO, Ph.D. (IL-17)** (University of Lisbon, Portugal) *"Why do health humanities & pharmacy narratives matter in pharmaceutical education and practice?"* -(Online)
12:05-12:30	**Res. Assist. Pharm. Leyla YUMRUKAYA (OL-05)** (Hacettepe University, Türkiye) *"The Cost of Spinal Muscular Atrophy: A Systematic Review"*
13:00-13:30	**Assist. Prof. N. Ipek Kirmizi Sonmez, Ph.D. (OL-06)** (Bahcesehir Universty, Türkiye) *"Investigation of the relationship between the prescribing practice of uncertain diagnosis and the cost of prescribing: A pharmacoeconomic analysis based on selected diagnoses"*
	VIP HALL
	SESSION V: A Closer Look at the Industry in Career Planning-I *(The presentations will be in Turkish)* **CHAIRS:** **Assoc. Prof. Nergiz Hacer TURGUT, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
10:00-10:20	**Novagenix Bio-Analytic Drug R&D Center**
10:30-10:50	**ALFA Analitik Laboratuvar Cihazlari TİC.LTD.ŞTİ**
	SESSION VIII: A Closer Look at the Industry in Career Planning-II *(The presentations will be in Turkish)* **CHAIRS:**

	Assist. Prof. Üyesi Hazal Ezgi GÜLTEKİN (İzmir Katip Çelebi University, Türkiye)
11:40-12:00	**Eda GÖKBULUT, Ph.D. (IL-18)** *"The Four Pieces of the Puzzle in Pharmacy: Public-Industry-Academy-Pharmacy"* *"Eczacılıkta Puzzle'ın 4 Parçası: Kamu-Endüstri-Akademi-Eczane"*
12:10-12:30	**ZEISS Microscopy**
12:40-13:00	**Gen-Era Diagnostics**
14:30-15:00	**SESSION IX: A Closer Look at the Industry in Career Planning-III** **CHAIRS:** **Assist. Prof. Merve SAYLAM, Ph.D.** (İzmir Katip Çelebi University, Türkiye) **Bera Yazılım**
	HALL C
09:30-13:30	Oral presentations (OPs)

MAY 6, 2023 Saturday , 3rd DAY	
	VIP HALL
	SESSION X: Nanomedicines and Nanomaterials **CHAIRS:** **Prof. Emel Öykü ÇETİN UYANIKGİL, Ph.D.** (Ege University, Türkiye) **Assoc. Prof. Gülşah Erel AKBABA, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
09:30-10:00	**Prof. İhsan GÜRSEL, Ph.D. (IL-19)** (Izmir Biomedicine and Genome Center, Türkiye) *"Design characterization and in vivo performance of VLP Vaccine against SARS-CoV-2"*
10:00-10:30	**Prof. Kezban ULUBAYRAM, Ph.D. (IL-20)** (Hacettepe University, Türkiye) *"Advanced Biomaterials for Wound Healing and Hemostasis"*
10:30-10:55	**Assoc. Prof. Sinan GÜVEN, Ph.D. (OL-07)** (Izmir Biomedicine and Genome Center, Türkiye) *"Organ-on-a-chip platforms for drug screening"*
11:00-11:20	**COFFEE BREAK**
	SESSION XII: Biochemistry and Molecular Biology **CHAIRS:** **Prof. Güliz ARMAĞAN, Ph.D.** (Ege University, Türkiye) **Prof. Sinem Ezgi TURUNÇ ÖZOĞLU, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
11:45-12:15	**Prof. Luciano SASO, Ph.D. (IL-23)** (Sapienza University of Rome, Italy)

	"Pharmacological modulation of oxidative stress"-(Online)
12:15-12:40	**Asst. Prof. Yalçın ERZURUMLU, Ph.D. (OL-09)** (Süleyman Demirel University, Türkiye) *"Steroidal regulation of androgenic signaling in prostate cancer: Could it offer a powerful therapeutic approach?"*
12:40-13:50	**COFFEE BREAK**
HALL A (PROF. DR. FUAT SEZGİN CONFERENCE HALL)	
13:30-14:30	**SESSION XIV: Pharmacology and Clinical Pharmacy** **CHAIRS:** **Prof. Rümeysa DEMİRDAMAR, Ph.D.** (European University of Lefke, TRNC**)** **Prof. C. Kemal BUHARALIOĞLU, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
11:40-14:30	**POSTER SESSION**
14:10-14:40	**Prof. Şule APIKOĞLU Ph.D. (IL-27)** (Marmara University, Türkiye) *"Digital Healthcare Services for Drug Therapy Optimisation in the Elderly"*
14:40-15:10	**Prof. Seda ÜNSALAN Ph.D. (IL-28)** (Medipol University, Türkiye) *"Regulatory Requirements for Bioequivalence Studies"*
15:10-15:35	**Reşat ÇINAR, Ph.D. (IL-29)** (National Institutes of Health, USA) *"Polypharmacology in Fibrotic Disorders: Bench to Clinic Translation of Third Generation Cannabinoid Receptor 1 (CB1R) Antagonists"*-(Online)
HALL B (HEKİM HACI PAŞA CONFERENCE HALL)	
	SESSION XI: Drug Design, Synthesis and Development **CHAIRS:** **Prof. Rahime ŞİMŞEK, Ph.D.** (Hacettepe University, Türkiye) **Prof. Seda ÜNSALAN Ph.D.** (Medipol University, Türkiye)
09:30-10:00	**Prof. Soodabeh Davaran, Ph.D. (IL-21)** (Tabriz University of Medical Sciences, Iran) *"Novel nanoparticulate system for treatment of neurodegenerative diseases"*
10:00-10:30	**Prof. Ali ÇAĞIR, Ph.D. (IL-22)** (IZTECH, Türkiye) *"Investigation of the antiproliferative activities of intermediate and side products of ezetimibe synthesis in cancer cells"*
10:30-10:55	**Assist. Prof. Abdurrahman OLGAÇ, Ph.D. (OL-08)** (Gazi University, Türkiye)

	"A Tale of Two Diverse Sets of Novel 5-Lipoxygenase Activating Protein (FLAP) Inhibitors"
	SESSION XIII: Pharmaceutical Technology, Pharmaceutical Biotechnology and Radiopharmacy **CHAIRS:** **Prof. Evren ATLIHAN GÜNDOĞDU, Ph.D.,** (Ege University, Türkiye) **Prof. Zeynep ŞENYİĞİT, Ph.D.** (İzmir Katip Çelebi University, Türkiye)
11:20-11:45	**Dr. Sylvie CHALON, Ph.D. (IL-25)** (University of Tours, France) *"Radiotracers for imaging of neurodegenerative diseases"*-(Online)
11:45-12:15	**Prof. Hatice Yeşim KARASULU Ph.D. (IL-26)** (Ege University, Türkiye) *"Oral Lipid Based Drug Delivery Systems with Recent Scientific And Regulatory Approaches"*
12:15-12:40	**Assoc. Prof. Hasan AKBABA, Ph.D. (OL-10)** (Ege University, Türkiye) *"CRISPR-CAS9 Mediated Immune Checkpoint Gene Knockout with Targeted Nanoparticles Against Triple-Negative Breast Cancer"*
	SESSION XV: Pharmaceutical Toxicology and Pharmaceutical Microbiology **CHAIRS:** **Assist. Prof. Elif İnce ERGÜÇ, Ph.D.** (İzmir Katip Çelebi University, Türkiye) **Prof. Bayrı ERAÇ, Ph.D.,** (Ege University, Türkiye)
14:10-14:40	**Prof. Mert DÖŞKAYA, Ph.D. (IL-30)** (Ege University, Türkiye) *"Importance of Antigen Design in Nucleic Acid Vaccines: SARS-CoV-2 DNA Vaccine Experience"*
14:40-15:10	**Prof. Gülfem ECE, M.D. (IL-31)** (University of Health Sciences, Türkiye) *"Next Generation Probiotics and Microbiota"*
15:10-15:35	**Visiting Prof. Aziz EFTEKHARI (OL-11)** (Institute of Molecular Biology & Biotechnologies, Azerbaijan) *"Application of nano-antioxidants against cytotoxic agents"*
	HALL C
09:30-15:30	Oral presentations (OPs)
CLOSING	

PLENERAY LECTURES

PL-01 **Cosmetics Have Something About Feeling Good**
(Kozmetiğin İyi Hissetmekle İlgisi Olmalı)
Beril KOPARAL ERGÜN

PL-02 **Past, Present and Tomorrow of Pharmacy**
(Eczacılığın Dünü, Bugünü ve Yarını)
Mehmet MÜDERRİSOĞLU

INVITED LECTURES

IL-01 **Neurovascular Contributions To Dementia**
(Demansta Nörovasküler Ünite Fonksiyon Bozukluklari)
Müge YEMİŞÇİ ÖZKAN

IL-02 **Emerging Perspectives On Gene Therapy In Child Neurology**
(Çocuk Nörolojisinde Gen Tedavisine İlişkin Gelişmekte Olan Perspektifler)
Uluç YİŞ

IL-03 **Where Are We In The Treatment Of Alzheimer's Disease?**
(Alzheimer Hastalığında Tedavide Neredeyiz?)
Yaprak SEÇİL

IL-04 **Psychological Consequences Of Disaster**
(Afetin Psikolojik Sonuçları)
Tolga KÖSKÜN

IL-05 **Interview With Dev Adam On His Career Journey**

(Kariyer Yolculuğunda Dev Adam ile Söyleşi)

Erhan GÖLBEY

IL-06/ IL-07 **Opening Doors With Creative Drama**

(Yaratıcı Dramayla Kapıları Aralamak)

Erdem EREM - Ahmet EGE

IL-08 **Pharmacist Coaching**

(Eczacı Koçluğu)

Nur KARATAŞ

IL-09 **A Road Story In Pharmacy**

(Eczacılıkta bir yol hikayesi)

Cavide Esra ÖZDAĞ

IL-10 **Synthesis, Analysis, Risk-Knowledge-Data Based Process & Impurity Evaluation Of Drug Substances**

Esen BELLUR ATICI

IL-11 **Magnetite Biomineralization In Plants And Its Biomedical Applications**

Rovshan KHALILOV

IL-12 **Essential Oils And Neurodegenerative Diseases**

Fatih DEMİRCİ

IL-13 **Human Gut Microbial Metabolites – A Window To Gut Function And Gut-Host Signalling**

Lars Ove DRAGSTED - *(Online)*

IL-14 **Epidermal Sensors For Medical Diagnostics**

Onur PARLAK - *(Online)*

IL-15 **Mitochondria-Based Targeted Metabolomics Analysis For Neurodegenerative Diseases**
Cemil Can EYLEM

IL-16 **Health Technology Assessment (Hta) Of Neurodegenerative Diseases; Illustrations For Cell- And Gene-Based Therapies**
Maarten J. POSTMA - *(Online)*

IL-17 **Why Do Health Humanities & Pharmacy Narratives Matter In Pharmaceutical Education And Practice?**
Afonso Miguel CAVACO - *(Online)*

IL-18 **The Four Pieces Of The Puzzle In Pharmacy: Public-Industry-Academy-Pharmacy (Eczacılıkta Puzzle'ın 4 Parçası: Kamu-Endüstri-Akademi-Eczane)**
Eda GÖKBULUT

IL-19 **Design characterization and in vivo performance of vlp vaccine against sars-cov-2**
İhsan GÜRSEL

IL-20 **Advanced Materials for Tissue Regeneration and Hemostasis**
Kezban ULUBAYRAM

IL-21 **Novel Nanoparticulate System For Treatment Of Neurodegenerative Diseases**
Soodabeh DAVARAN

IL-22 **Investigation Of The Antiproliferative Activities Of Intermediate And Side Products Of Ezetimibe Synthesis In Cancer Cells**

Ali ÇAĞIR

IL-23 **Pharmacological Modulation Of Oxidative Stress**

Luciano SASO- *(Online)*

IL-24 **Production and Characterisation of Therapeutic Monoclonal Antibodies**

Hülya AYAR KAYALI

IL-25 **Radiotracers For Imaging Of Neurodegenerative Diseases**

Sylvie CHALON- *(Online)*

IL-26 **Oral Lipid Based Drug Delivery Systems with Recent Scientific And Regulatory Approaches**

Hatice Yeşim KARASULU

IL-27 **Digital Healthcare Services for Drug Therapy Optimisation in the Elderly**

Şule APİKOĞLU

IL-28 **Regulatory Requirements for Bioequivalence Studies**

Seda ÜNSALAN

IL-29 **Polypharmacology in Fibrotic Disorders: Bench to Clinic Translation of Third Generation Cannabinoid Receptor 1 (CB1R) Antagonists**

Reşat ÇINAR - *(Online)*

IL-30 **Importance of Antigen Design in Nucleic Acid Vaccines: SARS-CoV-2 DNA Vaccine Experience**

Mert DÖŞKAYA

IL-31 **Next Generation Probiotics and Microbiota**
Gülfem TEREK ECE

ORAL LECTURES

OL-01 **Investigation of Tetrahydrocannabinol's Activity in Parkinson's Disease via Machine Learning**
Mehmet Ali YÜCEL

OL-02 **The Radiosensitizing Effect Of Herbal Active Component, Betanin, In Prostat Cancer**
Elham AHMADIAN

OL-03 **Inhibitory Effects of Plantamajoside, The Major Component of Plantago major, on MAO-A, MAO-B, AChE and BChE**
Tuba AYDIN

OL-04 **Optical Biosensors for Disease Diagnostics**
Arif Engin ÇETİN

OL-05 **The Cost of Spinal Muscular Atrophy: A Systematic Review**
Leyla YUMRUKAYA

OL-06 **Investigation Of The Relationship Between The Prescribing Practice Of Uncertain Diagnosis And The Cost Of Prescribing: A Pharmacoeconomic Analysis Based On Selected Diagnoses**
N Ipek KIRMIZI SONMEZ

OL-07 **Organ-On-A-Chip Platforms For Drug Screening**
Sinan GÜVEN

OL-08 **A Tale of Two Diverse Sets of Novel 5-Lipoxygenase Activating Protein (FLAP) Inhibitors**
Abdurrahman OLGAÇ

OL-09 **Steroidal Regulation Of Androgenic Signaling In Prostate Cancer: Could It Offer A Powerful Therapeutic Approach?**
Yalçın ERZURUMLU - *(Online)*

OL-10 **CRISPR-CAS9 Mediated Immune Checkpoint Gene Knockout with Targeted Nanoparticles Against Triple-Negative Breast Cancer**
Hasan AKBABA

OL-11 **Application Of Nano-Antioxidants Against Cytotoxic Agents**
Aziz EFTEKHARI

ORAL PRESENTATION

OP-01 **Evaluation Of The Appropriateness Of Antimicrobial Drug Dosages**
Zeynep Ülkü GÜN

OP-02 **Drug Interactions Resulting In Increased Blood Lithium Level: A Case Repor**
Zeynep Ülkü GÜN

OP-03 **Liposomes For Imaging And Photodynamic Therapy Of Glioblastoma**
Fidan Gülçin ONARAL

OP-04 **In Silico Drug Repurposing As Inhibitors Against Gsk-3β**

Elif DENİZ

OP-5 **Evaluation Of Nutritional Needs Of Intensive Care Unit Patients By Clinical Pharmacists**
Zeynep Ülkü GÜN

OP-6 **Evaluation Of The Drug Related Problems In Critically Ill Patients**
Zeynep Ülkü GÜN

OP-7 **Investigation Of The Effect Of Sglt2 Inhibitors On Aortic Contractility In T2dm-Induced Rats In Organ Bath**
Humeysa KIYAK KIRMACI

OP-8 **Preparation And Characterization Of Tc-99m Radiolabelled Nanoparticles**
Elif Tugce SARCAN

OP-9 **Evaluate Factors Related To Intention Of Clinical Pharmacists And Candidates To Provide Pharmaceutical Care**
Nesligül ÖZDEMIR

OP-10 **Bispecific Antibody Development For Enhancing The Efficacy Of Antitumor Therapy**
Senem ŞEN

OP-11 **Factors Affecting The Career Preference Of Pharmacy Students**
Zeynep Yeşim AY

OP-12 **A Multiplexed Combinatorial Library Screening Approach For Peptide Drug Discovery Against Neurodegenerative Diseases**
Cemile Elif ÖZÇELIK

OP-13 **Formulation And Characterization Of Indomethacin And Metformin Loaded Dual Noisome**

Emine Esin ÇALIŞKAN

OP-14 **An Innovative Formulation Approach To The Treatment Of Schizophrenia: Fast Dissolving Films**

Hazal Ezgi GÜLTEKIN

OP-15 **Pattern Of Medication Use In Older Adults At Discharge From The Geriatrics Ward**

Aysu SELÇUK

OP-16 **Pattern Of Probiotics Use: Results From The Survey Of Community Pharmacists**

Aysu SELÇUK

OP-17 **Novel Acetylcholinesterase Inhibitors For Potential Therapeutic Treatment Of Alzheimer**

Hasan Tahsin ŞEN

OP-18 **Comparison Of Ph Stimuli-Responsive Controlled Release Of The Levocetirizine From Two Different Calixarene Nanofibers**

Kübra YILMAZ

OP-19 **Evaluation Of Pre- And Post-Educational Knowledge Levels Of Pharmacy Students In Turkey On HPV And HPV Vaccines**

Hümeysa Kıyak KIRMACI

OP-20 **Synthesis And Biological Evaluation Of Some Quinoxaline-Hydrazone Derivatives As Alpha-Glucosidase Inhibitors**

Merve ARI

OP-21 **Capecitabine Loaded Folate-Conjugated Mesoporous Silica Nanoparticles Synthesis And In-Vitro Characterization**

OP-29 **Anfis-Based Machine Learning Approach For Predicting Fluvastatin Release From Superporous Hydrogel Composites In Drug Delivery Systems**
Yağmur DALBUDAK

OP-30 **Toxicological Assessment Of Azoxystrobin In Sh-Sy5y Human Neuroblastoma Cell Line**
Ayşenur BILGEHAN

OP-31 **Radiolabeling And Quality Control Studies Of Tofacitinib Citrate Loaded Liposome Formulations**
Emre ÖZGENÇ

OP-32 **Estimating Swelling Behavior Of Guar Gum Hydrogel For Controlled Release Of Cancer Drugs: A Random Forest Algorithm Approach**
Yağmur DALBUDAK

OP-33 **Exploring The Swelling Properties Of Carboxymethyl Cellulose-Peg 300-Citric Acid Hydrogels For Wound Dressing Applications Using Random Forest Algorithm**
Derya Ozan KAYA

OP-34 **Evaluation Of Medication Adherence And Treatment Satisfaction In Patients Using Direct-Acting Oral Anticoagulants**
Fatıma Ulya YURUK

OP-35 **Evaluation Of Diabetes Knowledge Of Pharmacy Students**
Zeynep Yeşim AY

OP-36 **Ampisilin-Loaded Chitosan-Hyaluronic Acid-Based Polyelectrolyte Complex As Oral Film**
Sema ARISOY

OP-37 **The Effect Of Sex Differences On Donepezil-Induced Electrocardiogram Qt Prolongation**

Zinnet Şevval AKSOYALP

OP-38 **The Assessment Of Antimicrobial And Antibiofilm Activity Of Commercial Oral Healthcare Products Against Bacteria**

Aybala TEMEL

OP-39 **Synthesis And Investigation Of Cytotoxicity In Different Cell Lines Of Novel Hydroxypyranones**

Pelin Nur ÜÇKAN

OP-40 **In Vitro Evaluation Of Endocrine System Related Reproductive Toxicity Potentials Of 5-Fluoroindole Derived Melatonin Analogues With Antioxidant Activity**

Elif İNCE ERGÜÇ

OP-41 **Development And In Vitro Evaluation Of Caffeine Oral Micropellets With Biphasic Release Pattern**

Aslıhan ARSLAN

OP-42 **Polymeric Micelles Formulations Loaded With Candesartan For Intranasal Administration**

Hüsniye Hande AYDIN

OP-43 **Sensitive Detection Of Bacteria By Moleculary Imprinted Polymer**

Hüseyin Oğuzhan KAYA

OP-44 **Tumor-specificity and neurotoxicity of new pyrazole derivatives with sulfonamide moiety**

Dilan OZMEN OZGUN

OP-45 **Antibacterial, Antibiofilm, And Anti-Quorum Sensing Activity Of Cell-Free Supernatants Of Lactobacillus Sp. Isolated From Dairy Products**
Müjde ERYILMAZ

OP-46 **Are Animal Studies In High-Quality Journals More Reproducible?: A Small-Scale Analysis Of Transparent Reporting**
Betul Rabia ERDOGAN

OP-47 **Buccal Mucoadhesive System Formed By Liquid Crystals Of Rasagiline Mesylate For Non- Oral Parkinson Treatment**
Meliha GÜNEŞ

OP-48 **Evaluation Of Antioxidant And Anti-Inflammatory Activities Of Kojic Acid Derived Analogues**
Fadime Aydın KÖSE

OP-49 **Electrochemical Detection Of The Interaction Of A Furanocoumarin Derived Natural Component With Dna**
Hasan İŞBILIR

OP-50 **Evaluation Of Serum Biomarkers Of Medication Related Osteonecrosis Of The Jaw Around Dental Implant**
Mustafa HACILAR

OP-51 **Identifying The Attitude Of Pharmacy And Medical Students For Ethical Principles**
Fatma Ulya YÜRÜK

OP-52 **Novel Cholinesterase Inhibitors: Synthesis, Characterization, Molecular Docking, Dynamics And Adme Studies**

OP-61 **Aerodynamic Properties And Cell Culture Studies Of Dry Powder Inhaler Formulations Containing Gefitinib-Hsa Nanoparticles**

Merve GEYIK

OP-62 **Investigation Of The Effect Of Rutin In A Model Of Bleomycin-Induced Lung Fibrosis In Rats**

Nergiz Hacer TURGUT

OP-63 **Artificial Intelligence, Synthesis And Activity Studies Of Benzimidazole-Chalcone Compounds For Candida Albicans**

Ercan ADAL

OP-64 **Synthesis, Mpo Inhibitory And Antioxidant Properties Of Benzoxazole Derivatives**

Merve SAYLAM

OP-65 **Preparation, Characterization And Antimicrobial Activity Of Hpmc-Chitosan Based, Sulfanilamide Containing Patches For Acne Treatment**

Meryem KOÇAŞ

OP-66 **Studies On Pyridinium Derivatives As Potential Cholinestarase Inhibitors**

Gülşah BAYRAKTAR

OP-67 **Investigation Of Removal Of Some Dyestuffs From Solution By Electro-Fenton Method**

Çiğdem YENGIN

OP-68 **A Preliminary Study Of Cholinesterase Inhibition And Cytotoxicity Evaluation Of Indole-Based Chalcone Derivative**

Goksun DEMIREL

OP-69 **An In-Silico Investigation Of Marine-Sourced Natural Compounds Against Tam Tyrosine Kinase Receptors In Colorectal Cancer**

Sıla SUCU

OP-70 **Comparison The Solubility And Dissolution Rate Effects Of Beta-Cyclodextrin And Gamma-Cyclodextrin Complexations Of Rosuvastatin Calcium**

Dilara ERGÜL

OP-71 **Evaluation Of Possible Toxic Effects Of A Triazole Fungicide Triadimenol In Sh-Sy5y Cell Line**

Ayşenur BILGEHAN

OP-72 **(4-Hydroxyphenyl)-4-Methyl-1-((4- Substituephenylamino)Methyl)-3h-1,2,4-Triazole-3-Thione Derivatives As Inhibitors Of Monoamine Oxidase**

Hilal ZIVALI

OP-73 **Mao-Aromatase Inhibitor New Benzoxazolinone-Hydrazone Compounds: Design, Synthesis, In Silico And In Vitro Studies**

Hayrünnisa TAŞÇI

OP-74 **Preparation And Evaluation Of Docetaxel-Loaded Solid Lipid Nanoparticles As A Promising Treatment In Breast Cancer**

Gizem Rüya TOPAL

OP-75 **Sulfur Dioxide (So2) Donors Improve Erectile Function After Castration In A Rat Model**

Didem Yılmaz ORAL

OP-76 **Rp-Hplc Method Development For Simultaneous Determination Of Melphalan And Topotecan In Human Plasma Samples**

Büşra UÇAR

OP-77 **Untangling The Metabolic Complexity Of Autism Spectrum Disorder Using Metabolomics**

Bilge Başak FIDAN

OP-78 **Antimicrobial And Antibiofilm Activities Of New Hybrid Derivatives Containing Hydroxypyrone And Dithiocarbamate Structures**

Gülşah KARAKAYA

OP-79 **In Vitro Evaluation Of Endocrine Related Adverse Effects Of Some Prescribed Pharmaceuticals During Pregnancy**

Bita ENTEZARI

OP-80 **3-Cyanopropyl Functionalized N- Heterocyclic Carbene Precursors Synthesis And Enzyme Inhibition**

Erkan ÖNER

OP-81 **The Potential Role Of Inflammasome Activation In Gefitinib -Induced Hepatotoxicity**

Ege ARZUK

OP-82 **Ferroptotic Activity Of Synthetic Neuromelanin In Dopaminergic Cells**

Gizem Kaftan ÖCAL

OP-83 **Investigation Of Gene Expression Levels Of Some Proteins Related To The Pathogenesis Of Parkinson's Disease In Rats Exposed To Prenatal Stress**

İlayda VAROL

OP-84 **In Vitro Parkinson's Disease Models: 2d Or 3d?**

Zehra Gül MORÇIMEN

OP-85 **Synthesis, Biological Evaluation And Molecular Docking Studies Of New 1-(2-Chlorophenyl)Urea Derivatives As Inhibitors Of Human Soluble Epoxide Hydrolase**

Kübra İBIŞ

OP-86 **A Novel Series Of Antipyrine-Urea Analogues: Design, Synthesis And Biological Evaluation As Inhibitors Of Soluble Epoxide Hydrolase**

Deniz LENGERLI

OP-87 **Development And In Vitro Characterization Of Nasal Nanoemulsion Formulations Containing Melatonin**

Hazal KUDAL

OP-88 **In Vitro Anti-Inflammatory And Anticancer Activities Of Tanacetum Parthenium L. Extract And Its Major Metabolite Parthenolide**

Rengin BAYDAR

OP-89 **Optimization Of Dispersion Of Inorganic And Polymeric Nanoparticles For Characterization Studies**

Aysel KIZILTAY

OP-90 **Formulation Optimization For Ala-Loaded Lipid-Polymer Hybrid Nanoparticles Via The Design Of Experiments**

Özlem ÇOBAN

OP-91 **Decreased Serum Level Of Autotaxin In Patients With Polycystic Ovary Syndrome**

Ömer Faruk KIRLANGIÇ

OP-92 **A Novel Cationic Nanoemulsion For Toxoplasma Gondii Pdna Vaccine Delivery**

Yücel BAŞPINAR

OP-93 **Effects Of Metformin On Estrous Cycle And Ovarian Hormones In Female Rats With Fructose-Induced Metabolic Syndrome**

Esra SUMLU

OP-94 **Development And Characterization Of Ivermectin Loaded Liposomal Drug Delivery System With Ethanol Injection Method**

Meryem KOÇAŞ

OP-95 **Quercetin-Induced Cytotoxicity: Cellular Atp Alterations In Hepg2 Cells**

Ali ERGÜÇ

OP-96 **Empagliflozin Exerts H2s-Mediated Vascular Beneficial Effects In Diabetic Erectile Dysfunction**

Gülcan DEMIR

OP-97 **Cytotoxic Activities Of Isolated Compounds From Prangos Uechtritzii Boiss & Hausskn**

Gökay ALBAYRAK

OP-98 **Jr-Ab2-011, A Selective Mtorc2 Inhibitor Prevents Il-1β-Induced Inflammatory Response In Human Chondrocytes: Modulation Of Iκb-A/Nf-Kb Activation**

Meryem Temiz-RESITOGLU

OP-99 **Preparation And In Vitro Neuroprotective Evaluation Of Polycaprolactone And Polyvinyl Pyrrolidone Blended Nanofibrous For Transdermal Delivery Of Vitamin B12/Donepezil**

Büşra ERTAŞ

OP-100 **Prediction Of Butyrylcholinesterase Inhibitory Activity In Structurally Diverse Molecules Using In Silico Methods**

Fatma AKSAKAL

OP-101 **Sensing Cellular Activities In Various Biological Species Through The Fluorescent Probes**

Ecem SAYGILI

OP-102 **Development And In Vitro Characterization Of Nanoemulsion And Nanoemulsion Based Gel With Ilex Paraguariensis Methanol Extract**

Yaşar Furkan KILINBOZ

OP-103 **Employment Of Poly(Creatinine) And 5,10,15,20-Tetraphenyl-21h,23h-Porphine Nickel(Ii) As Electrocatalysts At Liquid/Liquid Interfaces In Thin Layers Of Organic Solvents For Hplc-Ecd Determination Of Paracetamol In Pharmaceutical Formulations**

Fatma Gülay DER

OP-104 **Synthesis, Characterization And Antimicrobial Activity Of Zinc Nanoparticle By The Green Method Using Pyracantha Coccinea M.J. Roem**

Nuran GÖKDERE

OP-105 **Effect Of A Single Dose Of Ionizing Radiation On A549 Cells: Mitochondrial Responses**

Kemal ATMACA, Hilmi ORHAN

OP-106 **The Role Of The Sphingosine Pathway In The Icariin-Induced Relaxations**

Ozan MERT

OP-107 **Mir-27b Suppress The Proliferation, Migration And Invasion By Regulation Of Emt In Lncap Cells**

Aylin ŞENDEMİR

OP-108 **Antioxidant Activities Of Marrubium Vulgare L. And Endemic Marrubium Bourgaei Subsp. Caricum P.H. Davis**

Tugce DEMIROZ AKBULUT

OP-109 **Research Of The Effect Of Acid Type And Polymer Concentration On Rheological Properties And Physical Stability Of Chitosan Hydrogels**

Muhammet Davut ARPA

OP-110 **Investigation Of The Effect Of Rutin In A Model Of Bleomycin-Induced Lung Fibrosis In Rats**

Şilan ÇATAK

OP-111 **Chemopreventive Effect Of Apple Against Colon Cancer**

Murat ZOR

OP-112 **Sensitive Spectrofluorimetric Method For Determinatıon Of Gentamicin**

Hüma YILMAZ

OP-113 **The Influence Of Chiral Switch: An Investigation Based On Summary Of Product Characteristics**

N İpek KIRMIZI SÖNMEZ

POSTER PRESENTATIONS

PP-01 **Unravelling The Effects Of New L-Heptanoylphosphatidyl Inositol Pentakisphosphate Derivatives For Gag/Ma-Targeted Hiv Eradication**
Halilibrahim CIFTCI

PP -02 **Evaluation Of Physicians' Perspectives On Drug-Drug Interactions**
Ceren ADALI

PP -03 **Design And Development Of Orally Disintegrating Films Containing Donepezil Hydrochloride For Alzheimer's Disease**
Merve İrem ÖZEN

PP -04 **Monoclonal Antibody Functionalized Polymeric Nanoparticles For Potential Targeted Therapy For Ovarian Cancer**
Seminay GULER

PP -05 **Preparation And Characterization Of Tc-99m Radiolabelled Nanoparticles**
Elif Tugce SARCAN

PP -06 **The Effect Of Exercise And Group B Vitamin Applications On Motoric And Physiological Parameters In Rats With Diabetic Parkinson**
Merve KİRAZ

PP -07 **In Vitro Characterization Of Monoclonal Antibody To Be Used In Antibody-Drug Conjugate Synthesis**
Duygu ERDOGAN

PP -08 **Evaluation Of Production Quality And Quantity In Fed Batch Studies Using Different Growth Media During The Production Of Recombinant Monoclonal Antibodies**

Elçin ÇAGATAY

PP -09 **Predicting The Swelling Behavior Of Pva-Based Superporous Hydrogels For Gastroretentive Drug Delivery Systems Using Artificial Intelligence Approach**

Uğur ÖZVEREN

PP -10 **Bayesian Optimization-Based Artificial Neural Networks For Predicting Swelling Behavior Of Hydrogel Composite Films For Transdermal Drug Delivery Systems**

Uğur ÖZVEREN

PP -11 **Development And Characterization Of Ivermectin Loaded Transfersome Formulations Using Experimental Design**

Özge SARIARSLAN

PP -12 **Preparation Of Sunitinib Liposomes For Theranistic Administration**

Zeynep ÜZÜMCÜ

PP-13 **Evidence-Based Complementary And Alternative Therapy Of Annona Squamosa Linn. Leaves Extract Derived Bioactive Fractions Against Diabesity. An In-Vivo, In-Vitro, And In-Silico Approach Using Fingerprint Analysis**

Ravi SINGH

PP -14 **Go-Ann Approach For Predicting Swelling Behavior Of Sodium Alginate Hydrogels In Oral Delivery Of Protein Drugs**

Uğur ÖZVEREN

PP -15 **Trastuzumab-Conjugated Poly (Lactic Acid)/Poly (Vinyl Alcohol) Nanoparticles As A Novel Drug Delivery System**
Kağan SAĞOL

PP -16 **Lamivudine-Loaded Solid Lipid Nanoparticles As A Novel Drug Delivery System**
Mine Nur ÖNER

PP -17 **Development Of Nanostructured Contrast Agent For Use In Magnetic Resonance Imaging Studies**
Esra YILDIZ

PP -18 **Antibody-Nanoparticle Conjugate Constructed With Trastuzumab And Nanoparticle Albumin-Bound Paclitaxel As A Novel Drug Delivery System**
İnanç GEMCI

PP -19 **Prepubertal Phthalate Exposure Can Cause Histopathological Alterations And Epigenetic Changes In Rat Brain**
Gülce CAN

PP -20 **Evaluation Of Production Quality And Quantity In Fed Batch Studies Using Different Growth Media During The Production Of Recombinant Monoclonal Antibodies**
Ekin ERDOĞMUŞ

PP -21 **Anti-Inflammatory Activity And Chemical Composition Of Prangos Ferulacea L. Essential Oil**
Damla KIRCI

PP -22 **Optical Imaging Potential Of Fluorescently Labeled Methotrexate-Loaded Human Serum Albumin Nanoparticles In Breast Cancer Cells**
Esra ÇELIKKAN

PP -23 **Contribution Of Oncology Pharmacists In Cancer Care**
Zeynep Yeşim AY

PP -24 **Synthesis And Characterization Of New Hexahydroquinoline Derivatives, Their Cytotoxic Properties And Ros Generation Potentials**
Ezgi PEHLIVANLAR

PP-25 **Syntehesis And Spectroscopic Properties Of Tert-Butyl 4-(4-(Difluoromethoxy)Phenyl)-2,7,7-Trimethyl-5-Oxo-1,4,5,6,7,8-Hexahydroquinoline-3-Carboxylate**
Ezgi PEHLIVANLAR

PP -26 **Alternative Analytical Method And Validation To Pharmacopeia Methods For NDMA And NDEA Related Compounds Of The Sartan Group Drug Product**
Hümeyra Funda VARDAR

PP -27 **Standardized Medicinal Aromatic Plants And Essential Oils Based On Pharmacopoeia Standards**
Ekin ERDOĞMUŞ

PP -28 **Evaluation Of Pharmacists' Perspectives On Job Satisfaction**
Pınar Bakir EKINCI

PP -29 **Anticholinesterase Properties Of Novel Phthalocyanines**
Didem AKKAYA

PP -30 **In Vitro Investigation Of Biological Activities Of Epimedim Pubigerum (Dc.) C. Moren & Decne**

Gökçe SEYHAN

PP -31 **Development Of The First Generic Drug Of Lyophilized Capreomycin Sulfate In Turkey**

İrem KARASU

PP -32 **Single-Step Extraction Optimization Strategies From Plasma Sample With Experimental Design Strategies For Integrated Metabolomics And Lipidomics Analysis By Gc-Ms And Lc-Ms**

Cemil Can EYLEM

PP -33 **Studies On The Synthesis Of Some Novel Benzyl Thiazolyl Carbamate Compounds As Hdac Inhibitor**

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PP -34 **Studies On The Synthesis Of Some Novel Phenyl Tetrazolo Thiazolyl Carbamate Compounds As Hdac Enzyme Inhibitors**

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PP -35 **Novel 3-Amino-Thiophene-2-Carbohydrazide Derivatives As Potential Anti Cancer Agents: Synthesis, Characterization, Molecular Docking, Dynamics And Adme Studies**

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PP -37 **Synthesis, Characterization, Molecular Docking, Dynamics And Adme Studies Of Novel Nipagin Derivatives As Potential Anti-Inflammatory Agents**
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PP -40 **Characterization Of Dry Powder Inhaler Formulations Containing Gefitinib-Hsa Nanoparticles**
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PP -41 **Studies On Preparation, Characterization And Stability Of Electrospun Proliposomes**
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PP -42 **An Alternative Evaluation Method For Phytocosmetics, Nutraceuticals And Medicines**
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PP -43 **Effects Of Face Masks On The Skin In The Covid19 Pandemic**
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PP -44 **Hyaluronic Acid And Caffeine Quantum Dots For Wound Healing And Skin Reparing In Patients Having Neurodegenerative Diseases**
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PP -46 **Synthesis And Biological Evaluation Of Some N-(Arylaminomethyl)-Benzoxazolone Derivatives**

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PP -47 **Synthesis And Biological Evaluation Of Some Phthalimide-Mannich Derivatives As A-Glucosidase Inhibitors**

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PP-48 **A Review Of Patient Compliance In The Treatment Of Parkinson's Disease**

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PP -49 **Studies On Synthesis Of Novel Methyl Tetrazolo Thiazolyl Carbamate Derivative Compounds As Anticancer Agent**

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PP -50 **Studies On Some 4-Phthalimidobenzensulfonamide Derivatives As Potential Mtdl For The Treatment Of Ad And T2dm**

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PP -51 **Assessment And Management Of Adult Asthmatic Patients In Community Pharmacies Of Port Said, Egypt.**

SYED SIKANDAR SHAH

PP -52 **Combinatorial Dual Drug Carbon Quantum Dots For Local Anesthesia**

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PP -53 **Cqd-Conjugated Metformin Effects On Alzheimer's Disease**
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PP -54 **Production Of Composite Tissue Scaffolds For Cartilage Tissue Engineering**
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PP -55 **A-Glucosidase Inhibitory Effect Of Aerial Parts Of Endemic Alkanna Trichophila Var. Mardinensis Hub.-Mor. Ethyl Acetate Extract**
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PP -56 **Synthesis And Cholinesterase Inhibitory Potential Of 2-Phenoxy-N-Substituted-Acetamide Derivatives**
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PP -57 **Preparation Of Expression Plasmid For Recombinant Production Of Tumor Necrosis Factor Alpha In Escherichia Coli**
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PP -58 **Salicylic Acid Carbon Quantum Dots As A Neuroprotective Drug**
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PP -59 **Design And Evaluation Of Surface-Coated Plga Nanoparticles With Poloxamer 188 As A New Drug Carrier Containing Methylene Blue And Galantamine To Treat Alzheimer's Disease**
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PP -60 **Pharmaceuticals Roles Of Hydrogels**
Behiye ÖZTÜRK ŞEN

PP-61 **A New Look At Medicinal Mushrooms**

Behiye ÖZTÜRK ŞEN

PP -62 **Drug Usage Of Vegan Patients**

Behiye ÖZTÜRK ŞEN

PP -63 **Current Methods In Cancer Treatment**

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PP -64 **Recent Developments In Molecular Docking And Challenges**

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PP -65 **Heterocycles In Anticancer Agents**

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PP -66 **New 1,3,4-Oxadiazole Derivatives: Synthesis And Cytotoxic Activity**

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PP -67 **Investigation Of The Immune Regulatory Effect Of Propolis**

Zehra Gül MORCIMEN

PP -68 **Development And Characterization of Quercetin-Loaded Folate-Plga NanoParticle Formulations and In Vitro Evaluation In Breast Cancer**

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PP -69 **Preparation And Characterization Studies Of The Nanoparticle Formulations Of The Pharmaceutical Part Of The Radiopharmaceutical To Be Developed For Use In The Diagnosis Of Alzheimer's Disease**

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PP -70 **Discovery of Novel Egfr Kinase Inhibitors: Synthesis, In Silico and Biological Studies**

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PP -71 **Synthesis And Biological Activities Of Some Benzazole Derivatives**

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PP -72 **Nanoparticle-Based Carnosine Surface for Target Cell Line**

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PP-73 **A New Privacy-Preserving Blockchain-Based Integration Platform for Traceability of Rare Diseases**

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PP -74 **Novel 1,3,4-Oxadiozole Oxime Hybrids: Design Synthesis, and Characterization**

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PP -75 **Citicoline Quantum Dots In The Treatment Of Neurodegenerative Disease Glaucoma**

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PP -76 **Cost-Effective Plasmonic Biosensor Platform For Label-Free Virus Detection**

Fatma KURUL

PP -77 **Refractive Index Sensing Based Plasmonic Platform for Monitoring of Single Cell Growth**

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PP -78 **Evaluation Of Rivaroxaban Crushed Tablet Suspension with Nasogastric Tube Application By In Vitro Analysis**

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PP -88 **Preperation Of a Cationic Nanoemulsion For Vaccine Delivery Of Toxoplasma Gondii pDNA**
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PP -89 **Liposomes For Vaccine Delivery Of Toxoplazma Gondii pDNA**
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PP -91 **Investigation Of Antioxidant And Antimicrobial Activities Of Muscari Armeniacum**
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PP -92 **Investigation Of Neuroregenerative Effects The Of Graphene In In Vitro Spinal Cord Injury Models**
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PP -95 **Electrochemical DNA Biosensor Applications With Newly Developed Electrode Surfaces Based On Carbon And Metal Oxide Nanoparticles**
Elifcan Emiroğlu BÖLÜKBAŞ

PP-96 **Investigation Of Biological Activities Of Arnebia Densiflora**
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PP -97 **Sorafenib Loaded Zif-8 Metal-Organic Frameworks As A Multifunctional Nano-Carrier Offers Effective Hepatocellular Carcinoma Therapy**
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PP -98 **Development And Characterization Of Sprayable Thermosensitive Benzydamine Gels For Dermal Application**
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PP -99 **The Effects Of Early Life Stress On The Kynurenine Pathway Enzymes In Rats**
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PP -100 **Investigation Of Molecular Mechanism For Chromatographic Resolution In Kiral Ethanol Ester Derivatives**
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PP -101 **Comparison Of Online Drug Interaction Programs In Terms Of Drug-Drug Interactions Identified In A Palliative Care Clinic**
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PP -102 **Antidepressant-Like Effects Of New Thiadiazole Derivatives**

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PP -103 **Antidepressant-Like Effects Of Some Piperazine Derivatives**

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PP -104 **Beneficial Effect Of Schinus Molle L. Essential Oil Inhalation On Scopolamine-Induced Impairments In Spatial Learning And Memory Performance Of Rats**

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PP -105 **Effects Of Subacute Ivermectin Administration On The Emotional Behavior Of Rats**

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PP -106 **Anti-Inflammatory Effect Of Syringic Acid: In Vivo And In Silico Results**

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PP -107 **Anxiolytic-Like Effects Of Some Piperidine Derivative Compounds Containing Benzimidazole Ring In Their Structure**

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PP -108 **Anxiolytic-Like Effects Of Some Piperidine Derivative Compounds Containing Benzimidazole Ring In Their Structure**

Özay ÖZTÜRK

PP -109 **Simultaneous Hplc Determination Of Ruscogenin, Neuruscogenin And Trimebutine In The Presence Of The Parabens**

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PP -110 **Phytotherapy In Oncology**

Arda KAVADAR

PP -111 **Regular Changes The Magnetic Characteristics Of Living Systems Under Stress Factors**

Rovshan KHALILOV

PP -112 **The Qualitative And Quantitative Analysis Of Phenolic Compounds Of Teucrium Chamaedrys Subsp. Chamaedrys And Teucrium Divaricatum Subsp. Villosum Plants By HPLC-DAD**

İrem Nisa KARABOYUN

PP -113 **Preformulation Studies Of Semi-Solid Lipid Nanoparticles For Topical Application**

Seda RENÇBER

PP -114 **Preparation And Characterization Of Gels Containing Linezolid Loaded Nanoparticle For Diabetic**

Yusuf POLAT

PP -115 **Development, Characterization And In Vitro Evaluation Of Nanoparticle Based Gene Therapy Approach For The Treatment Of Prostate Cancer**

Ezgi AYDIN

PP -116 **Piperidine / Piperazine Hydrazide Derivates As Donepezil Analogs And Evaluation Of Cholinesterase Inhibitory Activities**

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PP -117 **Microsphere Formulations Loaded With Tofacitinib Citrate For Intra-Articular Administration**

Özge DEMIR

PP -118 **Pharmacognosic Studies On Capparis Spinosa**

Rümeysa HARMAN

PP -119 **Induction Of PTEN Expression With Liposome:Pdna-PTEN Complex For The Treatment Of Breast Cancer Treatment : In Vitro Pre-Evaluation Studies**
Gizem ÇETINER

PP -120 **Analysis Of The Interaction Of An Anti-Diabetic Drug With Dna By Electrochemical Methods**
Hüseyin Oğuzhan KAYA

PP -121 **Antimicrobial And Anti-Biofilm Activities Of Kojic Acid Derivatives Against Bacteria And Fungi**
Aybala TEMEL

PP -122 **The Effect Of Prenatal Stress On The Expression Of Schizophrenia Candidate Genes In The Cerebral Cortex**
Irmak BAYAZIT

PP -123 **Prenatal Stress Has An Impact On The Gene Expression Of Fatty Acid Binding Protein-4 In Peripheral Tissues**
Sultan OZTURK

PP -124 **Synthesis Of Phenalenone-Based Probes And Investigation Of Their Optical Properties**
Simge KALMAZ

PP -125 **Development Of A New Fluorescent Probe For The Selectıv e Detection Of Fe3+ Ions** Berna Ceren ÖZCAN

PP -126 **Investigation Of Antibacterial, Antifungal And Antibiofilm Activities Of Origanum Onites L. Plant Extracts**

Aysun ÇELMELİ

PP -127 **Investigation Of Antimicrobial And Antibiofilm Activities Of Hypericum Perforatum L. Plant Extracts Against Bacteria And Fungi**

Bengüsu YILMAZ

PP -128 **Neuroprotective Effect Of Venlafaxine Against Lps-Induced Inflammation In Sh-Sy5y Cells**

Aiche İdil ARAP

PP -129 **Use Of Click Chemistry In Drug Development Applications**

Beyza DÜZLEYEN

PLENERAY LECTURES

PL01 – Cosmetics Have Something About Feeling Good

Beril KOPARAL ERGÜN

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"Wellness", the most important topic of recent years. It includes 7 topics of well-being. One of these is spiritual well-being. Cosmetics (both dermocosmetics and color cosmetics) are closely related to this mental well-being. On the other hand, the protection of skin health (predominantly by dermocosmetics) also covers physical well-being, which we cover under wellness. In recent years, color cosmetics have also contributed to skin care by enriching it with active ingredients and using fewer chemicals. In this context, the concept of color cosmetics that care for the skin is growing. However, having good skin, and especially seeing ourselves beautiful, is very important for feeling good about ourselves. The link between skin health and beauty and psychology has been known for years.

PL02 - Past, Present and Tomorrow of Pharmacy

Mehmet MÜDERRİSOĞLU

Türkiye

As a pharmacist for fifty-three years, I have had the chance to work in almost every branch of our profession. In every period of this profession, we have managed to reach salvation by experiencing certain difficulties. However, recently, and especially among young pharmacists, I see a despair syndrome that I find very dangerous. I think that the lack of hope in the future, from new graduates to senior pharmacists, is a very important issue that needs to be emphasized. While 85% of young people graduating from pharmacy faculties hope to open a pharmacy, the others are looking for a future in hospital and state pharmacy. At the point we have reached today, there are still many things that can be done in this profession and remedies that will give hope.

On April 12, 2014, while we were waiting for a regulation that could replace the law numbered 6197 published in 1953, which we expected with great hopes, I would like to state that unfortunately, it threw us backwards from 1953.

1. About thirty years ago, when the late Professor Suna Duru was the chairman of the pharmaceutical license commission, I read about six thousand pages to examine world practices and presented a forty-one-page law text to them for over-the-counter medicines called O.T.C. Today, I still do not think that there is a pharmacist who can know this subject in more detail than me. If the right and future-oriented decisions can be taken, the O.T.C. will be a hope of salvation for the future of the pharmacist.
2. Pharmacists should be made productive. We graduated by studying both phytopharmacy and cosmetology in our education. The world's greatest inventions, cosmetics and nutritional supplements have always come out of pharmacies, that is, pharmacists.
3. When Nutritional Supplement products are licensed by the "MINISTRY OF HEALTH", they should only have the phrase "SELLABLE IN PHARMACY" on their packaging. Since these products are complementary or supportive to existing medicines, they are too important to be left to herbalists or unconscious traders.
4. Pharmacists should be given the right to retire, i.e. after the age of sixty-five, they should be able to retire by appointing a managing director.
5. A pharmacist-pharmacist partnership should be allowed, this will bring the financial power required by larger capital and the increase in service arising from cooperation. A pharmacist-pharmacist partnership would also give hope to the pharmacist if a previously tried and failed decision, such as the restriction on opening a pharmacy, is changed.

INVITED LECTURES

IL01 – Neurovascular contributions to dementia

Müge YEMİŞÇİ ÖZKAN

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The brain is the most complex organ of our body and has the highest energy requirement compared to its size. This highly dynamic need primarily for oxygen and glucose, as well as for other macro- and micro-nutrients should be provided quickly and in sufficient quantity to the right place at the right time, therefore necessitating a tightly regulated and continuous cerebral blood flow. If there is a sudden cessation like an abrupt occlusion of a cerebral artery, such as in the case of a stroke, the cells die, and the brain is damaged irreversibly. If the blood flow is decreased and cannot supply the energy demand, then subtle changes occur that lead to chronic injury in the susceptible areas, and hence may lead to dementia. The neurovascular unit (NVU) is a special structure formed to meet the timely requirements of the brain. It is located between the brain parenchyma and vessels at the capillary level, consisting of endothelial cells, astrocytes, neurons, microglia, vessel smooth muscle cells and pericytes. The most vital role of NVU is the coupling between neural activity and blood flow. Our experimental studies demonstrated the importance of pericyte cells of the NVU, which wrap the vessels at the capillary level and are responsible for the regulation of cerebral microcirculation via their contractile properties. Pericytes play an important role in the pathophysiology of stroke or post-stroke dementia. We have shown that alpha-smooth muscle actin is an essential protein that is closely related to the contractile properties of pericytes. Besides, pericytes have roles in blood brain barrier and hence in the regulation of vessel permeability. Our recent studies also verified the presence and roles of a folate carrier RFC1 protein in the pericytes. NVU has roles both in health and disease. The recently emerged NVU dysfunction in neurodegenerative diseases, supports emerging concepts that would provide opportunities for novel therapeutic approaches in these disorders.

IL02 – Emerging Perspectives on Gene Therapy in Child Neurology

Uluç YİŞ

Dokuz Eylül University, TURKEY

Cmt Sisteminde Özet Yok

IL03 – Where are we in the treatment of Alzheimer's disease?

Yaprak SEÇİL

İzmir Katip Çelebi University, Turkey

Cmt Sisteminde Özet Yok

IL04 – Psychological Consequences Of Diseaster

Tolga KÖSKÜN

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Disasters are defined as events that seriously disrupt the lives of societies, cause widespread human, property, economic and environmental losses, and exceed the societies' own coping resources [1]. The severity of the impact is related to the characteristics of the disaster, the individual's pre-disaster status, personality traits, post-disaster difficulties, resources, and ways of coping [2]. Psychological reactions that can be seen after disasters include negative emotions such as anxiety, fear, anger, sadness, and memory, concentration, sleep and appetite problems. In terms of psychopathology, it is known that symptoms of disorders such as post-traumatic stress disorder (PTSD), depression, anxiety disorders, alcohol abuse, and somatization are common [3,4]. Individuals diagnosed with PTSD after the disaster may experience avoiding places, memories, and people associated with the event; re-experiencing; hyperarousal and startling in the face of stimuli reminding of the event; negative feelings and thoughts; attention and concentration problems, not being able to remember certain parts of the event [3,4,5]. However, traumatic events such as disasters shake people's core beliefs about the world, themselves, and other people. Challenging core beliefs cause people to think repetitively about the event. In this sense, it is stated that it is important to restructure one's core beliefs about the world in the healing process. Disasters lead to the loss of people's sense of security and control and cause feelings of hopelessness about the future. Finally, some positive psychological consequences may also occur after traumatic events. Appreciation of life, realizing the new possibilities in life, personal strength, change in interpersonal relationships, spiritual/existential change are some of them [6]. In this sense, both individual and social interventions have an important place in the post-disaster recovery process.

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IL05 – Interview With Dev Adam On His Career Journey

Erhan GÖLBEY

Dev Agency, Turkey

Cmt Sisteminde Özet Yok

IL06-IL07– Opening Doors With Creative Drama

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Creative drama offers individuals an active learning practice that goes beyond traditional teaching methods. It provides a hands-on learning experience where participants are actively engaged. In this aspect, it presents an effective method for individuals to explore learning, increase awareness, promote development, and open doors they seek in terms of their personal growth.

Creative drama in education is a teaching method where the focus is on the students/individuals rather than the instructor. It emerged in the early 1900s in England and gradually gained popularity. This internationally accepted teaching method first started academically in Turkey in 1982 under the leadership of the pioneer academician, Inci SAN, and theater artist Tamer LEVENT. These same individuals also organized the first international symposium in Turkey (1985) and established a non-governmental organization called Contemporary Drama Association (CDA) in 1990. With the establishment of CDA, the field of creative drama found its place in the education system and began to be used as a teaching method for personal/professional development and art education (Adıgüzel, 2019).

"Creative drama is the enactment of a purpose or idea, utilizing techniques such as improvisation and role-playing, based on the life experiences of a group of individuals. These enactment processes are conducted under the guidance of an experienced instructor and rely on spontaneity, the principles of here and now, and the "as if" approach. Creative drama draws upon the general characteristics of play." (Adıgüzel, 2019, p. 73).

For creative drama workshops, the essential elements include a group of participants, an instructor, a space, and a topic. The creative drama process unfolds in three main stages: preparation/warm-up, enactment, and evaluation/discussion. Role-playing and improvisation techniques play a central role in creative drama enactments. The outcomes of a creative drama workshop are shaped by the achievements that will be gained through these enactments (Adıgüzel, 2019).

As an education method, the field of creative drama is used in both educational and practical processes in various professional fields. In this regard, it is believed to be important to incorporate it into pharmacy faculties' educational activities, in-service training processes, awareness campaigns, social responsibility projects, and more.

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IL08– Pharmacist Coaching

Nur KARATAŞ

When we communicate in daily life, we encounter very few opportunities for active rest. For people, resting actively and with interest is a contact message and a need. In a documentary I watched on a platform, Jonah Hill broadcasts his conversation with his therapist Phil Stutz to shed light on other people. Jonah says there, the person I'm hiding my problems from just listens to me and doesn't give suggestions, whereas my friends that I just want to listen to me give me advice even though it's not their job. Coaching is moving forward in this area. The coaching person actively listens to the client, does not direct or manipulate. It does not judge the client with its own value judgments. It focuses on the person, what they really want and their potential. It reveals the potential within the person to reach the goals he wants to reach in life. When people understand some of the basic methods of coaching, they can also coach themselves. You can think of it as going outside of yourself and meeting with yourself. For this, important methods in coaching can be used. Some of these methods are; wheel of life model, transactional analysis, digging, revealing presentation, setting goals, using timing when setting goals, making decisions, determining values, brainstorming, challenging, using discretionary perspective, reframing.

IL09– Opening Doors With Creative Drama

Cavide Esra ÖZDAĞ

Buca Provincial Health Directorate

BİLİM FELSEFESİ, bilgi kuramı, bilen ile bilinen; suje ile obje yani insan ile nesne arasındaki ilişkiyi inceleyen felsefe disiplinidir. Konusu da bilgi kuramı, bilginin eleştirisini yapmak, kaynağını, özünü, niteliklerini araştırmak, bilginin mutlak mı yoksa göreceli mi olduğunu irdelemek gibi konuları araştırır. '' Ancak imgelem bilgiden daha önemlidir. Bilgi sınırlıdır. İmgelem evreni kuşatır. ''

AKILCI İLAÇ POLİKLİNİĞİ ARAŞTIRMA PROJESİ:

- Ordu ili Korgan ilçesi Devlet Hastanesi'nde 28 Mayıs 2014'te Ecz. Esra ÖZDAĞ tarafından başlatıldı.
- Kasım 2014'te Bilimsel Araştırma Projesi'ne dönüştürüldü
- SB-ODÜ Eğitim ve Araştırma Hastanesi'nde yürütülmeye başlandı.

YAKIN ERİMLİ HEDEF

- Hastane eczacısının katılımı ile, kronik hastalıklar; diyabet (DM), hipertansiyon (HT) hiperlipidemi, kronik obskrüktif akciğer hastalığı (KOAH), astım ve çoklu ilaç kullanımındaki değişiklikleri
  - Klinik veriler,
  - Yaşam kalitesindeki iyileşme,
  - Maliyet etkinliği, açısından bilimsel kanıta dayalı olarak değerlendirmektir.
- Kronik hastalıklarda AİP uygulamasında amaç, hekimin uygun gördüğü tedavinin doğru uygulanıp izlenmesinin sağlanmasıdır.
- AİP (Akılcı İlaç Polikliniği) DİYABET Sonuçları:

İlk başvuru ve 2.Kontrol İzlemleri HbA1c (%) Düzeyleri

HbA1c	Sayı (n)	Ortalama	Standart Sapma	Test İstatistiği
İlk Başvuru	54	8,5	± 1,6	*t:4,807 p=0,005
1.Kontrol	54	7.7	± 1,4	

AKILCI İLAÇ POLİKLİNİĞİ ARAŞTIRMA PROJESİ:

- Sağlık Bakanlığı Kamu Hastaneler Kurumu, Stok Analiz Daire Başkanlığı tarafından düzenlenen "Yılın Hastane Eczacısı Proje Yarışması"nda 2015 yılında birincilik ödülü almıştır.
- Sağlık Bakanlığı Türkiye İlaç ve Tıbbi Cihaz Kurumu tarafından düzenlenen proje yarışmasında 2017 yılında 3. lük ödülüne layık görülmüştür.
- Uzm.Ecz .Esra Özdağ Eczacı dergisi tarafından 2019 yılında klinik eczacılık dalında altın havan ödülüne layık görülmüştür.

İngiltere'de yapılan ve dönüm noktası niteliğindeki *UK Prospektif Diyabet Çalışması (UKPDS)* sonuçlarına göre, HbA1c düzeyinin her %1 oranında düşürülmesi, tüm ölüm nedenleri arasında %14, diyabetle ilgili ölüm oranlarında %21, diyabetle ilgili oluşabilecek komplikasyon oranında ise %21'lik bir azalma olmaktadır.

IL10– Synthesis, Analysis "Risk-Knowledge-Data" Based Process & Impurty Evaluation of Drug Substances -Online

Esen Bellur ATICI

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During the synthesis of active pharmaceutical ingredients (APIs), process-related impurities or degradation products may form. As per the general guidelines recommended by International Conference on Harmonisation (ICH Q3A) to qualify the drug substance, the amount of acceptable level for a known and unknown impurity should be less than 0.15% and 0.10%, respectively. [1] As a general rule, the in vivo response to a mutagenic carcinogen is proportional to the (daily) dose and duration of dosing. According to ICH M7, limits can be based on the LTL (less-than-lifetime) principle in that higher exposures (based on specific multiples of a lifetime limit) to a mutagenic impurity over periods of ≤ 10 years are less likely to produce a carcinogenic response in patients than lifetime exposure. A limit based on chronic (lifetime) administration can be considered a virtually safe dose for a carcinogenic compound (threshold of toxicological concern (TTC): 1.5 µg/day). According to ICH M7, alerting structures (class 3) having no mutagenicity data should be controlled at or below acceptable limits (TTC: 1.5 µg/day). [2,3] In order to meet the stringent regulatory requirements, impurities should be identified and their amounts should be controlled carefully. Impurities detected during the process development studies of APIs and potential impurities should be identified, synthesized, and characterized and the mechanism of their formation should be clarified.

One of the most important steps in designing, developing, and optimizing the synthesis of an API is the control of impurities formed during the reactions. The key is to determine the structure of the impurities and then clarify how they are formed. The simplest option here is to adjust the reaction conditions (reagents, solvents, temperature, concentration, order of addition, etc.) to prevent or minimize the formation of these impurities.

In this concept, the process development stages of an immunomodulatory imide drug (IMiD), a class of immunomodulatory drugs that adjust immune responses containing an imide group; synthesis, analysis, and risk-knowledge-data-based process/impurity evaluation will be presented. Analytical studies carried out in this work supported our synthetic process development and optimization studies and enabled us to see critical points of the process and impurities that need to be followed and controlled. With the knowledge of the impurities and their formation pathways, the synthetic process was optimized to eliminate and/or minimize the formation and carry-over of the impurities to the final drug substance. Also, setting tight and justifiable impurity limits for the starting materials and control of potential impurities including the genotoxic/mutagenic ones resulted in the production of highly pure API on a commercial scale. The product manufactured by using this drug substance is commercially available in Türkiye and European markets and has been submitted to US FDA.

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IL11– Magnetite Biomineralization In Plants And It's Biomedical Applications -Online

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Structural-functional changes and new physico-chemical properties that occur during stress in various living systems were investigated by us. As a result of studies conducted by the method of Electron Paramagnetic Resonance (EPR) spectroscopy, it was found that new magnetic properties are created in living systems during stress factors [1,2].
Identification of EPR spectra of dried samples of different plant and animal organisms recorded in a wide range of magnetic field (500-5500 G) showed that stress factors lead to the formation of nanophase iron oxide particles [3,4].
In our research, the leaves and seeds of various types of tree and shrub plants, which are widely distributed in Absheron, as well as the sprouts of various types of plant seeds germinated in laboratory conditions as a model system, were studied by the EPR method. In the recorded EPR spectra, in addition the signals of iron ions (g=4.3) and free radicals (g=2.0023), was also observed characteristic broad EPR signals of iron oxide nanoparticles (g=2,32; ΔH=320 G) detected by us for the first time in various organs of plants. Depending on the influence of stress factors, the regular change of the intensities of these signals was observed. In order to make sure the universality of the obtained results, we continued our research with the study of animal organisms. Among animal organisms, grape snails with shell (Helix pomatia) and laboratory rats (Wistar albino) (control and irradiated) were studied. [5,6].
It has been known that stress factors cause the formation of magnetic properties in living systems. The obtained results were confirmed by the Transmission Electron Microscope [7].

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IL12– Essential Oils And Neurodegenerative Diseases

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Central nervous system pathologies including neurodegenerative diseases increase with the aged geriatric population worldwide, having major health consequences. Essential oils in aromatherapeutical as well as in phytotherapeutical applications still have an impact with their neuroprotective, and anti-ageing potential, not only because of their successfull traditional use, but also according to supportive *in vitro, in silico* and recent *in vivo* studies reported.

In this presentation both experimental, and literature data of essential oils, volatiles and their constituents with potential on cholinesterase (AchE – BuChE), monoamino oxidase (MAO), tyrosinase inhibitions will be discussed.

Acknowledgement: This work is dedicated to those who deceased on Feb 6th during the century earthquake.

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IL13– Human Gut Microbial Metabolites -a Window to Gut Function And Gut Host Signalling (Online)

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The human gut microbiota has a large capacity for chemical biotransformation of compounds present in the gut lumen. This has a large impact on energy extraction from the food. It is also a major source of bioactive compounds affecting gut function as well as remote organs in the human body, including liver, kidneys and brain. The substrates in the gut include carbohydrates, amino acids and several endogenously secreted compounds such as bile acids. The best studied microbial metabolites include the secondary bile acid products and the short-chain fatty acids from carbohydrate fermentation. However, amino acid biotransformation products are also of major importance and include among others branched short-chain fatty acids, D-enantiomers of amino acids, and several indole- and phenyl-substituted simple aliphatic acids. Some of these compounds have local effects on stimulating or attracting immune cells or on gut function; actually the abiotic factors in the gut environment also determine which metabolites are formed. Importantly, the metabolites also reveal the nature of the substrates being fermented and this indicates the function of the gut and shows large inter-individual variability. Some microbial metabolites reach the circulation and affect kidney function, brain and other organs. The gut metabolite profiles measured in stool, blood or urine therefore constitute an important window into an individual's gut function and potentially many other aspects of health.

IL14– Epidermal Sensors For Medical Diagnostics (Online)

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Epidermal bioelectronic devices show great promise in healthcare due to their ability to provide longitudinal monitoring as well as on-demand delivery to maintain optimal health status and evaluate patients' physical conditions.[1] Epidermal biosensors are at the center of this effort and offer a vast potential to revolutionize conventional diagnostics that uses traditional laboratory tests-based evaluations, usually called 'clinical labs,' that are slow and mainly require in-person visits and frequent invasive sampling if the long-term analysis is necessary.[2]

In this presentation, I will give a brief overview of our recently developed epidermal diagnostic approaches targeting various metabolites, hormones and microorganisms as well as some of skin physical and chemical parameters to acquire better knowledge on early diagnosis and disease progression particularly for metabolic diseases and infections. This talk will summarize how to design epidermal sensors, and integrated electronics and how to use them in clinical settings with our unique access to patient materials, which creates an unprecedented opportunity to address fundamental questions in medical diagnostics.[3-4]

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IL15– Mithocondria-Based Targeted Metabolomics Analysis For Neurodegenerative Diseases

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A comprehensive analysis of intermediate molecular levels such as protein, metabolite, and lipid is necessary to illuminate direct causal and functional linkages between genotype and phenotype [1-3]. In this regard, multiple sample sets/aliquots and analytical methods are required to cover different intermediary molecular levels due to the dissimilarity of the physicochemical characteristics of biomolecules [4-5]. However, existing methods used for the simultaneous analysis of metabolites and lipids have not been thoroughly tested for reproducibility and wide applicability. Here, we developed and optimized comprehensive, reproducible, and robust metabolomics and lipidomics analysis from plasma samples. For this, we used experimental design strategies for developing a single-step extraction protocol and optimizing analytical protocols for GC–MS and LC-qTOF-MS analysis. The extraction efficiency of acetone, acetonitrile, ethanol, methanol, water, and combinations was tested for metabolites, whereas hexane, chloroform, dichloromethane, and methyl tert-butyl ether were tested for lipids. The methanol:water:chloroform (3:1:3, v/v/v) mixture was superior to the other extraction solvent combinations in all performance measures. We found that the derivatization efficiency increased with a higher concentration of methoxyamine hydrochloride (30 mg/mL in pyridine) and incubation time (at 37 °C for 120 min) with MSTFA + 1% TMCS. For LC-qTOF-MS, the reconstitution solution, and the column temperature was found critical for metabolomics and lipidomics analysis, respectively. This systematic optimization by integrated GC-MS and LC-qTOF-MS enables simultaneous, reproducible, and comprehensive analysis of metabolites and lipids from a single sample, making it a straightforward and practical approach for various sample types. By less than 30% CV, 50 metabolites were identified in GC-MS, 68 metabolites, and 353 lipids in LC-qTOF-MS analysis from plasma samples.

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IL16– Health Technology Assessment (HTA) Of Neurodegenerative Diseases; Illustrations For Cell- and Gene- based Therapies (Online)

Maarten J. POSTMA

Groningen University, Netherlands

Cmt Sisteminde Özet Yok

IL17– Why Do Health Humanities & Pharmacy Narratives Matter In Pharmaceutical Education and Practice (Online)

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Health humanities is the interdisciplinary field of study involving fine arts (e.g., painting, sculpture, photography) and humanities (e.g., literature, philosophy, history) in their approach to human health, health care, and well-being issues. Narrative medicine applies the skills in analyzing literature to deal with the relationships between healthcare professionals, patients, and relatives. It facilitates a deeper understanding and acceptance of patients' stories about health events (e.g., characters, plot) and emotions (e.g., metaphors, symbolic accounts). Pharmacists are professionals strongly oriented to patient care; thus, pharmacy-based narratives can be helpful in pharmaceutical education toward an enhancement of pharmacy practice effectiveness. This presentation aims to shed light on the humane side of the profession and how humanities and narratives can contribute to optimizing patients' treatments, improving compassion, and reducing human suffering.

Acknowledgement: Isabel Fernandes, Projeto de Humanidades Médica, Faculdade de Letras Universidade de Lisboa

IL18– The Four Pieces Of The Puzzle In Pharmacy: Public-Industry-Academy-Pharmacy

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As we all know, pharmacy is a challenging 5-year education in Turkey. The number of Faculty of Pharmacy has increased from 11 in 2003-2004 academic year, to 17 in 2012-2013 and to 60 today. Of the 47 pharmacy faculties providing education, only 14 have the capacity to provide accredited pharmacy education.
According to the figures of the Ministry of Health, the number of graduates per year is over 1600, but the number of faculty members per student is decreasing and varies greatly between faculties.
According to the report titled "Health Workforce Targets and Health Education" for 2023 published by the Ministry of Health; provided that if the current conditions remain constant, by the end of 2023, there will be an excess supply of approximately 9,000 people.
So what are the options after graduation? In this speech,I will mention to you about public, academy, industry and public pharmacy, which I see as the 4 most important parts of puzzle based on my experience.

IL19– Design Characterization and In Vivo Performance of VLP Vaccine Against SARS-CoV-2

İhsan GÜRSEL

İzmir Biomedicine and Genome Center, Turkey

Cmt Sisteminde Özet Yok

IL20– Advanced Biomaterials for Wound Healing and Hemostasis

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Disruption of the integrity and functions of the skin tissue due to mechanical forces, surgical procedures, burns (chemical, electrical, or radiation), genetic disorders (such as epidermolysis bullosa), or ulcers caused by chronic diseases reduces the quality of life of the patient and even causes death. Although there are important developments in wound treatments today, chronic/complex wounds are still a major health problem and the main cause of morbidity and bring a heavy economic and social burden. The reason for this is that there are wounds that require multiple medical treatments and take a long time to heal. Therefore, effective wound healing requires an understanding of repair mechanisms, appropriate dressing selection, and effective treatment. In recent years, with a deeper insight into biological events, the developments in micro/nanotechnology opened the way for a new generation of smart biomaterials for tissue regeneration. Tremendous progress has been made in the field of skin substitutes such as multifunctional dressing materials, the use of exosomes or stem cells, the inclusion of biological signaling molecules like growth factors, and tissue engineered skin, which are considered [1-3]. In this talk, advanced and bioactive biomaterials for tissue regeneration will be discussed. Our more recent work that exosome-integrated sponges and injectable hemostatic fibroin microgel will be presented.

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IL21– Novel Nanoparticulate System for Treatment of Neurodegenerative Diseases Drug design, Synthesis and development

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New therapeutic agents, biomaterials and drug delivery systems have been developed in recent years for effective treatment of central nervous system (CNS) diseases. The most important limitation of CNS diseases pharmacotherapy is the existence of the blood-brain barrier (BBB). Due to the ineffectiveness of drug delivery across the blood-brain, treatment of CNS disorders such as stroke, neurodegenerative diseases (ND) including Alzheimer's and Parkinson's disease, and brain tumors is challenging in brain-drug delivery.

Development of nanomaterial-based drug delivery systems offers promising approach for diagnosis and treatment of neurodegenerative diseases. Engineered nanoparticles decorated with affinity ligands or BBB transporters have become new horizon for drug delivery across BBB without disrupting its structure or functionalities.

We have developed innovative multifunctional nanostructures and delivery strategies for simultaneous imaging, diagnosis and therapy of CNS-related disorders. In first approach a magnetic MRI-guided shuttle peptide conjugated with a therapeutic drug has been synthesized and characterized *in-vitro* and *in-vivo* for brain drug delivery. In second approach we have fabricated a multimodal albumin-based magnetic nanoplatform for chemoradiationtherapy of brain tumors. The nanosystem has been prepared by capping of gold-coated magnetic nanoparticles with methotrexate-albumin conjugate and curcumin payload. The *in-vivo* and *ex-vivo* evaluations have showed that both system improve the permeability of therapeutic agents across the BBB and deliver an appropriate concentration of drug into the brain tumor. These specially designed BBB crossing nanobiomaterials may be good candidates for treatment of neurological disorders and improve functional recovery in the neurodegenerative diseases.

IL22– Investigation of the Antiproliferative activities of Intermediate and Side Products of Ezetimibe Synthesis in Cancer Cells

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Organic synthesis has a crucial role in both development and large scale production of the drugs. Often multistep syntheses are required and varying amounts of intermediate and side products can also be produced. Drug developers and companies are concentrated so much in order to produce the final products; they may overlook the potentials of these unwanted side products. Although, the target driven development of novel drug candidates is a very important part of research in order to produce chemotherapeutic agents, random screening of intermediate and side products may be also a good choice to discover novel cytostatic and cytotoxic compounds. This might be especially beneficial because they are synthetically available and we do not know all of the potential intracellular therapeutic targets yet.

In this study, antiproliferative properties of a number of intermediate and side products of ezetimibe synthesis [1,2] were evaluated in cancer cells. Ezetimibe is a β-lactam based selective cholesterol-absorption inhibitor and it is prescribed for reducing cholesterol level in blood. A number of intermediate and side products can be produced during the synthesis of ezetimibe as shown in Figure 1. The structures of these products have varying functional groups like β-lactam, tetrahydropyran or oxazolidinone . Screening of the eight derivatives, including ezetimibe itself, over three cancer cell lines (MCF-7, HeLa and LNCaP) was performed by MTT. The results indicated that one of the molecules was totally inactive while four of them was found to be cytotoxic and three of them was cytostatic. Two of the cytostatic compounds are quite promising candidates because they are possessing their cytostatic properties at lower concentrations compared to pazopanib that is the positive control and a well-known a novel multi-kinase inhibitor used in the treatment of advanced kidney cancer and some soft tissue sarcoma. Further investigations to determine their mechanism of actions is underway.

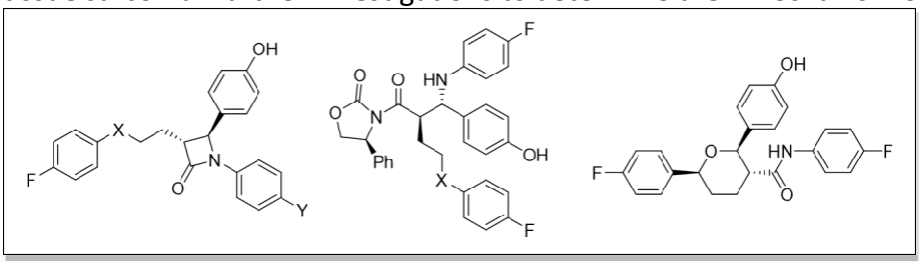

Figure 1. General representations of the structures of intermediate and side products of ezetimibe synthesis

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IL23– Pharmacological Modulation of Oxidative Stress (Online)

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Oxidative stress (OS) plays an important role in neoplastic diseases and inhibitors of nuclear factor erythroid 2-related factor 2 (Nrf2), the master regulator of endogenous antioxidant enzymes , could be useful in their treatment. However, novel approaches to redox therapies are necessary and the development of reliable biomarkers capable to predict the clinical responses is crucial.

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IL24– Production and Characterisation of Therapeutic Monoclonal Antibodies

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Chemical small molecules used in cancer and other diseases increase drug resistance with non-target toxicity problems and narrow the therapeutic window despite their extremely strong effects. In recent years, the pharmaceutical market has gravitated towards biologic drugs, with target-specific therapeutic monoclonal antibodies (mAbs) at the forefront of research. Studies are continuing on the production of biosimilars of mAbs that have been approved and started to be used in treatment. Therapeutic antibodies have been very effective in treating many types of diseases, including cancer, autoimmune and infectious diseases. The expiration of patents for many biotechnological drugs encourages the development of biological medicinal products "biosimilars", which cost less but do not have significant clinical differences in quality, safety and efficacy. MAbs are large molecules (150 kDa) and their structure is extremely complex and dynamic. To ensure product safety and efficacy, the physicochemical (structural) and functional properties of mAb, which have been extensively produced throughout mAb development and production, need to be characterized by a comprehensive set of modern analytical techniques.

Mab to be produced by the research cell bank (RCB) must be proven to be similar to the original drug by analytical and functional analyzes according to EMA and FDA regulations. The most important criteria in the biopharmaceutical drug development process is to have a vector with a high production capacity and a licensed cell line that is not subject to patent screening. Expression vectors are specially designed for the creation of stable cell lines to make recombinant proteins. These vectors have optimized sequences assembled in an optimal arrangement to maximize cellular production. The characterization of the primary structure and molecular identity of the produced biosimilar is performed using different orthogonal methods, after the concentration of the purified form is determined by protein A in UPLC. The analyzes and characterizations of biological drugs are performed with great emphasis on GMP and regulatory compliance and require highly complex analytical workflows. The developed product have to been evaluated in terms of structural, physicochemical and biological aspects. In this concept, amino acid sequencing, peptide mapping and N-glycan structure analyzes through LC-MS; molecular mass through LC-MS and SDS-PAGE; titer analysis, isoform profile, impurities and hydrophobic interaction through HPLC; isoform profile and isoelectric point through Capillary Electrophoresis (CE); protein concentration through spectrophotometry; pH and osmolality measurements; process impurities through ELISA, qPCR; biological characterization through surface plasmon resonance (SPR), western blot, ELISA are performed.

IL25–Radiotracers for Imaging of Neurodegenerative Diseases (Online)

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Neurodegenerative diseases such as Alzheimer's disease (AD), Parkinson's disease (PD), amyotrophic lateral sclerosis (ALS) and Huntington disease (HD) share several pathological features such as abnormal protein aggregation and neuroinflammation. Besides *in vivo* PET imaging of involved neurotransmission systems, exploration of these shared processes is highly valuable for improvement of the early and differential diagnosis, follow up and treatment evaluation. This exploration requires the choice of the relevant molecular target and the availability of specific radiotracer of each target. PET imaging of misfolded proteins characteristics of AD, i.e. Aβ and hyperphosphorylated tau, is to date achievable whereas no tool is yet available for α-synuclein aggregates which is the main feature of synucleinopathies (including PD, dementia with Lewy body and multiple system atrophy), and TDP43 present in ALS. Brain neuroinflammation can already be explored using radioligands of the mitochondrial marker of microglial activation 18kDa translocator protein (TSPO), although more specific targets are searched at the same time. Through the presentation of various PET studies in animal models and humans, the interests and limits of this imaging modality will be discussed.

IL26– Oral Lipid Based Drug Delivery Systems with Recent Scientific And Regulatory Approaches

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The oral route is the easiest for non-invasive administration. Therefore, most of the drugs on the market are given orally as it is both convenient and cost effective. However, there are many problems associated with this pathway, especially with poorly soluble drugs. Researches have attributed more than 40 percent of failures in new drug development to poor biopharmaceutical properties, particularly poor water solubility. In particular, problems with the low solubility of the active ingredient can delay or completely derail new drug development. New approaches in the formulation of water-insoluble drugs have provided significant benefits in reformulating many products currently on the market [1,2]
In recent years, lipid-based drug delivery systems (LBDDS) have been frequently used in formulation development studies of low-soluble active substances. Because many new drug molecules and existing drug molecules show low solubility, resulting in poor bioavailability and inter/intra-personal differences [3]. For the poorly soluble and low bioavailability drugs, among the most promising approaches are developed lipid formulations. LBDDS are one of the emerging technologies designed to address such challenges. Encapsulating or solubilizing the drug in lipid excipients can lead to increased solubilization and absorption, resulting in enhanced bioavailability [2,4]

In this presented, it was aimed to develop different lipid-based formulations containing poorly soluble drugs and to compare these formulations among themselves with in vitro and in vivo characterization studies [5,6,7,8,9]. Consequently, in this study poorly soluble drug's new LBDDs may be suggested with increased oral bioavailability as an alternative to classical dosage forms.

Acknowledgement: This study was supported by The Scientific and Technological Council of Turkey [TUBITAK Project No: 117S821, TUBİTAK, 112S637].

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IL27– Digital Healthcare Services for Drug Therapy Optimisation In the Elderly

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Health systems' goals include pursuing health care that is high quality, efficient, equal, affordable and accessible. The performance of health care systems in achieving this goal is affected by technological change i.e. digitalization of health services. Digitalization refers to use of digital technologies in the context of the production and delivery of a product or service. Digital technology has been driving a revolution in health care with mobile medical apps and software that support the clinical decisions of doctors, artificial intelligence and machine learning based tools that improve their ability to accurately diagnose and treat diseases, and digital tools to enhance the delivery of health care for the individual. Digital health services are defined as health services that are in part or fully digitalized. These services use digital elements to contribute to the goals of the service. The world's population is ageing rapidly. Increasing life expectancy brings new challenges for effective patient care related with the facts that the elderly has more chronic disorders that may be worsened by the drugs or affect a drug response; they use more drugs increasing the risk of adverse effects, drug interactions and non-adherence; they are frail; they have altered pharmacodynamics and pharmacokinetics of drugs; and they may be less able to obtain or afford drugs. A major risk of polypharmacy is potentially inappropriate prescribing which is defined as pharmacotherapy that fails to follow the accepted medical standards. This can include potentially inappropriate medication (PIMs) in which the risk outweighs the potential benefits and potentially prescription omissions (PPOs) which means not prescribing a beneficial medicine although it is not contraindicated. In this lecture information about the existing and future digital healthcare services designed to optimize drug therapy in the elderly will be addressed.

IL28– Regulatory Requirements for Bioequivalence Studies

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Generic medicines can only enter the market following the expiration of the patent for the innovator medicine. They are usually manufactured without a license from the innovator company and marketed after the expiry of patent or other exclusivity rights. They are also manufactured to the same internetional quality standards and GMP requirements as those required for innovators. As clinical trial data on the safety and efficacy of the active ingredient is already available from the innovator, these expensive, lengthy studies are not required for a generic. Instead, bioequivalence studies, performed to strict internationally agreed standards, are accepted by regulatory authorities worlwide.

The comparative bioavailability assessment of two or more formulations of the same active ingredient to be administered by the same route is termed bioequivalence. In bioequivalence studies, the plasma concentration time curve is generally used to assess the rate and extent of absorption. Selected pharmacokinetic parameters and preset acceptance limits allow the final decision on bioequivalence of the tested products [1].

There are various parameters such as study design, fasting or fed studies, volunteers recruitment, study dose, sampling points, analytical method validation parameters, pharmacokinetic parameters to assess bioequivalence and each authority has its own guidance/guidelines for the conduction of bioequivalence studies before approval of generic products. In Europe “Guideline on the Investigation of Bioequivalence” represents the most progressive bioequivalence guideline currently available in the ICH region [1]. This guideline specifies the requirements for the design, conduct, and evaluation of bioequivalence studies for immediate release dosage forms with systemic action The current guidelines for bioequivalence study in Turkey are consistent with this guideline described the principles of bioequivalence studies [2,3].

Bioequivalence study should be performed in compliance with Good Clinical Practice (ICH-GCP) [4], the Declaration of Helsinki [5] and national and international guidances/guidelines [1,2,3,6,7,8], .

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IL29– Polypharmacology in Fibrotic Disorders: Bench To Clinic Translation of Third Generation Cannabinoid Receptor 1 (CB1R) Antagonists (Online)

Reşat ÇINAR

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Fibrosis, a progressive and complex process affecting multiple organs with heterogeneous etiologies, leads to organ dysfunction and causes substantial economic burden. Patients with fibrotic diseases have large unmet medical needs and limited treatment options. Multiple failure from single targeted clinical trials suggested a need for multitargeted therapies to cure fibrotic disorders. Multiple studies demonstrated that either Cannabinoid receptor 1 (CB_1R) or inducible nitric oxide synthase (iNOS) are potential therapeutic targets for inhibition in fibrotic disorders. Recently, dual targeted hybrid CB_1R and iNOS inhibitors were rationally designed for fibrotic disorders. Peripherally restricted and dual-targeted CB_1R antagonists were identified as third generation CB_1R antagonists. Hybrid CB_1R/iNOS antagonist zevaquenabant (MRI-1867) provided a superior efficacy in liver, lung, kidney, and skin fibrosis compared to the single target CB_1R antagonist or iNOS inhibitors alone. Zevaquenabant improved antifibrotic efficacy and central nervous system safety compared to the other CB_1R antagonists. Zevaquenabant has emerged as a potential antifibrotic therapy, and currently completed in Phase 1 clinical trials and pending Phase 2 clinical trials for fibrotic disorders.

IL30– Importance of Antigen Design in Nucleic Acid Vaccines: SARS-CoV-2 DNA Vaccine Experience

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Nucleic acid vaccines started to gain importance in the 1990s and their importance has gradually increased with the advancing biotechnological developments. During the COVID-19 pandemic, mRNA vaccines as well as DNA vaccines have been approved by legal authorities for widespread use in humans. During this period, the design of the antigens expressed by mRNA and DNA vaccines has become very important in achieving this success. Previously, structural lab analysis data was at the forefront in vaccine antigen design. Thereafter, bioinformatics methods, in silico analyzes and artificial intelligence concept have started to be part of the design in recent years. Specifically, considering conserved epitope, glycosylation and amino acid sites, mutations in receptor binding sites, transmembrane, cytosolic and extracytosolic sites, disulfide bonds, loop and helix parts during vaccine antigen design have utmost importance for vaccine efficacy. In this presentation, bioinformatics approaches used in Spike antigen design used in DNA vaccines developed against COVID-19 at Ege University Vaccine Research, Application and Development Center will be discussed.

IL31– Next Generation Probiotics and Microbiota

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The gut microbiome affecting the human health is very important. Change in the gut microbiome content which is called dysbiosis has been related to several intestinal and systemic diseases, like inflammatory bowel disease, obesity, diabetes and metabolic syndrome, allergies, immune and cardiovascular diseases [1].

The abnormal diet intake, use of antibiotics, change in enviromental factors, formula feeding and cesarean sections all contribute to the intestinal dysbiosis [2]. Probiotics are one of the important factors affecting the gut microbiota and defined as live microorganisms that, have a health benefit on the host when administered in adequate amounts [3].

Different researches have shown that traditional probiotics produce short-chain fatty acids to reduce proinflammatory immune activity, optimize IgA production, modulate homeostatic bile acids production and secretion, and increase the integrity of intestinal epithelial layer [4]. Most of the probiotic strains available on the market belong to mainly lactic acid bacteria or Bifidobacterium spp. and the main isolation sources are fermented foods or the human gut [5]. Microbiota studies progress rapidly, and bioinformatics analyses are commonly used in human microbiome studies showing new bacterial candidates. Next generation probiotics (NGP) are microbial taxa that have the traditional definition of probiotics, but they do not have an history of use for health promotion. [2]. Unlike the traditional probiotics with a general target population that focus on gut health, development of NGP for other disease areas are growing strongly. This speech will focus on NGP and its benefits to the gut microbiota and other disorders.

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ORAL LECTURES

OL01 - Investigation of Tetrahydrocannabinol's Activity in Parkinson's Disease via Machine Learning

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Aryl hydrocarbon receptor (AHR) has various roles in physiological and pathophysiological processes, and it is mainly studied in toxicology. Previous studies showed that tryptophan, carbidopa and dopamine are agonists of AHR. Parkinson's disease is occurs mainly because of dysregulation of the dopamine system. For establishing AHR ligands, anti-Parkinson's and US FDA-approved drugs were screened by support vector machine algorithm. Apomorphine, tetrahydrocannabinol (THC) and 72 other molecules were detected as potential AHR ligands. Apomorphine and THC have more chemical similarity than the other 72 molecules. Apomorphine is a dopamine agonist and previous studies showed that THC may be effective in treating Parkinson's disease. Because of the machine learning results and similarity analysis, the authors proposed THC as a dopamine agonist. This idea was supported with molecular docking studies and literature research.

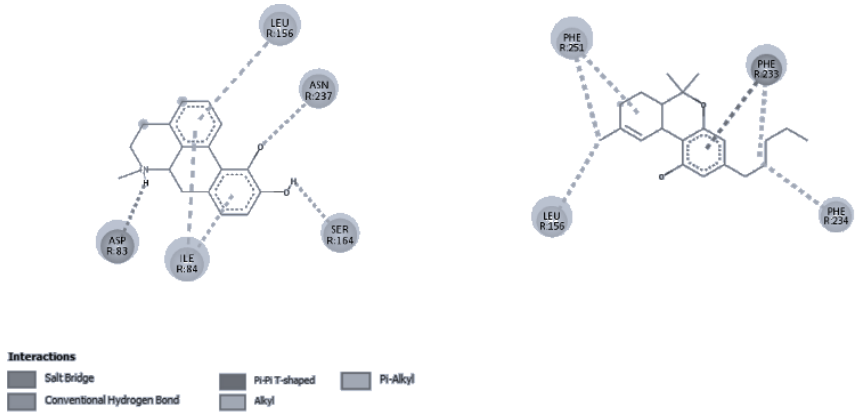

Figure 1. A) Interactions between dopamine receptor 1 and apomorphine, and B) interactions between dopamine receptor 1 and tetrahydrocannabinol

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OL02 - The Radiosensitizing Effect Of Herbal Active Component, Betanin, In Prostat Cancer

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Prostate cancer is among the most prevalent cancers among men with an increasing incididence rate.
Radiation therapy (RT) is a treatment modality for the management of prostate following surgery; however, it has different side effects on neighburing healthy tissues/cell.morover, radioresistance is an incresing phenomanoa in the recent years. Therefore, there is an urgent need for the introduction of a safe and effective radiosensitizing agent. Our study, evaluated the effects of betanin in combination with RT as a possible radiosensitizing agent in PC-3 cell line. MTT assay was used to assess the growth inhibitory effect of betanin. The possible synergistic effect was evaluated with CompuSyn software upon Trypan blue exclusion assay. The protein expression of P21 was determined using western blotting. Apoptosis-related gene expression was evaluated via Real time PCR.Treatment of PC-3 cells with betanin combined with RT resulted in synergistic anticancer effects with an optimum combination index of 0.61. the results indicated that betanin synergistically triggered RT-induced apoptosis and cell cycle arresst through modulating gene and protein expression in comaprison with monotherapies.These fndings highlight the potential effect of betanin as a radiosensitizer, indicating the synergistic anti-cancer effect of betanin and RT in prostate cancer.

OL03 - Inhibitory Effects of Plantamajoside, The Major Component of Plantago major, on MAO-A, MAO-B, AChE and BChE

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Plantago major (Plantaginaceae) is known as a common weed spreading all over the world. It has been called the "white man's footprint" by the Indians because it is found wherever Europeans are found [1]. The plant is used as a hepatoprotective and anti-inflammatory in traditional treatment in Türkiye [2]. In our previous study, the *P. major* methanol extract showed selective inhibition on the monoamine oxidase A (MAO-A) and monoamine oxidase B (MAO-B) enzymes [3]. In this study, the inhibitory effects of plantamajoside, the major component of *P. major* were investigated on MOA-A, MAO-B, acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) enzymes.

In the study, plantamajoside was purified from the methanol extract of *P. major* by silica gel column chromatography and its chemical structure was characterized by 1D NMR spectroscopy (Figure 1). Enzyme inhibitions were measured by spectrophotometer and IC_{50} values were calculated for each enzyme.

According to the results of the study, the IC_{50} values of plantamajoside for MAO-A, MAO-B, AChE and BChE were calculated in the range of 61,884±4,600 - 136,226±10,895 µM. In addition, it was determined that plantamajoside showed the best enzyme inhibition effect on BChE.

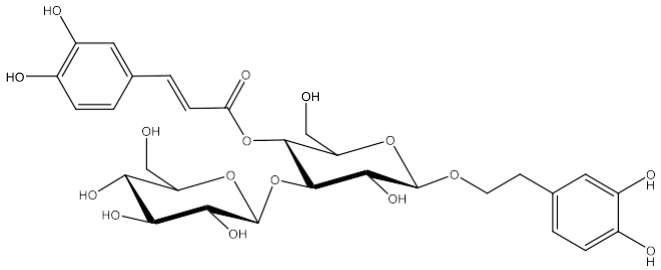

Figure 1. Structure of plantamajoside

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OL04 - Optical Biosensors for Disease Diagnostics

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Plasmonic biosensors received an immense attention due to their ability to overcome the limitations associated with the traditional optical approaches by bringing new functionalities. New generation plasmonic platforms enable real-time detection of molecules at very low concentrations without requiring optical labels. These platforms stimulate very sensitive optical responses by employing surface plasmons, which are strong surface electromagnetic waves concentrated in nanometer scale. Employing surface plasmons, conventional detectors, e.g., spectrometers, could be used to distinguish signal variations due to the presence of analytes. Conventional biosensing systems, employing a spectrometer, determine refractive index variations through exciting a high quality plasmonic mode and monitoring the spectral variations within. These platforms could enable the detection of pathogens, e.g., viruses or bacteria, at medically relevant concentrations for disease diagnostics in clinics with simpler sample preparation compared to the classical methods. Multiplexing and high-throughput capability could be added to plasmonic biosensors by integrating large-scale and high-density plasmonic chips to an imaging-based device. By integrating plasmonic substrates to a telemedicine platform, plasmonic biosensors could be also transformed into a portable platform which could be deployable for resource-poor settings. They could be also integrated to a portable read-out device, e.g., a laptop or a mobile phone, to generate sensing data in an inadequate medical infrastructure. By integrating microfluidic technologies with plasmonic platforms, real-time analyses of protein binding kinetics could be demonstrated in a cost-effective and label-free manner. Using powerful data processing algorithms, these microfluidic technologies could monitor binding interactions at pico-molar concentrations.

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OL05 - The Cost of Spinal Muscular Atrophy: A Systematic Review

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Spinal muscular atrophy (SMA) is a neurodegenerative disease, mostly caused by a genetic condition. It mainly emerged by homozygous deletion or minor mutations in the responsible gene, SMN1. Anomalies with the SMN1 gene lead to survival motor neuron (SMN) protein inadequacy, which causes the SMA symptoms. [1]. There are four different types of SMA, categorized by their onset time. Type 0, 1, and 2 have a lower life expectancy, ranging from days to years. The SMA symptoms include muscle weakness, respiratory difficulties, and axonopathy (defects in nerve fibres) [2]. Currently, three different therapeutic agents are available: nusinersen, onasemnogene abeparvovec and risdiplam. Nusinersen (Trade name: Spinraza) is the first approved therapy that increases SMN protein synthesis. Yet, the nusinersen response is not solid, different patients can respond with different levels of improvement [1]. Onasemnogene abeparvovec (Trade name: Zolgensma) is a gene therapy approved for the <2 years aged SMA patients [3]. Risdiplam (Trade name: Evrysdi) is an oral therapeutic agent, that targets the synthesis of the survival neuron protein [4]. Lopez-Bastida et al. presented that SMA has a major burden on societal costs [5]. In this review, I aimed to present the studies considering the cost of SMA diseases and show the current situation in the scientific literature. The systematic review was conducted on the Web of Science, in February 2023 with the search terms ‘spinal muscular atrophy’ and ‘cost’ without any time restriction. Only articles in English included in this study. Meeting abstracts, editorials, book chapters, proceeding papers and letters are excluded. After refining by category, results are screened as per their title and abstract with their relation to spinal muscular atrophy. A total of 215 results were obtained. 39 of the results were excluded: 2 of them were in different languages, 20 of them were meeting abstracts, 7 of them were editorials, 4 of them were book chapters, 4 of them were proceedings, 1 was commentary, and 2 of them were letters. Eventually, 176 articles were screened and 26 of them were included as per their relevance to the SMA and the cost. Among these 26 studies, only 8 studies have comprised the cost of SMA. There is one study that only focuses on SMA-specific medicine costs. Darrow et al. stated that the incremental cost-effectiveness ratio of two approved pharmaceuticals was high; 1.1 million $ for Spinraza and 243.000$ for Zolgensma in Type 1 SMA (6). Health-related quality of life was evaluated in 3 studies, in addition to assessing costs (7–9). Peňa-Longobardo et al. emphasized that SMA has a considerable impact both for the patients and the caregivers (9). Darba and Marsa analyzed the hospitalization costs, they presented that the length of stay was 10 days in average and mostly related to respiratory needs (10). Chen et al. assessed the hospitalization costs and they showed that nearly half of the costs were due to hospitalization (11). Darba, also emphasized the majority of expenses are caused by hospitalization costs in Catalonia. SMA is known as a fatal disorder in childhood and is common (12). The treatment options are limited and their efficacy has remained moderate (6). Considering the economic impact of rare diseases, SMA received attention from authorities and society. Since its consequences are wide-ranging and its social costs presented to be higher than other rare diseases such as ataxia. Besides, informal caregiving indicated more than %70 of the total

costs (9). The articles included in this study have common results: SMA has a great impact from both economical and social angles. In conclusion, the attention to the SMA is understandable considering its effect. The limited treatment options and the impacts of the SMA raise awareness about the screening options (13–15). Thus, screening should take place worldwide to decrease SMA incidence and its impact on both the healthcare system and society.

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OL-06 Organ-on-a-chip platforms for drug screening

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In vitro organ-on-a-chip (OoC) platforms can host and maturate stem cell derived engineered human tissues. Such platforms provide novel research venues for life sciences by mimicking the native tissue architecture, biophysical environment and functionality. Such tools facilitate investigation of cellular mechanotransduction, tissue morphogenesis and advanced control of other physiological factors affecting *in vitro* performance of organoids. Advances in stem cell research enable the in vitro recapitulation of human organogenesis and let the generation of functional tissue models called organoids. Today, combination of on-chip microfluidic systems with stem cell technologies creates many organ models such as lung, gut, brain, liver, kidney and stomach, which can be connected to form human-on-a-chip systems. Translation of these platforms to clinical settings promises effective disease models, test beds for toxicology and diagnosis. As growing interest of pharma industry on bioengineered OoCs, organoid models drug screening become more attractive. This talk covers fundamental aspects of on-chip system design and integration with stem cell research.

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OL07 A Tale of Two Diverse Sets of Novel 5-Lipoxygenase Activating Protein (FLAP) Inhibitors

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FLAP is an integral membrane protein and regulates leukotriene (LT) biosynthesis by transferring arachidonic acid (AA) to 5-lipoxygenase (5-LO). FLAP also acts as an anchor and activates 5-LO. By this activation, AA gets metabolized and produces LT metabolites. Inhibition of the production of those metabolites is a promising strategy for treating various types of inflammatory diseases. In this work, we will present the development story of two chemically distinct scaffolds (quinazoline-4(3H)-one-7-carboxamides and 1,2,4-triazoles), which were first discovered as FLAP antagonists via a virtual screening (VS) study (0.87 and 2.18 µM (1,2, respectively) [1]. By further development studies, quinazolinone derivatives were designed to dually inhibit FLAP and soluble epoxide hydrolase (sEH) [2] and triazole derivatives were designed to block 5-LO product formation through binding to FLAP [3]. The structural modifications on the most potent quinazolinone derivative reached (3) 0.70 µM for sEH and 2.70 µM for FLAP, and the most potent triazole derivative (4) reached 1.15 µM for FLAP. Both structures can potentially achieve a more potent FLAP-antagonistic effect through further developments by following the hints derived from structure-activity relationship data and computational analysis.

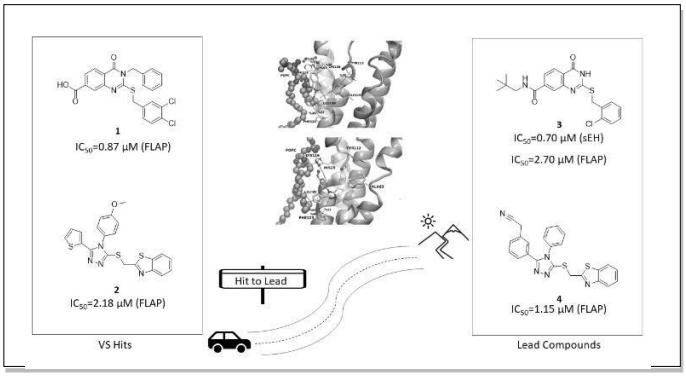

Figure 1. The transition from VS-derived potent hits to lead compounds.

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OL08 Steroidal Regulation Of Androgenic Signaling In Prostate Cancer: Could It Offer A Powerful Therapeutic Approach?

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Prostate cancer is one of the important health problems of our age and is the second most common cancer worldwide in men [1]. Androgenic signaling is critical for normal prostate development and any stage of prostate cancer. Dysregulation of androgenic signaling is one of the main factors in the development of prostate cancer. Recent studies have focused on investigating patterns of advanced regulation by diverse steroids in prostate cancer cells [2]. Moreover, it has now been understood that endoplasmic reticulum (ER) protein quality control systems, such as ER-associated degradation (ERAD) and unfolded protein response (UPR) signaling, are essential mechanisms that play a role in prostate cancer progression [3,4]. These mechanisms are tightly regulated by androgenic signaling in prostate cancer cells and also play an active role in controlling acquired drug resistance and tumorigenic properties such as proliferation, invasion and migration [3,4]. Therefore, elucidating the novel steroidal regulation pathways of these mechanisms and the crosstalk of androgenic signaling with other steroid hormones such as progesterone, estrogen, $1,25(OH)_2 D_3$ and glucocorticoid hormones are extremely important for understanding prostate cancer biology [5,6,7,8]. In our laboratory, we characterized the novel steroidal regulation patterns of ERAD and UPR signaling in prostate cancer cells. Present data revealed that progesterone, estrogen, $1,25(OH)_2 D_3$ and dexamethasone hormones divergently regulated ERAD and UPR signaling in prostate cancer cells. More importantly, progesterone and estrogen hormones remarkably supported the tumorigenic features of prostate cancer cells and the androgenic signaling, likewise androgens, whereas $1,25(OH)_2 D_3$-mediated signaling pathway negatively regulated ERAD components and remarkably reduced the androgenic singling in prostate cancer cells. All these findings strongly suggest that therapeutically targeting steroidal signaling pathways may present powerful treatment and/or prevention options for prostate cancer.

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OL09 CRISPR-CAS9 Mediated Immune Checkpoint Gene Knockout with Targeted Nanoparticles Against Triple-Negative Breast Cancer

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Immuno-oncology has been involved among the most crucial cancer therapies after surgery, radiation therapy, and chemotherapy in the last decade. However, in order for cancer immunotherapy to be successful, the recognition of cancer cells by the immune system needs to be increased. To increase the recognition of cancer cells by genetic modifications could be supplied by gene knockout of immune checkpoint protein ligands on cancer cells. For this purpose, it is aimed to use the CRISPR/Cas9 gene edition system for the knockout of the programmed cell death receptor (PD-1) ligand-1 (PD-L1), which is one of the effective immune checkpoint proteins [1].

One of the most popular CRISPR/Cas9 gene edition systems is plasmid vectors that express Cas9 protein together with a target-specific single guide RNA. It is common to use viral vectors to deliver these relatively large plasmid DNAs into the cell. However, the transduction of CRISPR plasmids via viral vectors is limited due to their immunogenicity, insertional mutagenesis, and safety problems [2].

For an effective in vivo CRISPR/Cas9 based treatment, it is necessary to develop targeted non-viral delivery systems with high transfection efficiency. Solid lipid nanoparticles (SLNs) are important candidates for plasmid DNA transfection due to their low toxicity, efficacy, and targetability [1].

In this study, a CRISPR/Cas9 plasmid (PX459) was cloned for the knockout of the PD-L1 gene cell lines and delivered via iRGD peptide-tagged SLNs to evaluate the targeted anti-tumor effects [3]. Then, characterization, transfection efficiency, quantitative gene knockdown, and in vitro/in vivo efficiency studies were carried out. Gene knockout was evaluated in the MCF7 and 4T1 cell lines, and qRT-PCR studies demonstrated that PD-L1 expression was significantly reduced in the targeted cells. Evaluation of anti-cancer, immuno-oncologic efficacy mediated by PD-L1 knockdown via a targetable nanoparticle delivery system was investigated in a mouse orthotopic breast cancer model. Compared to the controls, mouse survival was significantly increased and anticancer activity was determined. The developed method has the potential for complete recovery when used in combination with chemotherapeutic or monoclonal antibody-mediated treatments.

Acknowledgment: This study has been financially supported by the Scientific and Technological Research Council of Turkey under grant codes SBAG-218S682 and SBAG-122S966.

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OL10 Application Of Nano-Antioxidants Against Cytotoxic Agents

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A significant health concern now is developmental toxicity brought on by exposure to a concoction of pesticides. Reactive oxygen species are produced more frequently by pesticides, which also negatively affect endogen antioxidant defense. Complex antioxidant mechanisms that shield cells from prooxidant environments have evolved in humans. A person's overall antioxidant level can be destroyed by a deficiency in any one of these nutrients. Endogenous or exogenous antioxidants can be received through dietary supplements or as a component of a diet. The utilization of naturally occurring, small-molecule exogenous antioxidants as treatments for many diseases has not been successful, despite the fact that oxidative damage is a factor in many illnesses. A good exogenous antioxidant should be easily absorbed and give enough protection. Through the identification of nano-antioxidant substances using various methods, nanoscale systems, as technological drivers of innovation, have also provided a positive perspective. According to accumulating data, nano-antioxidants reduce toxicity caused by oxidative stress more effectively than crude antioxidants. Nano-antioxidants are therefore special agents that outperform all traditional antioxidative therapy.

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ORAL PRESENTATIONS

OP01 – EVALUATION OF THE APPROPRIATENESS OF ANTIMICROBIAL DRUG DOSAGES

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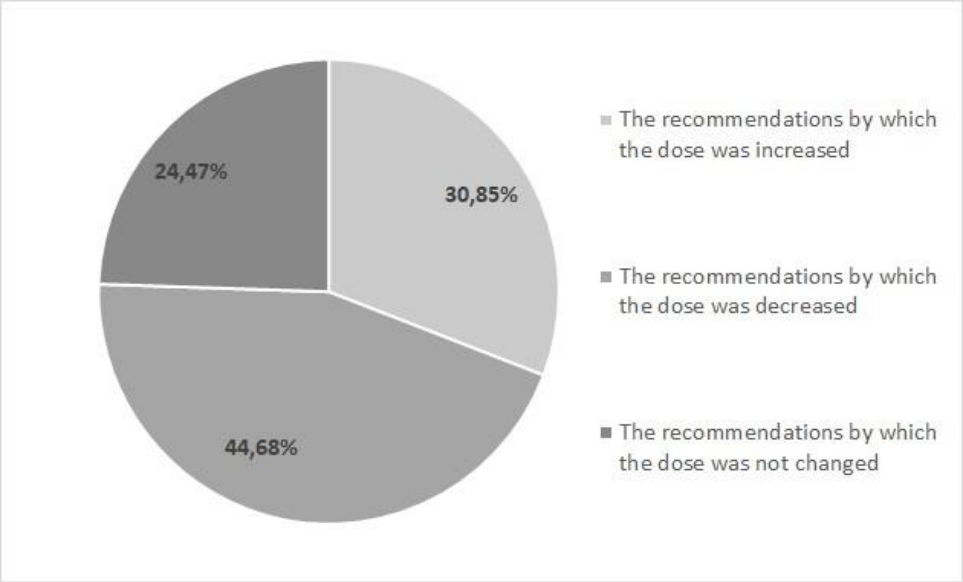
The purpose of this study was to investigate the factors that required dose adjustments of antimicrobial drugs used to treat infectious diseases in intensive care unit (ICU) patients and to identify the drugs that require the most dose adjustments.

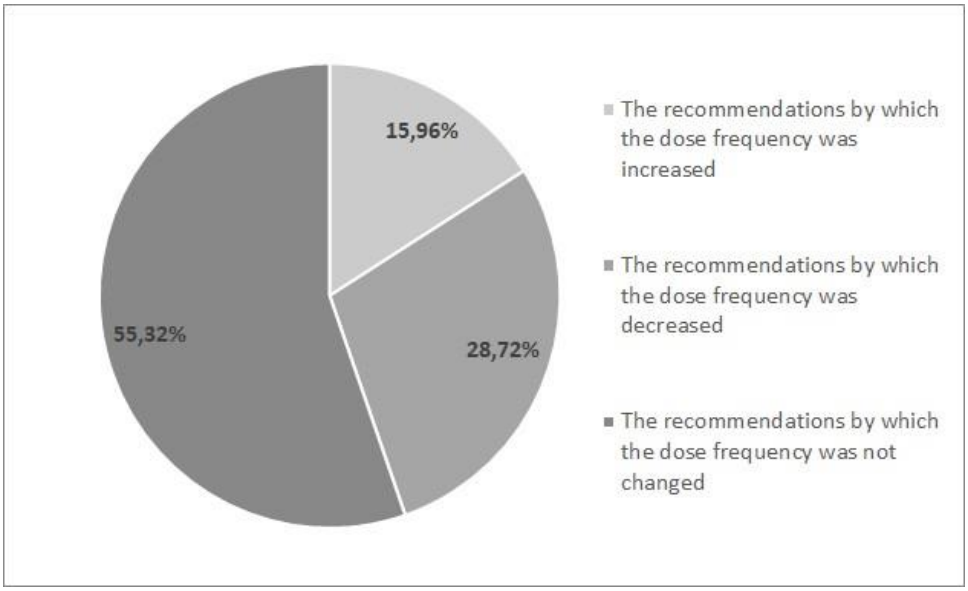
The 26-bed reanimation ICU of Inonu University Turgut Özal Medical Center hosted this prospective study from September to December 2022. Two clinical pharmacists on duty monitored hospitalized patients' antimicrobial drug dosages daily using UpToDate®, Micromedex®, and Sanford Antimicrobial Therapy Guide®. The antimicrobial drug dosage recommendations were conveyed to the infectious disease specialist in charge. The acceptance status of the recommendations, and the patients' demographic information were recorded.

The study involved 133 ICU patients, and antimicrobial drug recommendations were made for 48 patients, 31 (64.58%) of whom were male. The median (IQR) age of the 48 patients was 67 (54–77). The number of recommendations was 94, and all of them were accepted by the physician. The recommendation rates according to the causes were: inappropriate dosages based on renal functions (71.28%), presence of continuous renal replacement therapy (11.70%), indication (10.64%), body weight (4.26%), and loading dose (2.13%). The recommendations were made in accordance with the varying doses or administration frequencies of antimicrobial drugs, and their distributions are shown in Graph 1 and Graph 2. The top 3 drugs for which recommendations were made the most were colistin (21.28%), meropenem (18.09%), and piperacillin-tazobactam (12.77%).

In the study, most common problem of dose inappropriateness of antimicrobial drugs was lack of dose adjustment according to renal functions. The most troublesome drug was colistin, which is frequently used to treat Acinetobacter pneumonia. Clinical pharmacists and physicians may help rationalize ICU antimicrobial drug use by working together [1, 2].



Graph 1. Distribution of recommendations for dose modification



Graph 2. Distribution of recommendations for dose frequency modification

Acknowledgement: We would like to convey our deepest gratitude to the healthcare team of the reanimation intensive care unit for making the current study could be performed.

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OP02 – DRUG INTERACTIONS RESULTING IN INCREASED BLOOD LITHIUM LEVEL: A CASE REPOR

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Lithium is a mood-stabilizing drug primarily used in the treatment of bipolar disorder [1]. The therapeutic range of lithium is 0.8-1.2 mmol/L in acute mania attacks and 0.6-1 mmol/L in maintenance treatment [2]. This case report describes drug interaction-induced lithium toxicity and its management.

A 36-year-old woman with hypertension and bipolar disorder was admitted to the emergency department with lethargy and tachycardia. After a blood sample showed a lithium level of 1.4 mmol/L, the patient was treated in the emergency room and referred to the intensive care unit (ICU). When the ICU blood sample showed 1.7 mmol/L lithium, the clinical pharmacist reviewed the patient's medications for lithium interactions using the UpToDate Drug Interaction® program. The patient was using quetiapine 50 mg and candesartan/hydrochlorothiazide 32 mg/12.5 mg. It was determined that there were two category D interactions between the candesartan/hydrochlorothiazide and lithium. Candesartan raises lithium blood level, while hydrochlorothiazide decreases renal excretion of lithium. Also, dexketoprofen, a non-steroidal anti-inflammatory drug (NSAID), raises lithium blood levels, and the patient uses it for pain per need. The ward physician was recommended to start amlodipine 10 mg for hypertension and acetaminophen per need, which do not interact with lithium. Two days after the drugs were stopped, the patient's blood lithium level returned to normal (1.2 mmol/L). After her blood parameters improved, the patient was discharged. The patient was informed about drug interactions at discharge. When the patient was contacted after discharge, it was learned that her physician had replaced the candesartan/hydrochlorothiazide with benidipine and indapamide.

Blood Lithium level may vary depending on drug interactions. Lithium levels should be closely monitored due to changes in lithium blood levels. Consequently, clinical pharmacists can counsel on drug interactions.

Acknowledgement: We would like to convey our deepest gratitude to the healthcare team of the reanimation intensive care unit for making the current study could be performed.

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OP03 – LIPOSOMES FOR IMAGING AND PHOTODYNAMIC THERAPY OF GLIOBLASTOMA

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Glioblastoma multiforme is a highly aggressive brain tumor. In this study, positively charged (stearylamine (SA)), ^{68}Ga-labeled, IR780 encapsulated, N-acetyl glucosamine (NAG) modified liposomes were formulated for both PDT/PTT and PET imaging of glioblastoma. Their characterization and labeling efficiency was performed. In vitro cytotoxicity studies were performed. PDT activities in U87 glioblastoma cell lines were evaluated by exposing to NIR laser light.

IR780 and NAG were purchased from Sigma-Aldrich. All other chemicals were of analytical grade.

Formulations were prepared according to film method [1] (Table 1). Extrusion was performed for size reduction of formulations. Characterization of formulations was performed by measuring mean particle size, PDI, zeta potential, obtaining polarized light microscopy images, EE%.

Content of Formulation	Molar ratio
PL90G:Chol:PEG2000-DSPE:SA:IR780:DOTA-Bn-DSPE	50:29,2:5:5:0,5:0,3
PL90G:Chol:PEG2000-DSPE:SA:NAG:IR780:DOTA-Bn-DSPE	50:29,2:5:5:10:0,5:0,3

Table 1. Contents and molar ratios of liposomes.

Liposomes were labeled with ^{68}Ga (0.3 mCi) at different pH, temperatures, and incubation times. ITLC-SG plates were used to calculate labeling efficiency by gamma counter [2].

PDT/PTT activity of liposomes was performed on U87 cell line by evaluating cell viability by MTT analysis under laser light (808 nm 1W/cm^2) for 10 minutes [3].

For the cytotoxicity study MTT analysis were performed in U87 and L929 cells after the application of formulations and free IR780 solution to 96-well plates [3].

Vesicles were observed in polarized light microscopy images. The mean particle size and zeta potential of liposomes were measured as 181-189 nm (PDI=0,16) and -5,1 mV, respectively. EE% of formulations was found in the range of 79-84%. Liposomes were ^{68}Ga-labeled about 48% efficiency. A significantly higher decrease in percent cell viability was observed after the application of liposomes exposed to laser light than without light in the U87 cell line. Lower IC_{50} values were observed with the application of free IR780 solution than formulations indicating that IR780 release from the formulations is in a controlled manner as desired. Formulations designated concentration-dependent cytotoxicity in U87 cell line. Theranostic liposomes were evaluated as potential for PDT/PTT and PET and NIR imaging of glioblastoma due to characterization and in vitro studies.

Acknowledgement: This work is supported by the grant of TUBİTAK Project (No: 219S986).

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OP04 – IN SILICO DRUG REPURPOSING AS INHIBITORS AGAINST GSK-3β

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Tau, a protein associated with microtubules, is widely distributed throughout the central nervous system and promotes the polymerization, assembly, and stability of microtubules. Hyperphosphorylation of tau proteins leads to intracellular neurofibrillary tangles, which are the pathological hallmark of numerous neurodegenerative diseases (e.g., Alzheimer's disease) and are collectively referred to as "tauopathies" [1]. The most notable kinase identified in tau phosphorylation is glycogen synthase kinase 3 (GSK3). Among the GSK-3 isoforms, GSK-3β has been linked to the pathophysiology of neurodegenerative diseases. Pharmacological inhibition of GSK-3β has been suggested as a potential therapeutic target for these diseases [2, 3]. In this study, the literature and databases (e.g., HIT 2.0, PubChem, and ChEMBL) were searched for potential inhibitory drugs against GSK-3β and found 58 drugs. The drugs were filtered according to physicochemical-pharmacological properties and toxicity profiles via SwissADME, ADMETlab 2.0, pkCSM, and ProTox-II, free web tools. After pre-filtration, molecular docking was performed against GSK-3β (PDB ID: 5K5N) with the remaining seven drugs (Nabumeton, Loxoprofen, Ketoprofen, Oxytetracycline, Benzoyl Peroxide, Naproxen, and Epinephrine Hydrochloride). According to the results, nabumetone had the best binding energy (-7.39 kcal/mol) and inhibition ability at the lowest concentration (3.8 µM) (Table 1) against GSK-3β among the seven drugs [compared to PF-04802367 (PDB ID: 6QH), a highly selective brain-penetrant kinase inhibitor]. Nabumetone is an NSAID used to treat some arthritis, postoperative pains, and dysmenorrhea. Our results suggest that nabumetone may be a potential inhibitor of GSK-3β.

Table 1. The docking scores of the hit drugs against human GSK-3β (PDB ID: 5K5N).

The Compounds	Binding Energy (kcal/mol)	Ligand Efficiency	Inhibitory Conc. (µM)
PF-04802367 (PDB ID: 6QH**)**	-7.66	-0.31	2.41
Nabumeton	**-7.39**	**-0.43**	**3.8**
Loxoprofen	-7.2	-0.4	5.31
Ketoprofen	-7.01	-0.37	7.28
Oxytetracycline	-6.97	-0.21	7.83
Benzoyl Peroxide	-6.93	-0.39	8.27
Naproxen	-6.76	-0.4	7.96
Epinephrine Hydrochloride	-3.85	-0.3	1500

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OP05– EVALUATION OF NUTRITIONAL NEEDS OF INTENSIVE CARE UNIT PATIENTS BY CLINICAL PHARMACISTS

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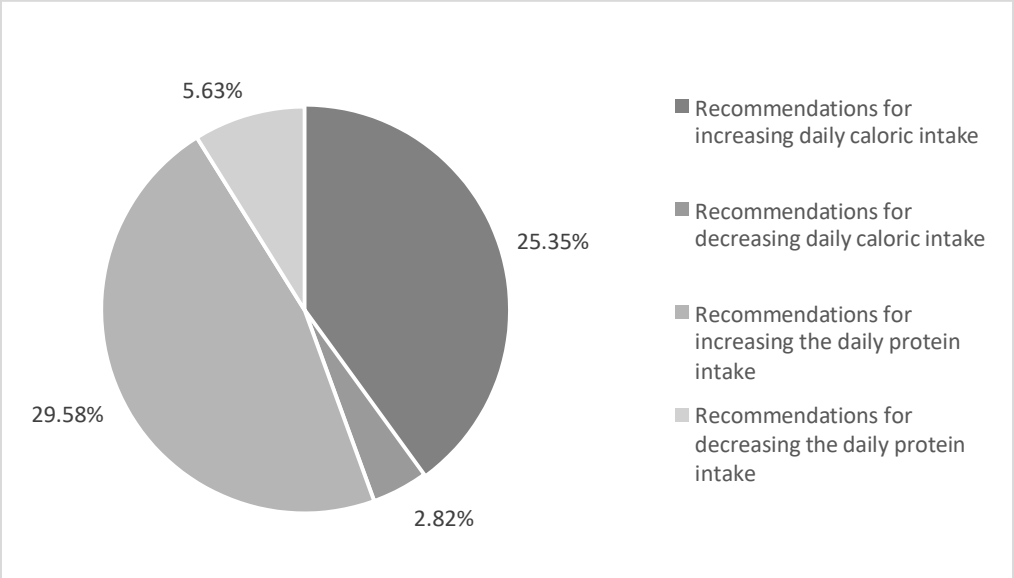
Malnutrition is defined as "a condition resulting from nutritional deficiencies, altering body composition (decreased lean mass), poor physical and mental function, and deterioration in clinical outcomes due to disease" [1]. Malnutrition in intensive care unit (ICU) patients affects disease progression and prolongs hospital stays [2]. In this study, it was aimed to present the recommendations of clinical pharmacists in terms of nutrition in critically ill patients.

This prospective study was conducted in an ICU between November 2022 and January 2023. Two clinical pharmacists made recommendations for the nutritional status of 41 (61% male; 39% female) patients in line with current guidelines. The mean age of the patients was 63.78±19.03. Basal energy expenditure was calculated using the Harris-Benedict formula, and the most appropriate nutritional product was selected based on individual requirements. The recommendations and the demographic characteristics of the patients were recorded.

According to the reasons, the recommendation rates were categorized as: feeding started (9.86%), feeding stopped (1.41%), feeding dose increased/reduced (28.17%), protein intake increased/reduced (35.21%), management of nutritional side effects (15.49%), and changes in administration (9.86%). Daily caloric and protein intake recommendations were shown in Graph 1.

Enema for constipation (54.54%), prokinetic metoclopramide (36.36%), and discontinuation of parenteral nutrition/insulin addition due to hyperglycemia (9.09%) were recommendations targeted at nutritional side effects.

In this study, it was found that the majority of the nutritional recommendations were associated with insufficient caloric intake. The patients' targeted calorie intake was gradually reached in a few days by choosing the best nutritional product. Clinical pharmacists and other health care professionals can collaborate on patient nutrition to prevent malnutrition-related problems.



Graph 1. Distribution of recommendations for daily caloric and protein intake.

Acknowledgement: We appreciate the healthcare team of the reanimation intensive care unit for their support with this study.

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OP06– EVALUATION OF THE DRUG RELATED PROBLEMS IN CRITICALLY ILL PATIENTS

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The aim of this study is to determine the drug-related problems (DRPs) seen in intensive care unit (ICU) patients and to record and present their recommendations for these problems.
The 13-bed reanimation ICU of Turgut Özal Medical Center hosted this prospective study from May to December 2022. DRPs found by a clinical pharmacist in ICU patients, their causes, interventions, and recommendations were documented in the Pharmaceutical Care Network Europe (PCNE) v9.1 system and revealed by descriptive statistical analysis via Statistical Package for the Social Sciences (SPSS) v27.0.
The study included 70 patients who had at least one DRP. Patient characteristics are given in Table 1.
A total of 162 interventions were made for a total of 162 DRPs detected. The number of DRPs per patient was found to be 2.31. The distribution of DRPs is given in Graph 1.
The first 3 diagnoses in which the most DRPs were detected were 13.58% subarachnoid hemorrhage; 8.64% bacterial pneumonia; 8.64% respiratory failure; and 8.02% traffic accident. Meropenem (7.41%), colistin (7.41%), pantoprazole (4.94%), levetiracetam (4.94%), lactulose (4.94%), piperacillin-tazobactam (4.32%), and nitroglycerin (4.32%) were the first three drugs that caused the most DRPs. In total 177 causes were identified, 20.90% of which were no or incomplete drug treatment in spite of existing indication, 15.82% of which were drug dose of a single active ingredient too high, and 11.30% of which were duration of treatment too long. In 40.12% of interventions, the dosage of the drug was changed; in 24.69% of interventions, the drug was paused or stopped; and in 22.22% of interventions, a new drug was started. Physicians accepted 86.43 % of the recommendations.
To sum up, DRPs are often encountered in ICUs. In previously conducted studies, the DRP number was reported as 206 in 108 patients and 220 in 113 patients. [1,2]. In our study we have found 162 DRPs in 70 patients.

Acknowledgement: We would like to convey our deepest gratitude to the healthcare team of the reanimation intensive care unit for making the current study could be performed.

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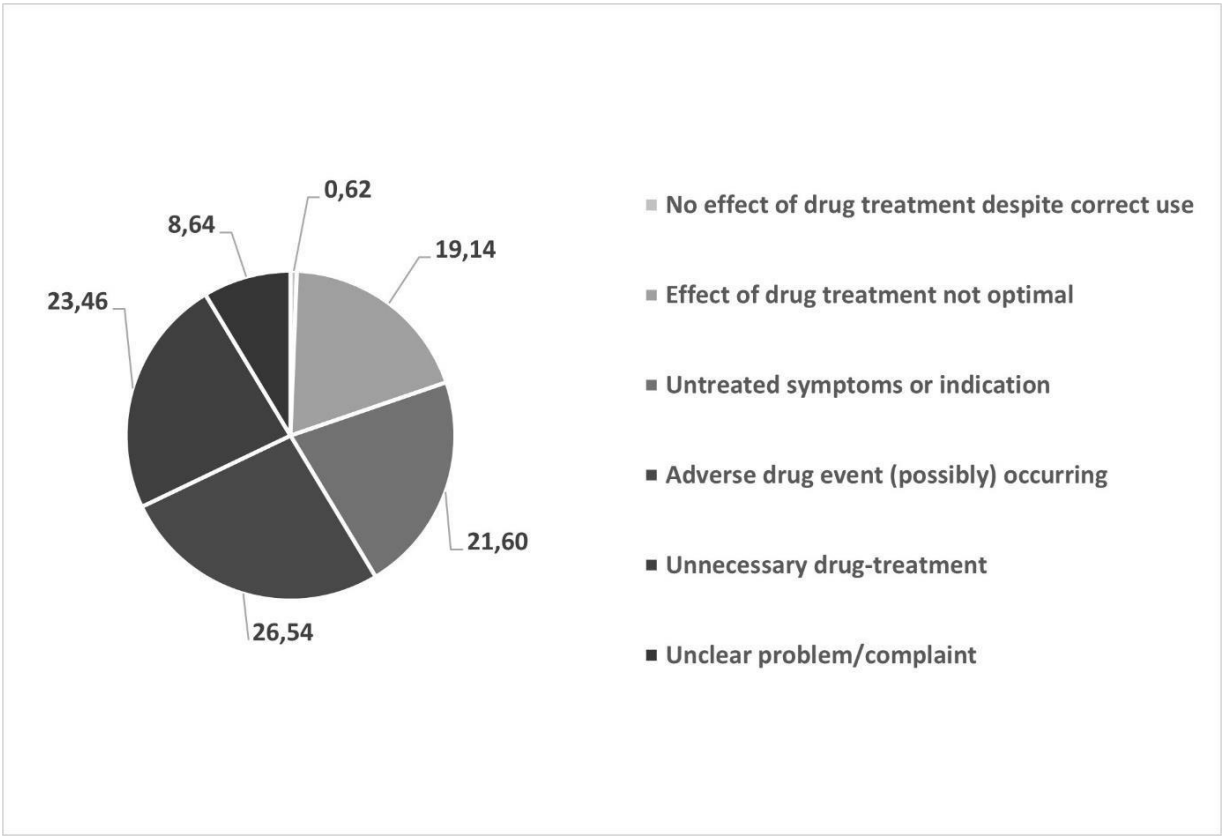
Gender	Male 43 (61.43%) Female 27 (38.57%)
Age	71 [59.5 – 81.0]
Type of admission	Emergency 21 (30.0%) Transferred from another ward 15 (21.43%) Transferred from another hospital 34 (48.57%)
GCS at admission	7.5 [3.0 – 13.75]
Intubation at admission	32 (45.71%)
APACHE II	18 [11.25 – 25]
Duration of hospitalization	13.5 [7 – 34.25]
Medical condition	Surgical 24 (34.29%) Medical 46 (65.71%)
Type of discharge from the ICU	Continuing to be hospitalized 2 (2.86%) Transferred to another ward 26 (37.14%) Home 8 (11.43%) Transferred to another hospital 1 (1.43%) Exitus 33 (47.14%)
APACHE II: Acute Physiology and Chronic Health Evaluation II, GCS: Glasgow Coma Scale, ICU: Intensive care unit Categorical variables were presented as number (%) Continuous variables were presented as median [IQR]	

Table 1 Information of patients



Graph 1 The distribution of DRPs according to the PCNE classification system (%)

OP09– PREPARATION AND CHARACTERIZATION of Tc-99m RADIOLABELLED NANOPARTICLES

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Poly(D,L-lactide-co-glycolide) (PLGA) is the most common polymer for nanoparticle (Np) preparation which are biodegradable and biocompatible systems [1]. Other hand, Technetium-99m (^{99m}Tc) is one of the oldest and most commonly used radionuclide in nuclear medicine. In this study, ^{99m}Tc radiolabeled Nps were investigated for possible future use in nuclear medicine.

In this study, PLGA nanoparticles were prepared using by nanoprecipitation methods [2]. Briefly, PLGA was dissolved in 2 ml acetone and added drop by drop to aqueous phase (0.5% PVA) under magnetic stirring to form NPs. The suspension was stirred at 1000 rpm to evaporate the acetone overnight. Zeta potential, mean particle sizes and size distribution (PDI) were measured to characterize nanoparticles. NP formulations were radiolabelled with ^{99m}Tc (0.25 mCi) with tin reduction method and different radiolabelling conditions were applied to find optimum formulation (Table 1). Radiochemical yield of nanoparticles were checked by ITLC and stability studies were conducted to investigate the change in radiolabelling [3].

Table 1. Different radiolabelling conditions of NP formulations.

Formulation Codes	$SnCl_2$ volume (µl)	Incubation pH	Incubation Temperature (°C)	Incubation Time (min)
Np1	50	7	25	30
Np2	10	7	25	30
Np3	250	7	25	30
Np4	50	5	25	30
Np5	50	9	25	30
Np6	50	7	25	5
Np7	50	7	25	60
Np8	50	7	10	30
Np9	50	7	50	30
Np10	25	7	25	30

Zeta potential of NP solution were found as 6,05±1,31 mV. Also, the particle size was found 207,95±1,90 (nm) and PDI was found as 0,2925±0,04 which shows homogenous size distribution. Generally for successful radiolabeling, above 95% of radiochemical yield is requested, Np1, Np4, Np7, Np8 and Np10 formulations met this criteria with RCP(%) as as 99,5±0,0578; 98,5±0,3026; 98,2±4,9313; 96,1±2,1258, and 98,8%±0,1376 (%), respectively. As the highest RCP(%) was found Np1 formulation and it was chosen as the optimum formulation. Stability study was performed on Np1 formulation. According to the stability results, Np1 formulation was found as stable up to 12 hr which is the two half-life time of ^{99m}Tc.

PLGA NPs radiolabelling conditions were investigated and optimum conditions were found in Np1 with high yield. Also, ^{99m}Tc-Np1 formulation stability results showed high stability for 2 half-life time of ^{99m}Tc.

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OP10– EVALUATE FACTORS RELATED TO INTENTION OF CLINICAL PHARMACISTS AND CANDIDATES TO PROVIDE PHARMACEUTICAL CARE

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There are many clinical pharmacy postgraduate education programs in Türkiye. The aim of this study was to identify factors related to Turkish clinical pharmacists' and candidates' intention to provide pharmaceutical care. This prospective observational study was carried out among graduates and students of postgraduate clinical pharmacy programs between June 2021 and May 2022. A 52-item Turkish scale based on the Theory of Planned Behavior (TBP) was developed after searching relevant studies [1], an expert panel discussion, translation and cultural adaptation, a pilot study, test-retest reliability analysis, and explanatory factor analysis (including calculation of Cronbach for each construct). Online survey link was sent. The multiple linear regression model was used after the univariate regression analysis. Two hundred sixty-four participants accessed to the link and 156 participants completed the survey (response rate: 59.1%). The median value of age [IQR] of participants was 34 [12] years. Twenty-point-five percent of the participants were male. According to the multiple linear regression analysis, higher subjective norm ($p=0.016$), higher self-efficacy ($p<0.001$), younger age ($p<0.001$) and having a PhD ($p=0.038$) were associated with higher intention score. Higher self-efficacy and positive beliefs of their peers and other healthcare professionals were associated to a higher intention score for providing pharmaceutical care. Other factors associated with their intention to provide pharmaceutical care included their younger age and having a PhD.

DRD-2023

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OP11– BISPECIFIC ANTIBODY DEVELOPMENT FOR ENHANCING THE EFFICACY OF ANTITUMOR THERAPY

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The ongoing effort are still here to find a solution to the increasing risk of cancer, which causes many deaths worldwide. One promising approach in oncology is the ability to target tumor cells specifically by using molecules that are overexpressed or mutated in tumors compared to normal tissues. Synthetic biology has provided researchers with various tools for developing new drugs, and antibody engineering is one of the key techniques. Adding multiple functions to antibodies by these methods are adaptable and effective approaches for detecting or treating cancerous tumors in a complicated tumor setting[1]. Later in the 1990s, with the development of advanced genetic engineering methods, more efficient techniques for producing these engineered antibodies became available. Bispecific antibodies, which can simultaneously bind to two different targets with the same antibody, are particularly effective for treating solid tumors. [2,3]. The key characteristics of cancerous tissues are their metastatic and neoplastic structures, which are regulated by human epidermal growth factor receptor 2 (HER2) and epidermal growth factor receptor (EGFR). The goal is to create bispecific antibody molecules that can target both of these proteins simultaneously[4]. To develop these bispecific antibodies, an important method is the "knobs-into-holes" technology, which involves making specific mutations in the CH3 domain of two separate antibody heavy chains. This technology ensures that the resulting bispecific antibody is stable and has high expression levels, making it a promising therapeutic[5].In conclusion, researchers are making progress in developing new drugs by targeting specific molecules in tumor cells. The ongoing development of our research suggests that bifunctional antibodies have significant potential for therapeutic use in various types of solid tumors.

This study was supported by TUBITAK Project Number 119C054 and 217S118.

Keywords: bispecific antibody, therapeutics, synthetic biology, antibody engineering

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OP12– FACTORS AFFECTING THE CAREER PREFERENCE OF PHARMACY STUDENTS

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Pharmacy is an interdisciplinary field of science, comprising almost every aspect of drug discovery, synthesis, manufacture, and patient care. There is an increasing number of pharmacy students in Turkey. The aim of this study is to investigate the factors that lead them to be a pharmacist and to evaluate students' attitudes toward different career sectors. A cross-sectional observational study using an online self-administered survey is conducted among pharmacy students in Istanbul/Turkey. The questionnaire consists of sociodemographic characteristics of students, factors affecting students' choice of profession, and students' attitudes toward different career sectors. A total of 216 students participated in the study and the average age was found as 22.04 ± 1.72 years. 22.7% of the students have at least one health professional in their family. 49.1% of the students do not have information about the law numbered 6308 while choosing the pharmacy faculty. The main factors for students to choose the faculty of pharmacy; The desire to improve people's health (75%), the desire to work in the healthcare system (74.6%), job security (72.7%), and because it is a respected profession (71.8%). Community pharmacy was found to be the most-preferred career domain after graduation (79.6%), pharmaceutical industry was found to be as second (71.3%). On the other hand, over 60% of participants reported a preference for working abroad. 80.6% of the students stated that they did not regret choosing the profession of pharmacy. However, 83.8% of the students are worried about not being able to work in the field they want, and the vast majority (71.3%) are worried about the future of the profession. In conclusion, while most of the students want to work in community pharmacy, the tendency to other pharmacy fields is also substantial. By determining the pharmacy students' goals and needs, we aim to draw the government’s attention to these to ensure a future balance between supply and demand and effective pharmacy workforce planning.

OP13– A MULTIPLEXED COMBINATORIAL LIBRARY SCREENING APPROACH FOR PEPTIDE DRUG DISCOVERY AGAINST NEURODEGENERATIVE DISEASES

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Peptide therapeutics are very robust and advantageous molecules for treating diverse disease conditions. These molecules can be developed from naturally occurring or mimicking native peptides, rational design, and peptide libraries[1]. Day by day, the approved therapeutic peptide amount increases with its powerful activities. Till now, there are 80 peptide-based drugs approved and more than 300 peptides under clinical trials[2]. The potential brings an advantage for treatment of such diseases that are still a subject for providing a way to halt the disease progression. By depending on this, we aimed to select peptide drug candidates for Parkinson's and Alzheimers's disease since their common molecular property of them is the formation of pathogenic amyloid fibrils. Currently, there are several therapeutic approaches that are only effective in masking or slowing down symptom development. Nonetheless, different approaches are developed for inhibiting amyloid aggregation in the secondary nucleation phase, which is critical for amyloid fibril formation. Instead of targeting secondary nucleated protein structures, we tried to inhibit monomeric amyloid units as a novel approach for halting disease-condition[3]. To achieve this, we combined yeast surface display and phage display library approaches. We expressed *a*-synuclein, amyloid β_{40} and amyloid β_{42} on yeast surface, and we selected peptides by using phage display library.After iterative biopanning cycles optimized for yeast cells, we selected several peptides as drug candidate molecules. All of the peptides have been used in vitro characterization methods which are QCM-D measurement, AFM imaging, and ThT assay, and they have yielded promising results. Thus, using peptides is a good choice for diverse disease-prone molecule inhibition for those inhibit fibrillization. Also, these selected peptides can be used as drugs and sensors to detect disease quickly and halt disease progression.

Acknowledgement: We thank TUBITAK; project number: 216S127.

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OP14– FORMULATION AND CHARACTERIZATION OF INDOMETHACIN AND METFORMIN LOADED DUAL NIOSOME

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Indomethacin and metformin loaded dual niosome formulation was prepared by film hydration method [1]. The particle size, polydispersity index and zeta potential of the niosomes were determined using Zetasizer. The morphological appearance of niosomes was observed by scanning electron microscopy (SEM). Entrapment efficiency of drug loaded niosomes was determined by HPLC. Thermal properties of niosomes were investigated by differential scanning calorimetry (DSC). In order to characterize the structure and explore the chemical bonding patterns between indomethacin or metformin and the niosome components was performed by Fourier Transform InfraRed Spectroscopy (FTIR). In vitro drug release studies were conducted in triplicates using dialysis membrane and data was fitted to various mathematical models to study the drug release kinetics [2]. As a result of in vitro release studies, it was determined that the formulations comply with first order kinetics.

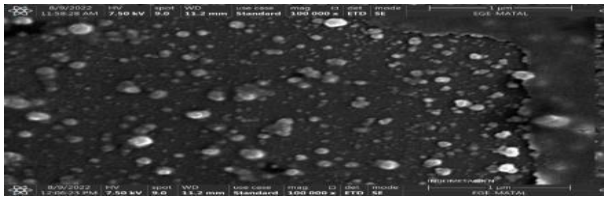

Figure 1. Dual Niosome Formulation's Scanning Electron Microscopy (SEM) image

Acknowledgement: The study was supported by TÜBİTAK (120S926).

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OP15– AN INNOVATIVE FORMULATION APPROACH TO THE TREATMENT OF SCHIZOPHRENIA: FAST DISSOLVING FILMS

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Risperidone is a second-generation antipsychotic drug that is used to treat schizophrenia and bipolar disorder. Patients with schizophrenia show resistance to taking medication [1, 2]. Fast dissolving films (FDFs) are drug delivery systems that allow rapid disintegration when applied on the tongue or release the drug it contains and provides its swallowing with saliva after disintegration [3]. Thus, FDFs are promising systems for an effective treatment of schizophrenia. The aims of the present study were to produce risperidone containing FDFs and to characterize them. FDFs containing the mixture of hydroxypropyl cellulose (Klucel™) and polyvinylpyrrolidone (Kollidon® 90F) in different ratios were prepared by the solvent casting method. The viscosities of the polymer solutions were measured using a rotational viscometer. The visuals of the prepared film formulations were presented in Figure 1. The thickness of the films were measured via a digital micrometer. The disintegration time of the films were measured in pH 6.8 buffer solution. Elongation %, as a mechanical property, of the FDFs was measured using a texture analyzer. The polymer solutions exhibited a viscosity in the range of 7.5±0.4-25±0.7 cP. The thickness values of the obtained film formulations were found to be between 23.7±2.8 and 49.8±9.8 µm. In European Pharmacopoeia 9.0, the dosage forms are defined as 'orodispersible' if its disintegration time is less than 3 min. In the present study, all the film formulations disintegrated under 50 sec. Thus, the films showed acceptable disintegration time according to the criteria involved in the pharmacopeia. The prepared film formulations exhibited acceptable elongation % values. In summary, risperidone loaded FDFs were manufactured and characterized successfully. The results obtained from the characterization studies of the film formulations also showed their suitability for the intended use to increase patient compliance in schizophrenia.

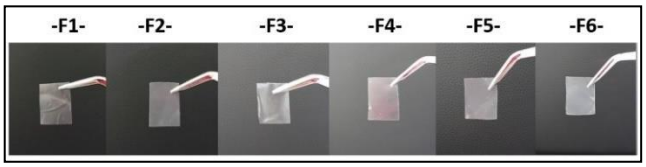

Figure 1. *Images of the film formulations (F1-F6).*

Acknowledgement: This study was supported by İzmir Kâtip Çelebi University Scientific Research Projects Coordination Unit (Project number 2021-GAP-ECZF-0025). The authors are also thankful to Deva Pharmaceuticals (Turkey), Ashland (Turkey), and BASF (Turkey) for kindly gifting Risperidone, Klucel™ and Kollidon® 90F, respectively.

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OP16– PATTERN OF MEDICATION USE IN OLDER ADULTS AT DISCHARGE FROM THE GERIATRICS WARD

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Polypharmacy is usually seen in older adults due to having multiple comorbidities which may in turn lead to the use of many medications [1]. Medications can be managed at home without proper help or guidance by older adults. Therefore, they may be at risk of experiencing harm from medications when used inappropriately. There is a great need to identify the pattern of high-risk medication use among older adults to understand the healthcare needs of older adults regarding the management of such medications at home. The objective of this study was to analyze the pattern of high-risk medication use in older adults at discharge from the geriatrics ward. A retrospective study was conducted at Ankara University, Ibn-i Sina Hospital, Geriatrics Ward. A sample of the patient group was randomly selected from the one-year data of medical and medication use records. Patients were eligible if prescribed at least one medication during the hospital discharge. Most of the patients were prescribed at least one high-risk medication (78%). A total of 281 medications were prescribed at discharge from the geriatrics ward in 45 older adults. Among these, 18% of them were medications causing QT prolongation such as tramadol, quetiapine, and trazodone. Only, 9% of them were high-alert medications such as insulin and anticoagulation therapies. The most commonly prescribed chronic medications were a low dose of aspirin (6%), proton pump inhibitors (6%), and metoprolol (4%), respectively. The most commonly prescribed vitamin supplement was vitamin D (12%). This study identifies that high-risk medication use was common in older adults. To avoid undesirable outcomes from these medications, education and/or specific guidance and/or onsite support on how to take or administer these medications can be provided to older adults and their caregivers for the appropriate management of these medications at home.

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OP17– PATTERN OF PROBIOTICS USE: RESULTS FROM THE SURVEY OF COMMUNITY PHARMACISTS

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Probiotics are live microorganisms that can provide health benefits to the host such as improving immune function and digestion [1]. Although probiotics are approved as dietary supplements, they are likely to be used for treatment and disease prevention by consumers [1]. They are sold in community pharmacies and thus pharmacists guide consumers in determining whether probiotics are right for the specific patient. The objective of this study was to identify the pattern of probiotic use via conducting a survey of community pharmacists. Method: A cross-sectional study was conducted among community pharmacists from 15 January 2022 to 15 March 2022. A self-administered survey including 28 items with a Likert scale was employed. A total of 103 community pharmacists participated in the study. Of these, 54% were female. The majority of the pharmacists had at least one probiotic product in their community pharmacy (92%). The most common reasons for patients to take probiotics were strengthening their immune system (36%), previously taking antibiotics (32%), and eliminating the effects of food poisoning (17%), respectively. As indicated by the pharmacists, most of the patients were not experienced any side effects from the probiotics (84%). Saccharomyces spp. (45%) and Lactobacillus spp. (36%) were the most commonly selected bacteria species for probiotics use. Probiotics were commonly used by patients, who visited community pharmacies. Pharmacists must ensure the safe use of probiotics by checking product quality and high-risk populations before recommending any probiotics.

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OP18– NOVEL ACETYLCHOLINESTERASE INHIBITORS FOR POTENTIAL THERAPEUTIC TREATMENT OF ALZHEIMER

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Alzheimer's disease (AD) is a disorder that causes degeneration of the brain cells and is the main cause of dementia [1]. Several physiological processes in AD destroy Acetylcholine (Ach) producing cells which reduce cholinergic transmission through the brain. Acetylcholinesterase inhibitors (AChEIs), act by blocking cholinesterase enzymes (AChE and butyrylcholinesterase (BChE)) from breaking down ACh, which results in increasing ACh levels in the synaptic cleft [2]. This preliminary study aimed to show the acetylcholinesterase inhibitor effects of newly synthesized potential Alzheimer drugs.

New series of benzimidazole derivatives bearing thiosemicarbazide and oxadiazole side chain at the first position were synthesized and docked computationally to the active site of the human acetylcholinesterase. All synthesized compounds were evaluated according to their docking scores. Molecular docking studies were performed using the Glide module of Schrödinger software 2022-1 version.

Thiosemicarbazide derivatives were obtained by reacting benzimidazole hydrazides and corresponding isothiocyanates with reflux in an ethanol medium. The hydrazides were converted to 1,3,4-oxadiazoles using mercuric (II) acetate. Molecular docking studies were performed to explain the potent AChE inhibition of the compounds studies to explain high affinity. Docking results for 7a, 10d=10a, and 4d against the target protein AChE showed a high binding affinity docking score of −12.415, −12.313, and −12.310. Compounds 2a, 4a, 6a, 2d, 7d, and 11d also showed promising docking scores compared to donepezil and rivastigmine's scores. These 10 compounds with high pharmacophore fit values showed interactions with important residues at the active site.

These results suggest that novel benzimidazole derivatives targeting acetylcholinesterase are a promising strategy for Alzheimer's therapy.

Keywords: Alzheimer, Acetylcholinesterase, Benzimidazole, Thiosemicarbazide, 1,3,4-Oxadiazole

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OP19– COMPARISON OF PH STIMULI-RESPONSIVE CONTROLLED RELEASE OF THE LEVOCETIRIZINE FROM TWO DIFFERENT CALIXARENE NANOFIBERS

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Nanofibers have widely been used for drug delivery systems.[1] The aim of this study is to develop electrospun calixarene nanofiberbased drug delivery system to achieve controlled release of levocetrizine. 5,11,17,23-Tetra-ter-bütil-25,27-bis(3-morfolinopropil) amid-26,28 dihidroksi-kaliks[4]aren (CLX-MORF) and 5,11,17,23-Tetra-ter-bütil-25,27-bis(furfuryl) amid-26,28 dihidroksi-kaliks[4]aren (CLX-FUR) were have been synthesized. Then, their nanofibers were produced by electrospin method. The fabricated multilayered electrospun nanofiber was first characterized in terms of morphology, followed by human serum albumin binding and levocetirizine loading at 7.4 of pH level, and release in different physiological pH (2.2; 7.4 and 8.6) [2] Binding of the protein was studied by using fluorescence spectroscopy and loading and release of the drug were done with UV spectropohotometer. Maximum amount of HSA onto nanofiber was found to be as 1.37 µg in 20 mM tris buffer, 7.4 of pH end of 60 min for (CLX-MORF). Data showed that the maximum loading amount of LEV was measured to be as 4.13 µg to the 2.25 cm^2 of surface in 20 mM tris buffer, 7.4 of pH end of 60 minutes for CLX-FUR. While max release of LEV was also 0.59 mg for CLX-FUR nanofiber, that of LEV was 0.55 mg at 7.4 of pH end of 60 minutes for CLX-MORF nanofiber. Loading of drug to nanofibers was clarified by SEM, TEM, EDX, and FT-IR analysis. Antimicrobial activity of the nanofibers was also studied. As a result of these studies, both calixarene nanofibers were suitable platform for pH stimuli-responsive controlled release. [3]

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OP20– EVALUATION OF PRE- AND POST-EDUCATIONAL KNOWLEDGE LEVELS OF PHARMACY STUDENTS IN TURKEY ON HPV AND HPV VACCINES

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Cancer is the leading cause of death in every country. In women, cervical cancer is the fourth most frequently diagnosed cancer and the fourth reason of cancer death. Pharmacy faculty students are also future health professionals who can help raise public awareness about cervical cancer and its prevention through the availability of effective and safe Human Papillomavirus (HPV) vaccines. It is important to evaluate their knowledge in order to develop education and awareness programs to increase their knowledge and improve their attitudes towards cervical cancer prevention. The aim of this study is to evaluate the effectiveness of a short structured presentation about HPV and HPV vaccine on the HPV knowledge of pharmacy students. Institutional-based, descriptive and cross-sectional pre- and post-test comparative study was conducted to understand the difference between HPV and HPV vaccine knowledge levels after one and a half hours of training given to pharmacy faculty students of a university. The Health Belief Model Scale for HPV and its Vaccination and HPV Infection Knowledge Scale were applied [1]. 106 students answered the pretest questions. 83 students answered the posttest questions. 4.7% of the students who participated in the pre-test stated that they had not received training on cervical cancer before. While 17.9% of the participants gave the correct answer to the question "Condom prevents HPV infection" before the training, 57.8% gave the correct answer after the training. It was observed that there was a significant decrease in the perception of severity in the post-test compared to the pretest, and a significant increase in the perception of barriers, benefit, and susceptibility ($p<0.05$). The results of the current study indicated that students' knowledge about HPV and its vaccination is limited and the educational intervention improved knowledge on cervical cancer and HPV. This study suggests that educational intervention effectively strengthens our understanding of the spread of HPV and cervical cancer.

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OP21– SYNTHESIS AND BIOLOGICAL EVALUATION OF SOME QUINOXALINE-HYDRAZONE DERIVATIVES AS ALPHA-GLUCOSIDASE INHIBITORS

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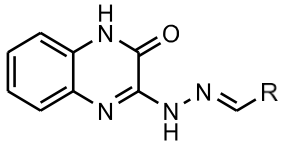
Diabetes mellitus (DM) is a major health problem and according to International Diabetes Foundation, 643 million people will have diabetes by 2030 [1]. Diabetes has a wide variety of complications such as diabetic neuropathy, amputations, renal failure and blindness. These complications cause increasing disability and major health costs for every society [2]. Alpha (□)-glucosidase inhibitors (AGIs) function predominantly in the gastrointestinal tract and inhibit □glucosidase enzyme, which is responsible for the digestion of complex carbohydrates. Consequently, AGIs delay the absorption of glucose from the intestines and by that reduce the postprandial blood glucose levels [3]. Additionally, some research showed that AGIs can be used to target other pathologies such as HIV, hepatitis and cancer [4]. Currently, used AGIs such as acarbose, voglibose and miglitol are semi-synthetic, expensive and have various side effects [3]. Therefore, there's a need for safe and effective new□-glucosidase inhibitors in the clinic.

Heterocyclic compounds gained a lot of attention in drug development because their wide range of bioactivities. Among them, the quinoxaline scaffold displays a broad activity spectrum with anti-microbial, anti-inflammatory, anti-diabetic, anti-cancer and anti-tuberculosis [5]. With the aim of novel AGIs, we synthesized some quinoxaline-hydrazone derivatives (Fig. 1). The structure of the synthesized compounds was confirmed with spectral analyses and the biological activity study was performed spectrophotometrically using acarbose as a reference drug. According to biological activity results, synthesized compounds have better or comparable activities with acarbose. Finally, based on our preliminary results quinoxaline-hydrazone derivatives can be a good candidate for the research of new □-glucosidase inhibitors.



R= Phenyl(**1**); 4-methoxyphenyl(**2**); 4-diethylphenyl(**3**)
4-cyanophenyl(**4**); 4-carboxyphenyl (**5**)
2-pyridyl(**6**); 2-furyl(**7**); 2-pyrrolyl(**8**)

Figure 1. General structure of the synthesized compounds (**1-8**).

Acknowledgement: This study was supported by research grant from TUBITAK 2209-A (Project ID: 1919B012200420).

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OP22– CAPECITABINE LOADED FOLATE-CONJUGATED MESOPOROUS SILICA NANOPARTICLES SYNTHESIS AND IN-VITRO CHARACTERIZATION

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Capecitabine is an anti-neoplastic prodrug used in monotherapy or combination therapy in colorectal cancers[1][2]. This study is proposed for increasing the antitumor activity of capecitabine by folate-conjugated mesoporous silica nanoparticles (MSN) and investigate its anti-cancer activity in-vitro.

For the synthesis of MSN, double surfactant system[3] was used. For this process cetyltrimethylammonium bromide(CTAB), poloxamer 407 (LutrolF 127), tetraethyl orthosilicate (TEOS) and aqueous ammonia was vigorously stirred with deionized water, then centrifuged and vacuum dried. After the synthesis, zeta potential, polydispersity index and particle size of MSNs were determined using Zetasizer; morpholocial apperance was observed by scanning electron microscopy (SEM) and Brunauer–Emmett–Teller (BET) surface area analysis was done. In vitro drug release studies were conducted in triplicates by using dialysis membrane and data was fitted to various mathematical models to study the drug release kinetics.

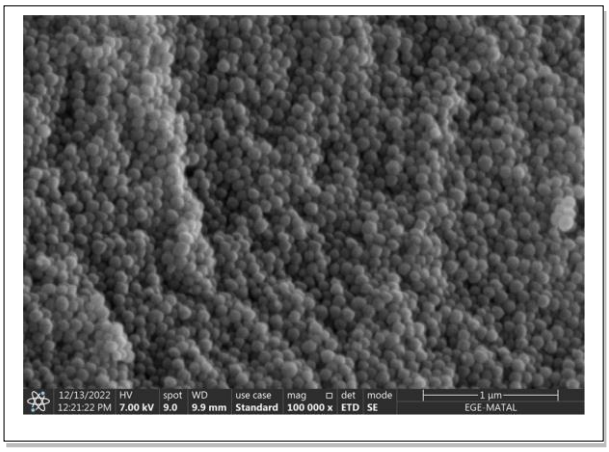

Figure 1. Mesoporous Silica Nanoparticles'(MSN) scanning electron microscopy(SEM) image.

Acknowledgement: The study was supported by TUBITAK (120S926).

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OP23– RADIOLABELING AND CELL INCORPORATION STUDIES OF INDOMETHACIN AND METFORMIN LOADED DUAL NIOSOME FORMULATIONS

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In the present study, indomethacin and metformin loaded dual niosome formulations were developed by film hydration method, and prepared niosomes had a particle size of between 100-300 nm, a PdI value under 0.5, and a negative charge between −30 and -50 mV. Then, all niosome formulations were radiolabeled with [^{99m}Tc]Tc using stannous salts (chloride) as a reducing agent and the radiochemical purity (RP) and stability of the niosome formulations were assessed by radioactive thin-layer chromatography (RTLC). The cell incorporation of [^{99m}Tc]Tc-labeled niosome formulations, as well as reduced/hydrolyzed (R/H)-[^{99m}Tc]$NaTcO_4$ in the HT-29 (human colorectal adenocarcinoma) cells, was then assessed. All niosome formulations were effectively radiolabeled with [^{99m}Tc]Tc using 500 µg mL^{-1} stannous chloride for 15 min, and RP was found to be over 95%. Compared to R/H-[^{99m}Tc]$NaTcO_4$, the incorporation percentages of [^{99m}Tc]Tc-labeled niosome formulations were shown to be higher in cancer cells (Figure 1). In conclusion, the newly developed [^{99m}Tc]Tc-labeled indomethacin and metformin dual niosome formulations may be useful in nuclear medicine imaging.

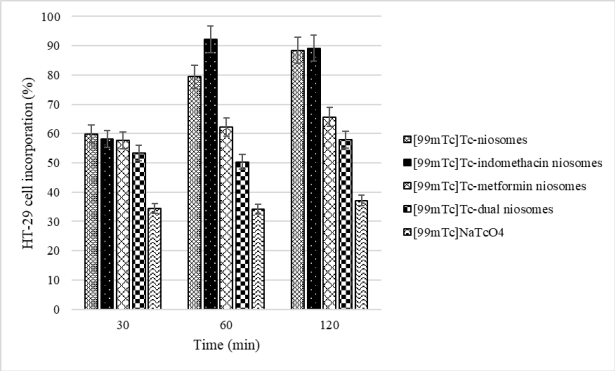

Figure 1. Ability of [^{99m}Tc]Tc labeled niosomes and R/H-[^{99m}Tc]$NaTcO_4$ to incorporate into the HT-29 cell line.

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OP24– MICROMERIA FRUTICOSA-LOADED NANOFIBERS EXHIBITS ANTIDIABETIC EFFECT VIA SUBLINGUAL ROUTE BY REGULATING GLUT-2

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Diabetes mellitus (DM) is a complex chronic disease caused by hyperglycemia, which is the result of insulin (INS) secretion problems or its ineffectiveness and DM requires constant care. In our study, it was aimed to examine the antidiabetic effect of Micromeria fruticosa subsp. Brachycalyx-loaded nanofibers (MFF) with in vivo tests on streptozotocin/nicotinamide (STZ/NA)-induced T2DM rats and in vitro cell culture tests on 1.1B4 (human beta cells) and BRIN-BD11 (rat beta cells) [1].

MF was loaded in NFs by the electrospinning technique, and FTIR, SEM, XRD, DSC, and tensile tests were utilized for the characterization of MFF. The antidiabetic activity of MFF was investigated with in vitro cell culture and in vivo animal tests.

MFF disintegrated in simulated saliva in almost 134.3 sec. MF is released from MFF more regularly and relatively fast in 20 min. MFF is more successful than MF in balancing blood glucose levels. SGLT-2 and TNF-α levels increase; and GLP-1, GLUT-2, PPAR-γ, and INS levels decrease in diabetic rats induced by STZ/NA. MFF has better improved these antidiabetic parameters than MF. Increased histopathological damage to the liver, pancreas, and kidney caused by diabetes is repaired with the treatments. Human fibroblast cell viability significantly increases with NFs. In the high glucose medium culture with MFF, the expressions of GLUT-2, glucokinase, and INS are improved in BRIN-BD11 and 1.1B4.

MFF is a new treatment approach for T2DM via affecting especially GLUT-2 and its antidiabetic effects may be attributed to the presence of flavonoids, phenols, tannins, and terpenoids.

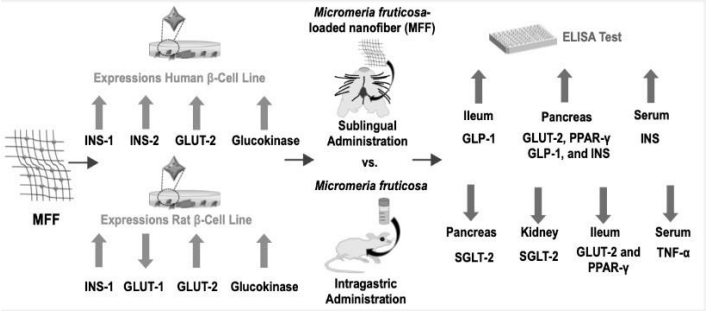

Figure 1. *Schematic illustration of the study.*

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OP25– CYTOTOXIC ACTIVITIES OF A CARDIAC GLYCOSIDE (OLEANDRIN)-LOADED-STIMULUS-SENSITIVE-BETA CYCLODEXTRIN-BASED NANO-CAPSULES

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Nerium oleander is a highly poisonous ornamental plant belonging to the Apocynaceae family, known as oleander in our country. Its leaves are especially rich in oleandrin, a cardenolide-type cardiac glycoside. Bioactivity studies such as anti-viral and anti-cancer for Nerium oleander extract and its active molecule, oleandrin, have gained importance in recent years [1]. Although cardiac glycosides, especially oleandrin, have high cytotoxic properties, they may show low in vivo bioavailability and accumulation in undesirable tissues and organs [2]. In addition, since the therapeutic doses are close to the toxic doses, it is essential to develop new carrier systems that will increase the bioavailability of these molecules and that can act on the tumor tissue, not on the undesirable tissues, especially in cancer treatment.

Cyclodextrin is a polymer with a significant place in supramolecular chemistry, enabling the encapsulation of a wide range of target molecules using different techniques, including host-guest and electrostatic interactions [3]. Stimulus-sensitive drug delivery systems also called smart systems, provide a release response to target-specific drug accumulation and small changes in the physicochemical environment around the tumor tissue and externally [4].

In this study, we synthesized a UV light-sensitive nano-capsule [5] with a hydrodynamic diameter range of 200-400 nm through layer-by-layer assembly of cyclodextrin-based polymers to increase the bioavailability of oleandrin and reduce its cytotoxicity to healthy cells. The obtained cyclodextrin-based nano-capsules were characterized using FT-IR spectroscopy, SEM, and TEM microscopy techniques, and the size and surface net charges were determined with Zeta Sizer. Cytotoxic activities were determined by MTT analysis on two pancreatic cancer cell lines (PANC-1, MIA PaCa-2) and a healthy cell line (HEK-293). We also investigated UV light's effect on cytotoxicity, which demonstrated that for nano-formulations up to 0.2 µg/ml, especially in the PANC-1 cell line, UV application caused an increase in cytotoxic activity.

Keywords: oleandrin, nanomaterials, beta-cyclodextrin, cytotoxic activity, UV-sensitivity
Acknowledgment: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK) 1001 Project Grant No: 218M565.

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OP26– TOTAL SAPONIN CONTENT AND ANTI-MIGRATION ABILITY OF SAPONARIA MESOGITANA ON HUMAN NEUROBLASTOMA (SH-SY5Y) CELLINE

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Medicinal plants are effective natural sources of healthcare for treatments of many ailments including cancer. Saponaria genus (family Caryophyllaceae) has been shown to possess antioxidant, antimicrobial and antiproliferative activities. The plant secondary metabolites (PSMs) can be classified as phenols, terpenoids, alkaloids, glicosides and saponins. Saponaria species are known to contain saponins which have a wide variety of biological activities. The purpose of this study was to investigate the total saponin amount of Saponaria mesogitana and its cytotoxic and anti-migration effects on the human neuroblastoma cancer cell line (SH-SY5Y).

Extraction of the plant was performed using an orbital shaker with methanol. The extract obtained was filtered, concentrated with a rotary evaporator and lyophilized. Total saponin content was determined by the vanillin-sulfuric acid method. The extract was mixed with the same amount of vanillin (8%, w/v) and twice the amount of sulfuric acid (72%, w/v). The mixture was incubated at 60°C for 10 min followed by cooling in an ice water bath for 15 min. Absorbance was measured at 535 nm. The total saponin content was expressed as equivalents of Quillaja (mg QAEs/g) [1]. SH-SY5Y cells were grown in DMEM supplemented with 10% FBS, 1% Penicillin-Streptomysin, 1% L-glutamin in 96 well plate at 37°C in a humidified atmosphere containing 5% CO_2. The cytotoxic activity of the S. mesogitana extract at concentrations ranging from 1 to 100 µg/mL was evaluated on SH-SY5Y cell line. After 24 h incubation MTT assay was performed. Cell migration differences between the extract treated and untreated cells were tested by scratch wound healing assay. Quantification of the wound area was measured by using Wound Healing Size Tool, which is an ImajeJ/Fiji plugin and allow you to measure the area of the wound and scratch width in µm. Statistical analysis was performed according to the Two-Way Anova analysis by using Graphpad Prism version 9.

The IC_{50} value of the extract on SH-SY5Y cells was determined as 47.68 µg/mL at 24h. According to our results it was observed that the control cells can migrate faster than the extract treated cells when we evaluted both the differences of the wound areas and scratch width. Wound closure percent was calculated as 63% and 28% in control and extract treated cells, respectively. When we compared cell migration rate (µm/hours) between the extract treated and non-treated cells, S. mesogitana treated cells had a rate of 3.5 µm/hours while non-treated cells had 4.18 µm/hours. Results from the evaluation showed that S. mesogitana had a cytotoxic effect on SH-SY5Y cells after 24 h. This effect was also seen in scratch wound assay that S.mesogitana treated cells were found slower than untreated cells in migration. It can be proposed that the observed cytotoxic and anti-migration effects of the S. mesogitana extract can be ascribed to the existence of saponin compounds. Further analysis is needed to discuss the anticancer effects of S. mesogitana on neuroblastoma cells.

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OP27– THE ANTICANCER POTENTIAL OF CYCLAMEN GRAECUM EXTRACT IN PHOTODYNAMIC THERAPY AGAINST NEUROBLASTOMA CELLS

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Medicinal plants are natural sources to unravel novel bioactive compounds to satisfy human pharmacological potentials. Cyclamen species are one of the medicinal plants that stand out with their potential anticancer effects. Cyclamen graecum L. is a tuberous geophyte and has been used for its biological activities in folk medicine [1].

Cancer is one of the leading causes of death in Turkey as well as the whole world. Alternative methods are being explored due to the side effects and the failure of conventional treatment methods. Photodynamic therapy (PDT) is a local and non-invasive therapeutic approach with minimal side effects, based on photochemical interaction mechanisms. It produces reactive oxygen species with the interaction between the light-activated drug (photosensitizer) and the light. This interaction uses the molecular oxygens in the environment with a series of chain reactions inside the cells and ends up with cell death via apoptosis or necrosis. PDT is a promising therapeutic approach to overcome the problems related to the conventional treatments of cancer. Plants in nature are one of the potential sources for obtaining new photosensitizers (PSs) that are less toxic than synthetic compounds. Although several works have been done regarding PDT in the last decades, relatively minor attention has been paid to the study of medicinal plant extracts as photoactivatable “green drugs”.

Neuroblastoma (NB), is an embryonal tumor of the sympathetic nervous system, that accounts for 15% of pediatric cancer deaths [2]. In this study, we investigated the effect of ethanolic leaf extracts of C. graecum as a photosensitizer in PDT applications on the human neuroblastoma cancer cell line (SH-SY5Y). 450 and 655 nm wavelengths were used to activate the extracts of C. graecum and their efficiencies were compared in terms of cell viability. 25 J/cm^2 energy density was determined for both of them and it was used to activate different concentrations of the plant extracts (10, 25, 50, and 100 μg/ml). When these concentrations were applied to cells at dark, they did not exhibit any toxic effect. However, there was a significant increase in cell death, when the leaf extracts were activated with light. In general, the percentages of cell death obtained with PDT applications were higher when the leaf extract was activated by 655 nm of wavelength. With 100 μg/ml of concentration, PDT application at 450 nm of wavelength caused a 25% decrease in cell viability, and PDT application at 655 nm of wavelength caused a nearly 30% decrease in cell viability. These outcomes show that the leaf extract of C. graecum is a promising photosensitizer for PDT. As a future study, different parameters will be used to obtain a higher photodynamic effect which may cause at least a 60% decrease in cell viability. Besides, the most appropriate wavelength to activate the extracts of C. graecum will be determined for its use in PDT applications as a potential photosensitizer.

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OP28– IN VITRO EVALUATION OF ANTI-ALZHEIMER'S EFFECT OF DONEPEZIL-LOADED PLGA NANOPARTICLE-EMBEDDED PVA/PEG NANOFIBERS

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Alzheimer's disease (AD) is the most common neurodegenerative dementia type. This disease is identified by cognitive dysfunctions, namely executive problems, impairment of expressive speech, and visuospatial abnormalities. Nowadays, different drug groups are preferred for the treatment of this vitally important disease [1]. Donepezil (DO), one of the reversible AChE inhibitors (AChEIs), is one of the most widely used drugs. The oral administration of DO causes various gastrointestinal side effects such as diarrhea or nausea. In addition, drug delivery of DO is limited because of the blood-brain barrier [2]. In this study, it was aimed to improve a new treatment strategy for patients with AH. DO-loaded PLGA nanoparticles (DNP) were embedded in PVA/PEG nanofibers (DNPF) produced by pressurized gyration for sublingual administration. Therefore, it was purposed targeting to the brain, increasing the bioavailability, providing sustained release, and enhancing the stability of DO. In addition, chemical, morphological, and crystalline structures of all DNP and DNPF were evaluated by using FT-IR, SEM, and XRD, respectively. It was proven DO to load into nanoparticles and nanofibers. The physical parameters of the polymer blend and the thermal properties of the products were examined. Furthermore, in vitro drug release tests and wetting and disintegration tests were carried out. The encapsulation efficiency of DO-loaded NP was found as 85.3±0.1%. First 24 hours, DO was released at 57.33% from NP and it was seen a sustained profile for DO levels for 18 days. DNPF were totally disintegrated in 9 sec. The cytotoxic effects and anti-Alzheimer effects of DNP and DNPF on the SH-SY5Y human neuroblastoma cell line were examined in cell culture. These nanofibers and nanoparticles can be safely recommended for further biocompatibility and animal tests with their anti-Alzheimer effects. Therefore, a new promising drug carrier system was improved for the treatment of AH.

OP29– DEVELOPMENT AND IN VITRO INVESTIGATION OF CURCUMIN-LOADED NANOPARTICLE-EMBEDDED SODIUM ALGINATE/GELATIN 3D-PRINTED SCAFFOLDS FOR ALZHEIMER'S DISEASE

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Alzheimer's disease (AD) is one of the major public health issues in the current era. However, the approved drugs used in the treatment of AD can only improve the symptoms, but they are unable to stop, slow down, or prevent the progression of the disease. Oxidative stress is involved in the development of AD by triggering amyloid plaque deposition, hyperphosphorylation of tau protein, synapse, and neuron loss. This relationship suggests that oxidative stress is an important part of the pathological process of AD and antioxidants may be beneficial for individuals with AD. Curcumin (CUR) displays antioxidant activity by preventing the production of various reactive oxygen species by diketone and phenolic groups in its structure. Also, CUR can inhibit amyloid-β aggregation and cross the blood-brain barrier. Brain-targeted nanoparticles (NPs) intend to enhance clinical outcomes by improving the diagnostic and therapeutic activity of drugs in the management of AD [1, 2, 3]. With this background, we synthesized CUR-loaded poly-lactic-co-glycolic acid (PLGA) NPs with prolonged release and successfully embedded them in 3D-printed sodium alginate (SA)/gelatin (GEL) scaffolds that can be rapidly dissolved sublingually. The morphology and in vitro efficiency of the NPs and scaffolds were evaluated. FTIR and XRD results showed that a successful formulation with significant encapsulation had been achieved, while thermal studies also showed similar results. In vitro drug release studies have demonstrated successful controlled release of CUR from NPs for 18 days. The cytotoxic effects and anti-Alzheimer effects of NPs and scaffolds on the SH-SY5Y human neuroblastoma cell line were examined in cell culture. According to the results, these NPs and scaffolds can be safely suggested for further studies of biocompatibility and animal testing with anti-Alzheimer effects. Consequently, the sublingual application of CNP-embedded scaffolds has promising potential for the treatment of AD.

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OP30– ANFIS-BASED MACHINE LEARNING APPROACH FOR PREDICTING FLUVASTATIN RELEASE FROM SUPERPOROUS HYDROGEL COMPOSITES IN DRUG DELIVERY SYSTEMS

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As an effective antihyperlipidemic drug, fluvastatin acts by strongly blocking the HMG-CoA reductase enzyme in the liver, which is crucial for the conversion of HMG-CoA to mevalonic acid, a fundamental step in cholesterol synthesis [1]. The excellent lipid-lowering effect of fluvastatin is compromised by its poor aqueous solubility and short elimination half-life, which limit its bioavailability. To improve the efficacy of fluvastatin, various strategies have been explored to increase its bioavailability, but with limited success [2]. On the other hand, superporous hydrogels are novel materials for gastroretentive drug delivery systems that offer prolonged gastric retention and improved solubility. This approach has the potential to significantly improve the bioavailability of fluvastatin [1]. However, predicting the drug release kinetics from superporous hydrogels is a complex process, and requires the development of accurate mathematical models.

In this study, we used an ANFIS-based machine learning approach to predict fluvastatin release from superporous hydrogel composites in drug delivery systems. The ANFIS-based machine learning approach enabled us to accurately predict fluvastatin release from superporous hydrogel composites, indicating that these composites could be an effective material for gastroretentive drug delivery systems. Our study demonstrates that ANFIS-based machine learning can accurately predict drug release kinetics, providing a valuable tool for drug development. By reducing the number of experimental studies required, this approach can accelerate the development process and bring new therapies to patients faster. The methodology presented in this study can also be extended to other poorly soluble drugs and drug delivery systems.

Keywords: ANFIS (Adaptive Neuro-Fuzzy Inference System), Fluvastatin, Drug Delivery Systems, Drug Release Prediction, Machine Learning, Pharmaceutical Technology.

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OP31– TOXICOLOGICAL ASSESSMENT OF AZOXYSTROBIN IN SH-SY5Y HUMAN NEUROBLASTOMA CELL LINE

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Fungicides are used globally to protect plants and food crops from soil-borne fungal diseases to enhance the agricultural yields and maintain a high-quality produce [1]. However, adverse environmental and human health effects, occupational and consumer risks resulting from the environmental contaminants have been reported over the years. One of the widely-used fungicide azoxystrobin (AZS), a strobilurin-derived fungicide, disrupts mitochondrial respiration by inhibiting electron transport, thus preventing ATP production and promoting neuronal cell death. Strobilurin fungicides have been studied for their toxicity both in vitro and in vivo. Exposure to these environmental chemicals can elicit reproductive impairment, hepatotoxicity, impaired mitochondrial function and oxidative stress [2,3]. Also, epidemiological studies have attributed transcriptional markers associated with autism, brain aging and neurodegeneration to the effects of environmental neurotoxicants, including strobilurins. Studies showed AZS-induced toxic effects in various tissues but underlying mechanisms of the neurotoxic effects have not been elucidated yet [2,4]. In this study, it was aimed to evaluate the possible toxic effects of AZS in human neuroblastoma (SH-SY5Y) cells, a widely established in vitro model for neurotoxicity experiments. The cells were treated with AZS in different concentrations for 24 hr. Following exposure, we used standard methods for evaluating specific targets: cytotoxicity by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) test, induction of reactive oxygen species (ROS) by fluorescent dye, and cell apoptosis by FITC Annexin V assay. In the MTT analysis, IC50 value of AZS were 44,87 µM for 24 hr exposure. ROS levels increased significantly compared to control in a dose-dependent manner, after AZS exposure in the range of 6,25-25 µM (>1,5-folds; $p \leq 0.05$). Annexin V assay results showed that ROS induced apoptosis. The apoptosis levels increased significantly after AZS exposure in the range of 6,25-25 µM (>5-folds; $p \leq 0.05$). Our findings suggested that azoxystrobin-induced neurotoxic effects may be a consequence of ROS generation and ROS induced apoptosis**.** However, the underlying mechanisms of AZS-induced neurototoxicity should be evaluated by further studies to better understand its toxic potential and conduct assessment of occupational and environmental risks.

Keywords: Azoxystrobin, Neurotoxicity, SH-SY5Y

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OP32– RADIOLABELING AND QUALITY CONTROL STUDIES OF TOFACITINIB CITRATE LOADED LIPOSOME FORMULATIONS

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Tofacitinib citrate loaded liposome (TOFA-Lipo-1-a) and empty liposome (Lipo-1), Tofasinitib citrate loaded nanoliposome (TOFA-Lipo-2-a), and empty nanoliposome (Lipo-2) formulations were prepared to be used in the diagnosis of rheumatoid arthritis. In radiolabeling studies, the effect of different amounts of reducing and antioxidant agents on the labeling efficiency was evaluated, and ideal radiolabeling conditions were selected. During radiolabeling of formulations with Tc-99m, tin chloride was used as a reducing agent, and ascorbic acid was used as an antioxidant agent [1,2]. The radiolabeling efficiency of the formulations was determined by thin-layer chromatography (TLC) [3].

To examine the effect of reducing agent and antioxidant amounts on radiolabeling efficiency, Lipo-1, TOFA-Lipo-1-a, Lipo-2, and TOFA-Lipo-2-a formulations were prepared and added to 1 mL of physiological saline. 1 mL of each formulation was taken into each vial. 10, 250, and 1000 µg/mL of freshly prepared stannous chloride stock solution with a concentration of 1 mg/1mL, through which nitrogen gas was passed, was added to the bottles and divided into three main groups, respectively. 0,1 and 0,5 mg ascorbic acid was added to formulations containing different amounts (10, 250, 1000 µg/mL) of reducing agents. 0.1 mL of Tc-99m with 1 mCi activity was added to each mixture and mixed in a vortex-type mixer for 1 minute. It was observed that the formulation with the highest radiolabeling efficiency was the formulation prepared with the addition of 250 µg/mL stannous chloride and 0.1 mg ascorbic acid (Figure 1).

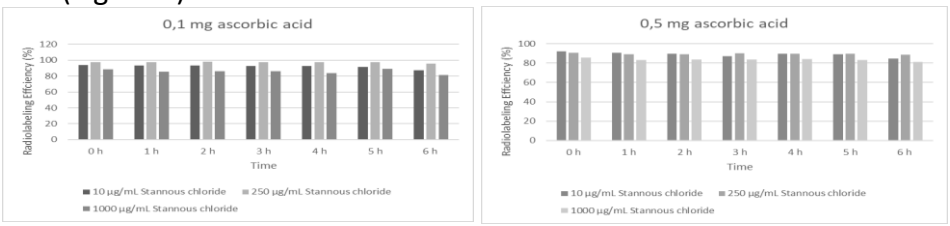

Figure 1. Radiolabeling efficiency of TOFA-LIPO-2-a formulation prepared using different amounts of stannous chloride and ascorbic acid.

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OP33– ESTIMATING SWELLING BEHAVIOR OF GUAR GUM HYDROGEL FOR CONTROLLED RELEASE OF CANCER DRUGS: A RANDOM FOREST ALGORITHM APPROACH

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Hydrogels are an important class of materials that offer a wide range of applications in various fields such as biomedical, environmental, and food science due to their unique properties and ease of modification. The biodegradability and low toxicity of hydrogels make them ideal candidates for drug delivery systems, especially for use in sensitive areas of the body. Among the various hydrogels, guar gum is a popular choice due to its biocompatibility and biodegradability. Guar gum is a natural polysaccharide extracted from the seeds of the Cyamopsis tetragonoloba plant. It is biocompatible, biodegradable, and non-toxic, which makes it an ideal candidate for drug delivery in cancer treatment. In this study, we propose a method to estimate the swelling behavior of guar gum hydrogels using the random forest algorithm. The random forest algorithm is a machine learning method commonly used for classification and regression tasks. It is an ensemble learning method that combines multiple decision trees to improve prediction accuracy. Our training data set consisted of data on the swelling behavior of guar gum hydrogel under different pH conditions, which came from research previously published in the literature. To evaluate the performance of the random forest algorithm, we used three metrics: mean absolute error (MAE), root mean square error (RMSE), and coefficient of determination (R^2). Our results showed that the random forest algorithm was able to predict the swelling behavior of guar gum hydrogel with high accuracy. The R^2 value was close to 1, indicating that the model can explain most of the variability in the data. Our results show that the proposed method can predict the swelling behavior of the hydrogel with high accuracy. This method can be further optimized and applied to other drug delivery hydrogels.

Keywords: Random Forest Algorithm, Cancer Treatment, Swelling Properties, Guar Gum Hydrogel.

OP34– EXPLORING THE SWELLING PROPERTIES OF CARBOXYMETHYL CELLULOSE-PEG 300-CITRIC ACID HYDROGELS FOR WOUND DRESSING APPLICATIONS USING RANDOM FOREST ALGORITHM

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Wound dressing materials should possess certain characteristics such as high water absorption capacity, good flexibility and biocompatibility. Carboxymethyl cellulose (CMC) is a widely used biopolymer for wound dressings due to its high water absorption capacity, non-toxicity and biodegradability. To improve its properties, CMC can be combined with other polymers such as polyethylene glycol (PEG 300) and citric acid to form hydrogels with improved swelling and mechanical properties. The objective of this study is to investigate the swelling properties of hydrogels prepared by combining CMC, PEG 300 and citric acid and to evaluate their potential for application as wound dressings. The swelling behavior of hydrogels is an important parameter that determines their suitability for use as wound dressings. The Random Forest algorithm as a machine learning was used to predict the swelling behavior of the hydrogels. Moreover, the algorithm was used to asses the potential of developed hydrogel for the use of wound dressings. The hydrogels were prepared by mixing CMC, PEG 300, and citric acid in various ratios. The hydrogels were characterized by measuring the swelling ratio, water absorption capacity, and mechanical properties such as elongation. The algorithm was trained using a data set consisting of the swelling ratio of the hydrogels. The data set was divided into a training data set and a test data set, and the algorithm was evaluated based on its accuracy in predicting the swelling behavior of the hydrogels. The results showed that the Random Forest algorithm was able to predict the swelling behavior of the hydrogels with a high degree of accuracy ($R^2 > 0.98$). The methodology outlined in this study can be extended to other drugs using delivery systems, making it a powerful technique for improving drug development and refinement.

Keywords: Random Forest Algorithm, Carboxymethyl Cellulose, Swelling Properties, Wound Dressing, Hydrogel

OP35– EVALUATION OF MEDICATION ADHERENCE AND TREATMENT SATISFACTION İN PATIENTS USING DIRECT-ACTING ORAL ANTICOAGULANTS

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The aim of our study is to evaluate the medication adherence and satisfaction with anticoagulant treatment in patients using direct-acting oral anticoagulants (DOAC) in the cardiology outpatient clinic and the possible factors affecting it. This study was conducted in a cardiology outpatient clinic between May 2022 and September 2022. A total of 200 patients who applied to DOAC and used it before or started using it were included in the study. Duke anticoagulant satisfaction scale (DASS) and five-item Medical Compliance Report Scale (MARS-5) were administered to each patient once, on the day of enrollment of the patients. The Turkish reliability and validity of these two scales were made and permissions for use were obtained [1,2].The mean age of the patients was 65.9±0.8 (range: 34-94), mean body mass index (BMI) was 28.9±0.4 (16-50).It was concluded that the higher the score a patient received from DASS, the less satisfied he was with his treatment. On the other hand, as the score increased in the scale of reporting drug compliance, it was revealed that the patient was compliant with the treatment.MARS-5 mean score was calculated as 20.8±0.3 (5-25). DASS mean score was calculated as 82.9 ±1.6 (25-175). It was determined that there was an inverse correlation between MARS-5 and the total score of the DASS, which was statistically significant (Spearman's rho=-0.42, p<0.0001). Although there was no significant difference between the DOAC active ingredients, rivaroxaban had the highest drug compliance. Patients applying to an outpatient cardiology clinic who used DOACs exhibited low levels of medication adherence and anticoagulant satisfaction, according to findings from 200 patients. It is anticipated that clinical pharmacy services may positively influence the health outcomes of both the control and study groups.

Acknowledgement: Cardiology; Direct Acting Oral Anticoagulant; Medication Adherence; Duke Anticoagulant Satisfaction Scale

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OP36– EVALUATION OF DIABETES KNOWLEDGE OF PHARMACY STUDENTS

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Diabetes is a global health concern. Pharmacists contribute to improving health outcomes by providing pharmaceutical care to patients with Diabetes Mellitus (DM). There are studies showing that pharmacy students need more knowledge in order to competently contribute to diabetes management. The aim of this study is to determine the level of diabetes knowledge of the undergraduate students of Health Sciences University Hamidiye Faculty of Pharmacy. A cross sectional study using online self-administered survey was conducted during 2 weeks among the 4th and 5th year pharmacy students. Sociodemographic characteristics of the students were collected. A structured questionnaire about the definition, causes and symptoms of diabetes (40 items) [1] were applied. The response options were “yes; no; or I do not know”. Each correct answer was scored as 1 point, incorrect or I don't know answers are scores as 0 point. The maximum possible score was 40. Diabetes Knowledge Scale scores and the correlation of the scores with students’ sociodemographic characteristics are main outcome measures. Of the 196 students 77% were female and 43.4% of them had diabetes family history. Forty-one percent of the participants stated that they were involved in the care of at least one diabetes patient. The mean knowledge score was found to be as 34.07 ± 4.13. The subscale scores were found to be as follows; diabetes general knowledge 7.04 ± 1.15 (8 items), diabetes risk factor 2.88 ± 0.37 (3 items), diabetes symptoms 2.70 ± 0.53 (3 items), diabetes diagnosis 3.46 ± 0.91 (4 items), diabetes treatment 7.64 ± 1.62 (10 items), diabetes complications 3.81 ± 0.58 (4 items), and diabetes diet and exercise 3.78 ± 1.19 (5 items), and diabetes control 2.76 ± 0.48 (3 items). The Cronbach's alpha value of the scale was found to be 0.767. Students were found to have adequate background knowledge regarding diabetes diagnosis, symptoms, and risk factors. However, knowledge deficits in areas such as diet in diabetes and treatment in gestational diabetes have been identified among participants.

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OP37– AMPISILIN-LOADED CHITO

SAN-HYALURONIC ACID-BASED POLYELECTROLYTE COMPLEX AS ORAL FILM

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Periodontitis is an inflammatory periodontal disease defined by the progressive loss of the tissues surrounding the tooth [1]. Systemic antibiotic treatment using only Ampicillin or combining with Metronidazole and Ampicillin is used to successfully management of periodontitis [2]. In this study, a drug delivery system was designed to obtain a local treatment alternative and to sustain drug release for the whole treatment period of periodontitis. Ampicillin was used as a model drug to develop a new oral film by cross-linking with chitosan and hyaluronic acid (HA) to form a polyelectrolyte complex(PEC)-based system.

Oral films were produced by solvent-casting method. Different HA amounts were added to the chitosan solution in the formulation study to obtain desirable drug release. All formulas exhibited an excellent uniformity of weight with low deviation among manufacturing replications. The swelling index of the films increased substantially at first, and the films appeared to be entirely swelled and hydrated after 15 minutes [3]. At the 336th hour, the I1 coded oral film (12 % HA) released 87 % of loaded Ampicillin, suggesting that Ampicillin release increased with the HA concentration. Changing the HA concentration (6% vs. 3%) did not influence the released percent from I3 or I5. FTIR studies suggested that Ampicillin had no effect on the interaction of chitosan and HA. Ampicillin-loaded films coded I1, I3, and I5 showed different thickness which are acceptable thicknesses as an oral film.

The ability of the release system to extend the drug release rate determines the efficacy of periodontitis treatment. Cross-linking is one of the essential film-forming strategies for controlling drug release rates. I1coded film with 12% HA was selected as an optimum formulation for further studies. As a result, a new oral film was designed for effective Periodontitis treatment. Further studies like anti-bacterial efficiency tests are planned to obtain.

Acknowledgment: Authors declare no conflicts of interest related to this study.

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OP38– THE EFFECT OF SEX DIFFERENCES ON DONEPEZIL-INDUCED ELECTROCARDIOGRAM QT PROLONGATION

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Alzheimer's disease is one of the neurodegenerative diseases and the incidence of Alzheimer's disease is higher in females compared to males [1]. Donepezil is a cholinesterase inhibitor and is approved for Alzheimer's disease treatment. Recently, a dear doctor letter about electrocardiogram QT prolongation with donepezil was released from the Turkish Pharmacovigilance Center (TUFAM) in 2022. Therefore, our aim is to investigate the QT prolongation that has been reported with donepezil and to highlight the effect of sex differences on this adverse event.

Adverse events with donepezil (donepezil, donepezil hydrochloride, donepezil hydrochloride 5 mg, donepezil hydrochloride 10 mg, and donepezil hydrochloride ODT) were collected using FDA Adverse Event Reporting System (FAERS) database from 1997 to 2022. Long QT syndrome, Torsade de Pointes, and Electrocardiogram QT prolongation adverse events were included in our study. These adverse events were analyzed as reaction type, sex, and reporter. For QT prolongation adverse events of donepezil to compare with the other Alzheimer's disease medications, a proportional reporting ratio (PRR) was calculated [2]. The chi-square test was used to evaluate the differences in categorical variables. Statistical analyzes were performed with GraphPad Prism software (USA).

Total 14426 adverse events were submitted to the FAERS database and 72.26% of adverse events were reported by healthcare professionals. Bradycardia (7.06%) and drug interaction (6.92%) were the most frequent. Females have higher total adverse events with donepezil compared to males (7837 vs 5189; $p<0.0001$). In 9.70% of reported total adverse events, sex was not specified. Cardiac disorders with donepezil were slightly higher in females than males (1458 vs 995; $p=0.41$), but QT prolongation adverse events were significantly higher in females (332 vs 83; $p<0.0001$) (Figure 1). As a result of the PRR calculation, it was understood that the QT prolongation was reported as most common with donepezil (donepezil > galantamine > memantine > rivastigmine). QT prolongation has not been reported with aducanumab.
In conclusion, especially female patients with Alzheimer's disease who are being treated with donepezil should be advised to use caution when taking other drugs that may prolong the QT interval.

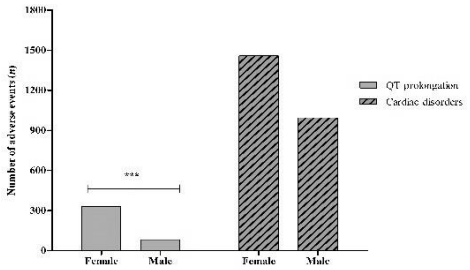

Figure 1. Sex differences in QT prolongation and cardiac disorders reported with donepezil. The chi-square test was used for statistical analysis and ***p<0.0001

Keywords: Alzheimer's disease, donepezil, female, male, QT prolongation.

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OP39– THE ASSESSMENT OF ANTIMICROBIAL AND ANTIBIOFILM ACTIVITY OF COMMERCIAL ORAL HEALTHCARE PRODUCTS AGAINST BACTERIA

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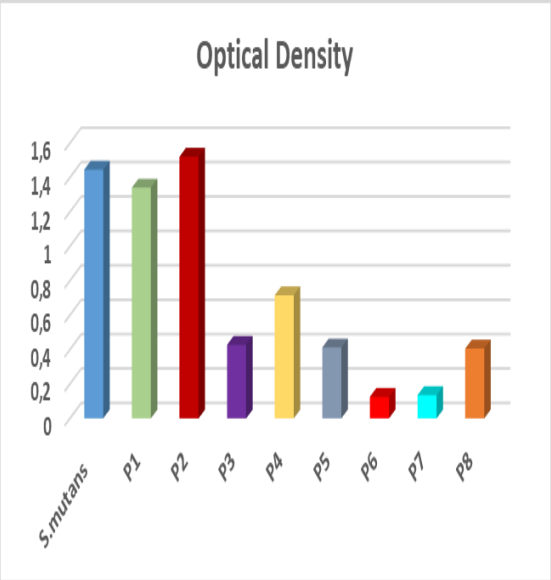
The practice of mouth rinsing has been used by humans for over 2000 years, but it has been as little as 30 years since the introduction of a commercially available mouthwash specially formulated to control dental problems and oral hygiene [1]. Today, mouthwashes with different formulations are frequently used by the public for reasons such as improving breath and refreshing the mouth. The chemical compositions (parabens, sodium fluoride/chloride, chlorhexidine, alcohol, cetylpyridinium chloride, etc.) of these easily accessible and used products are different, or their effectiveness may also vary [1,2]. The aim of this study was to investigate the antimicrobial and antibiofilm activities of commercial mouthwashes against Streptococcus mutans and Enterococcus faecalis.

Eight commercial mouthrinses with different ingredients (Table1) were included in this study. Antimicrobial activities of the commercial mouthrinses were investigated by broth microdilution method in accordance with EUCAST recommendations. Antibiofilm activity was evaluated by spectrophotometric microplate method.

P2 and P8, even at the highest concentration, showed the lowest antibacterial activity against two bacteria species. P4, P5 and P7 showed the highest antimicrobial activity against both S.mutans and E.faecalis. The antibacterial activity of these mouthrinses against S.mutans were higher than E.faecalis. P1 and P7 demonstrated the lower antibacterial activity and their antibacterial effect was higher against S.mutans than E.faecalis. P6 and P7 has shown high antibiofilm activity against S.mutans biofilm. It was determined that the biofilm formation of strong biofilm producer S.mutans decreased by 91.3% and 90.6% in the presence of P6 and P7, respectively (Figure1).

	Ingredients
P1	*Xylitol, PVG, PEG40, Sodium saccharin, Stannous fluoride*
P2	*Alcohol, Sorbitol, Benzoic acid, Sodium benzoate, Sodium saccharin, Eucalyptol, Menthol*
P3	*Glycerin, Sodium fluoride, Sorbitol, Sodium benzoate, Eugenol, Sodium chloride, Citric acid, Chamomilla flower extract*
P4	*Glycerin, Sodium fluoride, Potassium sorbate, Sodium saccharin, Sodium fluoride, Menthol, Sorbitol, Cetylpyridinium chloride*
P5	*Glycerin, Sorbitol, PEG60, Sodium benzoate, Methylparaben, Propylparaben, Cetylpyridinium chloride, Saccharin, Sodium phospate*
P6	*Glycerin, PEG60, Sodium saccharin, Sodium fluoride, Methylparaben, Propylparaben, Sodium citrate*
P7	*Glycerin, Sorbitol, Camellia sinensis leaf extract, Menthol, Citrus Lemon Peel Oil, Propylene glycol, Poloxamer 407, Sodium saccharin, Cetylpyridinium chloride, Sodium fluoride*
P8	*Glycerin, Sodium bicarbonate, Thymus Vulgaris Leaf Extract, Eucalyptus Globulus Leaf Oil*



It was determined that the mouthwashes with high antibiofilm activity contained methylparaben, propylparaben, cetylpyridinium chloride and sodium fluoride. It was noteworthy that commercial mouthwashes with higher antibacterial activity contained cetylpyridinium chloride and sodium fluoride, unlike other mouthwashes. The using at the appropriate concentration (with or without dilution) of mouthwashes is an important parameter in terms of effectiveness.

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OP40– SYNTHESIS AND INVESTIGATION OF CYTOTOXICITY IN DIFFERENT CELL LINES OF NOVEL HYDROXYPYRANONES

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Kojic acid (5-hydroxy-2-hydroxymethyl-4H-pyran-4-one) is a natural fungal metabolite produced by many species of Aspergillus and Penicillium molds. Mannich bases synthesized from kojic acid have been determined in extensive studies conducted by our study group that they have a wide variety of biological activities. In recent studies, the effects of Mannich bases on cell viability were determined by Sulforhodamine B assay using A375 human malignant melanoma, HGF-1 human gingival fibroblast, and MRC-5 lung epithelial cell lines [1-3].In this study, first, in light of the findings of our previous studies, new anticancer active compounds were synthesized from compounds with high anticancer activity. Various spectroscopic methods such as ^{1}H-NMR and ^{13}C-NMR and elemental analyses have elucidated their structures. Subsequently, compounds were applied to various human cancer cell lines including five human tumor cell lines, MCF7 (human breast, adenocarcinoma), MDA-MB-231 (human breast, adenocarcinoma), SK-MEL (human, melanoma), A549 (human lung carcinoma cell line), HT-29 (human colon, adenocarcinoma) and on a healthy cell line Vero (African green monkey kidney epithelial) by MTT assay.
Compound 1 (3-hydroxy-6-(hydroxymethyl)-2-((4-(4-iodophenyl)piperazine-1-yl)methyl)-4H-pyran-4-on) showed remarkable cytotoxicity with IC_{50} values between 8.11 and 21.24 µG/mL. The IC_{50} value on a healthy cell line is over 100 µG/mL. Compared to healthy cell lines, SK-MEL cells have 12 times less IC_{50} value, with a therapeutic index over 12. Therefore SK-MEL is designated the most sensitive cell line among the studied among our newly synthesized compounds group. When compared to KOJI MG84, the closest cytotoxic effectivity to KOJI MG84 is observed on the SK-MEL cell line in compound 1, with 4 times less cytotoxic activity. It was more potent than the other compounds in five cancer cell lines and the positive control doxorubicin. Compound 1 and its cytotoxicities are reported for the first time.

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OP41– IN VITRO EVALUATION OF ENDOCRINE SYSTEM RELATED REPRODUCTIVE TOXICITY POTENTIALS OF 5-FLUOROINDOLE DERIVED MELATONIN ANALOGUES WITH ANTIOXIDANT ACTIVITY

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In drug discovery and development process it is really important to investigate the efficacy of the drug candidate as well as its adverse effects. The compounds that interact with endocrine system function can either interact with receptors and act as an estrogen receptor agonist/antagonist or modulate enzymes that involve in biosynthesis and metabolism of steroid hormones. Investigation of the potential endocrine system related adverse effects of the drug candidates via in vitro screening tests is an approach that also adopted by regulatory organizations if needed. Melatonin is a natural indolic hormone and its antioxidant activity via several mechanisms has been reported. However its short half-life as a result of its rapid metabolic inactivation is an important limitation in its therapeutic use. This drawback can be conquered by designing and synthesizing novel melatonin analogues. In the present study potential antioxidant activity of the 5-floro indoles derivatives was investigated via both cell-based and cell-free in vitro assays. Since the parent compound melatonin interacts with estrogen signaling pathway via inhibiting aromatase enzyme and estrogen receptor, it is suggested that these novel compounds may have endocrine related adverse effects. Therefore, endocrine related reproductive toxicity potential of the newly synthesized melatonin analogues which are suggested as antioxidant drug candidates were also investigated. For this reason aromatase inhibitory and estrogen receptor agonist/antagonist effects of the compounds were investigated. The effect of newly synthesized compounds on aromatase activity was tested directly by an in vitro screening assay in 96-well plate format using 7-methoxy-4-trifloromethyl coumarin as a substrate while indirect measurement was evaluated by MCF-7 cell proliferation in estrogen free medium in the presence of testosterone. Potential estrogenic /antiestrogenic effects of the compounds were evaluated by miniaturized E-Screen assay, as the most sensitive in vitro endocrine disruptor screening assay. As a result among tested compounds with antioxidant activity dichloro substituted one was showed both estrogen receptor antagonist and aromatase inhibitory activity. Furthermore one of the difluoro substituted derivative showed cytotoxic activity towards normal human breast epitelial MCF-10A cells, in addition to its estrogen receptor antagonist activity. In conclusion, endocrine disrupting and cytotoxicity potential of these compounds should be considered while suggesting them candidate as an oxidative stress modulator in diseases related to oxidative stress, like neurodegenerative diseases and diabetes.

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OP42– DEVELOPMENT AND IN VITRO EVALUATION OF CAFFEINE ORAL MICROPELLETS WITH BIPHASIC RELEASE PATTERN

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Introduction: Caffeine is a natural stimulant that is mainly found in cocoa, coffee, guayusa and guarana plants. It increases alertness, boosts energy, and positively affects mood. However, caffeine can also cause nervousness and rebound crashes [1]. A combination of guayusa and green tea provides a synergistic blend of xanthine stimulants, ensuring a gentle increase in mood, vigilance, and physical vigor [2]. Green tea extract contains several antioxidants and enhances energy and focus [3]. Guayusa extract has multiple beneficial compounds linked to potential health benefits, including antioxidants that support the mood-enhancing effects of caffeine [4]. Caffeine was formulated with a mixture of green tea extract, guayusa extract, and vitamin B12. Its biphasic release system offers an immediate release of guayusa extract and caffeine, followed by a prolonged release of green tea extract and caffeine. The formulation's primary packaging is sachets, and it has excellent taste-masking of bitter plant constituents, making it easy to administer without water.

Materials and Methods: The biphasic release providing caffeine formulation, which features both immediate and prolonged release patterns, was created using pelletization technology. The manufacturing process was optimized separately for each type of pellets. The immediate release pellets were developed using microcrystalline cellulose, caffeine, green tea extract, and vitamin B12, glycerol monostearate, inositol hexanicotinate, while the prolonged release pellets were developed using microcrystalline cellulose, caffeine, guayusa extract, hypromellose and glycerol monostearate. Hypromellose was used as a hydrophilic matrix system to provide prolonged release. Manufacturing steps of both core pellets include granulation, extrusion, spheronization and drying, respectively. To mask the bitterness of green tea and guayusa extracts, a specific coating material was applied using a fluid bed coater with a Wurster tube. The coating material contains basic methacrylate copolymer, tartaric acid, stearic acid, and magnesium stearate. The final formulation included both immediate release pellets and prolonged release pellets filled into the sachets with the specified weight for each type of pellet. The in vitro release studies of prolonged pellets were carried out in a pH 6.8 phosphate buffer medium during a 6-hour period.

Results: While the immediate released pellets were significantly dissolved in 30 minutes, the prolonged release formulation exhibited an in vitro release profile, where not more than 50% of caffeine was released in the first 90 minutes, was reached to 75% at 180 minutes, and not less than 90% of caffeine is released until the 5th hour. The biphasic release system enables immediate energy boost, due to an ultra-rapid release system while the prolonged-release mechanism prevents a caffeine crash and estimated to produce a lasting effect for up to 5 hours.

Conclusions: The biphasic release caffeine formulation is a natural energy supplement designed to lift the mood and energy levels whenever needed to most. The micropellet formulation comprises a well-balanced blend of the Amazonian plant-stimulant guayusa, green tea extract and wake-promoting vitamins. Formulated as a biphasic release system it enables an ultra-rapid release of green tea extract, and nootropic vitamins, accompanied by a prolonged release of guayusa stimulants and caffeine. Taste of bitter plant-constituents masked using functional coating and a pleasant user experience has been provided.

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OP43– POLYMERIC MICELLES FORMULATIONS LOADED WITH CANDESARTAN FOR INTRANASAL ADMINISTRATION

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Migraine is a neurological disorder characterized by recurrent, moderate to severe pain that is difficult to treat for both patients and doctors [1]. Candesartan cilexetil is an angiotensin-converting enzyme (ACE) receptor blocker and it is completely transformed into the active ingredient candesartan at the time of absorption from the gastrointestinal system [2]. Candesartan provides effective migraine prophylaxis with a tolarebility profile because it reduces the effects of angiotensin II, which has several effects that may be relevant to migranine such as direct vasoconstriction and increased sympathetic discharge [3].
The nasal route in migraine prophylaxis has the advantages of being rapid and systemically effective, not being subjected to first-pass effects by the liver, and targeting drugs directly from the nasal cavity to the brain [4]. Polymeric micelles (PMs) are nanoscopic core/shell structures formed by amphiphilic block copolymers. They can help increase drug efficacy, reduce side effects, reduce dose and dosing frequency due to their small size and favorable physicochemical properties [5, 6].

Our study aimed to formulate a novel candesartan-loaded, polymeric micelle-based drug delivery system, focusing on the nose-to-brain pathway, as a key delivery route to treat migraine diseas. PMs were prepared via thin film hydration technique adopting a central composite face-centered design (CCFD). A three-level four-factor CCFD design was applied. The independent variables were; P123 concentration ($\mathbf{X_1}$), Pluronics®:drug ratio ($\mathbf{X_2}$), hydration volume ($\mathbf{X_3}$) and stirring time ($\mathbf{X_4}$). The levels of each factor were designated as (−1,0,+1) and their corresponding actual values are shown in Table

1.

Table 1. Central composite face-centered design for Candesartan[a] loaded polymeric micelles

Factors	Levels		
	-1	**0**	**1**
X_1: P123 conc.	%50	%75	%100
X_2: Pluronics:drug ratio[b]	20:1	30:1	40:1
X_3: Hydration volume	5	7.5	10
X_4 : Stirring time (min)	20	40	60

[a]Weight of Candesartan = 10 mg.

[b] Mixture of Pluronics® (P123 and L121) according to **X_1** levels.

Thirty different formulations were developed and evaluated in terms of entrapment efficiency (EE), particle size (PS), polydispersity index (PDI), zeta potential (ZP), and in vitro release. The formulation of Pluronic:drug ratio 39.995, Pluronic concentration 50.115, hydration volume 5 mL, mixing time 56.7 minutes was selected.

Acknowledgements

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OP44– SENSITIVE DETECTION OF BACTERIA BY MOLECULARY IMPRINTED POLYMER

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Over the past decades, biosensor systems are of great importance because of their capability to solve a potentially large number of challenges in various fields. The increasing demand for biosensors has resulted in considerable developments for detection of analyte of interest at levels of sophistication not possible before. A biosensor is a device that consolidates a biological element with an electronic constituent to produce a measurable signal [1]. The most widely used sensing elements are the antibodies, enzymes, synthetic molecular recognition elements such as nanomaterials, molecular imprinted polymers, aptamers, metal oxides, and peptides. [2]. Biosensors are divided into optical, electrochemical, mass sensitive, thermal, and others according to the transducer types. Among them, electrochemical based biosensors provide cost-effective, sensitive, rapid, and selective analysis.

Molecular imprinted polymers (MIPs) are substances that selectively bind to the target template, by mimicking the antigen-antibody interaction [3]. MIPs are generally incorporated into biosensor systems due to their high selectivity for the target molecule [3]. *Enterococcus faecium* is a member of normal microbiota in humans, but also one of the most common causes of nosocomial infections. Besides, it causes urinary tract infections and bacteremia. Due to their high resistance to antibiotics, its early detection is quite important. Culture-based methods, ELISA, spectrophotometry, and PCR are classical methods for bacteria detection [3, 4]. These conventional methods take longer analysis time and require expensive equipment [4]. In our study, we have developed a MIP-based electrochemical biosensor for the sensitive and selective detection of *E. faecium bacteria*. *E. faecium* and pyrrole were mixed and electropolymerized via voltametric methods. Specific cavities were created through chemical reactions, and then MIP structures were subjected to analyte solution. Changes in charge transfer resistance were examined with electrochemical impedance spectroscopy before and after interaction with bacteria. The limit of detection was found as 9 CFU/mL. Selectivity studies were also performed to evaluate the biosensor performance. Our biosensor system was successfully applied in real samples.

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OP45– TUMOR-SPECIFICITY AND NEUROTOXICITY OF NEW PYRAZOLE DERIVATIVES WITH SULFONAMIDE MOIETY

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Many of anticancer medications are toxic to both neoplasms and normal tissues, and show potent side effect of neurotoxicity. This study aimed to design and synthesize new anticancer candidates with higher tumor-specificity and lower side effect. A total 21 pyrazole derivatives with sulfonamide moiety were prepared[1] and evaluated against human oral squamous cell carcinoma (Ca9-22, HSC-2) squamous cell carcinomas as well as against human normal oral cells (HGF, HPC), and differentiated rat PC-12 neuronal cells (prepared by overlay method in NGF-supplemented serum-free medium). QSAR, cell cycle analysis and western blot analyses were performed[2]. Among 21 derivatives, compound **12** and **19** showed higher tumor-specificity (TS, determined by the ratio of CC_{50} for non-malignant cells to that for malignant cells) than other cytotoxic derivatives as well as 5-FU and melphalan. QSAR study revealed that TS values were controlled to a large extent by the electronic properties of the substituents and positive surface area. Two representative compounds induced the accumulation of G_1 phase cells with concomitant reduction of S and G2/M phase cells without induction of subG1 population (DNA fragmentation). However, these compounds induced the disruption of neurites. Compounds **12** and **19** showed comparable TS values with 5-FU and melphalan, but induced potent neurotoxicity, suggesting the importance of establishing the administration method for these lead molecules.

	CC_{50} (μM)											
	Human OSCC cell lines			Human oral normal cells								
	Ca9-22	HSC-2	mean	HGF	HPC	mean	dPC-12	TS		PSE		TN
	(A)		(B)	(C)		(D)	(E)	(D/B)	(C/A)	($100D/B^2$)	($100C/A^2$)	(E/B)
Compound 12	15.8	16.6	16.2	>200.0	>200.0	>200.0	5.1	>12.3	>12.7	>76.2	>80.4	0.3
Compound 19	32.3	29.3	30.8	>200.0	>200.0	>200.0	2.0	>6.5	>6.2	>21.1	>19.2	0.1
5-FU	128.2	29.9	79.1	>1000.0	>1000.0	>1000.0	328.3	>12.6	>7.8	>16.0	>6.1	4.2
Cisplatin	5.7	3.7	4.7	140.5	132.0	136.3	13.4	28.8	24.5	609.5	428.2	2.8
Melphalan	31.7	14.4	23.0	169.1	200.0	184.6	24.3	8.0	5.3	34.9	16.9	1.1

Figure 1. Tumor-Specificity and Neurotoxic avtivity of the compounds

Keywords: Cytotoxins; bioassays; neoplasms; organic syntheses; selective toxicity; structure-activity relationships; neurotoxicity.

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OP46– ANTIBACTERIAL, ANTIBIOFILM, AND ANTI-QUORUM SENSING ACTIVITY OF CELL-FREE SUPERNATANTS OF LACTOBACILLUS SP. ISOLATED FROM DAIRY PRODUCTS

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Antibiotic resistance is a critical health problem leading to infections with high morbidity and mortality. The inadequacy of antibiotics in treating infections caused by resistant bacteria has led scientists to search for new molecules that can inhibit the mechanisms involved in pathogenicity. One of these mechanisms is quorum sensing, which plays a vital role in the synthesis of virulence factors and the pathogenicity of bacteria. New compounds with antibacterial, antibiofilm, or anti-quorum sensing effects that can be found by exploring natural sources, such as bacterial metabolites, may be effective in controlling the resistance problem. Lactobacillus species are bacteria found in various environments, including the gastrointestinal and vaginal tracts of humans and animals, as well as dairy products and fermented foods. These bacteria are generally considered safe, and some specific strains are used as probiotics in pharmaceuticals and dietary supplements. Lactobacilli produce metabolites with various biological effects, including organic acids, diacetyl, acetoin, hydrogen peroxide, reuterin, antifungal peptides, and bacteriocins [1]. The aim of this study was to evaluate the antibacterial, antibiofilm, and anti-quorum sensing activity of cell-free supernatants (CFSs) of Lactobacillus sp. isolated from raw milk and cheese samples. A total of 42 Gram-positive bacilli/coccobacilli were isolated from 15 different raw milk and five different cheese samples using MRS Agar medium. Twenty of them were identified as Lacticaseibacillus casei/paracasei/rhamnosus (13), Lentilactobacillus parabuchneri (3), Latilactobacillus curvatus (2), Limosilactobacillus fermentum (1), Loigolactibacillus corynformis ssp. coryniformis (1) at species level using MALDI-TOF MS. The antibacterial activity of the CFSs were investigated against Escherichia coli ATCC 25922, Pseudomonas aeruginosa ATCC 27853, Klebsiella pneumoniae ATCC 13883, Staphylococcus aureus ATCC 25923, S. aureus ATCC 43300 (methicillin-resistant strain) and S. epidermidis ATCC 12228 using agar spot and well diffusion methods. The antibiofilm activity was determined by in vitro microplate-based biofilm model against P. aeruginosa PAO1 using the crystal violet assay. The percentage biofilm inhibition values were calculated. The anti-quorum sensing activity was performed by the disc diffusion method using reporter bacteria Chromobacterium violaceum ATCC 12472. Lacticaseibacillus rhamnosus GG (ATCC 53103) standard strain was used as a control in all experiments. According to the agar spot test results, all L. casei/paracasei/rhamnosus CFSs exhibited antibacterial activity against E. coli. Furthermore,

none of the CFSs showed antibacterial activity against the test bacteria. The percentage of biofilm inhibition values of the CFSs varied between 38,12%-83,84%. It was determined that all tested CFSs, except for one L. parabuchneri CFS isolated from the milk sample, exhibited anti-quorum activity. Although the tested CFSs did not demonstrate a broad-spectrum antibacterial effect against the test bacteria, their antibiofilm and anti-quorum sensing effects were notable. As a result, Lactobacillus sp. CFSs may represent an alternative option for the treatment of bacterial infections.

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OP47– ARE ANIMAL STUDIES IN HIGH-QUALITY JOURNALS MORE REPRODUCIBLE?: A SMALL-SCALE ANALYSIS OF TRANSPARENT REPORTING

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Reproducibility of preclinical studies defines that the same results are obtained when the experiments are performed by the same/different investigators in the same or different laboratories. Non-reproducible preclinical studies lead to a waste of money, animals, resources, time, and personnel. Non-transparent reporting of methodology is one of the biggest barriers to reproducible preclinical studies and their translation to clinical studies [1]. In recent years, scientists and journals have published guidelines to improve reproducibility. Despite all efforts, even high-quality journals convey insufficient information to perform the same study and consequently obtain the same results. This study aims to raise awareness of the transparent methodology reporting and the impact of journal quality.The PubMed database was used to retrieve relevant articles in 2022 by searching for the keyword combinations "type 2 diabetes, heart failure, mouse or rat" and "type 2 diabetes, cardiomyopathy, mouse or rat". After screening out review, irrelevant, non-English, and ESCI articles, 60 eligible original articles of 93 were included in the analysis. Compliance with transparent reporting was assessed using the following 11 criteria: ethical approval statement, ethical approval number, place of acquisition of animals, the total number of animals, animal strain, sex of animals, age of animals, the weight of animals, housing conditions, randomization for group allocation and reference to the disease model. For each criteria, compliance with transparent reporting was assessed as a percentage. Studies were divided into 4 groups (Q1 (n=30), Q2 (n=20), Q3 (n=8), Q4 (n=2)) according to quartiles of journals and into 2 groups according to low [from 1.96 to 5.58] (n=27) and high [from 5.99 to 15.33] (n=33) impact factors with a geometric mean of 5.803. The information on the quartile of journals and the impact factor was obtained from the WOS database. Only descriptive statistics were performed using GraphPad 9.5.0 and data are given as mean ± SD.Compliance with the above criteria was found at 98.44%, 65.63%, 84.38%, 57.81%, 100.00%, 93.75%, 76.56%, 43.75%, 62.50%, 62.50%, and 54.69%, respectively in 60 papers. More than 90 % of the studies reported information on ethical approval statements, animal strain, and animal sex. The least frequently reported information in the studies (less than 50 %) was the weight of the animals. Compliance with the 11 criteria (%) was found 71.80 ± 15.53 in Q1, 73.16 ± 11.61 in Q2, 76.11 ± 13.70 in Q3 and 81.80 ± 12.87 in Q4 journals. In addition, compliance with the 11 criteria (%) was found 74.08 ± 12.53 in journals with lower impact factors and 72.45 ± 14.99 in journals with higher impact factors. This small-scale analysis suggests that there are no apparent differences in the reporting of transparent methodology in terms of journal quality. Regardless of the quartile and impact factor of the journals, the guidelines for transparent reporting and the checklists should be applied to each publication where possible. In addition, researchers should check the overall reporting quality in the relevant published studies when referring to them, independently of journal quality. This would allow researchers to plan and conduct more robust and reproducible preclinical studies.

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OP48– BUCCAL MUCOADHESIVE SYSTEM FORMED BY LIQUID CRYSTALS OF RASAGILINE MESYLATE FOR NON- ORAL PARKINSON TREATMENT

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The "off period" seen in the morning due to the inability to get the dose corresponding to sleep, insufficient level of drug in the blood and gastrointestinal problems is an important problem affecting the quality of life of the patients of Parkinson disease (PD). Studies show that these problems can be effectively managed with non-oral treatments alone[1, 2]. There are many mucoadhesive systems, for example lyotropic liquid crystals (LCs), which can establish an oblique contact with the buccal mucosa and allow to increase the residence time to optimize drug bioavailability. The aim of this study is development of Rasagiline mesylate loaded LCs and *in vitro* evaluation of formulations.

Materials and Methods: LCS formulations were prepared using GMO: Plx 188 and distilled water [3]. For the characterization studies, polarized light microscope images and SAXS analysis were performed. The formulations were also evaluated for their pH values, textural, rheological and mucoadhesive properties.

Results and Discussion : This research revealed that GMO is a suitable surfactant for the formation of lamellar liquid crystals with water. It formed stable lyotropic layered liquid crystals with distilled water (75:25 and 70:30) ratio and 1.5% Plx188

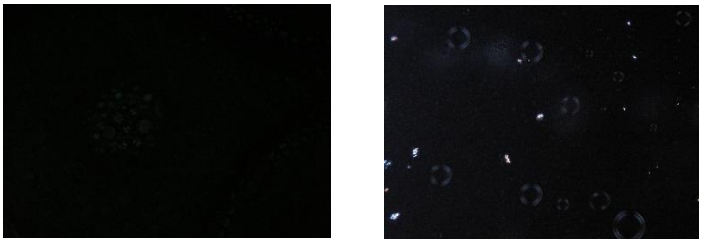

Figure 1. POM images of F5 and F6 formulations

SAXS X-ray scattering analysis was performed to confirm the results from polarized light microscopy and provide more quantitative data on the nanostructure of the LCs. When the viscosity results were evaluated, it was observed that the viscosity decreased with the decrease in the amount of GMO. A decreasing viscosity graph was obtained against shear rate. During administration, high shear rates will decrease the viscosity of the systems, facilitating their spreadability and applicability. Since the G' values of the formulations are lower than the G'' values, it is thought that it can be applied as spray or drops as an application method. Moreover, mucoadhesions of LCs containing 25% and 30% water were also found suitable for buccal application.

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OP49– EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF KOJIC ACID DERIVED ANALOGUES

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Kojic acid (5-hydroxy-2-(hydroxymethyl)-4H-pyran-4-one) is a natural metabolite with strong anti-tyrosinase activity, naturally synthesized in various fungal species and some microorganisms [1]. The tyrosinase enzyme is responsible for the synthesis of melanin in mammals and is involved in multiple metabolic pathways, such as skin pigmentation, neurodegeneration and antibiotic resistance [2]. In addition to these effects, kojic acid and its derivatives are also known to be potent antioxidant compounds [3].

This study aimed to examine the antioxidant, anti-inflammatory and potential cytotoxic activities of 3-hydroxy-6-hydroxymethyl/chloromethyl-2-substituted-4H-pyran-4-one derivatives. The antioxidant activity studies were carried out using TEAC, DPPH, and CUPRAC colorimetric methods [4]. In addition, the compounds' cytotoxic, antioxidant and anti-inflammatory activities were investigated at different concentrations (25, 50 and 100µM) on the LPS-treated macrophage (RAW 264.7) cell line via WST-1, DCFDA and Griess assays, respectively [5,6].

The results showed that compounds having 2,6-dichlorobenzyl piperazine and trans cinnamyl piperazine structure at the second position of hydroxypyranone ring, exhibited the highest antioxidant and antiinflammatory activities. The findings indicate that clarifying the detailed action mechanisms of these molecules with further studies is essential for developing new drug candidate molecules.

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OP50– ELECTROCHEMICAL DETECTION OF THE INTERACTION OF A FURANOCOUMARIN DERIVED NATURAL COMPONENT WITH DNA

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The binding of a drug molecule to DNA can affect its structure and function, leading to changes in gene expression, protein synthesis, and cellular processes. Understanding the nature of the drug-DNA interaction is therefore crucial for drug development and optimization. The interaction of a drug molecule with DNA can have important implications for understanding the drug's mechanism of action, as well as potential side effects or toxicity. Electrochemical methods such as voltammetry, amperometry, and impidimetry can provide useful information about the binding strength and the type of interaction between DNA and drug candidate molecules [1]. Oxypeucedanin is a furanocoumarin compound that is found in plants such as Angelica, Ferulago, and Oranges genera [2]. The compound has been known to own anti-proliferative, cytotoxic, antispasmodic, anti-inflammatory, anti-influenza, and antiallergic properties making it a potential candidate for drug development. In terms of its chemical structure, oxypeucedanin has a coumarin core with a furan ring attached to it. Oxy also has a side chain containing a carboxylic acid group, which can participate in various chemical reactions. Its unique structure make Oxy is an interesting target for drug discovery and development.

In this talk, we will present the experimental data for electrochemical detection of Oxy, and its interaction with DNA. First, we will present the electrochemical properties of Oxy. Then, the interaction of Oxy with DNA will be discussed. Experimental parameters, interaction mechanisms, and the toxicity effect of Oxy on DNA will be introduced. The findings from these studies could be used for development of a novel drug based on Oxy.

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OP51– EVALUATION OF SERUM BIOMARKERS OF MEDICATION RELATED OSTEONECROSIS OF THE JAW AROUND DENTAL IMPLANT

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The aim of this study is to classify the MRONJ patients after implant treatment according to the latest staging system as early stage (stage 0) and advanced stage (stage 1, 2, 3) and evaluate how these groups affect the serum markers of bone turn-over, inflammation and endocrine function. In this retrospective study; we examined 26 patients with MRONJ after dental implant treatment who presented between 2017 and 2022 in the our department. We recorded patients' clinical and radiological signs, location of exposed or necrotic bone, existence of infection, pain, degree of osteonecrosis and results of serum samples. In our study, patients were divided into 2 groups according to the criteria's stated by American Association of Oral and Maxillofacial Surgeons (AAOMS). Patients in Group I were in stage 0 (early stage) and patients in Group II were in stage 1, 2 and 3 (advantage stage). Serum samples were analyzed for thyroid stimulating hormone (TSH), triiodothyronine (T3), thyroxine (T4), C-Telopeptide (CTx), 25 Hydroxy vitamin D, bone-specific alkaline phosphatase (BALP), osteocalcin (OCN) and parathyroid hormone (PTH). There was a significant difference between the groups only levels of serum PTH showed ($p < 0.05$). TSH, T3, T4, BALP and OCN are higher in Group II. The levels of 25 Hydroxy vitamin D and C-Telopeptide (CTx) are higher in Group I. According to our study results, there was a significant difference between the groups only levels of serum PTH showed ($p < 0.05$). There were no significant difference other endocrine and bone turnover markers. Serum markers of bone turnover have become more available to follow- up early and advanced stages of medication related osteonecrosis of the jaw patients. However, it is important to remember that individual markers reflect different biochemical and physiological processes and may not, therefore, always show identical changes.

OP52– IDENTIFYING THE ATTITUDE OF PHARMACY AND MEDICAL STUDENTS FOR ETHICAL PRINCIPLES

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Ethics can be defined as the evaluation of moral values, human behaviors, and attitudes from good or bad or right or wrong. The regulation of professional ethics in the form of rules in order to guide the practices and behaviors of the members of the profession constitutes the ethical rules of the profession and includes the obligations of the profession towards those served. The existence of ethical decisions in health care has led to the need to determine the awareness of the students studying in the field of health sciences (medicine, dentistry, pharmacy, nursing, etc.) towards ethical principles and to determine their approaches. The aim of this study is to determine the attitudes of medical and pharmacy faculty students toward ethical principles. This cross-sectional and descriptive study was carried out at the University of Health Sciences between January and March 2023. Turkish version of the 'Scale for Attitudes of Ethical Principles' was directed to the first and last-year students of Health Sciences University Hamidiye Faculty of Medicine and Pharmacy via Google forms. As the score obtained from the scale increases (35-175), it is revealed that the awareness of the participant is high [1]. The statistical analysis is performed by SPSS 15.0 program. Cronbach Alpha internal consistency coefficient of the scale was calculated as 0.85. A total of 253 students (pharmacy n= 123, medicine n= 130) were included in our study. The difference between the total scale scores (65.33 vs 120.41) of the first and last-year medical students was found to be statistically significant ($p<0.0001$). Likewise, the difference between the total scale scores (60.45 vs 130.78) of the first and last-year students of the faculty of pharmacy was found to be statistically significant ($p<0.0001$). It was observed that there was a statistically significant and positive linear relationship at the $p<0.000$ level between all sub-dimensions of the questionnaire. A significant difference was found between the awareness of the first and last-year students of both pharmacy and medicine faculties about ethical principles. We think that one of the factors that cause this result is the increase in personal maturity during university education. We think that it would be beneficial to start courses on ethical principles at an earlier stage of the education process in all faculties, especially those in the field of health, and to include them more in the education program.

Acknowledgment: Pharmacy, Medicine, Ethic, Scale for Attitudes of Ethical Principles

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OP53– NOVEL CHOLINESTERASE INHIBITORS: SYNTHESIS, CHARACTERIZATION, MOLECULAR DOCKING, DYNAMICS AND ADME STUDIES

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Alzheimer's disease (AD) is a progressive and irreversible neurological illness that causes cognitive impairment, neuroinflammation, glial activation and degeneration of synapses, which are clinically characterized by cognitive decline and memory loss, pathologically neurofibril tangles formed by tau fibrils and amyloid-β plaque deposition [1].

In this study, 10 new triazole-arylidenehydrazide hybrid compounds **(1-10)** were synthesized starting from p-aminobenzoic acid (PABA) (Figure 1). All the synthesized compounds were characterized by spectroscopic methods such as NMR and HRMS. To determine the cholinesterase inhibitory activities of synthesized compounds, they were tested against AChE and BuChE by in vitro and in silico methods. Molecular dynamic studies were also performed to determine the stability of ligand-protein complexes which are the best-docked poses of molecular docking. In addition, in silico ADME parameters and drug similarities of all the synthesized compounds were evaluated [2].

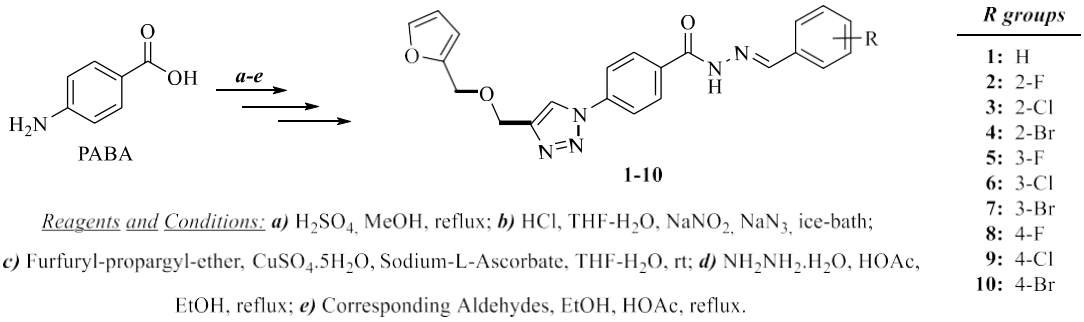

Figure 1. Synthesis of target compounds

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OP54– COATING OF TITANIUM DENTAL IMPLANTS WITH A-TOCOPHEROL LOADED NANOFIBRES BY ELECTROSPINNING

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Dental implants are a commonly used treatment option that provides support for the replacement of missing teeth [1]. In our study, dental implants were coated with α-tocopherol loaded PCL nanofibres and the osseointegration process was analysed [2]. The coating process was performed by electrospinning method. The dental implant was fixed at the level of the collector plate in the electrospinning device. Electrospinning with different concentrations of PCL solution containing α-tocopherol was optimised by evaluating the applied voltage, distance between the nozzle and collector plate, and flow rate conditions. SEM analysis of the coated implants, in vitro release profile, effects on mouse fibroblast and osteoblast cells were analysed. Electrospinning with 20% PCL solution containing α-tocopherol was successfully optimised under 13kV voltage, 15 cm nozzle to collector plate distance and 5ml/h flow rate conditions. SEM analysis showed that the implant surface was covered with continuous fibres. It was observed that the active substance release was prolonged as the concentration of the PCL solution increased. For this reason, implants coated with 20% PCL solution, which enabled the coating process and gave the desired release profile, continued to release in a controlled manner for up to 120 hours. In biocompatibility studies, it was observed that the implants significantly increased cell proliferation.

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OP55– PREDICTING HPV STATUS FROM 3D CT IMAGES OF OROPHARYNGEAL CANCER PATIENTS USING ROSE AND RANDOM FOREST ALGORITHMS

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Head and neck malignancies, which include a variety of tumor types are the sixth most prevalent cancer in the world [1]. Human papillomavirus (HPV) has appeared as a novel risk element for this type of cancer, particularly for oropharyngeal cancer (OPC) [2]. Patients who test positive for HPV infection have significantly different clinical behaviors in OPC than those who test negative [3]. Hence, planning the course of treatment (pharmacological and radiation therapy) for OPC patients is highly dependent on their HPV status. In this study, three-dimensional (3D) segmented head and neck computed tomography (CT) images are used to identify HPV status in patients with OPC by utilizing radiomics and machine learning algorithms. 238 patients' CT images were resampled and normalized. 25 out of 1142 features were chosen by applying correlation coefficient analysis [4], backward elimination [5], and random forest feature importance analysis [5]. Random Over-Sampling (ROSE) [6] oversampling algorithm was performed on the training set since the dataset was highly imbalanced and then 161 samples were obtained for each class of the training set. A random forest (RF) classification algorithm was performed as a prediction model using five-fold cross-validation. To decide the optimum hyperparameters, 500 different combinations of hyperparameters were tested on the RF model using the Randomized Search CV method on training feature sets with five folds nested cross-validation. Model efficiency was evaluated separately on the unused 20% of the initial imbalanced data. HPV status was determined with an accuracy of 91% (95% CI: 83-99) and an area under the curve (AUC) of 0.78 (95% CI: 66-89) on the test data. In conclusion, radiomic features obtained from 3D CT scans can accurately predict HPV status noninvasively in OPC patients by using ROSE and Random Forest algorithms despite the small and imbalanced data. Further work is needed to check the methods for balance and larger data.

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OP56– EVALUATION OF BIOLOGICAL ACTIVITIES OF GLECHOMA HEDERACEA L.

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Glechoma hederacea L. (Labiatae) is a perennial, herbaceous plant that grows widely in Asia, Europe, and the US. It is also known as “ground ivy,” “gill-over-the-ground,” and “creeping Charlie.” The aerial parts of the plant are used as a folk remedy for various purposes, such as treating inflammation, gastrointestinal system disorders, arthritis, headache, asthma, flu, cough, diabetes, abscesses, scurvy, and jaundice. The plant is also used internally as an expectorant and tonic, and externally for wound healing [1-3].

This study aims to investigate the antibacterial, antibiofilm, and anti-quorum sensing activity of methanolic, ethanolic, and aqueous extracts of Glechoma hederacea L. In the antibacterial activity tests, the following test bacteria were used: Escherichia coli ATCC 25922, Klebsiella pneumoniae ATCC 13883, Pseudomonas aeruginosa ATCC 27853, Staphylococcus aureus ATCC 25923, and S. aureus ATCC 43300 (methicillin-resistant strain). The extracts were dissolved in sterile distilled water, and minimum inhibitory concentration (MIC) values were determined using the broth microdilution method [4]. Serial two-fold dilutions ranging from 10 mg/ml to 0.078 mg/ml were prepared in Mueller Hinton Broth (Difco, Difco Laboratories, Detroit, MI, USA). The antibiofilm activity was determined by an in vitro microplate-based biofilm model against P. aeruginosa PAO1 using the crystal violet assay, and the percentage biofilm inhibition values were calculated. The anti-quorum sensing activity was performed by the disc diffusion method using reporter bacteria Chromobacterium violaceum ATCC 12472. Based on the results of the broth microdilution test, the aqueous extract did not exhibit any antimicrobial activity against the test bacteria. The highest antimicrobial activity was observed with the methanolic and ethanolic extracts against Klebsiella pneumoniae, and the methanolic extract against S. aureus ATCC 43300, with a MIC value of 5 mg/ml. However, the observed activity was considered weak when compared to control antibiotics. The extracts did not show any antibiofilm activity. While the aqueous extract did not show any anti-quorum sensing activity, it was found that the methanolic and ethanolic extracts exhibited anti-quorum sensing activity.

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OP57– AN OVERVIEW OF TECHNOLOGY DEVELOPMENT AREAS' WEBSITES

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Industry-university cooperation have a vital role to promote innovations. A technology development zone (TDZ) is a way to increase the interactions between institutions and companies. One of the first examples is Silicon Valley which was founded by Stanford University in the early 1950s [1]. TDZ, which is of great importance in terms of research and development activities offers significant opportunities to entrepreneurs and researchers in various regions of Turkey like all around the world. In Turkey, the science and technology parks are embedded in the national policies in the mid-1980s. In 2001, the law on TDZs is enacted and these zones have taken place in conjunction with the universities [2].

The legislation provides information about the scope of activities and benefits provided by technology development areas [3]. Companies in these zones operate in many areas ranging from energy to healthcare. Pharmaceutical sector, a component of healthcare, is known as one of the top investors to research and development [4].

Along with the innovative characteristics, companies in the TDZs also have corporate identities. As for many organizations, websites are the main tools for in TDZ's and companies in terms of their recognition and representations [5]. Therefore, in this study, we aimed to determine the current state of pharmaceutical companies' websites in these Technology Development Zones in Turkey. Websites of the TDZs determined through the web site of the Ministry of Industry and Technology between 27-26 March 2023 [6]. The business area is determined as per the companies' legal name and the terms such as medical, health, health system, and pharmaceutical are evaluated as healthcare sector related. Only companies that include pharmaceutical in their name are included as pharmaceutical companies. Websites of the pharmaceutical companies are examined based on some criteria previously formed in literature [5,7,8].

Within this scope, content of the websites has been evaluated. There are 98 technology development zones in Turkey. Of these total, 15 development zone is under construction. The websites of 64 of these zones have been accessed. Of the accessed websites 61 include a list of companies. The total company number was 6226 and 358 (5,76%) of them are related to the healthcare sector. Of those 359 healthcare-related companies, only 39 (10,89%) were pharmaceutical companies. The websites of 9 of the pharmaceutical companies were not accessible. A total of 30 websites were examined as per their content such as having logos, language options, communication information, information on products, separate tabs for healthcare professional and patients. All of the companies have their corporate logo and communication information, 17 of them have the language option, 7 of them have a separate

tabs/pages for healthcare professionals and the patients and, only 5 of the companies have product information on their websites. Technology development zones, also known as technoparks, cyberparks and with different names, provide a lot of information through their websites to those who want to benefit from their opportunities [3]. Since the websites as a major tool for public relations and communication with other stakeholders, The scope of these websites is of great importance in terms of enabling users to access information. [5]. When the current situation in Türkiye is examined, it is observed that improvements are needed in terms of several aspects of these websites. Language options, having separate pages/tabs for patients and professionals and product information were found to be missing despite their importance. The language options are crucial for the collaboration and communication with the possible stakeholders. Particularly, it is considered important that the websites of the companies related to healthcare, which have a crucial strategic position, make the necessary arrangements to provide their users with current information.

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OP58– SYNTHESIS AND ANTICANCER ACTIVITY OF 5- CHLORO-3-((6-CHLORO-[1,2,4]TRIAZOLO[4,3- b]PYRIDAZIN-3-YL)METHYL)BENZO[d]THIAZOL- 2(3H)-ONE

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Breast cancer is the most common cause of cancer cases among women worldwide estimated to cause 1 million deaths in 2040 [1]. Heterocycles are important building blocks of anticancer agents [2]. Of the aromatic heterocycle compounds, it has been widely reported that nitrogen-based heterocycles and benzothiazole derivatives have anticancer properties [2-4]. In this study, benzothiazol-2(3H)-one and [1,2,4]triazolo[4,3-b]pyridazine cores were merged and 5-chloro-3-((6-chloro-[1,2,4]triazolo[4,3-b]pyridazin-3-yl)methyl)benzo[d]thiazol-2(3H)-one compound was designed. The compound was synthesized by both conventional and microwave irradiation methods. It was evaluated against MCF-7 breast cancer cells.

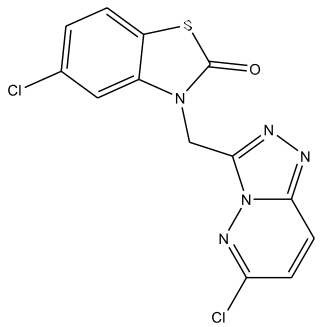

Figure 1. Structure of the synthesized compound

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OP59– CELLULAR BARCODING TECHNOLOGY TO REVEAL INTRATUMOUR HETEROGENEITY

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Colorectal cancer (CRC) is the third most common cancer in Turkey with an expected survival of 5 years [1]. Although treatment is initially effective with targeted agents, it is often unsuccessful as a result of secondary drug resistance mechanisms [2]. Identifying the mechanisms underlying drug resistance and better treatment options is arguably one of the biggest challenges facing cancer research. Integrating the understanding of intratumour heterogeneity into novel experimental model systems is of great importance in order to comprehensively reveal drug resistance mechanisms [3]. With the help cellular barcoding technology, it is now possible to better understand ongoing intratumour heterogeneity caused by drug resistance [4]. Here in this study cellular barcoding technology has been utilized to reveal capecitabine-resistance in HCT-116 cells and SN-38-resistance in HT-29 cells. Amplicon-based next-generation sequencing approach enabled to detect barcode frequencies in drug resistant parallel replicates in comparison to untreated initial and DMSO control counterparts. Importantly, detection and enrichment of both pre-existing and de novo barcode frequencies in drug resistant groups helped to conclude the polyclonal drug resistance as a mechanism of resistance within this system. Overall, these findings helped to explain mechanism of capecitabine- and SN-38-mediated drug resistance in HCT-116 and HT-29 cell lines, respectively, in addition to prevelance of intratumour heterogeneity within the same system.

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OP60– RELEASE FACTORS OF BIOFILM-RELATED WOUND PATHOGENS ADVERSELY EFFECT DIABETIC CELLS

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Microorganisms in tissues play a major risk in the development of chronic wounds. Release factors from biofilms can negatively impact cell function by contributing to the chronicity of the wound. Diabetes mellitus (DM) is known as the most severe metabolic disorder. Polymicrobial biofilms, one of the factors delaying the healing of diabetic wounds, can prevent the treatment outcome resulting in lower extremity loss and death. Investigating the interactions between biofilm communities and cells involved in diabetic mode is important to understand what impasse these processes will lead cells to.

We designed a polymicrobial biofilm model of Staphylococcus aureus, Pseudomonas aeruginosa, and Enterococcus faecalis on tissue culture inserts to obtain the supernatants of release factors of mature biofilms with 4 days and treated the diabetic fibroblast cells with this supernatant. We elucidated the alterations of transcripts in the cells infected with the supernatants by RNA sequencing (RNA-seq) analysis. The inflammatory responses in the cells were revealed. The potential effects of some antidiabetic drugs such as metformin, dapagliflozin and pioglitazone on the viability of the diabetic cells alone or treated with supernatants were evaluated by measuring the cell viability and confocal microscopy analysis. The RNA-seq results of the current study revealed many pathways related to cancer and inflammation such as p53, apoptosis and signaling mechanism including HIF-1, TNF-alpha, IL17, FoxO and NF-kappa β were upregulated. These initial preliminary results have provided insight into the potential carcinogenic effects of biofilm-associated bacteria in patients with DM. The biofilm-releasing factors decreased cell viability by 50% at 4 hours and by 80% at 24 hours, while a significant increase in cell viability was observed at 24 hours when antidiabetic drugs were added. The immune profiles associated with allergic inflammation were increased in the treated cells.

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OP61– ASSESSMENT AND MANAGEMENT OF ADULT ASTHMATIC PATIENTS IN COMMUNITY PHARMACIES OF PORT SAID, EGYPT.

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Asthma is a long-term disease with complex syndrome which affect over 5% of world population. Despite a better understanding of the pathophysiology of asthma and associated therapeutic regimens, the disease continues to escalate in terms of prevalence and severity. The characteristic features of chronicity and remissions ensure a fertile ground for patient non-compliance. The protective measures taken by asthmatic patients play a significant role in boosting their quality of life. This study aimed to evaluate current knowledge and management of adult asthmatic patient in community pharmacies of Port Said, Egypt. A descriptive study was carried out from 15th February to 15 March 2022 in Port Said, Egypt. A validated questionnaire was used to collect data from adults asthmatic patients. A total of 150 questionnaires were distributed among which only 100 of them fulfilled our criteria and was included in the study. Data analysis was done by using SPSS version 20 and descriptive statistics were used to analyse the results of the study. Among 100 participant's majority (56%) were males. More than half of the respondents 53% had poor General knowledge of asthma. 57% of the respondents have good knowledge regarding symptoms and severity of asthma while 40% have low level of knowledge regarding treatment of asthma. A high proportion of respondents who have good knowledge of asthma and its treatment and good adherence to inhaler use may therefore have good control of asthma leading to reduced morbidity and mortality. This study concluded that the participants have good realization and understanding regarding knowledge of asthma, but still a significant number of respondents have low level of knowledge. Therefore, pre-service and in-service training and awareness programs regarding education of health problems affecting asthmatic patients should be arranged and pharmacists are highly advised to spread healthy habits and play their crucial role as health educators and managers.

Key Words: Asthma, community pharmacist, adult asthmatic patient, Egypt.

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OP62– AERODYNAMIC PROPERTIES AND CELL CULTURE STUDIES OF DRY POWDER INHALER FORMULATIONS CONTAINING GEFITINIB-HSA NANOPARTICLES

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Non-small cell lung cancer (NSCLC) is a common type of lung cancer. The most important problem in the treatment is the inability of the administered drug to reach the tumor site at the desired level, and severe side effects are seen due to the toxicity of anticancer drugs. Severe systemic side effects are seen in oral or parenterally administered formulations. In order to overcome this problem, an inhaler formulation was developed within the scope of the project.

In our study, gefitinib incorporated in a nanoparticulate system combined with human serum albumin (HSA) as a natural polymer and dipalmitoylphosphatidylcholine as a surfactant via Nanoparticle Albumin Bound technology with minor modification and coated with hyaluronic acid for CD44 targeting [1,2]. Nanosuspension was converted into dry powder inhaler (DPI) form by adding various carriers and lyophilization. The particle size distribution of the targeted nanoparticles obtained was measured by dynamic light scattering technique, and the aerodynamic parameters of the resulting DPIs containing different carriers were measured by Andersen Cascade Impactor analysis. The resulting nanoparticles had a mean size of 114.5±10.87 nm, PDI of 0.39±0.035, and -24.6±0.289 mV of zeta potential (n=3, mean±SD). The encapsulation efficiency was determined by the ultracentrifugation method and calculated as 97.44%±0.3 (n=3, mean±SD). DPI containing a mixture of phenylalanine and mannitol as carriers exhibited a mass median aerodynamic diameter of less than 4 µm, indicating its potential to reach the alveoli effectively. Additionally, the DPI formulation exhibited a high emitted fraction of 98%, signifying its ability to easily aerosolize during inhalation.

Cell viability was determined by MTT assay using L929 mouse fibroblast cells and Mouse Lewis Lung Carcinoma-1 (LLC-1) for 24h, 48h and 72h. Cells were treated gefitinib, DPI carrying gefitinib and blank DPI ranging from 1.875 to 120 µM. Chosen DPI concentration range was considered safe on L929 cells. The IC50 value of gefitinib on LLC-1 cells was calculated as 11.42 µM (24h), 14.96 µM (48h), and 11.99 µM (72h). There was no significant difference in the viability of cells exposed to gefitinib and DPI at 24h and 48h, however, at 72h, gefitinib-carrying DPI reduced cell viability at the lowest doses (1.875 µM), while gefitinib began to show its effect only after 7.5 µM concentration. Cellular uptake of the formulation was shown via Nile Red loaded DPIs on LLC-1 cells. Mean fluorescence intensity of Nile Red in cells and percentage of cells carrying Nile Red were measured using flow cytometry (FACS Canto II). Autofluorescence emission of untreated cells was used as control. Nile red was observed to be taken up by more than 80% of the cells within 4h and increased over time. Cytocentrifuge of cells incubated with nanoparticles carrying Nile Red were performed for 3 min at 50xg after 16h of incubation. Cells were fixed with 4% paraformaldehyde and counterstained with 4',6-diamidino-2-phenylindole (DAPI). Images were captured with fluorescence microscopy (Olympus, Center Valley) and processed with ImageJ Fiji Software (NIH). As a result, improved cytotoxic effect, intracellular uptake and aerodynamic parameters were achieved with the DPI.

Acknowledgement: This study was supported by a grant from TÜBİTAK (SBAG-120S895).

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OP63– INVESTIGATION OF THE EFFECT OF RUTIN IN A MODEL OF BLEOMYCIN-INDUCED LUNG FIBROSIS IN RATS

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Idiopathic pulmonary fibrosis (IPF); is a degenerative fatal lung disease characterized by alveolar endothelial and epithelial damage, extracellular matrix deposition, and progressive scarring [1]. Rutin, a flavonoid glycoside, is found in many plant-derived foods, including fruits, vegetables, herbs, wine, and tea [2]. It has been shown to have multiple pharmacological activities, including anti-inflammatory, anti-cancer and antioxidant properties [3-5]. The current study aimed to investigate the possible modulatory effects of rutin on bleomycin (BLM) induced pulmonary fibrosis (PF) in Wistar-albino rats and the mechanisms underlying these effects. Rats were randomly distributed into five groups of six rat in each group: control, BLM, BLM+rutin25, BLM+rutin50, and rutin only treated group. Rats were subjected to a single dose of BLM (5mg/kg, intratracheal) and rutin was given orally (25 or 50 mg/kg) for 14 days following BLM instillation. Body and lungs were weighed for lung index. Elisa method was used to evaluate hydroxyproline content, antioxidant and anti-inflammatory effects. Fibrosis score, collagen deposition and inflammation were assessed with Hematoxylin-Eosin (HxE) and Masson trichrome staining. Expressions of inducible nitric oxide synthase (iNOS), transforming growth factor-beta 1 (TGF-β1) and caspase 3 were evaluated immunohistochemically. Rutin at both doses (25 or 50 mg/kg) showed potent antifibrotic effect elicited by BLM that was reflected upon the histopathological examination. Rutin significantly reduced collagen accumulation, MDA, TNF-α levels, and increased SOD and GPx activity. Moreover immunohistochemical examination showed that rutin suppressed the expression of iNOS, TGF-β1 and caspase 3 in lung tissues. Collectively, these results demonstrate potential protective effects of rutin for managing BLM-induced pulmonary fibrosis.

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Keywords: Rutin, Pulmonary fibrosis, iNOS, TGF-β1, caspase 3

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OP64– ARTIFICIAL INTELLIGENCE, SYNTHESIS AND ACTIVITY STUDIES OF BENZIMIDAZOLE-CHALCONE COMPOUNDS FOR CANDIDA ALBICANS

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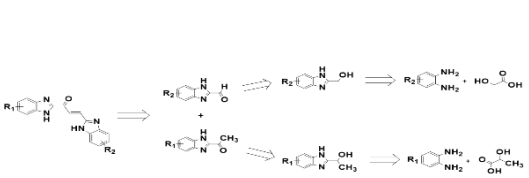
As in many other infectious diseases, developing new and effective drugs against diseases caused by fungi is among the important research areas in recent years. The most basic goal in this field research is to reach the most effective compounds in a short time and with the lowest cost. For this purpose, new methods are being developed to discover new active molecules. Artificial intelligence is one of these methods and has been achieved significant success in drug discovery in recent years. The main purpose of this study is to develop new antifungal drug molecules using artificial neural networks. There are some reasons of selection benzimidazole and chalcone structures for this activity. Benzimidazole ring is a pharmacophore group that is recognized by living organisms because they are bioisosteres of the basic structures of DNA bases. Benzimidazole is also used in therapy due to their different pharmacological activities. On the other hand, chalcone structure, belonging to the flavonoid family, are open-chain molecules that carry an α, β-unsaturated carbonyl system between two aromatic rings and represent an important class of drug molecules [1]. In this study, the dataset prepared for *C. albicans,* and artificial intelligence model was developed using the Keras-based deep neural networks architecture.[2] After the model was evaluated, the activity of benzimidazole-chalcone derivatives against *C. albicans* predicted by the model. After the predictions of model are found reasonable, benzimidazole-chalcone derivatives were synthesis with Claisen-Schmidt reaction. The antifungal activities of the designed compounds were determined by in vitro microdilution method. It was determined that **EA-13** compound showed strong activity (MIC values 31.25 µg/mL) against *C. albicans* (Figure). The findings obtained by artificial intelligence model and in vitro antifungal studies show that benzimidazole-chalcone derivative compounds can be promising precursors with strong antifungal effects.



Compound No	R_1	R_2	*Candida albicans* ATCC 10231
EA-1	-H	-H	125
EA-2	-Cl	-H	62.5
EA-3	$-CH_3$	-H	62.5
EA-4	$-NO_2$	-H	62.5
EA-5	-H	-Cl	500
EA-6	-Cl	-Cl	125
EA-7	$-CH_3$	-Cl	62.5
EA-9	-H	$-CH_3$	250
EA-10	-Cl	$-CH_3$	125
EA-11	$-CH_3$	$-CH_3$	500
EA-12	$-NO_2$	$-CH_3$	62.5
EA-13	-H	$-NO_2$	31.25
EA-14	-Cl	$-NO_2$	125
EA-15	$-CH_3$	$-NO_2$	62.5
EA-16	$-NO_2$	$-NO_2$	62.5
Fluconazole			-
: Effective on microorganisms at all concentrations studied			

Figure. Synthesis and antifungal activities of benzimidazole-chalcone derivatives

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OP65– SYNTHESIS, MPO INHIBITORY AND ANTIOXIDANT PROPERTIES OF BENZOXAZOLE DERIVATIVES

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Inflammation is a part of the complex protective response of vascular injury [1]. This process may induce oxidative stress associated with increased free oxygen radical levels and reactive metabolite production. These generated metabolites may further lead to various inflammatory diseases by damaging vital biomolecules such as lipid, protein, DNA [2].

Myeloperoxidase (MPO) is an enzyme located in neutrophils and plays a significant role in antimicrobial activity through its two catalytic cycles: chlorination and peroxidation. On the chlorination cycle, MPO catalyzes highly reactive hypochlorous acid (HOCl) production starting from hydrogen peroxide (H_2O_2) and chloride ions (Cl^-). In addition, hydroxyl ($OH^{\cdot}$), peroxyl ($ROO^{\cdot}$), and nitrosyl ($NO^{\cdot}$) radicals are generated due to one electron reactions on the peroxidation cycle. As MPO-derived HOCl and reactive metabolites are some examples of internal oxidative stress sources, this enzyme has become an interesting target for the treatment of inflammatory diseases [3].

In this study, we designed and synthesized benzoxazole derivatives bearing amide and hydrazide functions. MPO inhibitory activity of the compounds have been measured by taurine chloramine assay. Additionally, we determined the antioxidant properties by 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) and 2,2-diphenyl-1-picrylhydrazyl hydrate (DPPH) assays to correlate MPO activity and antioxidant capacity [4]. The potential cytotoxicity of the compounds has been studied against macrophage (RAW 264.7) cell lines by MTT [5].

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OP66– PREPARATION, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITY OF HPMC-CHITOSAN BASED, SULFANILAMIDE CONTAINING PATCHES FOR ACNE TREATMENT

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Acne vulgaris is a chronic, inflammatory disease of the pilosebaceous unit that primarily affects the face and trunk and is observed in areas with a high density of sebaceous glands. Sulfanilamide the active component of sodium sulfacetamide, is a bacteriostatic topical agent of the sulfonamide group and effectively treats acne[1,2]. In this study, a new patch formulation containing sulfanilamide were prepared that can be used to treat acne. A new chitosan patch was developed using non-toxic polymer hydroxypropyl methylcellulose (HPMC) and chitosan, containing sulfanilamide for effective acne treatment. Patches were prepared by using solutions of different concentrations of chitosan (0.25%- 1%) in water/acetic acid (33 mL/ 0.7 mL); HPMC (0.125%- 0.5%) in water and 0.5% sulfanilamide. Aqueous solutions containing HPMC-Sulfanilamide were slowly added to the chitosan solution and mixing was continued on a magnetic stirrer for 30 minutes until the solution was homogeneous. Then, 2 ml of gels were poured into well plates with a diameter of 2.5 cm and a height of 2 cm. The formulations freeze-dried by lyophilization and weighted. All formulations exhibited an acceptable uniformity of weight with low deviation among producing replications. The average dimensions of the patches were found to 18.63$\pm$0.7 mm in diameter and 3.37$\pm$0.5 mm in height. The patches were tested and evaluated by physicochemical properties: swelling ratio, porosity, absorbency, Fourier transform infrared spectroscopy(FTIR), and photographed the surface and cross-section morphology under SEM technique was measured [3]. Complex formation was observed as a result of FTIR studies and SEM images were consistent with the porosity values. Moreover, in vitro release and antibacterial activity were studied on two formulations which had highest and lowest porosity. The formulations were provided a controlled release and antibacterial activity. As a result, a controlled-release patch was developed in the treatment of acne.

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OP67– STUDIES ON PYRIDINIUM DERIVATIVES AS POTENTIAL CHOLINESTARASE INHIBITORS

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Alzheimer's disease (AD) is the most common form of dementia in elderly people and effects nearly 35 million people nowadays. Decreased cholinergic transmission, amyloid plaques, tau hyperphosphorylation, neurofibrillary tangles, and oxidative stress, etc. contributes the multifactorial pathology of AD [1].

The diminished cholinergic transmission results in the impairment of memory and cognitive functions [1]. Acetylcholinesterase (AChE) enzyme hydrolyses acetylcholine, the main neurotransmitter in the central nervous system (CNS). Catalytic active site (CAS) is responsible for the hydrolysis function of the enzyme while peripheral anionic site (PAS) interacts with ACh and orientates it towards CAS. Additionally, peripheral anionic site mediates the amyloid plaque formation. Taken together, dual binding site AChE inhibitors that interacts with PAS and CAS have been developed [2].

Butyrylcholinesterase (BChE) is another abundant cholinesterase enzyme in the CNS. It has been reported that BChE levels increases to compensate the decrease of AChE in AD brain. Therefore, inhibition of both enzymes alleviates the cholinergic transmission [1].

Apart from CNS, inhibition of AChE in the peripheral nervous system is a common strategy in the treatment of myasthenia gravis and glaucoma [3,4].

Literature survey indicates that pyridinium bearing aromatic/heteroaromatic compounds possess AChE inhibitory potency. Additionally, it has been reported that pyridinium core and aromatic/heteroaromatic groups may interact with both CAS and PAS of AChE resulting in the dual inhibition of enzyme[5].In this study, we have designed and synthesized pyridinium derivatives as potential cholinesterase inhibitors. The synthesis of the target compounds realized in 2 steps. In the first step, the pyridine bearing intermediate was synthesized using Claisen-Schmidt reaction [6]. Then, title compounds were obtained by the quaternization of pyridine with 3-substitutedbenzyl chloride derivatives [5]. The AChE and BChE inhibitory activities of the final compounds were tested using a slightly modified Ellman method [7].

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OP68– INVESTIGATION OF REMOVAL OF SOME DYESTUFFS FROM SOLUTION BY ELECTRO-FENTON METHOD

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In the content of our study, investigation of removal of congo red, methylene blue, indigo carmine and neutral red dyes from solution by electro-Fenton method [1-4] is conducted. Platinum mesh netting was used as the cathode material and high purity platinum wire was used as the anode material, for this purpose. An eight hour monitorization was performed solution phase at pH 2.5-3.5 range, containing iron (II) sulfate heptahydrate as catalyst and sodium sulfate as electrolyte, where 400 rpm magnetic stirring and dissolved oxygen was provided. Based on the UV-Vis spectrums of the samples stored in Eppendorf tubes, degredation rate of both dyes was observed lower than expected. Among the experimental parameters that are mostly in agreement with the papers in literature related to electro-Fenton method, only cathode surface area was observed not to be big enough. Therefore hydroxyl radical was produced simultaneously at low concentration and dyes were degredated at lower levels. On the other hand, decrease observed in the UV-Vis spectrum of dyes during the 480 minutes monitorization pointed out that even at least a partial success of degradation process by electro-Fenton method was achieved. It's been concluded that a far more effective degradation will be achieved if the monitorization time was increased from 8 to 12 or 24 hours.

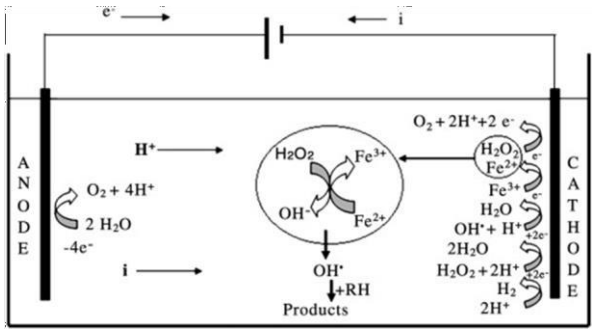

Figure 1. Reaction diagram showing formation of hydroxyl radical in EFT.

At the end of a 360 minute electro-Fenton method monitorization process; Decolorization Percent for indigo carmine (DP%) was calculated as = [(1.9-1.8)/1.9]x100 = 5.26%. DP% for neutral red was calculated as = [(0.85-0.7)/0.85]x100 = 17.65% for the first run and as = [(0,84-0,75)/0,84]x100 = 10.71% for the second run. It's been concluded that a far more effective degradation will be achieved if the monitorization time was increased from eight to twenty four hours.

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OP69– A PRELIMINARY STUDY OF CHOLINESTERASE INHIBITION AND CYTOTOXICITY EVALUATION OF INDOLE-BASED CHALCONE DERIVATIVE

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Alzheimer's disease (AD) is an irreversible, complex, age-related neurodegenerative disorder. Clinicians utilize cholinesterase inhibitors and N-methyl-D-aspartate (NMDA) receptor antagonists. Nevertheless, these medications were unable to slow the progression of AD. Therefore, it is essential to develop potent anti-AD drugs [1]. The chalcone skeleton is one of the favored scaffolds investigated for a wide range of medical applications. As inhibitors of enzymes or proteins associated in the etiology of Alzheimer's disease, such as cholinesterase, beta secretase, tau proteins, etc., a number of chalcone analogs have already been discovered [2]. Therefore, here we aimed to preliminary evaluation of indole-based chalcone, (E)-1-(3,4-dimethoxyphenyl)-3-(1H-indol-3-yl)prop-2-en-1-one, as potent acetylcholinesterase inhibitor. (E)-1-(3,4-dimethoxyphenyl)-3-(1H-indol-3-yl)prop-2-en-1-one was synthesized under basic conditios according to Claisen-Schmidt condensation. Its chemical structures were confirmed via NMRs and HRMS methods. In vitro enzyme assasy was carried out according to our previous study [3]. Then, MTT proliferation and viability test was employed to identify the cytotoxic properties of that compound in SH-SY5Y cell line which has been used in various areas of neuroscience including research on neurotoxicity.The compounds inhibitor concentration 50 (IC_{50}) value was 0,0267 µM against AChE. MTT assay was carried out for the compound to clarify whether the compound is toxic or non-toxic towards SH-SY5Y cell line [4]. MTT results showed that IC_{50} value of that compound was 64.3 µM. The results showed that chalcon-based compound could be considered as promising and non-toxic at the concentrations compound used. Indole-based chalcone types compounds will be designed for further studies to get more scientific data.

Acknowledgement: We thank to Assoc. Prof. Dr. B. Nurpelin Saglik for enzyme assay study.

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OP70– AN IN-SILICO INVESTIGATION OF MARINE-SOURCED NATURAL COMPOUNDS AGAINST TAM TYROSINE KINASE RECEPTORS IN COLORECTAL CANCER

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Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the second leading cause of cancer-related deaths worldwide [1]. TAM tyrosine kinase family is obtained from three proteins: Tyro3, Axl, and MerTK. TAM receptors are overexpressed in both CRC cells and tissues and these receptors have become potential therapeutic targets for CRC [2]. Natural compounds are metabolites that organisms synthesize and secrete for self-defense and are already used in cancer therapy [3]. Genus Caulerpa, marine macroalgae, has 36 different secondary metabolites to protect themselves from pathogens. The aim of the study is to investigate the efficiency of marine-sourced natural compounds against TAM tyrosine kinase family receptors by in-silico approaches. The receptors (Axl and Mertk) were obtained from Protein Data Bank (Axl PDBID: 5U6B, Mertk PDBID: 7AAY). SwissModel was used for the modeling of Tyro3. The receptors were prepared using AutoDock Tools-1.5.6. The most common secondary metabolites (13 of 36 compounds) of the marine macroalgae, Caulerpa, were obtained from PubChem. AutoDock Vina was used for molecular docking studies. According to the results, racemosin C and monomethyl caulerpinate had the highest binding energies against TAM tyrosine kinase receptors. The binding energies of racemosin C were found as -9.2, -9.9 and -10.3 kcal/mol for Tyro3, Axl, and Mertk, respectively. The binding energies of monomethyl caulerpinate were found as -9.1, -9.5 and -9.5 kcal/mol for Tyro3, Axl, and Mertk, respectively. In conclusion, TAM tyrosine kinase receptors are of great importance for colorectal cancer treatment. Racemosin C and monomethyl caulerpinate could be evaluated as important molecules against these receptors.

Acknowledgement: This study was funded by Dokuz Eylül University Scientific Research Projects (Grant number: TLO-2023-3094)

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OP71– COMPARISON THE SOLUBILITY AND DISSOLUTION RATE EFFECTS OF BETA-CYCLODEXTRIN AND GAMMA-CYCLODEXTRIN COMPLEXATIONS OF ROSUVASTATIN CALCIUM

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The present work focuses on the inclusion complexations (ICs) of rosuvastatin calcium (RSV) with beta (β) ve gama (γ) derivatives of native cyclodextrins (CDs) and investigate effects on improved solubility and dissolution rate. The phase solubility studies illustrated that RSV solubility increased in the presence of γ CD with a negative deviation that indicates A_N type diagrams, while β CD showed Bs type, upon addition of β CD, an increase in the solubility of the drug was observed up to a particular point [2]. Stability constant (K), was found to be 70.2 M^{-1} for β and 106.8 M^{-1} for γ CD. ICs of RSV were prepared with β and γ CD by at 1:1,1:2 and 1:4 different molar ratios by freeze drying method [3]. Further, ICs was characterized physicochemically by FT-IR and DSC, and also drug loading efficacy, water solubility and in vitro dissolution analyses were performed. FT-IR and DSC results revealed formation of ICs between RSV and CD. High drug loading efficiency was obtained for all ICs in the range of 99.41–101.84%. Water solubility studies showed that ICs with β CD have increased solubility of RSV about 1.3 times regardless of CD ratios ($p>0.05$). As compared to β CD ICs, the solubility of RSV was significantly greater in γ CD ICs and increased up to 1.45, 1.72 and 2.00 fold at 1:1, 1:2 and 1:4 ratio, respectively. Conspicuously, RSV solubility increased with increasing ratio of γ CD ($p<0.05$). The dissolution profiles of the pure RSV and ICs were examined at pH 6.6 citrate buffer according to USP monograph. Compared with pure RSV, all ICs showed improved dissolution rates and immediate release profiles. However multiple point comparison of dissolution profiles indicated that γCD ICs have higher drug release. Particularly γ CD ICs at 1:4 ratio released the highest RSV with 95.12% at 3 min and 100% completion in 15 min whereas pure RSV dissolved 59,68% at 3 min. It is concluded that γ CD provided a better improvement on RSV solubility and dissolution rate than β CD.

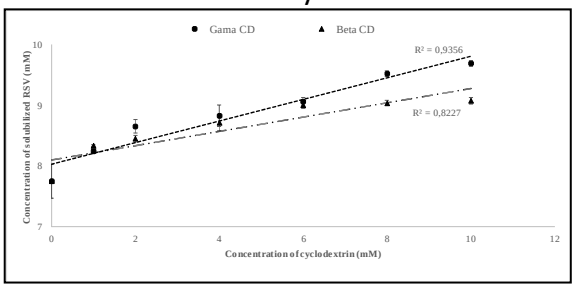

Figure 1. Phase solubility diagram of RSV in aqueous solution with β CD and γ CD (mean ± SD, n = 3).

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OP72– EVALUATION OF POSSIBLE TOXIC EFFECTS OF A TRIAZOLE FUNGICIDE TRIADIMENOL IN SH-SY5Y CELL LINE

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Azole fungicides, especially triazoles, are globally used in agriculture and medicine as antifungal agents; used in plant and food crops protection products, also pharmacologically used to treat fungal infections in humans [1]. However, adverse environmental and human health effects, occupational and consumer risks resulting from these environmental contaminants have been reported over the years. Triadimenol (TN), a potent metabolite of a triazole fungicide triadimefon, is one of the most commonly used fungicides. Although the fungicidal activity of triadimefon and triadimenol through the inhibition of sterol synthesis, the primary mode of toxicity in mammals appears to be neurotoxicity [2,3]. It has been reported that acute exposures to the TN affects central nervous system (CNS) catecholamines and induces a neurotoxic syndrome in rats [4,5]. Thus, it is vital to assess the risk of pesticide metabolite products to the environment. In this study, it was aimed to evaluate the possible cytotoxic, apoptotic and oxidative effects of TN in human neuroblastoma (SH-SY5Y) cells, a widely established in vitro model for neurotoxicity experiments. The cells were treated with TN in different concentrations for 24 hr. Following exposure, we used standard methods for evaluating specific targets: cytotoxicity by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) test, induction of reactive oxygen species (ROS) by H2DCFDA (2',7'-dichlorodihydrofluorescein diacetate) fluorescent dye, and cell apoptosis by FITC Annexin V assay. According to the MTT analysis, IC50 value of TN was determined as 303,045 µM for 24 hr exposure. As a result of the IC50 value obtained in the light of cytotoxicity data, the exposure concentrations for ROS and apoptosis assays were determined. TN did not cause any significant changes in ROS levels at any treatment concentrations. On the other hand, Annexin V assay results showed that apoptosis levels increased significantly after TN exposure at the highest dose of 100 µM (<2-folds; $p \leq 0.05$). Other than the highest dose, there was not any significant change observed compared to control group. Our findings suggested that TN exposure induces apoptosis by a different mechanism other than ROS over production. The results highlight the importance of understanding TN's toxic potential and conduct assessment of occupational and environmental risks; However, further studies are required to clarify the TN-induced neurototoxicity mechanisms.

Keywords: Triadimenol, Neurotoxicity, SH-SY5Y

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OP73– (4-HYDROXYPHENYL)-4-METHYL-1-((4-SUBSTITUEPHENYLAMINO)METHYL)-3H-1,2,4- TRIAZOLE-3-THIONE DERIVATIVES AS INHIBITORS OF MONOAMINE OXIDASE

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Alzheimer's disease (AD) is a chronic neurodegenerative disorder with multifaceted pathogenesis. More than 50 million people have dementia worldwide, and AD is the most common cause of dementia, which is the leading cause of 60–70% of cases [1]. Very few drugs approved by the FDA will prevent neuronal cell loss in patients with Parkinson's disease (PD) or Alzheimer's disease (AD). Inhibition of monoamine oxidases (MAO), a strategy to counteract oxidative stress and beta-amyloid plaque deposition, would regulate neurotransmitter levels and create a therapeutically robust and targeted approach [2]. Heterocyclic ring–carrying compounds (triazole, benzimidazole) are included in the literature to develop monoamine oxidase (MAO) inhibitors against Alzheimer's disease [3]. In the present work, 5 new 5-(4-hydroxyphenyl)-4-methyl-1-((4-substituephenylamino)methyl)-3H-1,2,4-triazole-3-thione (**Comp 1-5**) were designed and synthesized. The structures of the synthesized compounds were elucidated using FT-IR, ^{1}H-NMR, ^{13}C-NMR spectral data. The predicted inhibitory activities of these compounds on the X-Ray crystal structures of different proteins obtained from the literature were evaluated using in silico methods. Molecular docking studies were performed using hMAO-A (PDB: 2Z5X) and hMAO-B (PDB: 4A79) crystals with the extra precision (XP) scoring function of Glide. The inhibition effects of the designed compounds on MAO enzymes were investigated by in vitro methods. The enzyme inhibition assay revealed that synthesized compounds have robust inhibition profiles against both hMAO-A and hMAO-B. The compound **2** displayed IC_{50} values of 0.057 µM and 0.060 µM against hMAO-A and hMAO-B respectively. The reference drugs moclobemide (IC_{50} = 6.061 µM) and selegiline (IC_{50} = 0.037 µM) displayed a significant inhibition against hMAO-A and hMAO-B.

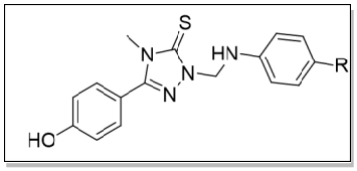

Figure 1. The skeletal structure of the compounds (Comp **1-5**), which design, synthesis, characterization, and activity studies were performed within the scope of this study

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OP74– MAO-AROMATASE INHIBITOR NEW BENZOXAZOLINONE-HYDRAZONE COMPOUNDS: DESIGN, SYNTHESIS, IN SILICO AND IN VITRO STUDIES

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Mood lability and decreased rate of cognitive activity are common problems experienced by perimenopausal, premenstrual women, and especially estrogen receptor (ER)-dependent breast cancer patients treated with aromatase inhibitors (AIs). It has been reported that this is directly related to the decrease in the level of estrogen in the body, and it has been determined that the role of estrogen in the regulation of monoamine oxidase (MAO) enzymes in the brain is the main reason for this situation [1]. The oxidative activity of MAO enzymes on neurotransmitters and their effects on cholinergic, serotonergic and dopaminergic systems have been clarified and its contribution to the emergence of these neurological/neurodegenerative disorders has been proven [2]. Studies on the use of MAO inhibitors for neuroprotective/neurotherapeutic benefits date back many years [3]. However, the idea that it can be used to relieve neurological/psychological side effects that occur in treatment with aromatase inhibitors is new [4].

In this study, the MAO and aromatase inhibitory activities and cytotoxicity in breast cancer cell line (MCF-7) of the synthesized compounds with structure of 3-(5-methyl-2-benzoxazolinon-3-yl)-N'-(substituted-arylidene)propionylhydrazine were evaluated. In order to prevent and reduce the neurological/psychological side effects in breast cancer treatment with AIs, it is aimed to discover new compounds that are dual MAO-Aromatase enzyme inhibitors. It was determined that some compounds in the series showed inhibitory activity comparable to the reference compounds and significant protein-ligand interactions were established in molecular modeling studies. At the same time, it was determined that these compounds showed high cytotoxicity in MCF-7 cell line.

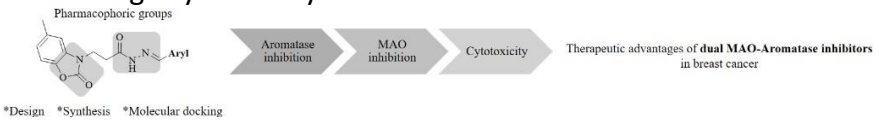

Figure 1. General structure of the synthesized new MAO-aromatase inhibitor compounds.

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OP75– PREPARATION and EVALUATION OF DOCETAXEL-LOADED SOLID LIPID NANOPARTICLES AS A PROMISING TREATMENT IN BREAST CANCER

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Docetaxel (DTX) is an anticancer agent that has low hydrophilicity and permeability. The lipophilic characteristics of DTX reduce its absorption in the bloodstream, which decreases its therapeutic effectiveness and safety. This situation is also associated with side effects of DTX during treatment because of its usage in higher doses [1,2]. Solid lipid nanoparticles (SLNs) are nanometer-sized spherical particles containing solid lipids, surfactants and an aqueous solution. These particles consist of biocompatible lipids, so they are an excellent carrier system with no toxicity. SLNs can enhance the effect and safety of chemotherapeutic agents [3,4]. Thus, this study aimed to design DTX-loaded SLNs to decrease drug toxicity and increase therapeutic efficacy and stability.

SLNs were prepared by the homogenization-sonication method. Nanoparticles were characterized by particle size and distribution, zeta potential, and entrapment efficiency. TEM image of the formulation was obtained to check the morphologic properties. Differential scanning calorimetry (DSC) and fourier-transform infrared spectroscopy (FTIR) were used to evaluate the matrix structure of SLN. In vitro cytotoxic effects of SLNs against breast cancer cells (MCF-7) was determined by MTT assay.

According to our results, the mean particle sizes found 178,7±0,5 nm and 195,4±0,1 nm for free SLNs and DTX-SLNs, respectively. Also, polydispersity index (PDI) values were 0,179±0,01 and 0,207±0,02; zeta potentials were -10,8 mV and -17,9 mV, respectively. TEM analyses showed that spherical particles were obtained. According to the release study, DTX had a slower release profile compared to its free form. DSC and FTIR analyses showed that DTX was trapped in the lipid matrix. When the cytotoxic effects of the obtained particles on MCF-7 were evaluated, it was observed that cell viability decreased with the increase in concentration in cells treated with drug-loaded particles at all exposure times (24 h, 48 h and 72 h). However, it was determined that free SLNs did not reduce cell viability below 50%, except for 72 h of particle exposure.

These results suggest that DTX-SLNs may be a promising drug delivery system for breast cancer therapy.

Keywords: Docetaxel, solid lipid nanoparticles, breast cancer, MCF-7

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OP76– SULFUR DIOXIDE (SO2) DONORS IMPROVE ERECTILE FUNCTION AFTER CASTRATION IN A RAT MODEL

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Erectile dysfunction (ED) is caused by decreased blood flow in the corpus cavernosum (CC) and down-regulated production of the nitric oxide synthase (NOS) enzyme in low androgen status. An endogenous vasodilator gasotransmitter like NO is sulfur dioxide (SO_2)[1]. Additionally, CC from castrated rats had a reduced SO_2 signaling pathway. The current investigation aimed to determine whether treatment with SO_2 donors, sodium sulfide (Na_2SO_3), and sodium bisulfite ($NaHSO_3$) could be beneficial in treating ED in a rat model of castration.

Sprague-Dawley rats (n=30) were divided into four groups: control; control rats-treated with SO_2 donors; castrated rats; castrated rats-treated with SO_2 donors. Rats underwent castration by bilaterally scrotal incisions. 4 weeks after the castration, SO_2 donors, Na_2SO_3 (0.54 mmol/kg) and $NaHSO_3$ (0.18 mmol/kg) were administered for 4 weeks[2]. Erectile response by in vivo cavernosal nerve stimulation and in vitro relaxant and contractile responses of the CC were measured.

Erectile responses in castrated rats were reduced compared with controls. SO_2 donors treatment increased erections at all voltage levels. The endothelium-dependent and endothelium-independent responses in castrated rats were less than in controls. Sildenafil-induced relaxation in the castrated group was lower than in the control group. SO_2 donors treatment restored the reduction in castrated rats. The contractile responses in castrated rats were increased compared to control rats. The increment was returned by the treatment.

Through the improvement of endothelium and sildenafil-induced relaxation in the castration, SO_2 donors enabled the restoration of erectile function. These findings imply that sildenafil and SO_2 donor therapy are two novel possible treatments for ED brought on by androgen deprivation. A new signaling role for SO_2 in ED treatment with targeting the androgen receptor signaling pathway in patients with advanced prostate cancer may be emerging.

Acknowledgement: This study was supported by Ankara University Research Foundation (TDK-2022-2463).

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OP77– RP-HPLC METHOD DEVELOPMENT FOR SIMULTANEOUS DETERMINATION OF MELPHALAN AND TOPOTECAN IN HUMAN PLASMA SAMPLES

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Cancer is a complex disease that occurs with the uncontrolled division and proliferation of cells [1]. Different approaches can be used alone or in combination for the treatment of cancer. Antineoplastic drugs destroy cancer cells or stop their proliferation [2]. Melphalan is an antineoplastic agent belonging to the class of nitrogen mustard alkylating agents [3]. Topotecan is a semi-synthetic alkaloid derivative with similar anticancer activity to camptothecin [2].
Some analytical methods have been described for determination of melphalan and topotecan individually in human plasma samples. Although, there are cases where melphalan and topotecan are used together [4, 5], an analytical method performing the analysis of melphalan and topotecan simultaneously has not been developed up to date. In case of melphalan and topotecan are used for a combinational therapy, determination of the melphalan and topotecan concentrations is important to manage the dose for patients.

The main purpose of this study is to develop a fast, reliable, accurate and precise HPLC-UV method for determination of melphalan and topotecan in human plasma samples. For this purpose, ultrafiltration, a membrane filtration technique, was employed for sample preparation and a C18 column was used for the separation.

Separations were carried out with Superco 5 µm C18 100 Å LC Column (100 x 4.6 mm). The column temperature was set at 25 ^{0}C and the flow rate was 1.0 mL min^{-1} while using a gradient elution program using methanol:water mixture in different ratio. The standard stock solutions of melphalan (1000 µg mL^{-1}) and topotecan (1000 µg mL^{-1}) were freshly prepared in isotonic solutions. The working standard solutions were prepared freshly before injection by diluting the stock solution with methanol:water (50:50 v/v) mixture. Standard solutions were added to the commercial blank plasma samples. 500 µL of plasma sample was taken into an eppendorf tube and 500 µL of methanol was added to precipitate the proteins. After vortexed for 1 minute and centrifugation, supernatant was taken into Merck Millipore-0.5 Centrifugal Filter having 10 kDa pores. This solution was centrifuged at 12.000 rpm for 10 minutes and supernatants transferred to vials for HPLC analysis.

The method was linear in the range of 0.2–20 μg mL^{-1} for melphalan and topotecan with excellent determination coefficients ($R^2 > 0.9993$). The recovery of melphalan and topotecan in human plasma was 97.21% and 99.88%, respectively. The findings of this analysis with high recovery values with high accuracy and precision proved the matrix minimizing effect of the presented sample preparation technique.

The developed HPLC method could be used in routine clinical applications where the analysis of melphalan and topotecan is needed to manage the dose.

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OP78– UNTANGLING THE METABOLIC COMPLEXITY OF AUTISM SPECTRUM DISORDER USING METABOLOMICS

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Autism Spectrum Disorder (ASD) is a heterogeneous neurodevelopmental disorder that affects the interaction, communication, learning and social behaviors of individuals in various aspects [1]. There are still no validated blood-based biomarkers for ASD, hindering early diagnosis and treatment [2]. Genetic factors play a role in the majority of ASD cases, but environmental factors are also effective. Environmental factors can directly affect the phenotype [3]. Metabolomics studies is a sub-discipline of omics that examines the instantaneous changes in the effect on the phenotype. Early diagnosis and early intervention is a very important element for autism. In particular, regressive ASD , which is a complex subtype of ASD, remained weaker in language development, more severe autism than individuals with non-regressive ASD [4]. This study aims to investigate the differences between ASD (Autism Spectrum Disorders) cases with regression and without regression by assessing biomarkers, clinical manifestations and the regression specific features.Liquid Chromatography-Quadrupole Time-of-Flight Mass Spectrometry analysis was performed. Samples prepared by precipitation of proteins using methanol [sample:methanol 1:2 (v/v)] were injected into the device as duplicate. C18 column was used as chromatography column. A gradient elution program was carried out while the flow rate is 0.3 mL/min. Peak picking, statistical transformations and pathway analysis steps performed with using XCMS, metaboanalyst and impala softwares.As a result of chromatographic and bioinformatic analysis, a total of 6657 peaks were found between individuals with and without ASD (Resgression negative), of which 1675 were statistically significant ($p<0.05$, $FC>1.5$). While the total number of metabolites obtained from the MetaboAnalyst 5.0 program was 116, 68 of them matched with the ones found in HMDB (Human Metabolome Data Base). Afterwards, these matched metabolites were evaluated to better understand the differences between the regression positive and regression negative groups.

In the metabolomic pathway analysis using the IMPaLA platform, the pathways that matched metabolites belonged were found. For those who play an important role in ASD, it was found that the pathways that were more important than the changes of regression positive regression negative groups versus the control group were serotonin metabolism, bile acid and fatty acid metabolisms, lipid metabolism. In addition, it was observed that these pathways were significantly affected between regression negative and regression positive groups.

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OP79– ANTIMICROBIAL AND ANTIBIOFILM ACTIVITIES OF NEW HYBRID DERIVATIVES CONTAINING HYDROXYPYRONE AND DITHIOCARBAMATE STRUCTURES

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The therapeutic effects of synthetic and natural origin compounds have been investigated for many years for the treatment of bacterial, fungal and viral diseases. Despite this, almost all microorganisms have developed resistance to most agents in order to adapt themselves. This condition, known as antimicrobial drug resistance, has been one of the most challenging steps of treatment. Therefore, drug research focuses on the discovery of new drug molecules that are more effective and can prevent the development of resistance in order to overcome this problem [1].

Within the scope of this study, synthesis of 10 new hybrid derivatives by combining 3 different pharmacophore groups, dithiocarbamate structure, hydroxypyron ring and aromatic rings bearing various electronic substituents in their chemical structure, those antimicrobial activity is known and proven to contribute to this effect, were done. In addition to standard strains (Staphylococcus aureus ATCC 29213, Escherichia coli ATCC 25922 and Candida albicans ATCC 90028), the antibacterial and antifungal effects of these compounds against clinical isolates known to cause infection in humans were determined by disc diffusion and microdilution methods, and the effects of these compounds on biofilm production of microorganisms (anti-biofilm activity) was investigated [2].

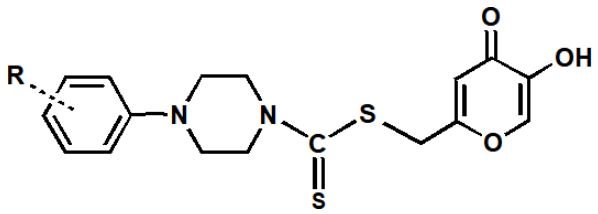

Figure 1. Synthesized hybrid derivatives

When the disc diffusion test findings were evaluated as a result of bioactivity studies, it was determined that Compound 3, carrying 3-chlorophenyl structure, was the most effective against S. aureus and C. albicans and Compound 8, having 2-methoxyphenyl moiety, was the most active compounds against E. coli among the newly synthesized compounds. According to the results of the microdilution method, the most effective compounds against all microorganisms were Compounds 4, 5 and 6, which carry electron-withdrawing groups from the aromatic ring. As the results of antibiofilm activity, compounds with the highest biofilm formation inhibition percentages against all studied strains were determined as Compounds 2, 7 and 8, while the antibiofilm activity was also observed in Compound 10 against C. albicans. The data obtained from this study will contribute to the development of new drug candidate compounds to solve the current problem caused by long-term drug use and/or the development of multi-drug resistance.

Acknowledgement: This study is supported by TÜBİTAK Project No: 221S500.

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OP80– IN VITRO EVALUATION OF ENDOCRINE RELATED ADVERSE EFFECTS OF SOME PRESCRIBED PHARMACEUTICALS DURING PREGNANCY

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It is aimed to determine the endocrine disrupting potential of paracetamol, indomethacin, alpha-methyldopa and pantoprazole which are frequently prescribed pharmaceuticals during pregnancy. In vitro aromatase inhibitory, estrogen receptor (ER) agonist/antagonist (E-Screen assay) and hormone biosynthesis modulatory effects (H295R steroidogenesis assay) of the selected pharmaceuticals were evaluated. Their effects on viability of MCF-7/BUS and H295R cells were also evaluated by MTT assay. None of the pharmaceuticals affected H295R cell viability. Only indomethacin reduced MCF-7/BUS cell viability at 100µM and 300µM. Among the tested pharmaceuticals, only paracetamol and indomethacin were found to inhibit aromatase activity with IC50 values of 14.7 x 10^{-5}M and 57.6 x 10^{-5}M respectively. Moreover, indomethacin showed a biphasic ER agonist effect. ER antagonist effects of indomethacin and pantoprazole were confirmed by performing two stepped E-Screen assay. Thereafter, effects of pharmaceuticals on synthesis of testosterone (T) and estradiol (E2) levels were tested. Alpha-methyldopa increased E2 at all tested concentrations and T at 1.48 and 4.4µM. On the other hand, other tested pharmaceuticals did not affect steroidogenesis. These data suggest that all tested pharmaceuticals may have potential endocrine related adverse effects which should be considered when using in pregnancy.

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OP81– 3-CYANOPROPYL FUNCTIONALIZED N- HETEROCYCLIC CARBENE PRECURSORS SYNTHESIS AND ENZYME INHIBITION

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N-heterocyclic carbenes (NHC) are heterocyclic compounds consisting of singlet carbenes and containing a nitrogen atom. The ease of synthesis, functionalization, isolation, and success of NHCs in complexing with a wide variety of hard/soft metal ions increase the importance of NHCs as excellent ligands. In this study, 3-cyanopropyl-functionalized NHC precursors were synthesized and inhibition effects on carbonic anhydrase enzymes (hCA I and hCA II) and acetylcholine esterase (AChE) enzyme were evaluated. Substances showing good inhibition effect on hCA I enzyme compared to acetazolamide were determined as 1c>1a>1b>1d, respectively. 1f and 1e showed similar effects with acetazolamide on hCA I enzyme. The effect of 1g coded substance on hCA I was lower than acetazolamide. Compared with acetazolamide, the substances showing an inhibitory effect on the hCA II enzyme were determined as as 1d>1f>1a>1c, respectively. The substance coded 1b showed a similar effect with acetazolamide on the hCA II enzyme. Substances coded 1e and 1g showed a lower effect on the hCA II enzyme than acetazolamide. Substances that showed good inhibition effect on AChE enzyme compared to tacrine were determined as 1a>1c>1e>1b>1f coded substances, respectively. The 1d coded substance showed similar effects with tacrine on the AChE enzyme. The 1g coded substance had a lower effect on the AChE enzyme than tacrine.

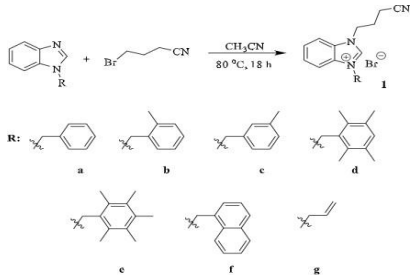

Fig. 1. Codes of synthesized chemicals

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OP82– THE POTENTIAL ROLE OF INFLAMMASOME ACTIVATION IN GEFITINIB - INDUCED HEPATOTOXICITY

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Gefitinib, a growth factor tyrosine kinase inhibitor (EGFR-TKI), is widely used against non-small cell lung cancer. However, it has been reported to cause serious adverse effects, including hepatotoxicity, proximal tubular injury, and even death (1). The precise mechanism(s) of gefitinib-induced liver toxicity remains unclear (2). In the present investigation, it was aimed to assess the role of two inflammasome components, caspase-1 and interleukin-1β (IL-1β) in the pathogenesis of gefitinib hepatotoxicity. HepG2 cell in vitro model was used to investigate the potential effects of gefitinib on inflammation induction. Cells were incubated with different concentration of gefitinib for 48h. Then the cell viability was determined by MTT assay in order to determine the IC50 (3). Reactive oxygen species (ROS) formation induced by gefitinib was measured by DCFH-DA assay (4). Caspase-1 activity was measured by spectroscopy-based approach, and IL-1β secretion was evaluated by ELISA assay to determine the effect of gefitinib on secretion and activation of inflammasome components (5). The present study demonstrated that gefitinib significantly decreased cell viability in a dose-dependent manner. Gefitinib exposure for 48 h increased the levels of ROS. Moreover, treatment of gefitinib caused dramatic increase in caspase-1 activities and led to IL-1β secretion in HepG2 cells. Inflammasomes may play a significant role in drug-induced toxicities. This study suggests that inflammasome activation is involved in the process of gefitinib-induced hepatotoxicity. Further studies are needed to increase our understanding and to support these findings.

Acknowledgement: Ege University Scientific Research Projects Foundation (EGE-BAP) Committee is acknowledged for their financial supports (Project Number: 22969).

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OP83– FERROPTOTIC ACTIVITY OF SYNTHETIC NEUROMELANIN IN DOPAMINERGIC CELLS

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Neuromelanin (NM) is a dark, insoluble, granular pigment found in the brain. High metal binding capacity of NM supports its protective role in physiological conditions. However, NM is also known to bind iron ions in excess, gain redox activity and trigger free radical formation which is consistent with ferroptotic cell death [1].
In our study, we aimed to evaluate the possible ferroptotic effect of NM in dopaminergic cells. Synthetic NM (0.1-100 µg/mL) was produced and imagined with scanning electron microscopy (SEM). Pigments were applied to human neuroblastoma cells (SH-SY5Y) in the presence of N-acetylcystein (NAC), ferrostatin-1 (Fer-1) or liproxstatin-1 (Lip-1). Ferroptosis inducer, erastin (30 µM, 24 hours), was used as a positive control. Then, the changes in cell viability, GSH and 4-HNE levels were evaluated.
Following the application of synthetic NM (0.1-100 µg/mL), cellular uptake was visualized at 48h. Also, a significant decrease in cell viability and GSH levels was observed following NM (IC_{50} 47.84 ± 4.53 µg/mL) treatment. Pretreatment with NAC (1mM) significantly reduced NM-induced cellular death ($p<0.05$). In addition, 4-HNE levels was significantly decreased whereas GSH levels (5.44-fold) were increased in NM+Fer-1 and NM+Lip-1 treated groups ($p<0.05$).
In conclusion, NM accumulation in brain may trigger cell death by regulating redox state. Our results support the idea that NM may induce ferroptosis during aging.

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Key Words: Neuromelanin, ferroptosis, oxidative stress

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OP84– INVESTIGATION OF GENE EXPRESSION LEVELS OF SOME PROTEINS RELATED TO THE PATHOGENESIS OF PARKINSON'S DISEASE IN RATS EXPOSED TO PRENATAL STRESS

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The characteristics of the growth environment starting in the womb include important risk factors for lifelong physical and mental health problems for the individual [1]. Parkinson's Disease (PD) is a progressive disorder usually seen in older people and characterized by impairments in motor control. This disease is caused by damage to dopaminergic neurons in the region of the brain called substansia nigra pars compacta. Although the cause of neuronal damage is not known for certain, environmental and genetic factors, male gender, and old age are thought to play a role [2]. We conducted this study with the aim of investigating the effects of prenatal stress experienced by the offspring on the development of PD in the future. Changes in the expression levels of tyrosine hydroxylase (TH), α-synuclein (SNCA), dopamine transporter (SLC6A3), and parkin (PRKN) proteins, which are involved in the pathogenesis of PD, were demonstrated in the cerebral cortex of male rats exposed to prenatal stress. In our study, prenatal stress was induced by dexamethasone (Dex), a synthetic corticosteroid. From GD 14 to 21, pregnant rats were injected daily with Dex at a dose of 100 µg/kg s.c. or saline. After the birth, at the age of 3 months, male rats were decapitated (n=5) and cortexes were dissected on ice. Total RNA was isolated from cortexes and used for cDNA synthesis. Gene expressions were conducted with real-time PCR using the comperative ΔΔCT method. The statistical differences between groups were analyzed by the Mann-Whitney test. Level of $p<0.05$ was considered to be statistically significant. Prenatal Dex exposure caused significant increases in the mRNA expressions of TH and SLC6A3. No significant differences were found in the mRNA levels of PRKN and SNCA between the control and Dex groups (Fig. 1). As a result, offspring that develop in the stressful womb environment during pregnancy may be more susceptible to PD later in life through the changes in the cortical mRNA levels of TH and SLC6A3, which are involved in the pathogenesis of PD.

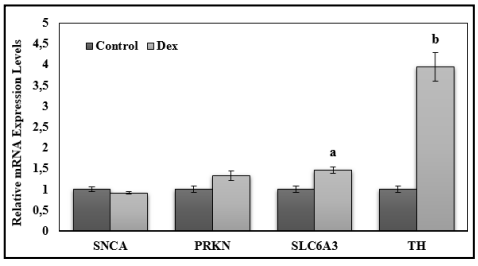

Figure 1. Relative mRNA expression levels of SNCA, PRKN, SLC6A3, and TH in the control and Dex groups. The results were given mean ± S.E. (n=5, [a,b]$p<0.01$ vs control).

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OP85– IN VITRO PARKINSON'S DISEASE MODELS: 2D OR 3D?

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Parkinson's Disease (PD) is the second most common neurodegenerative disease after Alzheimer's. The disease is characterized by the loss of dopaminergic neurons in the substantia nigra, particularly affecting the ventral component of the pars compacta. In pharmaceutical trials, 2-dimensional (2D) cultures are not sufficient to simulate the 3-dimensional (3D) organization of the tissues, as well as transport limitations of drugs in physiological conditions[1]. Researchers have recently developed 3D disease models for drug trials that can meet these needs and bridge the in vitro and in vivo models.

In this study, the effectiveness of a 3D in vitro PD model was evaluated by comparing 6-OHDA-induced 2D and 3D models using SH-SY5Y and PC12 dopaminergic neuronal cells. The 3D in vitro model has been optimized to allow high-throughput testing of new drugs and therapeutic approaches in a more realistic microenvironment. The 2D and 3D PD models were compared by performing cell viability, lactate dehydrogenase, live&dead analyses, PD specific immunofluorescence staining and gene expression analysis. In the live&dead analysis, it is seen that the dead cells in the PD microtissues increased after 6-OHDA treatment (Figure1).

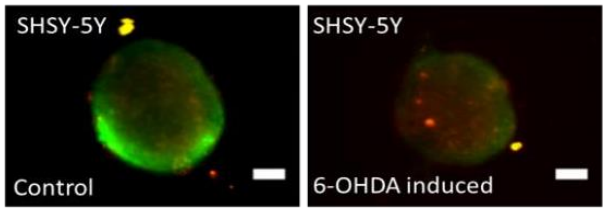

Figure 1. Live&dead analysis of 3D SH-SY5Y microtissues. After 2 days of incubation, the cell viability is lower in the 6-OHDA-induced groups compared to control groups. Live cells were stained green, and dead cells were stained red. Scale lines; 100 µm

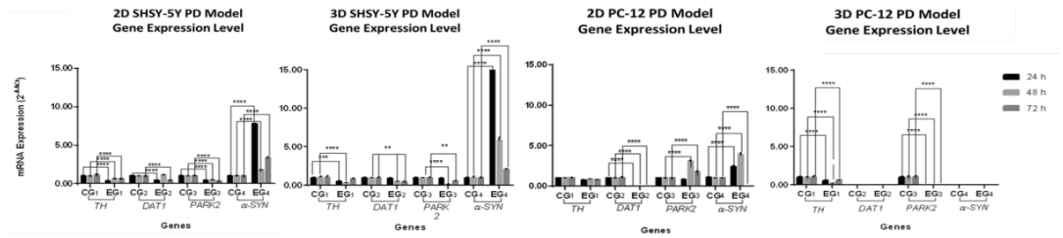

Figure 2. Relative expression rates of TH, DAT1, PARK2, α-Syn in 2D and 3D PD models. CG1-4: Control Groups, EG1-4: Experimental Groups ($p > 0.01$, *$p < 0.05$, **$p < 0.01$, ***$P<0.001$, **** $P<0.0001$).

Higher expression of PD-related genes was observed in the 3D SH-SY5Y model (Figure 2). It was concluded that SH-SY5Y microtissues could be used more reliably as a 6-OHDA toxicity-induced PD model and the model would show maximum efficacy 24 h after 6-OHDA induction. It has been shown that this 3D in vitro PD model can be an alternative experimental model that can fill the gap between 2D in vitro and in vivo studies in the diagnosis and treatment of PD.

Acknowledgement: This work was supported by a research grant from the Scientific and Technological Research Council of Turkey (TUBITAK), project number 215M888 and by COST Action CA16119 – CellFit. Şeyma TAŞDEMİR was supported by TUBITAK-BIDEB 2211 National Scholarship Program for PhD Students.

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OP86– SYNTHESIS, BIOLOGICAL EVALUATION AND MOLECULAR DOCKING STUDIES OF NEW 1-(2- CHLOROPHENYL)UREA DERIVATIVES AS INHIBITORS OF HUMAN SOLUBLE EPOXIDE HYDROLASE

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The three primary enzymatic branches of the arachidonic acid (AA) cascade produce natural bioactive lipid mediators that control a wide range of physiological and pathophysiological processes, including inflammation, pain, and hypertension. Recently, scientists have become interested in the CYP 450 branch as a potential novel molecular target, which converts AA to epoxyeicosatrienoic acids (EETs). Although endogenously formed EETs have anti-inflammatory characteristics, they are quickly degraded by the soluble epoxide hydrolase (sEH) into inactive or weakly active dihydroxyeicosatrienoic acids (DHETs). Based on this information, sEH inhibitors have been found to enhance EET levels and prolong their biological actions such as lowering blood pressure, reducing inflammation and pain states in in vivo models. Thus, sEH has been suggested as a pharmaceutical target for the therapy of a variety of illnesses, including disorders associated with pain and inflammation. Most of the sEH inhibitors that have been discovered so far are urea or amide derivatives. These derivatives create a powerful network of hydrogen bonds between urea or amide moieties and the catalytic residues of sEH. Briefly, the urea or amide NH forms hydrogen bonds with Asp335, while the carbonyl oxygen establishes hydrogen bonds with Tyr383 and Tyr466 residues. These catalytic residues are located at the corner of the L-shaped pocket of sEH and together they constitute the catalytic triad. The enzymatic pocket, consisting of short (10Å) and long (15Å) branches, is mostly hydrophobic, but there are also a few important amino acid residues, such as Gln384, where polar interactions can occur [1,2].

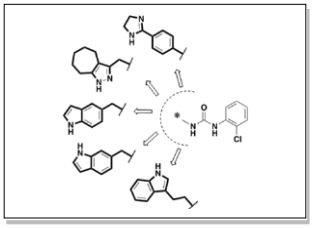

Figure 1. The designed 1-(2-chlorophenyl)urea derivatives

Within the scope of this presentation, a small series of compounds containing 1-(2-chlorophenyl)urea pharmacophore as potential sEH inhibitors were designed (Figure 1) and their activities against the human sEH enzyme were investigated using commercially available sEH inhibitor screening kit (Cayman Chemical, Cat No: 10011671) and molecular modeling studies were carried out. Biological results have shown that these compounds have a strong inhibition potential at 10 µM screening concentration. Moreover, molecular docking results have indicated that in addition to the H-bond interactions of the urea group with catalytic residues, additional interactions with Gln384 and Trp336 in the long and with His524 and

Trp525 in the short pocket contribute to the inhibitory potency of the compounds. In conclusion, we describe here a small series of phenyl urea derivatives incorporating H-bond donor/acceptor features flanking the central urea group as a secondary pharmacophore, warranting further research to confirm their potential application in the design of improved sEH inhibitors.

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OP87– A NOVEL SERIES OF ANTIPYRINE-UREA ANALOGUES: DESIGN, SYNTHESIS AND BIOLOGICAL EVALUATION AS INHIBITORS OF SOLUBLE EPOXIDE HYDROLASE

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Soluble epoxide hydrolase (sEH) catalyzes the degradation of anti-inflammatory epoxy eicosatrienoic acids (EETs) to rather harmful and inflammatory dihydroxy eicosatrienoic acids (DHETs) in the cytochrome P450 branch of the arachidonic acid (AA) cascade. Therefore, the idea of elevating the endogenously formed levels of EETs and thus prolonging their anti-inflammatory effects in vivo through inhibition of sEH has been an attractive research area with therapeutic potential against various inflammation-related diseases. Most of the previously reported sEH inhibitors have central urea or amide groups as the primary pharmacophore, which establish significant binding interactions with the three amino acid residues (Asp335-Tyr383-Tyr466) in the hydrolase catalytic site of sEH. In addition, these inhibitors also have a secondary pharmacophore that boosts the inhibitory activity by increasing the binding interactions with the amino acids at the right and left pockets surrounding the hydrolase catalytic site [1, 2].

In this study, we present a small series of urea derivatives (Figure 1) containing the antipyrine motif as a secondary pharmacophore on one side and carrying different benzyl groups, which are frequently recurring chemical fragments in the architecture of urea-type sEH inhibitors, on the other side of the central urea pharmacophore [3]. The biological activities of the synthesized compounds were evaluated using a commercially available sEH inhibitor screening kit (Cayman Chemical, Catalog No. 10011671) and the results have shown that some of the compounds had considerable inhibitory potential at three different screening concentrations. Overall, these results indicate that the synthesized antipyrine-benzyl urea derivatives are prone to further studies to validate their potential applications in the design of improved sEH inhibitors.

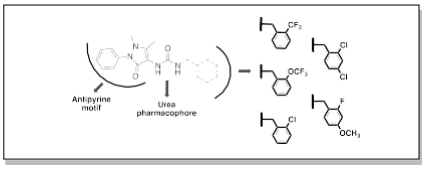

Figure 1. Representation of synthesized antipyrine analogs

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OP88– DEVELOPMENT AND IN VITRO CHARACTERIZATION OF NASAL NANOEMULSION FORMULATIONS CONTAINING MELATONIN

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Melatonin is a hormone secreted from the pineal gland in the brain and provides deep sleep. The level of this hormone decreases after the age of 40, and this causes sleep disorders (Meschino, 2012). Currently, it is being used as an active ingredient due to its role in the treatment, support, and regulation of many crucial diseases with its antioxidant, oncostatic, beta-amyloid plaque prevention, and circadian rhythm regulatory properties [1]. Melatonin is available commercially in oral formulations such as syrup, drops and tablet. Oral formulations have low bioavailability and limited crossing of the blood brain barrier. Therefore, in this study, it was aimed to develop an oil/water nasal nanoemulsion formulation using pseudoternary phase diagram (PPD) [2]. With the solubility study of oils, surfactants and cosurfactants, excipians to be used in the formulations were determined as Labrafil, Tween 80 and Transcutol. The characterization studies were performed according to the ICH guidelines [3]. The optimum formulation was determined according to PPD, particle size, zeta potential, and PDI and started the stability studies.

Acknowledgement: This study was supported and funded by TUBITAK as a part of their TUBITAK 2209-A Undergraduate Research Projects Support Program. We thank DEVA Holding for their donation of melatonin.

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OP89– IN VITRO ANTI-INFLAMMATORY AND ANTICANCER ACTIVITIES OF TANACETUM PARTHENIUM L. EXTRACT AND ITS MAJOR METABOLITE PARTHENOLIDE

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Tanacetum parthenium L. (Feverfew) is a daisy-like Asteraceae plant carrying sesquiterpene lactones (parthenolide); used for treatment of migraine and for its anti-inflammatory effect. This study aims that the evaluation of *T. parthenium* (aerial parts) extract and its major metabolite parthenolide for its *in vitro* COX-1/COX-2, LOX inhibitory activity. The extract is prepared by maceration with methanol. Before activity evaluation, *T. parthenium* extract (European Pharmacopoeial quality) was analyzed and confirmed by HPLC. MTT was used for *in vitro* cytotoxic effects using the HEK293/A549, MCF7, PC3 cell lines. To evaluate the COX-1/COX-2 inhibition assays, studied with commercial test kits (20µg/mL concentration for extract, 5 µg/mL concentration for parthenolide). The major component of *T. parthenium* extract was characterized as %0,5 parthenolide. The cytotoxicity result showed that all anticancer data were found statistically significant. The IC_{50} results for COX-1 and COX-2 inhibition of the extract are 10.45 and 9.81µg/mL, results for the pathenolide are 4.86 and 1.90µg/mL. According to the anti-inflammatory activity results, it was determined that *T. parthenium* extract was selective COX-2 inhibitor and its SI value was 0.93. Additionally, SI value of the parthenolide is 0.39. The inhibition value of the extract on LOX is %80 and the inhibition value of the parthenolide is %41.13. The results suggested that *T. parthenium* extract showed selective potential for COX-2 enzyme inhibition. The extracts were tested against selected cancer cell lines for the first time to the best of our knowledge. Further *in vivo* tests are required to confirm the anti-inflammatory and anticancer potentials of the *T. parthenium* extracts, also combination studies are worthwhile to screen. The authors declare no conflict of interest.

OP90– OPTIMIZATION OF DISPERSION OF INORGANIC AND POLYMERIC NANOPARTICLES FOR CHARACTERIZATION STUDIES

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The aggregation and sedimentation of pharmeceutical nanoparticles (NPs) can significantly affect the true characterization of NPs. Dispersing NPs by using appropriate tools and/or chemicals into a stable suspension within nanoscale range is important for accurate measurement particle size distribution (PSD). For instance, in the case of aggregation, size measurement by SEM/TEM (direct measurement) gives a size nonsimilar to that measured by DLS(indirect measurement). In this study, two different concentration (0.1% and 0.5%, w/v) of NPs were prepared in water and effects of different sonication techniques, surfactants (nonionic and ionic) with varying time and concentration on dispersion of inorganic and polymeric NPs were investigated. Hydrodynamic diameter distribution and zeta potential were analyzed by using DLS and actual core size of the naoparticles was imaged by using SEM and TEM. Results showed that NP concentration had very low effect on the cluster size. Bath sonication was insufficient for effective dispersion and agglomeration of NPs resulted in rapid sedimentation of all particles after bath and prob sonication due to strong van der Waals forces of the NPs. PSD and TEM/SEM analyses confirmed the high influence of anionic surfactant with prob dispersion on efficient dispersion of NPS [Figure 1]. No significant difference was observed among samples with different concentration of surfactants for PSD and zeta potential values. These results indicate that agglomerated NPs can be broken down efficiently into homogenously dispersed nano size particles by probe ultrasonication and stability can be enhanced by supporting of dispersion with a suitable surfactant.

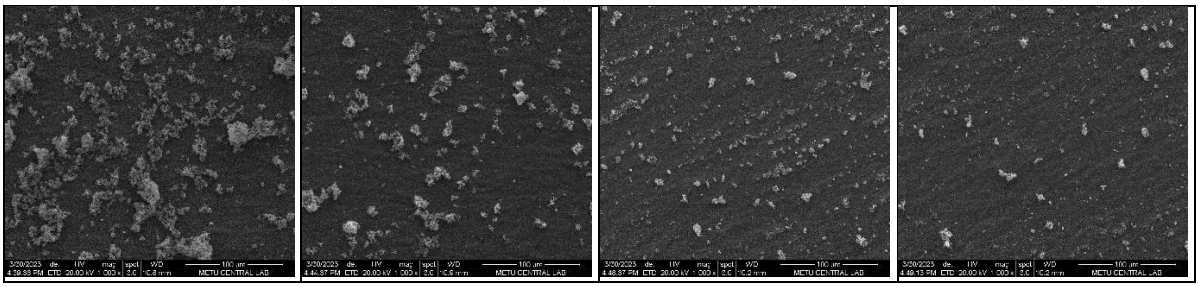

Figure 1. SEM analyses of polymeric NPs dispersed in water by a) 5 min sonication, b) 5 min sonication+SDS, c) 30 min sonication +SDS

Acknowledgement: Author thanks to Central Laboratory of METU for characterization analyses.

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OP91– FORMULATION OPTIMIZATION FOR ALA-LOADED LIPID-POLYMER HYBRID NANOPARTICLES VIA THE DESIGN OF EXPERIMENTS

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Alpha lipoic acid (ALA) is a compound with a dithiol structure. Due to its anti-inflammatory and potent antioxidant properties, it is widely used in treating various diseases such as Alzheimer's, schizophrenia, obesity [1]. Lipid-polymer hybrid nanoparticles (LPHNPs) are a new generation of core-shell nanostructures derived from liposomes and polymeric nanoparticles in which the polymer core is surrounded by a lipid layer [2]. Statistical design of experiments (DoE), a Quality by design approach, is a statistical method used to optimize various nanosystems. It helps to understand how input factors affect the product and allows the optimization of independent variables and the analysis of dependent variables [3]. In this study, we aimed to optimize ALA-loaded LPHNPs *via* the DoE approach.

To study the effect of various independent variables on formulation properties, twelve formulations were designed using the Placket-Burmann statistical approach. Drug amount, stirring rate, polymer amount, lipid/polymer ratio, water/organic solvent (W/Os) ratio and polyvinyl alcohol (PVA) concentration were chosen as the independent variables, and mean particle size (PS), polydispersity index (PdI), ζ potential (ZP) and entrapment efficiency (EE) were determined as the dependent variables. ALA-loaded LPHNPs were prepared by the nanoprecipitation method.

According to the results obtained, it was found that the stirring rate had a negative effect on PS and PdI. W/Os ratio had also a negative effect on the PdI, while PVA concentration affected positively the ZP. The most important parameters for EE were polymer amount and PVA concentration. To increase the strength of the effect of the independent variables on the dependent variables, the working ranges of the independent variables were expanded, and formulation optimization was performed using the Box-Behnken method. A design matrix was made, and twenty-four formulations were prepared with the same method. According to the results, the PS of LPHNPs ranged from 254.6±2.7 nm to 1425.3±68.7 nm with PdI between 0.248±0.019-0.851±0.103. ZP and EE ranged between -8.2±0.8 mV and -20.6±1.1 mV and 93.70±1.56% and 99.40±0.21%, respectively. As a result, it was observed that the independent variables have no significant effect on EE, while the stirring rate and polymer amount were the main factors affecting the PS, PdI, and ZP values of LPHNPs.

Acknowledgement: This work was supported by The Scientific and Technological Research Council of Turkey 2209/A University Projects Support Program (1919B012103258).

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OP92– DECREASED SERUM LEVEL OF AUTOTAXIN IN PATIENTS WITH POLYCYSTIC OVARY SYNDROME

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Autotaxin (ATX) is a 125 kDa secreted glycoprotein and hydrolyzes lysophosphatidylcholine into lysophosphatidic acid [1]. The aim of this study was to determine whether polycystic ovary syndrome (PCOS) is associated with the alteration of serum ATX levels. In addition, the relationship between ATX and several clinical and metabolic parameters was investigated in patients with PCOS. Twenty three women with PCOS and along with 20 healthy controls were enrolled in this study. Serum ATX concentration was evaluated using enzyme-linked immunosorbent assay (ELISA). Serum concentrations of insulin, luteinizing hormone, estradiol, total testosterone and C-reactive protein were significantly higher in the PCOS group than the control group. Our results revealed that serum levels of ATX in PCOS patients were lower compared to control (p=0.028). Among PCOS patients, there were no significant correlations between serum ATX levels and biochemical features. The findings of this study suggest that serum ATX may be a significant biomarker for screening PCOS.

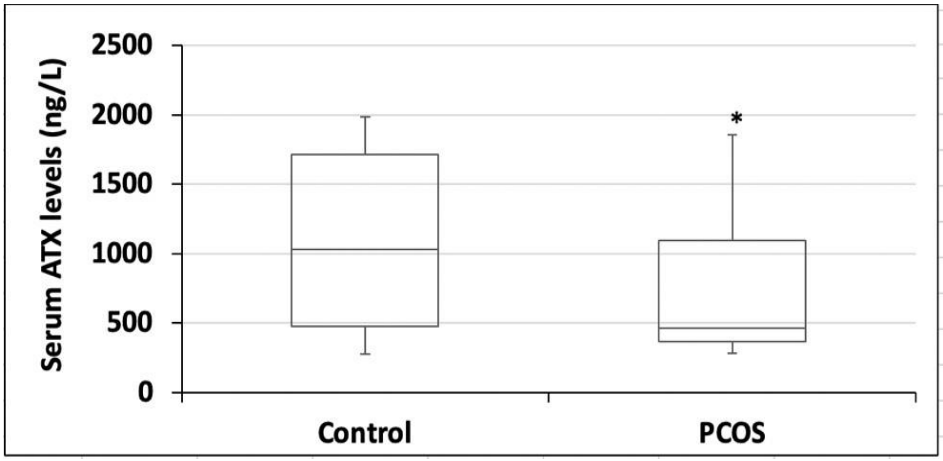

Figure 1. Serum ATX concentration in controls (n=20) and patients with PCOS (n=23). Data are expressed as the median and range.

Acknowledgement: This study was supported by Amasya University Scientific Research Project (number: FMB-BAP 22-0553).
Ethical approval: The study was approved by Amasya University Faculty of Medicine Clinical Research Ethics Committee (E-30640013-050.01.04-58503).
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OP93– A NOVEL CATIONIC NANOEMULSION FOR TOXOPLASMA GONDII pDNA VACCINE DELIVERY

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Abstract:
The obligate intracellular parasite *Toxoplasma gondii* (*T. gondii*) is causing toxoplasmosis in almost all warm-blooded animals, including humans. An effective, safe, and durable vaccine providing protective immunity for use in humans and animals is urgently needed. DNA vaccines are a promising vaccine platform because of ease production, safety, no need for cold chain and stimulation of both humoral and cellular immune responses. It is known that a large family of surface antigen-1 related sequence (SRS) proteins of *T. gondii* is involved in host cell attachment and immune subversion during chronic infection. The SRS13 protein, a stable and immunogenic member of the SRS family was synthesized and cloned into the FDA-approved DNA vaccine vector pVAX1 to construct the DNA vaccine after optimizing the SRS13 codon according to mammalian codon usage [1,2]. In this study a SRS13 plasmid DNA (pDNA) was loaded to a cationic nanoemulsion (CNE) due to the fact that CNEs can form a complex with nucleic acids via electrostatic interactions [3]. Didodecyldimethylammonium bromide (DDAB) was used as a cationic agent for preparing the CNE by microfluidization with increased duration of 1 (CNE1), 2 (CNE2) and 3 minutes (CNE3), respectively.
The prepared CNEs were characterized in terms of droplet size, polydispersity index (PDI), zeta potential (ZP), the complexation capacity with pDNA and SDS release by electrophoresis.
CNE1 had a droplet size of 140 nm, a PDI of 0.12 and a ZP of 32.1 Mv, CNE2 showed a droplet size of 137 nm, a PDI of 0.15 and a ZP of 50.5 mV, while CNE3 revealed a droplet size of 146 nm, a PDI of 0.18 and a ZP of 39.6 mV. All CNEs showed appropriate properties for further studies, but CNE2 seemed to be more appropriate due to a significant higher ZP, an important parameter for stability and complexation with nucleic acids. Thus, CNE was used for complexation studies with pDNA and revealed that CNE2 was able to form a complex with pDNA in a ratio of 1:10 (pDNA: CNE).

Keywords: Cationic nanoemulsion, microfluidization, complexation, stability, DNA vaccine, toxoplasmosis,
Acknowledgement:Special thanks to Prof. Dr. Özgen Özer from Department of Pharmaceutical Technology for her support during the particle characterization by Zetasizer Nano ZS.

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OP94– EFFECTS OF METFORMIN ON ESTROUS CYCLE AND OVARIAN HORMONES IN FEMALE RATS WITH FRUCTOSE-INDUCED METABOLIC SYNDROME

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Over the last few decades, fructose consumption has dramatically increased in worldwide [1]. Growing evidence suggests that excessive fructose intake can also induce reproductive problems such as deterioration of oocyte quality and a decrease in estrogen level by disrupting follicular development and ovulation processes [2]. This study aimed to investigate the therapeutic effects of metformin on serum and ovarian reproductive hormone levels as well as ovarian cycle of rats with high-fructose diet induced metabolic syndrome. Female Wistar rats were divided into five groups as follows: control, carboxymethyl cellulose, metformin, fructose, fructose+metformin groups. 20% fructose was added to the drinking water of the rats in the fructose and fructose+metformin groups for 15 weeks, while the other groups were given tap water. Metformin was administered 200 mg/kg/day by gastric gavage after the 7th week. Vaginal cytology was stained with Giemsa and evaluated under a light microscope before and at the 7th and 15th weeks of the experiment. At the end of the experiment, rats were sacrificed by taking intracardiac blood, and ovarian tissues were removed. Although dietary high-fructose significantly increased serum glucose (147.00±3.00 mg/dL), insulin (362.00±21.00 pmol/L) and triglycerides (642.00±68.00 mg/dL) levels, these parameters were decreased with metformin treatment (fructose+metformin group) ($p<0.05$). Metformin caused a decrease in serum aromatase (11.27±2.39 ng/ml) and estrogen (15.47±5.06 pg/ml) levels in healthy rats compared to the other groups, while testosterone (0.72±0.35 pg/ml) level was the highest in the fructose group. However, when the serum aromatase, inhibin, estrogen, progesterone, and testosterone levels of the experimental groups were compared, no significant difference was observed among the groups. It was noted that the ovarian tissue aromatase level decreased in the fructose group compared to the other groups, while the testosterone level increased ($p<0.05$). Metformin treatment (fructose+metformin) was found to have a curative effect on these parameters. In vaginal cytology, it was observed that fructose disrupted the estrous cycle and the cycle started again with metformin treatment. Metformin contributed to restoring the estrous cycle's regularity, which was disrupted by high fructose diet. Our results suggest that metformin may improve the ovarian hormonal balance impaired by a high fructose diet. We also demonstrated that vaginal cytology may be useful for monitor ovarian activity in metabolic syndrome.

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OP95– DEVELOPMENT AND CHARACTERIZATION OF IVERMECTIN LOADED LIPOSOMAL DRUG DELIVERY SYSTEM WITH ETHANOL INJECTION METHOD

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Ivermectin is an FDA-approved drug, which was discovered in 1975, and is widely used as an antiparasitic[1]. It has been used for the last 30 years and has an excellent safety profile. Moreover, it inhibited in vitro replication of in some positive, single-stranded RNA viruses such as dengue virus (DNV), Zika virus [2]. Despite its promising antiviral potential, the development of ivermectin formulations presents challenges, primarily due to its poor water solubility. Liposomes have advantages as a solubilization matrix for poorly soluble agents, and can be used as a controlled release reservoir and reducing toxicity. In this study, the aim was to prepare ivermectin loaded liposomes with a modified release behavior for antiviral treatment. We prepared liposomes by ethanol injection method, using egg phosphatidylcholine (EPC), soybean phosphatidylcholine (SPC) and distearoyl phosphatidylcholine (DSPC) as lipids, and the predetermined lipid molar ratios were 1.85 and 3[3, 4]. The physicochemical properties of the formulations were evaluated by particle size and zeta potential, encapsulation efficiency, and in vitro drug dissolution tests. FTIR studies were conducted to investigate the interaction between ivermectin and lipids. To examine the thermal behavior of the active substance and formulations, DSC analysis were held. The morphology of the liposomes was analyzed using high contrast transmission electron microscopy (CTEM). The optimal particle size was observed SPC formulation with the 1.85 ratio, which has a mean particle size of 196.1±4.7 nm. The lipid molar ratio and lipid type were observed to be effective on particle size. In all formulations zeta potential and PDI values were acceptable. The encapsulation efficiency of all formulations was found to be over 80%. The in vitro dissolution test was studied on the optimum formulation, which has 1.85 molar ratio of SPC. The cumulative release of the drug from the formulation reached 95% within 96 hours. In conclusion, modified release ivermectin loaded liposomes were successfully produced by ethanol injection method.

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OP96– QUERCETIN-INDUCED CYTOTOXICITY: CELLULAR ATP ALTERATIONS IN HEPG2 CELLS

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Quercetin (QUE) is flavonoid subclass of flavonols. QUE exerts many biological effects such as anticancer activity. QUE and its derivatives have high potential in chemopreventive and prevention of drug-induced advers effect studies. Adenosine triphosphate (ATP) is essential for cells in order to maintain homeostasis inluding proliferation and transport. Cancer cells show excessive and uncontrolled cell proliferation. For this reason, cancer cells need more energy than healthy cells. Although many mechanisms have been proposed for QUE-induced cytotoxic activity in various cancer cells, studies about the role of alterations in cellular ATP levels in HepG2 cells were limited [1,2]. Hence, this study was planned to investigate the alterations in cellular ATP levels in HepG2 cells exposed QUE.

Cytotoxic concentrations of QUE were determined by MTT assay as described previously with some modifications [3]. In brief, after attachment time (1×10^4 HepG2 cells/well) for 24 h, HepG2 cells were exposed to QUE at dose-dependent (50, 100, 250, and 500 µM) level for 24 h. We used 50 and 500 µM QUE as nontoxic and cytotoxic concentrations, respectively for further experiment. The second experiment used is the measurement of cellular ATP levels in HepG2 cells in order to observe energy status in cancer cells treated with QUE as described previously with some modifications [4]. In brief, after attachment (1×10^4 HepG2 cells/well) for 24 h, cells were incubated with 50, and 200 µM QUE concentrations. After treatment time, cellular ATP level was measured via luciferase-based ATP assay kit (Promega Corporation, Madison, WI, USA) according to the manufacturer's protocols [5].

MTT results indicated that 50 µM QUE did not cause any cytotoxicity while 100 µM and higher concentrations of QUE remarkably decreased cell viability. ATP assay showed that 50 µM QUE (subtoxic) did not alter cellular ATP levels. However 500 µM QUE (toxic) led to decrease of cellular ATP levels. These results suggest that decrease of ATP levels at high dose of QUE might play role in anticancer activity in HepG2 cells.

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OP97– EMPAGLIFLOZIN EXERTS H2S-MEDIATED VASCULAR BENEFICIAL EFFECTS IN DIABETIC ERECTILE DYSFUNCTION

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Diabetes causes endothelial/vascular dysfunction and results in erectile dysfunction(ED). Empagliflozin is a sodium-glucose cotransporter-2 inhibitor. H_2S deficiency is an indicator of ED. H_2S relaxed the corpus cavernosum(CC) taken from patients [1]. A pharmacologic intervention delivering H_2S will provide additional benefits to sexual function. Empagliflozin treated ED in CC of rats with diabetes, but its relationship with H_2S has not been investigated yet [2]. We aimed to demonstrate that the beneficial effects of empagliflozin on diabetic CC may be related to H_2S.

Rats were divided into the control, streptozotocin diabetes, and empagliflozin groups. The control was fed normal chow and the others were fed high-fat chow (35% kcal fat). At the end of 4 weeks, diabetes and empagliflozin groups received streptozotocin then followed by empagliflozin 10 mg/kg/day for 3 months. MCC strips were mounted in a strip myograph for isometric force recording. Acetylcholine(ACh,10^{-9}-10^{-4}M), L-cysteine(L-cys,10^{-6}-$3x10^{-3}$M,substrate), and Na_2S(10^{-6}-$3x10^{-3}$,H_2S donor) were obtained in phenylephrine($3x10^{-6}$M) pre-contracted CC. ANOVA was used for comparisons of E_{max} and pD_2 values.

ACh relaxations were inhibited in diabetic rats and empagliflozin prevented this inhibition(P<0.001). L-Cys-induced relaxations were diminished in diabetic rats and empagliflozin restored this relaxation(P<0.001). Na_2S relaxations were inhibited in diabetic rats and empagliflozin improved this(P<0.001).

Diabetes impairs Ach-, L-Cys- and Na_2S-mediated vascular responses in rat CC. Empagliflozin protects NO and H_2S-mediated vascular responses against diabetes. Studies investigating its relationship with endogenous H_2S production continue. Empagliflozin may protect sexual functions in diabetes-induced ED with its H_2S-mediated effects in addition to NO.

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OP98– CYTOTOXIC ACTIVITIES OF ISOLATED COMPOUNDS FROM PRANGOS UECHTRITZII BOISS & HAUSSKN

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The genus *Prangos* (Apiaceae) is an Iran-Turan element and is represented by 45 species worldwide, and 19 species in Türkiye [1]. The roots of the plant are benefited as an aphrodisiac, anti-hemorrhoidal, and wound-healing agent whereas the aerial parts are used as carminative and stimulant in Anatolian folk medicine [2]. In addition to various bioactivity studies of the genus such as antibacterial, antioxidant, antiviral, and anticholinesterase activities, cytotoxic activities of the different *Prangos* species have also been investigated. *Prangos uechtritzii* Boiss&Hausskn is an endemic plant of Türkiye, and the plant roots are rich in coumarins and furanocoumarins. In our previous study, coumarin and polyacetylene derivatives were isolated and identified from the plant roots [3]. This study aims to evaluate the cytotoxic activities of those isolated compounds (16 compounds) along with the *n*-hexane (PH), chloroform (PC), and methanol (PM) extracts of *P. uechtritzii.*

For this purpose, fourteen coumarin derivatives; umbelliferone, 6-formylumbelliferone, suberosin, 7-demethylsuberosin, (+)-ulopterol, tamarin, psoralen, imperatorin, (+)-oxypeucedanin, (+)-oxypeucedanin hydrate, (+)-oxypeucedanin methanolate, (+)-marmesin, (-)-prantschimgin, and (-)-adicardin; two polyacetylenes (-)-panaxynol, (+)-falcarindiol and three extracts (PH, PC, and PM) were tested for their cytotoxic activity against two healthy (NIH/3T3, HK-2), and four cancer (A-549, MCF-7, PC-3, and SH-SY5Y) cell lines by WST-1 method. Doxorubicin was used as a positive control. PH and PC showed cytotoxic effects on all the cell lines with IC_{50} values of 8.16-91.56 µg/mL. PH displayed a selective effect on SH-SY5Y cells [Selectivity Index (SI)= 2.5] compared to NIH/3T3. PC exhibited cytotoxic effects on PC-3 cells (SI=2) compared to both NIH/3T3, and HK-2. PM did not display cytotoxicity at 100 µg/mL. (-)-Panaxynol, (+)-falcarindiol, 6-formylumbelliferone, 7-demethylsuberosin, and suberosin exhibited effects with IC_{50} values of 8.65-87.91 µM. The other compounds showed no effect on the cell lines at 100 µM. Tamarin and 6-formylumbelliferone were evaluated for their cytotoxic activity for the first time in this study. The activity results of the compounds are consistent with the results of the extracts from which they were isolated. Apolar compounds and extracts were more effective than polar compounds and extracts, respectively. This result was probably due to the existence of glycosidic moiety decreasing the activity. *P. uechtritzii* could be a promising natural source in the development of new drugs for cancer treatment.

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OP99– JR-AB2-011, A SELECTIVE MTORC2 INHIBITOR PREVENTS IL-1β-INDUCED INFLAMMATORY RESPONSE IN HUMAN CHONDROCYTES: MODULATION OF IκB-α/NF-κB ACTIVATION

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Osteoarthritis (OA), in which inflammation and matrix degradation plays a crucial role, is a highly prevalent chronic joint disease characterized by cartilage degradation [1]. mTOR pathway is one of the well-known mediators of inflammation, cell survival, the aging process, however, its role in OA has not been determined [2,3]. To explore the role of mTORC2 in OA-related pathological changes, we examined whether mTORC2-mediated IκB-α/NF-κB p65 activity was altered in IL-1β-stimulated human chondrocytes. Next, we focused on the protein expression of proinflammatory cytokines such as TNF-α and IL-6, which may occur through this signaling pathway. Human chondrocytes were cultured and treated with pro-inflammatory cytokine IL-1β (2 ng/ml-24 h) in the absence or presence of JR-AB2-011 (50, 100, 250 μM), a specific inhibitor of mTORC2. At the end of 24 hours, all proteins were extracted using a lysis buffer including protease and phosphatase inhibitors. Protein expressions of Rictor, Akt, p-Akt, IκB-α, p-IκB-α, NF-κB p65, p-NF-κB p65, IL-6, and TNF-α in cell lysates were measured by western blot assay. First, in this study, we report an increased mTORC2 activity in IL-1β-stimulated human chondrocytes, with increased phosphorylation of its substrate Akt, as well as rictor expression. Also, IL-1β caused an increase in the expression of p-IκB-α, NF-κB p65, p-NF-κB p65, IL-6, and TNF-α protein expression with a decrease in IκB-α expression in the chondrocytes. JR-AB2-011 prevented all these changes induced by IL-1β. The main novel finding in the present study is that selective mTORC2 inhibition by JR-AB2-011 effectively prevents the inflammatory response induced by IL-1β by reducing the proinflammatory mediators via modulation of IκB-α/NF-κB activity. Therefore, we demonstrated a previously unknown function of mTORC2 inhibition that seems to be a potential therapeutic agent for OA.

Keywords: JR-AB2-011, IL-1β, mTORC2, inflammation, chondrocytes.

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OP100– PREPARATION AND IN VITRO NEUROPROTECTIVE EVALUATION OF POLYCAPROLACTONE AND POLYVINYL PYRROLIDONE BLENDED NANOFIBROUS FOR TRANSDERMAL DELIVERY OF VITAMIN B12/DONEPEZIL

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Alzheimer's disease (AD) is the most prevalent neuro-degenerative disorder amongst patients over 65 years old, and no effective treatment is available yet [1]. Although acetylcholinesterase inhibitors (ACEIs) provide efficacy in the treatment of moderate-to-severe AD, their's monotherapies limit this efficacy, thus necessitating combined therapy. Donepezil (DO), as an ACEI, increases cholinergic activity in the cerebral cortex, which plays an important role in memory and learning, as a result of preventing the breakdown of acetylcholine [2]. Vitamin B12 (VB12) deficiency causes an increase in radical oxygen species, resulting in decreased brain-derived neurotrophic factor and neural growth factor levels and neuronal damage. In addition, conditions that may occur as a result of oral administration, such as adverse drug reactions, multiple daily dosing, and drug-drug interactions, predispose to treatment non-adherence, especially in elderly patients [3]. The effects of the aforementioned drawbacks can be mitigated by the use of transdermal patches which can provide long-lasting effects with single-dosing and multi-drug release [4]. On the other hand, the transdermal route offers an attractive alternative route of drug administration, especially for Alzheimer's disease patients through eliminating gastrointestinal side effects and ultimately improving compliance [5]. The objective of this study was to develop a Vitamin B12 and Donepezil HCL matrix transdermal patch (DO/VB12-loaded NF) by HUMA-1. The optimized patch formulation was characterized, and the neuroprotective effect of the drug-loaded NF was tested on the amyloid-induced SHSY-5Y cell using an MTT assay. The protein expression levels of APP, ADAM-10 and BACE1 were analyzed with an RT-PCR array test. The present in vitro results firstly suggested that treatments with novel DO/VB12-loaded NFs might be promising for treating or preventing AD.

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OP101– PREDICTION OF BUTYRYLCHOLINESTERASE INHIBITORY ACTIVITY IN STRUCTURALLY DIVERSE MOLECULES USING IN SILICO METHODS

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Alzheimer's disease (AD) is recognized as the most common form of dementia that develops in the elderly and old age [1]. Cholinergic enzymes, acetylcholinesterase (AChE) and butyrylcholinesterase (BChE), are considered crucial targets for the design of multi-target compounds against AD. This is due to the positive contribution of cholinesterase inhibitors in coping with both the early and late stages of the disease [2]. Studies indicate that AChE is primarily responsible for the hydrolysis of acetylcholine in the healthy brain and during the early stages of AD. However, as AD progresses, BChE activity increases and takes over the hydrolysis of acetylcholine in the AD brain [3].

The present study aims to investigate the relationship between the structure–BChE inhibitory activity in a large set of structurally diverse molecules using the Electronic-Topological Method combined with Neural Networks (ETM-NN) [4]. Molecular docking and first-principles electronic structure calculations based on density functional theory (DFT) were utilized to study the binding mechanisms of the compounds with the BChE. The binding affinities and non-covalent interactions in the enzyme's active site were obtained through molecular docking, and frontier molecular orbital calculations were conducted to further understand these interactions. The results of the ETM-NN analysis yielded five pharmacophores (Ph) and anti-pharmacophores (APh) that are characteristic of the class of compounds that exhibit inhibitory activity against BChE. The statistical estimates of the five Ph and five APh for the inhibitory activity prediction were found to be 0.90 and 0.86, respectively. Molecular docking and the electron density distribution analysis revealed that active compounds exhibited more effective binding with BChE. Based on in silico studies, a system for predicting BChE inhibitory activity was developed, which could be used for effective screening and design of new potential drugs for AD.

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OP102– SENSING CELLULAR ACTIVITIES IN VARIOUS BIOLOGICAL SPECIES THROUGH THE FLUORESCENT PROBES

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Offering high selectivity and sensitivity along with practical metodologies, fluorecent probes (FPs) have a pivatol role in monitoring the wide range of analytes, and gained a substantial attention with the recent R&D studies. Considering their potential in tissue engineering applications, especially bioimaging and sensing, most FPs have been already introduced to 2D and 3D cell/ tissue culture applications as sensors/ tracer agents [1-3]. The working principles of these agents provide technical simplicity which also enable to get faster response particularly in imaging applications. The general structure of a chemosensor relies on receptor and reporter units. The interaction between the target cell, biomarker, or disease-related chemical molecules, and receptor unit leads to the appearance/change of the fluorescence signal of the reporter which is called fluorophore. Hence, various fluorophores (e.g., fluorescein, BODIPY, phenalenone etc.) have been used in *in vitro* life science applications to record changes in micro physiological conditions such as acidity, viscosity and reactive oxygen species levels which give a critical information regarding progression of diseases. Herein this study, the whole mechanism of FP, from synthesis to biosensing application have been presented to implicate the multidisciplinary nature of chemistry and bioengineering applications.

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OP103– DEVELOPMENT AND IN VITRO CHARACTERIZATION OF NANOEMULSION AND NANOEMULSION BASED GEL WITH ILEX PARAGUARIENSIS METHANOL EXTRACT

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Ilex paraguariensis (IP), commonly known as Yerba mate, is a member of *Aquifoliaceae* family and is naturally distributed in South America. Recent studies have shown that the extracts of IP have antioxidant, anti-inflammatory, and antifungal activities, so they have wound-healing potential [1,2]. Nanoemulsions (NEs), which are metastable systems with droplet sizes below 1000 nm, are appropriate for the efficient delivery of active substances through the skin. However, the clinical usage of NEs is restricted by their low viscosity and poor skin retention. Therefore, nanoemulsion-based gels (NEGs) have been suggested as a solution to these problems [3]. The aim of this study is to formulate and characterize NE and NEG formulations containing methanol extract of IP (MIP). MIP containing (MIP-NE) or blank NEs (B-NE) were prepared using ethyl oleate, Lipoid S100, Kolliphor RH40, Pluronic F127, DMSO, and ultrapure water. In order to obtain NEGs, NaCMC was added to NEs. For *in vitro* characterization of NEs, the droplet size, PDI, and zeta potential values were determined; also, pH, FT-IR, and rheological analysis were carried out for NEs and NEGs. The droplet size and zeta potential values of MIP-NE and B-NE were determined as 159.86±3.35 nm and 168.12±5.67, (-)27.94±2.36 mV and (-)29.92±1.61 mV, respectively. Moreover, PDI values of NEs were below 0.3, indicating monodispersity. The pH range of NEs and NEGs was 5.19-6.18, making them suitable for topical use. Also, NEGs showed pseudoplastic behavior that is crucial for topical application. It was confirmed that the extract was dispersed at the molecular level in the formulations by FT-IR analysis. In conclusion, NE and NEG formulations may be beneficial for topical administration of methanol extract of IP.

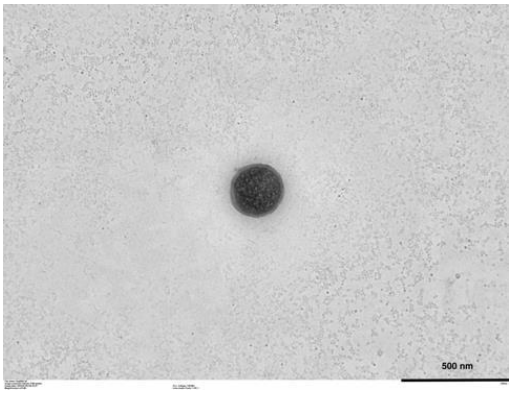

Figure 1. The TEM image of MIP-NE

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OP104– EMPLOYMENT OF POLY(CREATININE) AND 5,10,15,20-TETRAPHENYL-21H,23H-PORPHINE NICKEL(II) AS ELECTROCATALYSTS AT LIQUID/LIQUID INTERFACES IN THIN LAYERS OF ORGANIC SOLVENTS FOR HPLC-ECD DETERMINATION OF PARACETAMOL IN PHARMACEUTICAL FORMULATIONS

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In the recent years poly(amino acid) modified electrodes have been employed in electroanalysis [1-3], while similarly 5,10,15,20-tetraphenyl-*21H,23H*-porphine complexes of various transition metals have also been used in electrode modification procedures [4]. Thus we have modified electrode surface with poly(creatinine) by electropolymerization. Porphine-metal complexes usually display hydrophobic characters thus in the current study we have placed NiTPP in toluene layer on initially poly(creatinine) modified electrode to increase its solubility. Typically 1µL of toluene spread across the 7.065mm^2 electrode surface to produce approximately a 3µm thin layer, where dissolved NiTPP served as the electrocatalyst. Unmodified, poly(creatinine) modified and poly(creatinine)-NiTPP-Toluene modified electrodes displayed average current responses of 37.07, 42.36 and 54.28µA for 1mM paracetamol in 0.05M PBS (pH 7.4) solution in representative DPV voltammograms (Fig. 1). These results correspond to 14.27% and 46.43% increase in response for poly(creatinine) modified and poly(creatinine)-NiTPP-Toluene modified electrodes, respectively. Similar electrocatalysis was seen in HPLC-ECD chromatograms (Fig. 2).

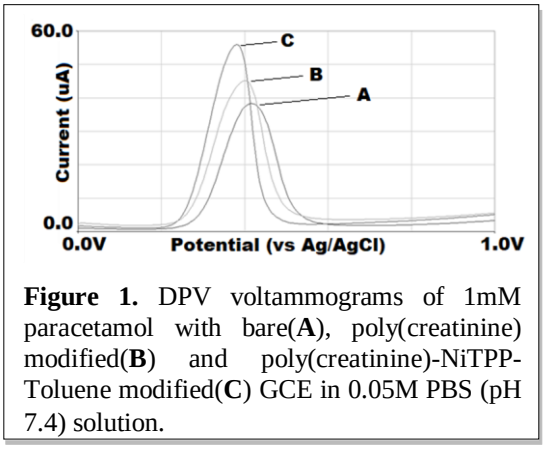

Figure 1. DPV voltammograms of 1mM paracetamol with bare(**A**), poly(creatinine) modified(**B**) and poly(creatinine)-NiTPP-Toluene modified(**C**) GCE in 0.05M PBS (pH 7.4) solution.

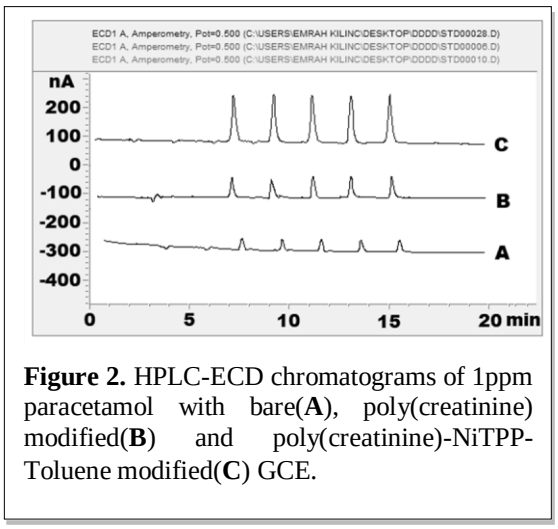

Figure 2. HPLC-ECD chromatograms of 1ppm paracetamol with bare(**A**), poly(creatinine) modified(**B**) and poly(creatinine)-NiTPP-Toluene modified(**C**) GCE.

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OP105– SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITY OF ZINC NANOPARTICLE BY THE GREEN METHOD USING PYRACANTHA COCCINEA M.J. ROEM

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Pyracantha coccinea M.J. Roem (Rosaceae) is a deciduous shrub native to Southeast Europe and Asia[1,2]. It is used in gardens as an ornamental plant. They are used in traditional medicine for diuretic, cardiac, and tonic characteristics of their fruits. The ethanol statement is found to be rich in phenolics, flavonoids, tannes, and saponins[2].Plant-induced phenolic acids have been used for green synthesis of metallic or metallic oxide nanoparticles (NPs). Nanoparticles synthesized by the green method are considered a clean, safe, inexpensive method according to traditional methods (physical and chemical methods). Nanoparticle synthesis with green method is less toxic due to minimal chemical use.[3] Antibiotic resistance is one of today's most important problems. It is thought that finding new molecules to inhibite the mechanisms involved in pathogenicity would be effective in solving the resistance problem.[4] Preparation of nanoparticles in specific sizes and shapes is thought to contribute to the development of new antibacterial agents. In this study, the phenolically rich *Pyracantha coccinea* M.J. Roem plant was extracted. The prepared statement was used to synthesize the zinc oxide nanoparticle and investigated at the characterization and antimicrobial activity.

In this study, the fruits of the *Pyracantha coccinea* M.Roem plant grown on the Beşevler campus of the Ankara University. The collected fruits were washed with distilled water and added to a mixture of ethanol:water (1:1). It was mixed in a magnetic mixer and extracted in an ultrasonic bath using an extraction method. A solution of 50 mmol zinc nitrate in distilled water was prepared. 20 ml of extract were added on it and the solution's pH was set to 10. The solution is incubated at 60 °C for 24 hours. At 9000 rpm, 30 min centrifuged and the supernatant part discarded. The resulting sediment was dried in a vacuum oven. The characterization of nanoparticles using the UV-Visible Spectrophotometer, FTIR, XRD and TEM. In the zinc nanoparticle (ZnNP) antibacterial activity tests, *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Staphylococcus aureus* ATCC 29213 (methicillin-susceptible), methicillin-resistant *Staphylococcus aureus* ATCC 43300 (MRSA) were used as test bacteria. *Candida albicans* ATCC 10231 was used for antifungal activity test. For the determination of minimum inhibitory concentration (MIC) values, the broth microdilution method was used. Serial two-fold dilutions ranging from 1 mg/ml to 0.0078 mg/ml were prepared.

After the synthesis of ZnNP, the solution observed a change in color over time. Observations showed that after the pH adjustment of the zinc nitrate solution, the color changed rapidly from colorless to light yellow and 24 hours later to light pink. From UV-visible spectrum, the peak of ZnNP has been observed to occur at 362 nm. The characterization of nanoparticles was investigated using FTIR, XRD and TEM.The ZnNP showed best antibacterial activity aganist Gram(+) bacteria. The MIC values of the ZnNP against *S. aureus* ATCC 29123 and *S. aureus* ATCC 43300 were found to be 0.125 mg/ml and 0.0625 mg/ml, respectively.

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OP106– EFFECT OF A SINGLE DOSE OF IONIZING RADIATION ON A549 CELLS: MITOCHONDRIAL RESPONSES

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Different doses and durations of ionizing radiation (IR) are used for imaging (radiography, etc.) or treatment (radiotherapy, etc.) in medical applications. While most of the deleterious effects of IR are caused by the direct effects of radiation on nuclear genetic material, IR-mediated reactive oxygen species may damage other organelles including mitochondria[1]. In the current study, A549 cells were exposed to 5 Gy single dose of IR, and cells were monitored on the 1st, 3rd, and 5th days. The mitochondrial membrane potential was not changed at the 1st and 3rd, day, however, it significantly collapsed on the 5th day compared to control. Accordingly, ATP levels were also significantly diminished on the 5th day, while they were significantly increased on the 1st and 3rd days presumably due to the initial adaptation to radiation stress. The presence and levels of ataxia telangiectasia mutated (ATM), cyclin-dependent kinase-1 (CDK-1) and ras-related nuclear protein (RAN) were determined by immunohistochemistry and western blot both in cytosolic and mitochondrial fractions. ATM increased both in cytosol and mitochondria significantly on the 1st day following irradiation, while CDK-1 and RAN proteins were increased only in mitochondria on the 1st day. ATM returned to control levels in cytosol, while significantly decreased in mitochondria on the 3rd day and continue to decrease in mitochondria on the 5th day. Levels of CDK-1significantly decreased in cytosol and returned to normal in mitochondria on the 3rd day,returned to control in cytosol but continued to decrease to significant levels in mitochondria on the 5th day. Cytosolic levels of RAN significantly decreased on the 3rd day, while mitochondrial levels stayed high. However, both RAN levels significantly decreased on the 5th day. Expression levels of mitochondrial Electron Transport Chain Complex I, III and V proteins were significantly increased only on the 3rd day and returned to control levels on the 5th day. However, levels of Complex IV were significantly decreased immediately on the 1st day following irradiation of the cells and stayed significantly decreased both on the 3rd and 5th days. Present data provide further details on the role of mitochondria in toxicity of a single moderate dose of ionizing radiation.

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OP107– THE ROLE OF THE SPHINGOSINE PATHWAY IN THE ICARIIN-INDUCED RELAXATIONS

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Sphingosine-1-phosphate(S1P) is involved in many physiological processes and the pathogenesis of diseases such as atherosclerosis and hypertension. The S1P pathway plays an important role in the development/stability/regulation of vascular tone[1]. Ceramidase and sphingosine kinases(SKs) are responsible for S1P production. S1P binds S1P1/S1P3 receptors and provides vasodilation and vascular permeability[2]. Icariin(ICA) is a flavonoid with smooth muscle relaxant, cardioprotective and anti-inflammatory. ICA activates the PI3K/Akt-eNOS-NO pathway like S1P[3]. ICA and S1P1R/S1P3R agonists have therapeutic effects in the central nervous system through common downstream mechanisms such as NF-κB, p38[4,5]. We elucidate whether the mechanism of ICA-induced relaxation is related to the sphingosine pathway.

Aorta rings were mounted in organ baths for isometric force recording. ICA(10^{-9}-10^{-4}M) responses were obtained in the presence of a nitric oxide synthase inhibitor (L-NAME) and in tissues with stripped endothelium to show that the effects of ICA are mediated by NO and endothelium. To investigate the role of the sphingosine pathway, ICA relaxations were repeated in phenylephrine-precontracted aortas in the presence/absence of D-erythro-MAPP(ceramidase inhibitor, 3μM/10μM) and N, N-Dimethylsphingosine(SK inhibitor, 10μM/30μM). ANOVA was used for comparisons of E_{max} and pD_2 values.

ICA-induced relaxations were inhibited by L-NAME and diminished in the endothelium-denuded aorta(P<0.001). MAPP in both concentrations did not affect the relaxations(P>0.05). 30μM DMS caused a significant decrease in ICA relaxations(P<0.001).

ICA indicates NO-mediated relaxant effects. Sphingosine kinase is involved in the relaxing effects of ICA, but not ceramidase. Functional studies in relation to ICA-sphingosine receptors are ongoing. The interactions of ICA with the enzyme/receptor will be elucidated by western blotting.

Acknowledgment: Ege University Scientific Research granted the study (BAP:75582).

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OP108– MiR-27b SUPPRESS THE PROLIFERATION, MIGRATION and INVASION BY REGULATION OF EMT IN LNCAP CELLS

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One of the important causes of prostate cancer (PCa) progression is cell metastasis due to inflammation. As in many cancer types, inflammation occurs with the effect of external factors in prostate cancer, and epithelial-mesenchymal transition (EMT) begins [1]. In addition to the EMT process, many biological mechanisms such as cell adhesion, migration, invasion, apoptosis, angiogenesis and colonization are indicative of the metastatic potential of cells [2]. In order to prevent the metastasis process of prostate cancer, EMT needs to be examined and new therapeutic approaches to reverse this need to be found [3]. It is very important to identify miRNAs that can regulate EMT and to determine the potential of miRNAs in PCa metastasis [4].

In this study, it is aimed to explain the contribution of miR-27B to important biological processes affecting the PCa microenvironment by examining proliferation, wound healing, cell migration, invasion, colonization and EMT markers and transcriptions after transfection of mimics in LNCaP cells. It is predicted that with miR-27B mimic transfection, mesenchymal features can be lost, epithelial features can be restored to the cell, and EMT can be prevented in PCa cells.

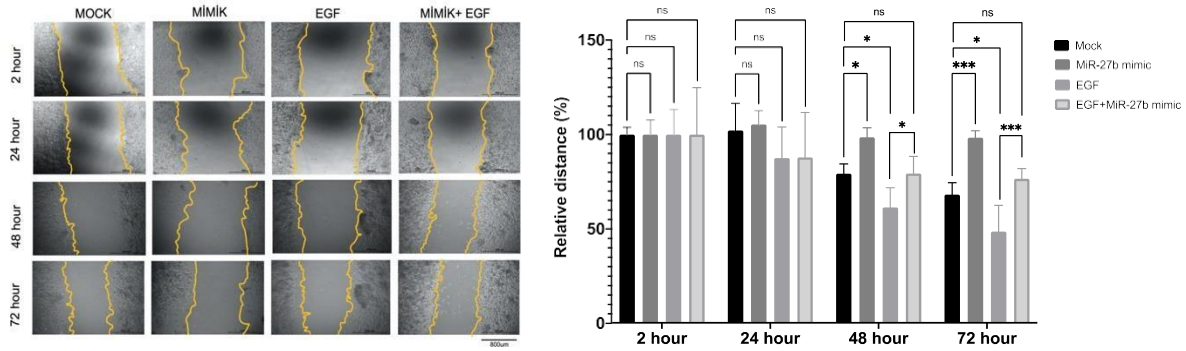

Figure 1. Wound healing results in cells after miR-27b transfections

Acknowledgement: This study was supported by Ege University Scientific Research Projects Coordination Unit. Project Number: FDK-2021-22637

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OP109– ANTIOXIDANT ACTIVITIES OF MARRUBIUM VULGARE L. AND ENDEMIC MARRUBIUM BOURGAEI SUBSP. CARICUM P.H. DAVIS

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Marrubium L. (Lamiaceae) is represented by 27 taxa, 16 of which are endemic in Anatolia [1]. Different species of this genus are traditionally used in Anatolia and the world for colds, expectorant, antipyretic, analgesic and wound healing effects [2–4]. The prominent species *M. vulgare* L., has been used in folk medicine since ancient Egypt. It is also included in many monographs and pharmacopoeias such as EMA, ESCOP, BHP, American Botanical Council, German E Commision and European Pharmacopoeia [5,6]. On the other hand, there is no study on biological activities of endemic *M. bourgaei subsp. caricum* P.H. Davis. Many studies have shown that the genus *Marrubium* is rich in phenolic compounds, flavonoids, lignans and labdane-type diterpenes [2,7].

In this study, the extracts of different polarities were prepared from *M. vulgare* L. and endemic *M. bourgaei subsp. caricum.* Dried aerial parts of the plants were extracted with 70% ethanol. The hydro-alcoholic extracts were then suspended in H_2O and partitioned with *n*-hexane, ethyl acetate and buthanol. In addition to DPPH and CUPRAC radical scavenging acitivities of ten extracts, their total phenolic and total flavonoid compounds were determined.

The results showed that the highest total phenolic and flavonoid contents and radical scavenging acitivities were in ethyl acetate extracts, which had the richest phenolic-flavonoid compounds. In addition, endemic *M. bourgaei subsp. caricum* showed higher activities than *M. vulgare*, which has been widely used among the people for centuries and found a place in the pharmaceutical and food industry.

Acknowledgement: This work was supported by TUBITAK (The Scientific and Technological Research Council of Turkey), Turkey (Grant number: 121-C-376).

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OP110– RESEARCH OF THE EFFECT OF ACID TYPE AND POLYMER CONCENTRATION ON RHEOLOGICAL PROPERTIES AND PHYSICAL STABILITY OF CHITOSAN HYDROGELS

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Chitosan is a biocompatible, biodegredable and bioadhesive polymer. Since chitosan only dissolves below at pH 6, dilute acidic media such as acetic acid, lactic acid, glutamic acid and citric acid are used to prepare chitosan based hydrogels [1]. The type of acid and the amount of chitosan affect not only rheological properties but also stability [2]. In this project, it was aimed to investigate the effect of the chitosan concentration (2.5-3.5%) and the acid type (acetic acid, citric acid, glutamic acid, lactic acid) on rheological properties and physical stability of chitosan based hydrogels.Chitosan hydrogels were prepared at 1:1 of molar ratio (chitosan: organic acid). Citric acid was used at 1.2 of molar ratio. Obtained hydrogels were lyophilized to characterise chitosan polymers by ATR FT-IR spectroscopy. Viscosity of the chitosan based gels were determined with a rotational viscometer (Brookfield DV2T). To measure of the spreadability of the hydrogels, the glass plates (20x20 cm^2) were used. pH of the gels was measured using a digital pH meter (Hanna HI83141). All studies were made at room temperature at least triplicate. To investigate of the short-term physical stability of the hydrogels, which were stored at 5±2°C and 25±2°C, the viscosity of the hydrogels was measured at the specific time intervals (1. 3. 7. 14. 21. and 30. day).The characteristic peaks of all the polymers were observed the IR spectra of the polymers. As a result of the study, it was observed that the viscosity increased and spreadability decreased as the chitosan concentration increased (Figure 1-a). The findings of rheological properties of the hydrogels represent pseudoplastic flow type. In gels containing chitosan at the same concentration, the highest viscosity was seen in gels prepared with lactic acid. Changes in the chitosan concentration were not cause a significant difference in the pH values. The viscosity of hydrogels was decreased on the time for all the chitosan gels. This decrease was more for the chitosan gels with lower polymer concentration. Besides, the viscosity of hydrogels, which were stored at 25°C, were decreased quicker (Figure 1-b).

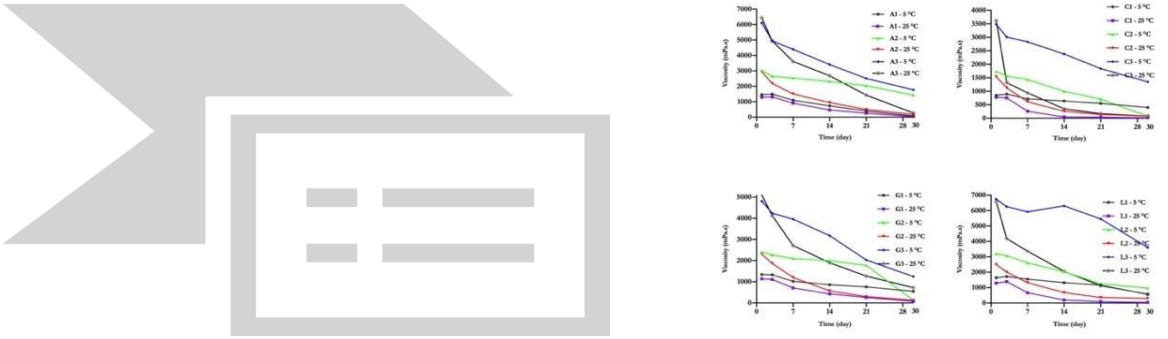

Figure 1. (a) The relation between of viscosity and spreadability of hydrogels, (b) The change in viscosity of hydrogels during 30 days short-term stability studies

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OP111– INVESTIGATION OF THE EFFECT OF HEROIN ON GLUTATHIONE METABOLISM AT METABOLOMIC LEVEL

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Heroin is a substance that is a synthetic opioid derivative with a high addictive potential. Serious toxic effects may occur due to heroin use. Although many different mechanisms are effective in the emergence of these effects, oxidative stress formation and glutathione (GSH) consumption are also included in the main toxic effect mechanism, causing serious oxidative damage to users. In this thesis study, investigating the effects of heroin on glutathione metabolism in SH-SY5Y neuroblastoma cell line with both targeted and untargeted metabolomic analyzes, revealing the relationship of heroin with enzymes in the GSH pathway with in silico modeling methods, It is aimed to conduct a preliminary study that will contribute to the general health status of addicts by revealing the possible protective effects on this toxicity with N-acetylcysteine (NAC) and N-acetylcysteine amidine (NACA). According to the findings, it was determined that the cytotoxic response due to heroin was prevented by NAC and NACA administration, and the decrease in GSH levels with heroin administration was also prevented by GSH precursors. However, when NAC and NACA were compared, there was no significant difference between them in terms of protection. In addition, in silico molecular modeling studies, a significant binding was determined between glutathione transferase, one of the important enzymes in the GSH pathway, and morphine, the most important metabolite of heroin. Metabolomics studies have also shown that both glutathione and cysteine metabolism pathways are altered by heroin administration and these targets are important in heroin toxicity. In the literature review, no study was found in which the comparative effect of NAC and NACA against heroin toxicity was examined at the metabolomic level, and it is planned to contribute to the development of an alternative approach that can be applied to heroin addicts in the future. Therefore, it will contribute to filling the scientific gap in the development of treatment approaches.

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OP112– CHEMOPREVENTIVE EFFECT OF APPLE AGAINST COLON CANCER

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Today, the link between fruit and vegetable consumption and improved health is becoming increasingly apparent. Research has shown that biologically active ingredients in plant-based foods, especially phytochemicals, have significant potential to modulate many processes in the development of diseases, including cancer, cardiovascular disease, diabetes, pulmonary disorders, Alzheimer's disease and other degenerative disease conditions. In 2004, Boyer and Liu published a detailed report on apple phytochemicals and their health benefits. After this report, the apple was not only a fruit that gave health among the people, but also scientifically it was certified as a food with positive effects on health. We have tried to collect and present studies after 2004, especially in terms of colorectal cancers.

We know that there are many active compounds with antioxidant and anticancer effects in apples. for example; Quercetin, catechin, proanthocyanidin, gallic acid, chlorogenic acid are some of them. "Maspin", a serine protease inhibitor found in apple peel, suppresses metastasis and angiogenesis, and prevents tumor formation. The researchers concluded that apple peels "have potent antiproliferative effects against cancer cells and apple peels should not be eliminated from the diet.". We have tried to collect and present studies after 2004, especially in terms of colorectal cancers.

DRD-2023

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OP113– SENSİTİVE SPECTROFLUORİMETRİC METHOD FOR DETERMİNATİON OF GENTAMİCİN

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A simple, reliable, highly sensitive and selective spectrofluorimetric method has been developed for determination of gentamicin sulfate. Gentamicin is an aminoglycoside antibiotic produced from *Micromonospora purpura*, which is effective against a wide variety of a susceptible gram-positive and gram-negative bacteria. A promising method was used to synthesize carbon dots (CDs) from Rosemary leaves, as a carbon source. The synthesized CDs was applied as a fluorophore in an optical sensor after modification with molecularly imprinted polymers (MIPs) for determination of gentamicin. For this purpose, a silica shell using tetraethoxysilane (TEOS), as a Si source, was stabilized on the surface of CDs. MIPs were synthesized in the presence of gentamicin as a template, using 3-aminopropyl triethoxysilane as a functional monomer and TEOS as a crosslinker, respectively. After optimization of the experimental parameters, a linear range of 0.02-1.50 µg/mL gentamicin was obtained for the suggested method. Finally, the proposed sensor was successfully applied for the determination of gentamicin in commercial human urine and milk. So this study describes a simple and very sensitive spectrofluorimetric method for determination of gentamicin in different medium

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OP114– THE INFLUENCE OF CHIRAL SWITCH: AN INVESTIGATION BASED ON SUMMARY OF PRODUCT CHARACTERISTICS

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The marketing of the single enantiomer of an already approved racemate as a separate entity on the market is defined as chiral switch, which aims to provide better efficacy and safety including pharmacokinetic and pharmacodynamic profile. Most authorities do not require comparative studies of a racemic product and its pure enantiomer counterpart during drug approval stage [1,2]. We aimed to compare the various expressions in summary of product characteristics (SmPCs) of racemates and their pure enantiomers.

We examined SmPCs of nine racemate/pure enantiomer drug pairs which underwent chiral switching among the most commonly utilized 100 active substances in Turkey. We evaluated the SmPC expressions in “indications”, “posology”, and “adverse effects” subheadings, with also taking the defined daily doses of the active substances into account.

Variations in expressions were observed in omeprazole/esomeprazole, lansoprazole/dexlansoprazole, ibuprofen/dexibuprofen and citalopram/escitalopram pairs in terms of indications. These differences included the absence of “ulcer-related disorders” in dexlansoprazole, “peptic ulcer treatment” in esomeprazole, “inflammatory diseases” in dexibuprofen and “prevention of depression relapses” in escitalopram. Decreased defined daily doses of the pure enantiomers compared with their racemate counterparts were apparent in most of the drug pairs. Differences in “very common” adverse effects were found in ibuprofen/dexibuprofen and citalopram/escitalopram pairs, which included gastrointestinal and neurologic undesirable effects.

We demonstrated various differences in indication, posology and adverse effect expressions between the racemate and pure enantiomer drug pairs which underwent chiral switching. Whether these distinctions are due to the changes in efficacy and safety profile or documentation is an important issue entailing further research.

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OP115– HEPATOPROTECTIVE EFFECTS OF CORNUS MAS ON ALUMINUM TOXICITY IN RATS WITH METABOLIC SYNDROME

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High-dose and long-term exposure to aluminum (Al) triggers oxidative stress induced apoptosis and inflammation that leads to toxic effects. Hepatotoxicity is among the main causes of death from Al exposure [1]. Obesity, dyslipidemia, hypertension and diabetes, which could be counted as a cluster of risk factors that cause metabolic syndrome (MS), increase the susceptibility to liver diseases [2]. Cornus mas (Cornaceae) fruits contain vitamin E, anthocyanins, flavonoids and oxalic acid. In different experimental animal studies, C. mas fruit extract has provided a protective effect against liver damage [3]. In our study, we aimed to examine the effects of C. mas fruit extract on liver damage caused by long-term and high-dose aluminum chloride (AlCl3) administration to rats with MS.

In our study, forty-two Sprague Dawley rats (200-300 g) were divided into 6 groups, as control, MS, MS+AlCl3, and 3 different MS+AlCl3+treatment groups. High fat diet and 15% fructose solution as drinking water were given to MS groups for 105 days. In the last 60 days of experimental period, AlCl3 was administered intraperitoneally to the AlCl3 groups at a dose of 100 mg/kg and C. mas fruit extract was administered perorally to the treatment groups at doses of 400, 700 and 1000 mg/kg. At the end of the experimental period, animals were decapitated and liver tissue samples were taken for histopathological analysis and evaluation of malondialdehyde (MDA) and tumor necrosis factor alpha (TNF-α) levels. MS and AlCl3 toxicity increased TNF-α and MDA levels in liver tissue. In the morphological examination, the liver tissue damage and histopathological degenerations were observed in the MS group and more severely in the MS+AlCl3 group. C. mas fruit extract reversed biochemical and morphological changes with dose-related correlation. In conclusion C. mas fruit extract alleviated the liver damage caused by MS and AlCl3 toxicity in rats with antioxidant and anti-inflammatory effects.

Keywords: Metabolic syndrome, aluminum, rats, liver, Cornus mas

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OP116– EVALUATION OF THE 'GERIATRIC DEPRESSION SCALE' IN OLDER PEOPLE AND DETERMINATION OF THE PREVALENCE OF ANTIDEPRESSANT USE

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Depression is defined as mental disorders that cause negative impact on quality of life. Depression in older people are associated with sleep disorders and social isolation that significantly reduce the quality of life [1]. The perception of stigma and atypical depression symptoms in older people complicate the diagnosis of depression [2]. In this study, it was aimed to investigate the risk factors for depression in older people and to determine the prevalence of antidepressant use.

The study was conducted prospectively in Lokman Hekim University Hospital between September 2022 and January 2023. Patients over the age of 60 who applied to the outpatient clinic were included. The 30-item Geriatric Depression Scale (GDS-30) was used as a depression screening tool. According to GDS-30, patients' depression status was classified as 'normal', 'moderate depression', and 'severe depression'.

A total of 144 patients were examined. The most common comorbidity was hypertension (25.7%). The rate of severe depression was significantly higher in women than in men (42.2% vs 21.3%, p=0.025). The rate of severe depression was higher in patients who used medications that may cause depression (compared to patients who did not use) (24.5% vs. 43.5%, p =0.068). Antidepressant medication was used in 19.4% of patients totally. Of the patients who did not receive antidepressant treatment, 37.1% were identified as moderate depressive and 29.3% as severe depressive.

According to our findings, only female gender was shown as a risk factor for depression. However, the high rate of severe depression in individuals who live alone and use medications likely to cause depression. In addition, it has been shown that most of the patients who are classified as severe depressive did not receive antidepressant treatment. To conclude, the possible risk factors for depression and cumulative effect of drugs on depression should be considered for a rational therapy.

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POSTER PRESENTATIONS

PP01 - UNRAVELLING THE EFFECTS OF NEW L-HEPTANOYLPHOSPHATIDYL INOSITOL PENTAKISPHOSPHATE DERIVATIVES FOR Gag/MA-TARGETED HIV ERADICATION

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Human immunodeficiency virus (HIV) has a devastating impact on people's lives. Although administration of multiple anti-HIV drugs hold promise to some extent, latent HIV reservoirs restrict the success of the therapy. Therefore, new approaches for complete HIV elimination from body must be implemented in particular targeting HIV-1 matrix antigen (MA) domain of Gag polyprotein precursor ($Pr55^{Gag}$), which regulates membrane binding through its interaction with phosphatidyl-inositol-4,5-bisphosphate (PI(4,5)P2). For that purpose, we previously developed inositol hexakisphosphate (IP6) derivative, L-Heptanoylphosphatidyl Inositol Pentakisphosphate (L-HIPPO), and showed its stronger membrane binding potential with MA domain compared to IP6 and PIP2 [1]. We also recently reported three crystal forms and the resulting X-ray structures of MA in complex with the IP6 molecule (PDB IDs: 7E1I, 7E1J, and 7E1K) [2]. Then, we designed new L-HIPPO derivatives with four new design strategy and performed molecular docking study for these phosphoinositides and determined that benzene-inserted compounds displayed higher docking scores than L-HIPPO. We created a large chemical library of new aromatic group-inserted L-HIPPO derivatives and carried out the same molecular simulation studies [3]. In the current study, we generated a new design strategy with thioic acid derivatives of long alkyl chains of L-HIPPO and designed 8 new derivatives and applied same docking procedures for these derivatives in the MA domain (PDB IDs: 7E1I, 7E1J, and 7E1K). According to the results, these derivatives revealed lower docking scores compared to L-HIPPO. This outcome also indicated that the presence of sulfur decreased the binding affinity of L-HIPPO compared to presence of oxygen. Furthermore, we *in silico* predicted some pharmacokinetic parameters of these derivatives. It was observed that they possessed modest pharmacokinetic profile.

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PP02 - EVALUATION OF PHYSICIANS' PERSPECTIVES ON DRUG-DRUG INTERACTIONS

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Drug-drug interactions (DDIs) may lead to adverse drug reactions and altered drug efficacy[1]. The knowledge of healthcare professionals on this subject is highly effective in preventing DDIs. In this study, it was aimed to determine the resources preferred by physicians in determining possible DDIs and to evaluate physicians' perspectives on DDIs.

The study was conducted as a questionnaire study between December 2022 and January 2023 at Lokman Hekim Hospitals. In the survey, the information sources, the effect of possible DDIs on drug prescribing processes, and physicians' perspectives on potential DDIs were evaluated. In addition, a questionnaire containing frequently encountered DDIs was prepared and physicians knowledge level were examined [2].

The total of enrolled physicians was 39. As an information source, 38.5% of the physicians preferred electronic references and 30.8% preferred summaries of product characteristics. About the potential DDI risk, 30.8% of the physicians stated that they were informed by the clinical pharmacist and 5.1% by the hospital pharmacist. In the information form containing potential DDIs, although the wrong answer and “no idea” option were in the majority (Table 1), 97.4% of the physicians thought that DDI information was important in their practice and were willing to obtain information about potential DDIs.

Our findings show that the level of knowledge of physicians on determining DDIs is low and they are willing to get information about it. In particular, methods such as continuing education seminars on frequently prescribed drugs, inclusion of pharmacists in the multidisciplinary care team, and development of computerized warning systems may contribute to the prevention of possible DDIs.

Table 1. Distribution of physician’s answers to potential drug-drug interactions

Drug-Drug Interactions	Correct Answer n (%)	Wrong Answer n (%)	No idea n (%)
Amiodarone-Moxifloxacin	9 (23.10%)	17 (43.60%)	13 (33.30%)
Diclofenac-Dexketoprofen	9 (23.10%)	19 (48.70%)	11 (28.20%)
Pantoprazole-Clopidogrel	8 (20.50%)	22 (56.40%)	9 (23.10%)
Valproic acid-Meropenem	8 (20.50%)	16 (41.00%)	15 (38.50%)
Haloperidol-Quetiapin	6 (15.40%)	17 (43.60%)	16 (41.00%)
Levothyroxine-Pantoprazole	5 (12.80%)	25 (64.10%)	9 (23.10%)
Colchicine-Clarithromycin	5 (12.80%)	19 (48.70%)	15 (38.50%)
Metoclopramide-Domperidone	2 (5.10%)	24 (61.60%)	13 (33.30%)

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PP03 - DESIGN AND DEVELOPMENT OF ORALLY DISINTEGRATING FILMS CONTAINING DONEPEZIL HYDROCHLORIDE FOR ALZHEIMER'S DISEASE

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Today, patient compliance is very low in traditional drug administration methods, especially in patients with diminished cognitive functions such as Alzheimer's disease patients [1]. In this study, orally disintegrating films (ODFs) containing donepezil hydrochloride were designed by using pullulan and lycoat hydrophilic polymers to treat the symptoms of Alzheimer's disease. ODFs, which are applied without the need for water, are expected to disintegrate within seconds and reveal the active pharmaceutical ingredient (API) within minutes when placed on the tongue [2]. Within the scope of validation studies of the API, determination of melting point, Fourier-transform infrared spectroscopy (FT-IR), and Ultraviolet–visible spectroscopy studies were performed. Within characterization studies of ODFs prepared by solvent casting method: determination of morphology, determination of folding, determination of swelling, determination of disintegration, determination of thickness, determination of pH, mass uniformity, in vitro release, and content uniformity studies were accomplished. The melting point of Donepezil HCl was found to be 220 - 224° C (decomposes). According to the UV-visible spectrophotometer, the standard calibration curve equation of donepezil HCl was found as $y = 0.0464x + 0.0259$ and $R^2 = 0.9994$. According to FT-IR, characteristic absorption bands of donepezil HCl were observed around 1681 cm^{-1}[3]. According to ANOVA, content uniformity and vitro release of both formulations were not statistically significant ($p > 0.05$).

F	Folding	DST Time (second)	Thickness (mm)	pH	Mass Uniformity (mg)	Swelling (%)	In Vitro Release (%)	Content Uniformity (%)
F-5	413,33 ± 8,32	90,33 ± 2,42	0,225 ± 0,009	5,68 ± 0,04	107,7 ± 4,29	83,04 ± 1,82	98,76 ± 1,07	99,33 ± 1,17
F-9	208 ± 4,58	35 ± 2,36	0,268 ± 0,015	6,25 ± 0,09	122,6 ± 3,16	90,54 ± 3,95	99,53 ± 0,07	99,55 ± 0,97
F-12	436,33 ± 4,93	43,2 ± 3,11	0,198 ± 0,013	5,72 ± 0,02	99,2 ± 4,47	109,34 ± 0,81	99,52 ± 0,12	98,87 ± 0,80
F-14	663,33 ± 6,11	34,83 ± 4,07	0,176 ± 0,012	6,51 ± 0,02	106,37 ± 3,40	111,989 ± 6,72	99,84 ± 0,07	98,75 ± 0,82
F-16	417,33 ± 5,03	24,16 ± 2,04	0,201 ± 0,009	6,25 ± 0,05	108,74 ± 4,48	93,781 ± 2,07	99,89 ± 0,08	98,98 ± 1,21

Table 1. Characterization of optimum ODF formulations (F: Formulations, DST: Disintegration)

ODFs, an innovative form that will improve patient compliance thanks to their ease of use, effectiveness, and fast, have been successfully designed and developed. This study will serve as a guide for coming research in the field when compared to related studies.

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PP04 - MONOCLONAL ANTIBODY FUNCTIONALIZED POLYMERIC NANOPARTICLES FOR POTENTIAL TARGETED THERAPY FOR OVARIAN CANCER

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Ovarian cancer is one of the most deadly cancer types in the female reproductive system and is the fifth leading cause of death among women [1]. The application of conventional chemotherapeutic drugs suffers from issues such as multidrug resistance, poor stability and targeting inefficiency [2]. Current strategies to boost delivery of highly effective drugs into cancer cells by using nanoparticles has attracted much more attention in the last decades, especially due to exceptional success of targeting highly expressed cancer-related ligands [3, 4]. Here, we have utilized different approaches to create highly effective targeted nanoparticles. The nanoparticles contain a cytotoxic drug-loaded polymeric core covalently modified with crosslinked protein shell designed to decrease serum protein interactions and to prolong the circulation stability. The shell is functionalized with ligand targeting monoclonal antibody to make effective internalization specifically into ovarian cancer cells. Therefore, monoclonal antibody functionalized polymeric nanoparticles can specifically bind to highly expressed ligands in ovarian cancer cells. With the unique ligand mediated cellular internalization, degradation of nanoparticles triggered the release of active cytotoxic drug to inhibit ovarian cancer cell growth and proliferation. This study showed that this targeted hybrid nanocarrier can improve therapeutic index for ovarian cancer and can be considered as a promising targeted cancer drug delivery platform.

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PP05 - PREPARATION AND CHARACTERIZATION of Tc-99m RADIOLABELLED NANOPARTICLES

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Poly(D,L-lactide-co-glycolide) (PLGA) is the most common polymer for nanoparticle (Np) preparation which are biodegradable and biocompatible systems [1]. Other hand, Technetium-99m (^{99m}Tc) is one of the oldest and most commonly used radionuclide in nuclear medicine. In this study, ^{99m}Tc radiolabeled Nps were investigated for possible future use in nuclear medicine.

In this study, PLGA nanoparticles were prepared using by nanoprecipitation methods [2]. Briefly, PLGA was dissolved in 2 ml acetone and added drop by drop to aqueous phase (0.5% PVA) under magnetic stirring to form NPs. The suspension was stirred at 1000 rpm to evaporate the acetone overnight. Zeta potential, mean particle sizes and size distribution (PDI) were measured to characterize nanoparticles. NP formulations were radiolabelled with ^{99m}Tc (0.25 mCi) with tin reduction method and different radiolabelling conditions were applied to find optimum formulation (Table 1). Radiochemical yield of nanoparticles were checked by ITLC and stability studies were conducted to investigate the change in radiolabelling [3].

Table 1. Different radiolabelling conditions of NP formulations.

Formulation Codes	$SnCl_2$ volume (µl)	Incubation pH	Incubation Temperature (°C)	Incubation Time (min)
Np1	50	7	25	30
Np2	10	7	25	30
Np3	250	7	25	30
Np4	50	5	25	30
Np5	50	9	25	30
Np6	50	7	25	5
Np7	50	7	25	60
Np8	50	7	10	30
Np9	50	7	50	30
Np10	25	7	25	30

Zeta potential of NP solution were found as 6,05±1,31 mV. Also, the particle size was found 207,95±1,90 (nm) and PDI was found as 0,2925±0,04 which shows homogenous size distribution. Generally for successful radiolabeling, above 95% of radiochemical yield is requested, Np1, Np4, Np7, Np8 and Np10 formulations met this criteria with RCP(%) as as 99,5±0,0578; 98,5±0,3026; 98,2±4,9313; 96,1±2,1258, and 98,8%±0,1376 (%), respectively. As the highest RCP(%) was found Np1 formulation and it was chosen as the optimum formulation. Stability study was performed on Np1 formulation. According to the stability results, Np1 formulation was found as stable up to 12 hr which is the two half-life time of ^{99m}Tc.

PLGA NPs radiolabelling conditions were investigated and optimum conditions were found in Np1 with high yield. Also, ^{99m}Tc-Np1 formulation stability results showed high stability for 2 half-life time of ^{99m}Tc.

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PP06 - THE EFFECT OF EXERCISE AND GROUP B VITAMIN APPLICATIONS ON MOTORIC AND PHYSIOLOGICAL PARAMETERS IN RATS WITH DIABETIC PARKINSON

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This study was carried out to investigate the positive effects, if any, of exercise and Group B vitamin applications on the physiological and locomotor functions of diabetic and/or parkinsonian rat models.

After the project and ethics committee approvals for the study were obtained, eight groups were randomly formed from 80 eight-week-old Wistar albino female and male rats obtained from ERU DEKAM unit to form the control and experimental groups. Groups; (I) Control group (n=10), (II) Diabetes group (n=10), (III) Parkinson group (n=10), (IV) Diabetes+Parkinson group (n=10), (V) Diabetes+Exercise group (n=10), (VI) Parkinson+Exercise group (n=10), (VII) Diabetes + Parkinson + Exercise group (n=10), (VIII) Diabetes + Parkinson + Exercise + Vitamin B group (n=10), a total of 80 rats were included in the study. In order to create a diabetic parkinsonian rat model, Parkinson's was induced by intraperitoneal rotenone (2,5mg/kg) administration for 28 days [1] following the formation of diabetes with a single dose of intraperitoneal streptozotocin (50mg/kg) [2]. Exercise groups were subjected to swimming exercise for 28 days. Diabetic+Parkinson+Exercise+Bvit group received B complex vitamins (B1, B2, B3, B5, B8: 50 mg/kg; B4: 21 mg/kg; B6: 10 mg/kg; B7, B12: 50 µg/kg; B9: 400 µg/kg) for 28 days by oral gavage in addition to exercise. Body weight, heart rate and %SpO_2 levels were measured in all groups at the beginning, middle and end of the study as described in the literature. Vertical pole and gait analysis tests were performed to evaluate motor functions. At the end of the experimental procedures, maximum blood tissue was obtained from the abdominal aorta under general anaesthesia and used for haematological data.

The data obtained from all groups were analysed using Kruskal Wallis, Mann Whitney U, Freidman, Wilcoxen and Freidman tests for significance levels within and between groups by using statistical programmes in computer environment. The significance level was taken as $p<0,05$ in statistical evaluations.

Body weights and heart rates were found to be lower in all exercise groups compared to the control group ($p<0,05$). It was determined that exercise and Bvit applications to diabetic and Parkinsonian groups caused significant changes in % SpO_2 and blood parameters levels in all experimental groups ($p<0,05$). Reductions in vertical pole test descent times, stride lengths and foot spans at different levels varying according to gender were found to be significant ($p<0,05$).

As a result, it was concluded that exercise and Bvit applications had positive effects on body weight, heart rate, $\%SpO_2$ levels, step lengths and leukocytic parameters in subjects with diabetes and Parkinson's disease, and that the preference of programmed and continuous exercise and diet programmes with high B vit content in dietary habits while determining the treatment strategies of these disorders may provide significant contributions to the quality of life of patients.

Keywords: B complex vitamins; Diabetes; Parkinson Disease; Rat; Swimming exercise.
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PP07 - IN VITRO CHARACTERIZATION OF MONOCLONAL ANTIBODY TO BE USED IN ANTIBODY-DRUG CONJUGATE SYNTHESIS

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Biological drugs began to come to the fore in cancer treatment. Among the biotherapeutics, target-specific monoclonal antibodies (mAbs) are the most studied and are beginning to be used in the clinic.The fact that cancer cells start to develop resistance against mAbs used in the clinic over time indicates that the production of new target mAbs have to be studied. In recent years, Antibody Drug Conjugates (ADCs) have started to be investigated in cancer treatment, which minimizes the side effects and multiple drug resistance (MDR) of drugs and combines the strong effect of cytotoxic drug and the target specific therapeutic power of mAbs alone. The monoclonal antibodies contained in ADCs are specific for the target cancer antigen and cytotoxic drug used in ADC are activated after it is taken into cancer cells [1-3]. Therefore, ADCs are more effective and safer than chemical drugs.

In the study, a monoclonal antibody (mAb) highly expressed by ovarian cancer cells will be conjugated to a potent cytotoxic drug in the conventional way. So far, method optimization for the characterization of commercial mAbs to be used in ADC synthesis has been done using SDS-PAGE, HIC-HPLC, SEC-HPLC, LC-MS, cell-based ELISA and cytotoxicty assay. Method optimizations will also be continued with commercial mAb using Capillary Electrophoresis and Surface Plasmon Resonance techniques. After the ADCs are synthesized, the full characterization of the ADCs by optimized methods will be performed and its efficacy in ovarian cancer cell lines will be demonstrated by in vitro studies. It is envisaged that the studies of the drug candidate whose in vitro efficacy will be proven will continue with in vivo studies.

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PP08 - EVALUATION OF PRODUCTION QUALITY AND QUANTITY IN FED BATCH STUDIES USING DIFFERENT GROWTH MEDIA DURING THE PRODUCTION OF RECOMBINANT MONOCLONAL ANTIBODIES

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Although chemotherapeutics used in cancer treatment have strong cytotoxic effects, they are not specific targeted molecules. This leads to increased side effects and drug resistance. In order to increase the therapeutic efficacy, it is of great importance to produce targeted monoclonal antibodies (mAbs) with high selectivity and to use them for therapeutic purposes. In mAb development, the most important parameters that need to be optimized for protein quality are the media and its components [1, 2, 3]. It is necessary to optimize the medium in order to increase both cell growth and mAb quantity and quality. By optimizing the composition of the medium, increasing the density of viable cells, prolonging the culture period, and revealing the true potential of a cell line, high titer of high quality produced mAb can be achieved [4]. Here, it was aimed to determine the optimum yield and quality growth medium by comparing the activities of recombinant mammalian cell lines carrying the gene to express the desired protein in different growth mediums.

The mammalian host cells were transfected with the vector carrying the desired gene region to be expressed, and pools of cells that produce the recombinant protein were formed. In order to determine the medium and conditions in which cell pools produce the best, fed batch studies were carried out with cells seeded in two different growth media. In this context, the cell pool with the high production capacity was determined by controlling data such as viable cell numbers, % viability, glucose amounts and pH of the medium. The production amounts of these pools with high production were analyzed in protein A column, BCA kit, SDS Page and 280nm absorbance.

The titers of mAbs were found to be in the range of 0.5 – 1,5 mg/ml. As a parallel method, the BCA kit was used and the consistency of production quantities was demonstrated. The molecular weights of these mAbs were found to be in the expected range.

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PP09 - PREDICTING THE SWELLING BEHAVIOR OF PVA-BASED SUPERPOROUS HYDROGELS FOR GASTRORETENTIVE DRUG DELIVERY SYSTEMS USING ARTIFICIAL INTELLIGENCE APPROACH

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Gastroretentive drug delivery systems offer a promising solution to improve the bioavailability of poorly soluble drugs. Superporous hydrogel composites are promising materials for these systems due to their prolonged gastric retention and solubility enhancing properties. Glutaraldehyde, sorbitan oleate, and polyvinyl alcohol (PVA) are commonly used to formulate superporous hydrogel composites, but their swelling behavior is not well known. In this study, we used the Levenberg-Marquardt optimization algorithm based on artificial neural networks (ANN) as an artificial intelligence approach to predict the swelling behavior of superporous hydrogel composites containing glutaraldehyde, sorbitan oleate, and PVA. By accurately predicting the swelling behavior, we can better understand the drug release kinetics of these composites and optimize their formulation for use in gastroretentive drug delivery systems. The artificial neural networks were trained and validated using experimental data from the literature, and the ANN (3-18-36-1) model performed better in terms of accuracy and predictive power ($R^2 > 0.98$). Our results showed that the swelling behavior of the superporous hydrogel composites strongly depended on the composition of glutaraldehyde, sorbitan oleate and PVA.

Accurate prediction of swelling behavior using a machine learning approach based on ANN provides a powerful tool for optimizing the formulation of superporous hydrogel composites for use in gastroretentive drug delivery systems. By eliminating the need for extensive experimental studies, this approach can accelerate the development process and bring new therapies to patients faster.

Keywords: ANN (Artificial Neural Networks), Drug Delivery Systems, Swelling Properties, Artificial Intelligence, Polyvinyl Alcohol (PVA).

PP10- BAYESIAN OPTIMIZATION-BASED ARTIFICIAL NEURAL NETWORKS FOR PREDICTING SWELLING BEHAVIOR OF HYDROGEL COMPOSITE FILMS FOR TRANSDERMAL DRUG DELIVERY SYSTEMS

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Transdermal drug delivery systems provide a non-invasive and convenient method of drug delivery. However, controlled release of drugs through the skin is challenging due to the complex nature of the skin barrier. On the other hand, recent advances in hydrogel technology have led to the development of smart hydrogels that respond to specific stimuli and allow even better control of drug release. Glycyrrhizic acid and chitosan are two commonly used materials for hydrogel composite films due to their biocompatibility and biodegradability. The objective of this study was to investigate the swelling behavior of hydrogel composite films composed of glycyrrhizic acid and chitosan for use in transdermal drug delivery systems, using artificial neural networks and a Bayesian optimization algorithm. The accurate prediction of swelling behavior in hydrogel composite films enables the design of precise drug delivery systems that release drugs at specific pH values. The developed artificial neural network model was trained and validated using experimental data from the literature, and the ANN (4-24-8-1) model performed better in terms of accuracy and predictive power ($R^2 > 0.99$). The model showed that the swelling behavior of the hydrogel composite films is highly dependent on the composition of glycyrrhizic acid and chitosan, as well as the pH of the surrounding medium. Accurate prediction of the swelling behavior using artificial neural networks provides a powerful tool for optimizing the formulation of hydrogel composite films for transdermal drug delivery systems. The approach described in this work can be applied to other drugs with delivery systems, making it an effective tool for drug development and improvement.

Keywords: ANN (Artificial Neural Networks), Drug Delivery Systems, Swelling Properties, Bayesian Optimization, Chitosan.

PP11-Development And Characterization Of Ivermectin Loaded Transfersome Formulations Using Experimental Design

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Rosacea is a chronic and inflammatory skin disease characterized by flushing, nontransient erythema, papules/pustules, telangiectasia, and phymatous changes. In a meta-analysis published in 2019, topical ivermectin was shown to be the most effective topical treatment for papulopustular rosacea (1). Ivermectin is a broad-spectrum antiparasitic semi-synthetic drug from the macrocyclic lactone class, also known as avermectins, and has low solubility in water (2). Transfersomes, composed of natural phospholipids and surface activators, are biocompatible and biodegradable vesicular systems with high drug encapsulation properties and a tendency to scale up. Transfersomes, due to their structure and properties, can increase both solubilities of substances such as ivermectin and its accumulation in the skin (3). The main objective of this study was to optimize and characterize the ivermectin-loaded transfersomes formulation.

Ivermectin-loaded transfersome formulations were prepared using the thin film hydration method and optimized with the Design of Experiment (DoE). After pre-formulation studies, Lipoid S45 (30-90 mg), Tween 80 (10-60 mg) and total organic phase (chloroform: methanol 4:1) (2-5 ml) were selected input factors for Box Behnken (3 Central Point) design. A model was created in DoE by measuring particle size (PS) (nm), polydispersity index (PDI) and zeta potential (ZP) (mV) for the 15 suggested formulations. The model was found to be compatible for PS and ZP. It was observed that the results were almost constant for the PDI. Therefore, candidate formulations were determined by considering only PS and ZP. Four different formulations were taken by giving different importance levels to obtain the highest value for the ZP, with the lowest PS on Design of Expert (Table 1).

Table 1. Recommended Formulations by Design of Experiment and Their Output Values (n=3, mean±Standart Deviation)

Formulation content Tween 80: Lipid: solvent (ml)	ZP Significance Level	PS (nm)	PDI	ZP (mV)	PS (nm) DoE	ZP (mV) DoE	P value PS	P value ZP	EE %
F1 60:30:5	0	112.70 ± 5.22	0.232 ±0.004	-14.00 ± 4.16	100.7± 10.81	-16.583 ±3.09	0.167	0.776	99.98
F2 43,343:30:5	1	111.80 ± 12.81	0.181 ±0.084	-19.41 ± 8.77	117.164 ±10.81	-25.175 ±3.09	0.506	0.566	100
F3 15,075:30:5	3	127.70 ± 3.30	0.185 ± 0.049	-15.03 ± 0.55	115.49± 10.81	-24.302 ±3.09	0.123	0.003	99.86
F4 10:30:5	5	106.58 ± 15.16	0.243 ± 0.055	-16.967 ± 2.50	106.192 ±10.81	-19.449 ±3.09	1.000	0.752	100

As a result of the statistical analysis between the PS and ZP estimation of the DoE program and the results for the candidate formulations, the model was found to be insignificant ($p>0.05$). Since the zeta potential directly affects the stability, the formulation with the highest zeta potential was chosen as the most suitable formulation. The PS, ZP and PDI values of optimum ivermectin-loaded transfersome formulation (F2) were found to be 111,80 nm, -19,41 mV and 0,181, respectively. The DoE approach provides the optimization of the ivermectin-loaded transfersomes for dermal application.

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PP12- PREPARATION OF SUNITINIB LIPOSOMES FOR THERANISTIC ADMINISTRATION

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Sunitinib (STB) is a multi-targeted tyrosine kinase inhibitor and used in the treatment of renal, gastrointestinal and pancreatic tumors [1]. With liposomal formulations, chemotherapeutic drugs can be encapsulated and targeted to the tumor actively or passively [2]. In this study, it is aimed to prepare liposome formulations containing (STB) with a particle size below 100 nm by passive targeting to the pancreatic tumor region.

The six liposome formulations containing STB (F1, F2, F3, F4, F5) with different concentrations of lecithin:cholesterol mixture were prepared by using thin film technique. The mean particle size, size distribution, and zeta potential of all liposomes were measured by using Malvern Zeta Sizer at 25°C. The SEM images of liposomes were performed with Thermo Scientific Apreo S microscope (Figure 1).

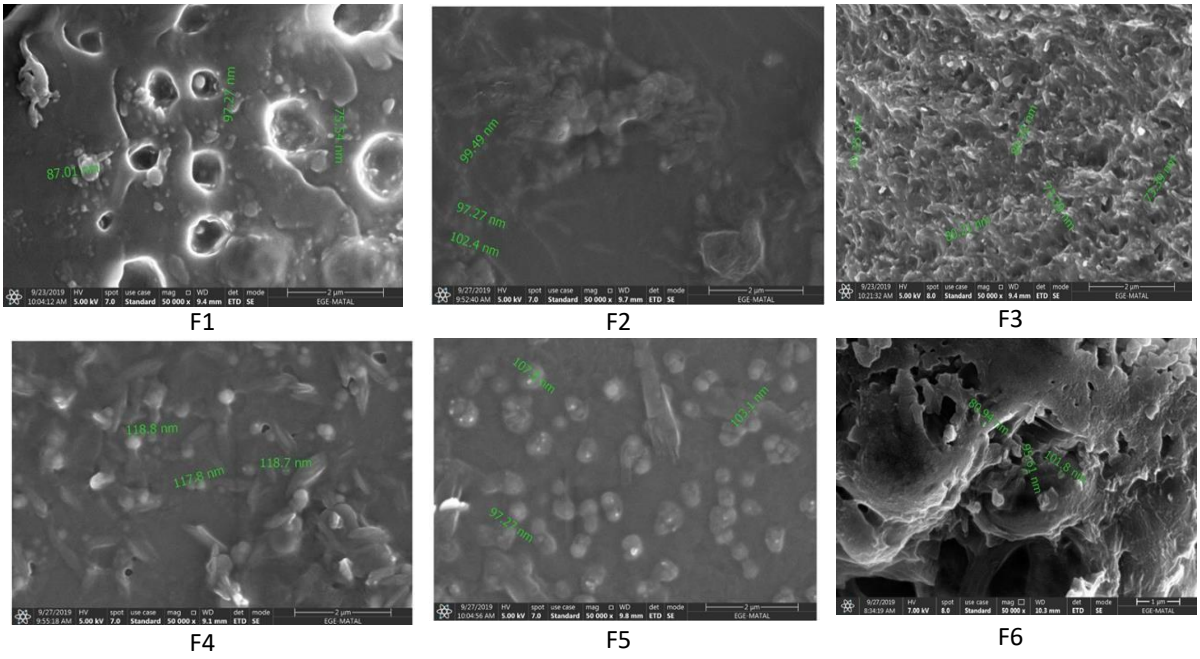

Figure 1. SEM images of developed liposome formulations

STB-loaded liposome formulations as theranostic agents were prepared successfully for cancer disease administration. After the preparation, liposome formulations exhibited proper characterization profiles with their nanosized and desired zeta potential values.

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PP13-Evidence-based complementary and alternative therapy of Annona squamosa Linn. leaves extract derived bioactive fractions against Diabesity. An In-vivo, In-vitro, and In-silico approach using fingerprint analysis

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Diabesity is a term derived from "Dia" (Diabetes) and "Besity" (Obesity). Obese individuals develop diabetes and are caused by the same pathophysiologic processes, so treating one could have a significant impact on the other [1]. To overcome the deadly disease, these patients will have to put forth a little effort, unlike lean diabetic patients. Only few drugs for treating diabesity are available in the market, and are having severe side effects. Natural floras have all the cures to idiopathic ailments. *Annona squamosa* (Family: Annonaceae) is having potential pharmacological activity used to treat and manage a range of diseases and disorders. However, its anti-diabesity potential has yet to be researched. The study aimed to investigate and validate the most potent bioactive fractions of *Annona squamosa* leaves extract for *its in-vitro, in-silico,* and *in-vivo* activity targeting diabesity and characterization of compounds in the most potent fractions. Dried leaves were collected and extracted with methanol using the cold maceration process. Bioactive fractions from methanolic extract were subjected to phytochemical characterization like total flavonoid content, total phenolic content, and total steroidal content. The *in-vitro* antioxidant (DPPH, ABTS, NO_2 & H_2O_2) free radical scavenging, and enzyme inhibition (pancreatic lipase,α -amylase, α -glucosidase) activities revealed that fractions F2 and F3 as the most potent fractions [2,3]. *In-vivo* study using MSG-HFD induce mice model demonstrated F2 as potent amongst the two [4]. LC-MS/MS, NMR, and FTIR spectral characterization have been used for identification of bio-active compounds in F2 [5,6]. An in-silico investigation revealed that the identified compounds from the fraction F2 performed best when docked with diabesity specific targets. The whole study revealed that the selected fractions had a promising anti-diabesity impact compared to the standard.

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PP14 -GO-ANN APPROACH FOR PREDICTING SWELLING BEHAVIOR OF SODIUM ALGINATE HYDROGELS IN ORAL DELIVERY OF PROTEIN DRUGS

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The development of oral delivery systems for protein drugs has been a significant challenge due to the susceptibility of proteins to degradation and denaturation in the harsh gastrointestinal environment. Hydrogels are an attractive option for oral delivery of protein drugs as they can protect proteins from the harsh environment and release them in a controlled manner. Sodium alginate hydrogels have been shown to be effective in the oral delivery of protein drugs. However, the swelling behavior of hydrogels during processing may affect the performance of the final product. In this study, we propose a gradient optimization-based artificial neural network approach (GO-ANN) for predicting the swelling behavior of sodium alginate hydrogels. The GO-ANN approach uses artificial neural network principles (ANN) and a gradient optimization algorithm to improve the accuracy of predictions. The GO-ANN model was trained on a data set consisting of experimental data on the swelling behavior of sodium alginate hydrogels. The data set was divided into training (85%) and testing sets (15%), and the GO-ANN model was evaluated based on its accuracy in predicting the swelling behavior of the hydrogels ($R^2 > 0.94$). The results showed that the GO-ANN model was able to accurately predict the swelling behavior of sodium alginate hydrogels with a high degree of accuracy. This study demonstrates the potential of the GO-ANN approach for predicting the swelling behavior of sodium alginate hydrogels for oral delivery of protein drugs. The GO-ANN model was able to accurately predict the swelling behavior of the hydrogels and was used to optimize the formulation for producing hydrogels with the desired swelling behavior.

Keywords: GO-ANN, Oral Delivery of Protein Drugs, Swelling Properties, Sodium Alginate Hydrogels.

PP15-TRASTUZUMAB-CONJUGATED POLY (LACTIC ACID)/POLY (VINYL ALCOHOL) NANOPARTICLES AS A NOVEL DRUG DELIVERY SYSTEM

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The aim of this study was to develop and characterize trastuzumab-conjugated poly (lactic acid)/poly (vinyl alcohol) (PLA/PVA) nanoparticle formulations as a novel drug delivery system. For this purpose, PLA/PVA nanoparticle formulations were prepared by the double emulsification/solvent evaporation method with a high-speed homogenizer [1]. Then, trastuzumab was bound to the nanoparticles during the preparation by solvent evaporation (M1) or either by adsorption (M2) or covalent binding (M3) [2]. PLA/PVA/trastuzumab nanoparticles were evaluated for clarity, particle size, distribution, zeta potential, surface and morphological features, antibody binding efficiency, and short-term stability. Based on the obtained results, the nanoparticle formulation prepared by solvent evaporation method has a suitable particle size (217.8±3.363 nm) and distribution (0.065±0.001), zeta potential (-1.78±0.762 mV), and high antibody binding efficiency (78.14±2.04%), and nanoparticles were spherical, had a smooth surface (Figure 1), and were stable up to 6 months. In conclusion, this novel formulation can be used as a potential drug delivery system.

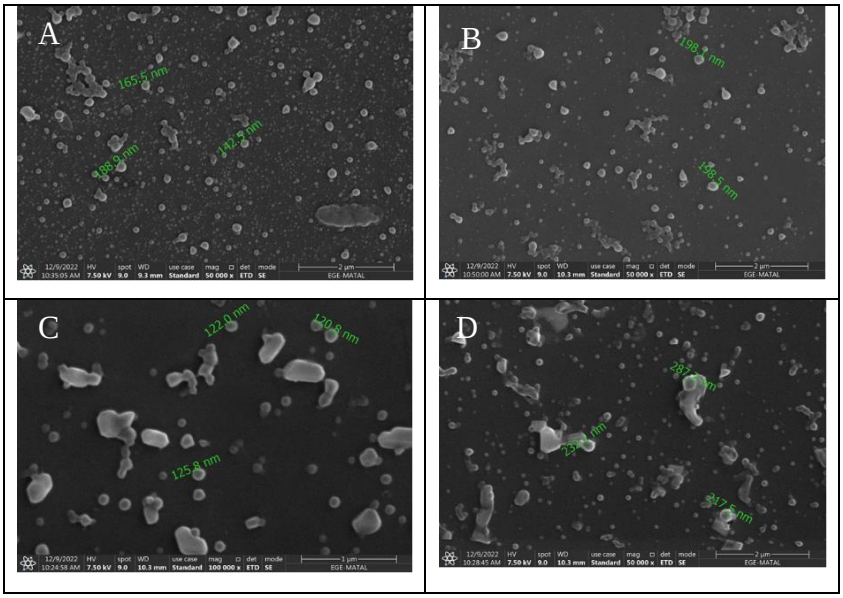

Figure 1. SEM images of formulations (A: PLA/PVA nanoparticle formulation, B: M1 nanoparticle formulation, C: M2 nanoparticle formulation, D: M3 nanoparticle formulation).

Acknowledgement: This work received a grant from the Scientific and Technological Research Council of Turkey (TUBITAK 2209-A, Project no: 1919B012102425).

References:

[1] Ekinci M, Yeğen G, Aksu B, İlem-Özdemir D. Preparation and Evaluation of Poly(lactic acid)/Poly(vinyl alcohol) Nanoparticles Using the Quality by Design Approach. ACS Omega. 2022;7(38):33793–33807. doi:10.1021/acsomega.2c02141
[2] Ekinci M, Dos Santos CC, Alencar LMR, Akbaba H, Santos-Oliveira R, İlem-Özdemir D. Atezolizumab-Conjugated Poly(lactic acid)/Poly(vinyl alcohol) Nanoparticles as Pharmaceutical Part Candidates for Radiopharmaceuticals. ACS Omega. 2022;7(51):47956–47966. doi:10.1021/acsomega.2c05834

PP16- LAMIVUDINE-LOADED SOLID LIPID NANOPARTICLES AS A NOVEL DRUG DELIVERY SYSTEM

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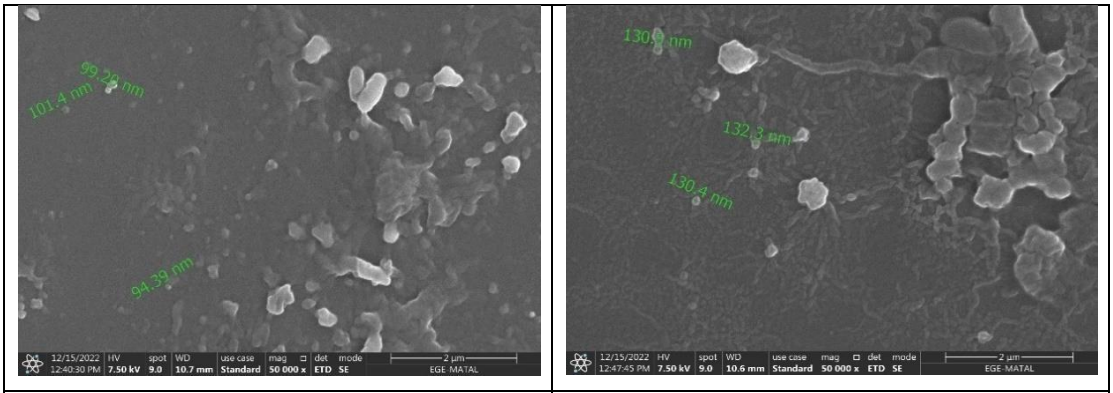
The aim of this study was to develop and characterizelamivudine-loaded solid lipid nanoparticles (SLNs) as a novel drug delivery system. For this purpose, SLNs were prepared by the high-speed mixing/ultrasonication method with small modification, which was previously described [1]. For the preparation of SLNs, Compritol ATO 888, gelucire 48/16 pellet and stearic acid as solid lipid; tween 20, tween 80, and soy lecithin as surfactants, and distilled water as water phase were used. All prepared SLNs were evaluated in terms of particle size, PdI value, zeta potential, SEM image analysis, encapsulation efficiency, and short-term stability.Based on the obtained results, the nanoparticle formulation prepared with gelucire 48/16 pellet and soy lecithin has a suitable particle size (129.5±2.540 nm) and distribution (0.354±0.044), zeta potential (-23.4±2.21 mV), and high encapsülation efficiency (60.25±3.60%). SLNs were spherical, had a smooth surface (Figure 1), and were stable up to 6 months. In conclusion, this novel formulation may be used as a potential drug delivery system.



A:Solid lipid nanoparticles | **B:**Lamivudine-loaded solid lipid nanoparticles

Figure 1. SEM images of formulations.

Acknowledgement: This work received a grant from the Scientific and Technological Research Council of Turkey (TUBITAK 2209-A, Project no: 1919B012204482).We are grateful to Assoc. Prof. Dr. A. Alper Öztürk from Anadolu University for lamivudine.

References:

[1] Öztürk AA, Yenilmez E, Arslan R, Şenel B, Yazan Y. Dexketoprofentrometamolloaded solid lipid nanoparticles (SLNs): Formulation, in vitro and in vivo evaluation. J Res Pharm. 2020;24(1):82-99. doi:10.35333/jrp.2020.114

PP17- DEVELOPMENT OF NANOSTRUCTURED CONTRAST AGENT FOR USE IN MAGNETIC RESONANCE IMAGING STUDIES

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The aim of this study was to develop and characterize iron oxide nanoparticles as a magnetic nanostructured contrast agent. For this purpose, synthesis of iron (II, III) oxide known as magnetic nanoparticle carried out according to the method by Mahmood et al. [1]. According to this method; $FeCl_3.6H_2O$ and $FeSO_4.H_2O$ were dissolved in distilled water and heated in a nitrogen atmosphere at 90°C for 30 min by stirring in a magnetic stirrer. A 0.1 M NaOH solution was added dropwise to the resulting mixture. The formation of nanoparticles was followed by turning the yellow colored mixture into black at the points where the NaOH drops fell. Precipitation was completed by adding 0.3 M NaOH solution to the final mixture, and after the precipitation process was completed, the nanoparticles were separated magnetically and washed with distilled water and dried in a desiccator with the help of vacuum. Then, surface modifications of the prepared magnetic iron oxide nanoparticles were carried out using PVA, PVP and PEG polymers. After, the prepared iron oxide nanoparticles were evaluated for particle size, distribution, zeta potential, surface and morphological features and short-term stability. According to obtained promising results, studies are continuing to determine the T1 and T2 Relaxation Times of the novel formulations.

Acknowledgement: This work received a grant from the Scientific and Technological Research Council of Turkey (TUBITAK 2209-B, Project no: 1139B412200495).

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[1] Mahmood I, Ahmad I, Chen G, Huizhou L. A surfactant-coated lipase immobilized in magnetic nanoparticles for multicycle ethyl isovalerate enzymatic production. Biochemical Engineering Journal. 2013;73:72-79. doi:10.1016/j.bej.2013.01.017

PP18- ANTIBODY-NANOPARTICLE CONJUGATE CONSTRUCTED WITH TRASTUZUMAB AND NANOPARTICLE ALBUMIN-BOUND PACLITAXEL AS A NOVEL DRUG DELIVERY SYSTEM

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The aim of this study was to develop and characterize an antibody-nanoparticle conjugate (ANC) constructed with trastuzumab (Herceptin®) and nanoparticle albumin-bound paclitaxel (nab-paclitaxel, Abraxane®) (trastuzumab/nab-paclitaxel) as a novel drug delivery system. For this purpose, the ANC was produced with trastuzumab and nab-paclitaxel by a synthesis using N-ethyl-N'-(3-(dimethylamino)propyl)carbodiimide (EDC) / N-hydroxysuccinimide (NHS). The ANC was evaluated for clarity, particle size, distribution, zeta potential, surface and morphological features, antibody binding efficiency, and short-term stability. Based on the obtained results, that trastuzumab/nab-paclitaxel was spherical with a suitable size and distribution, zeta potential value and high antibody binding efficiency. Also, the ANC was stable up to 6 months. In conclusion, this novel formulation can be used as a potential drug delivery system.

Acknowledgement: This work received a grant from the Scientific and Technological Research Council of Turkey (TUBITAK 2209-A, Project no: 1919B012103467).

PP19- TAMOXIFEN CITRATE-LOADED SOLID LIPID NANOPARTICLES AS A NOVEL DRUG DELIVERY SYSTEM

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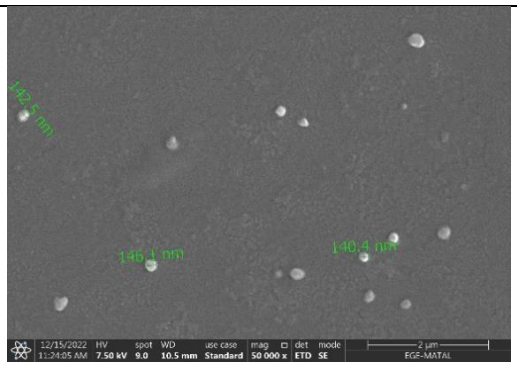
The aim of this study was to develop and characterize fluorescently labeled tamoxifen citrate-loaded solid lipid nanoparticles (SLNs) as a novel drug delivery system. For this purpose, SLNs were prepared by the high-speed mixing/ultrasonication method with small modification, which was previously described [1]. For the preparation of SLNs, gelucire 48/16 pellet as solid lipid; soy lecithin as surfactant, DCFH-DA as fluorescent dye; tamoxifen citrate as active ingredient; and distilled water as water phase were used. All SLNs (F1-F8) were evaluated in terms of particle size, PdI value, zeta potential, SEM image analysis, and encapsulation efficiency. Based on the obtained results, F7 formulation has a suitable particle size (125.8±3.350 nm) and distribution (0.341±0.016), zeta potential (-28.2±0.488 mV), and high encapsulation efficiency (62.30±2.58%). SLNs were spherical, had a smooth surface (Figure 1). In conclusion, this novel formulation may be used as a potential drug delivery system.



A: Blank SLNs (F5)	**B:** Tamoxifen citrate-loaded SLNs (F7)

Figure 1. SEM images of SLNs.

Acknowledgement: This work received a grant from the Scientific and Technological Research Council of Turkey (TUBITAK 2209-A, Project no: 1919B012214891).

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[1] Öztürk AA, Yenilmez E, Arslan R, Şenel B, Yazan Y. Dexketoprofen trometamol loaded solid lipid nanoparticles (SLNs): Formulation, in vitro and in vivo evaluation. J Res Pharm. 2020;24(1):82-99. doi:10.35333/jrp.2020.114

PP20- PREPUBERTAL PHTHALATE EXPOSURE CAN CAUSE HISTOPATHOLOGICAL ALTERATIONS AND EPIGENETIC CHANGES IN RAT BRAIN

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Di-(2-ethylhexyl) phthalate (DEHP) is a phthalate derivative extensively used in a wide range of products such as plastic materials, medical devices, toys, cosmetics and personal care products. Many mechanisms, including epigenetic alterations, may be involved in the effects of phthalates on brain development. In this study, Sprague-Dawley male rats in postnatal day 21-23 days were exposed to low dose DEHP (D1, 30 mg/kg/day) or high dose DEHP (D2, 60 mg/kg/day) in prepubertal period. Rats were euthanized in adulthood and histopathological and epigenetic changes (histone acetylation, DNA methylation) were evaluated in brain, cerebellum and hippocampus. Histopathological evaluations indicated the presence of edema in the brain tissue, vascular congestion and deterioration in neuropil. Damaged neuron remnants and increase in microglia cells were observed especially in D2 group. In cerebellum of study groups, indistinguishable cell extensions in the molecular layer, edema and congested vessels were observed. Collapsed vessels, increased number of microglia cells, degenerated Purkinje cells, gliosis, edema, loss of granular cells in the granular layer, enlargement of synaptic islands and deterioration in myelinated nerve fibers were observed in D2. Edema, microglia, and glial cells with pycnotic nuclei were observed in the hippocampus of both of the study groups. Pyramidal neuron loss was only observed in CA1 region in D1. In D2 group, loss of pyramidal neurons was determined in CA1, CA2 and CA3 regions. Prepubertal DEHP exposure caused insignificant decreases in DNA methylation levels in brain tissues of both groups. D1 and D2 had higher histone acetylation levels vs. control. However, the changes were only significant in D1. Our findings indicate that the presence of deterioration in brain tissue morphology was more prominent in high dose prepubertal DEHP exposure and the results suggested that epigenetic changes might be one of responsible mechanisms for the damage observed in brain tissue.

Acknowledgement: This study is supported by Lokman Hekim University Scientific Research Projects Coordination Unit, Project No: 20K0030

PP21- ANTI-INFLAMMATORY ACTIVITY AND CHEMICAL COMPOSITION OF PRANGOS FERULACEA L. ESSENTIAL OIL

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In the pharmaceutical and agrochemical industries, Apiaceae family members are important sources. Apiaceae is represented by 511 taxa in Turkey, with about 485 species. There are 181 endemic taxa among them. Prangos ferulacea L. (Apiaceae) is a plant species commonly known as "hog fennel" or "giant hogweed." It is found in various regions of the world, including Europe, Asia, and North America. It is also used as a traditional remedy for various ailments, including digestive disorders and hypertension [1,2].

In the present work, the fruits of P. ferulacea were collected in Erzincan, Turkey. The plant material was identified by the Dr. Hayri Duman (Herbarium number: archive number 57). The essential oil (EO) of P. ferulacea fruits was obtained by hydrodistillation using a Clevenger-type apparatus for 3h. Obtained essential oil was analysed both by GC-FID and GC-MS, simultaneously.

α-Pinene (50.0%), β-phellandrene (7.2%) and elemol (6.6%) were found as the main components of the EO of P. ferulacea fruits. The chemical composition of P. ferulacea fruits EO from Turkey was identified for the first time. Also, in vitro anti-inflammatory activity was evaluated by the 5-lipoxygenase (5-LOX) inhibitory effect of the essential oil, spectrophotometrically. The anti-inflammatory activity of the essential oil was determined as IC_{50}: 44.99±0.24 µg/mL. To the best of our knowledge, this is the first report on the enzyme inhibitory activity of EOs of P. ferulacea fruits.

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[1] Baser KHC, Kirimer N. Essential oils of Anatolian Apiaceae-A profile. NVEO, 2014;1(1):1-50.

[2] Tetik F, Civelek S, Cakilcioglu U. Traditional uses of some medicinal plants in Malatya (Turkey). J Ethnopharmacol. 2013;146(1):331-346

PP22- OPTICAL IMAGING POTENTIAL OF FLUORESCENTLY LABELED METHOTREXATE-LOADED HUMAN SERUM ALBUMIN NANOPARTICLES IN BREAST CANCER CELLS

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The aim of this study was to develop, characterize and evaluate methotrexate-loaded human serum albumin nanoparticle formulations (MTX-HSA-NPs) for optical imaging potential in breast cancer cells. For this purpose, nanoparticles were prepared by the method developed by İlem-Özdemir et al. before [1]. Different amounts of fluorescent dye were added to the nanoparticles during and after preparation (10 formulations). All prepared formulations were evaluated in terms of particle size, PdI value, zeta potential, SEM image analysis, encapsulation efficiency, and short-term stability. Then, optical imaging studies were performed on MCF-7 (breast cancer cells) and MCF-10A (healthy breast cells) with suitable formulations (F7 and F2) (Figure 1). In conclusion, this formulation (F7) may be used for optical imaging studies.

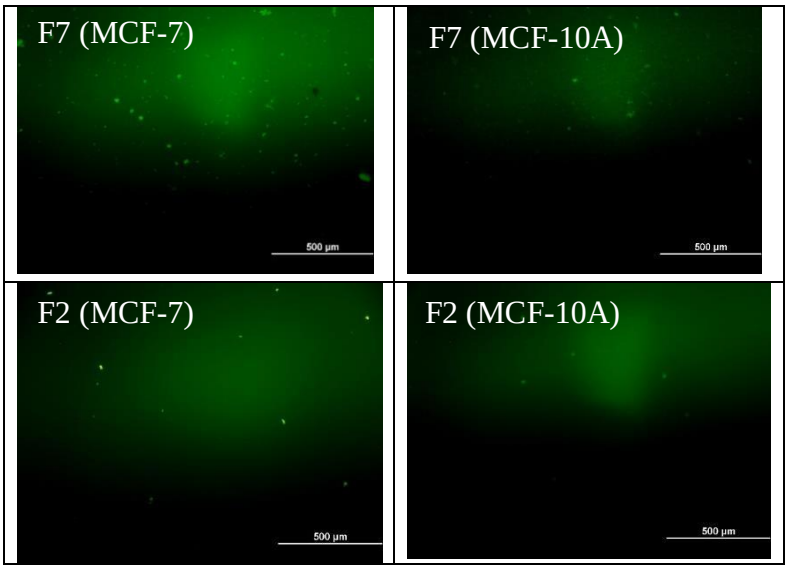

Figure 1. Optical images of formulations (F7: MTX-HSA-NPs; F2: HSA-NPs) in MCF-7 and MCF-10A cell lines.

Acknowledgement: This work received a grant from the Scientific and Technological Research Council of Turkey (TUBITAK 2209-A, Project no: 1919B012102450).

References:

[1] Ilem-Ozdemir D, Ekinci M, Ozgenc E, Atlihan-Gundogdu E, Asikoglu M. Optimization the preparation process of methotrexate loaded human serum albumin nanoparticles. In: 12th International Symposium on Pharmaceutical Sciences. Ankara; 2018. p. 93–4.

PP23- CONTRIBUTION OF ONCOLOGY PHARMACISTS IN CANCER CARE

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Oncology pharmacists' endeavor to achieve the goal of providing the highest quality medication counseling and treatment to patients undergoing cancer chemotherapy. To accomplish this objective, numerous studies are carried out focusing on several titles as drug-drug, drug-nutrient interactions, appropriate drug usage, adverse effects arising from polypharmacy, and problems related to adherence to treatment. Patients with cancer and chronic diseases may be at increased risk for higher toxicity levels due to drug-related problems during treatment. This situation arises from the narrow therapeutic index of anti-cancer agents, which poses serious problems for cancer patients. At the same time, cancer patients are the group of patients who can easily lose adherence to treatment due to the psychological destruction they experience. Several factors, fear of treatment due to lack of clarity about the treatment procedure, and reluctance to commence treatment owing to potential side effects, may contribute to decreased adherence to treatment in cancer patients. In the absence of proper education regarding pharmaceutical care before and after chemotherapy, patients may opt for herbal products to manage the side effects of treatment. On the other hand, misusage of over-the-counter drugs and other medical products also exacerbates the problem of side effects. Clear communication and education with patients regarding their treatment regimen prior to hospital discharge is crucial in preventing medication-related issues. Effective counseling by an oncology pharmacist can lead to reduced patient anxiety, increased medication comprehension, improved treatment adherence, and better overall care. This study aimed to highlight the crucial role of oncology pharmacists in ensuring the quality and safety of drug therapy in cancer treatment. For this purpose, the words "Oncology Pharmacist", "Hospital Pharmacist", and "Cancer" were searched in Google Scholar, Pub-Med, Science Direct. The study involved a thorough review of literature on oncology pharmacy over the past nine years, with particular focus on the summaries of relevant studies. Oncology pharmacist: In the process of purchasing products used in oncology treatment, considering the quality and safety of drug therapy, evaluating the economic benefits; the risk of drug selection, labeling, proper storage, or exposure of cytotoxic preparations to microbiological contamination, resulting in treatment failure and/or patient harm; ensuring correct data and labeling in drug distribution; any possible interaction with other drugs or supplements, even if the patients are affected by diet; from logistics, ordering, prescription, testing, preparation, documentation and invoicing with the use of information technology solutions; It is responsible for the quality assurance of evidence-based algorithms and guidelines in the use of drugs in tumor and supportive treatments, and the correct, quality and safe use of drugs with coordinated information and training strategies. In the absence of an oncology pharmacist, when these responsibilities are carried out by people who do not have knowledge of oncology and medicine, there are disruptions in all steps**. PMR**

(Pharmacist-led drug reconciliation) is a scheme established by research at the University of North Carolina Cancer Hospital. Along with PMR, it has been observed that most cancer patients have a drug change in their electronic health record, suggesting that a short oncology PMR can accurately continue and improve drug safety by avoiding prescribing and administration errors. Oncology Services Restructuring Program 2010-2023 is a program implemented in Turkey. In this program, it was stated that antineoplastic drugs should be prepared in vertical air flow cabinets, preferably by pharmacists or health personnel trained in this field. As a result of the findings obtained in the study, this deficiency in the field of pharmacy should be eliminated since treating patients with a lack of knowledge may cause vital problems. For this purpose, oncology pharmacy should be a separate specialty, the oncology service should be implemented more effectively, and the labor shortage problem should be resolved quickly.

PP24- Synthesis and Characterization of New Hexahydroquinoline Derivatives, Their Cytotoxic Properties and ROS Generation Potentials

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Inflammation is the underlying cause of many diseases such as cancer, atherosclerosis and neurodegenerative diseases. Therefore, modulating inflammatory pathways and inhibiting inflammatory mediators emerge as a new strategy in the treatment of various diseases. In this context, the discovery of compounds that inhibit the formation of inflammation by interacting with molecular targets with protein structure has an important place in drug research.

A great development in medicinal chemistry was experienced with the synthesis of 1,4-dihydropyridine (1,4-DHP) ring by Hantszch in 1882. This process has reached its true value with the introduction of drugs with 1,4-DHP structure into treatment [1]. Various derivatives have been synthesized due to the therapeutic success of the compounds carrying the 1,4-DHP structure. The condensation of the 1,4-DHP with cyclohexane gives hexahydroquinoline ring having various pharmacological activitys. In addition to its calcium channel blocker, antimicrobial and anticancer activities, the hexahydroquinoline ring has been found to be effective in inhibiting inflammatory mediators in recent years [2].

In this study, 15 compounds with the general structure of alkyl 2-methyl (2,6,6/2,7,7-trimethyl)-4-(difluoromethoxyphenyl)-5-oxohexahydroquinoline-3-carboxylate, which are expected to affect inflammatory mediators, were synthesized and the structures of the compounds has been elucidated by spectral methods such as IR, ^{1}H-NMR, ^{13}C-NMR ve HRMS. The cytotoxic properties and ROS generation potential of the compounds were determined. After determing their cytotoxıc and ROS-generating potentials, 6 compounds were chosen for futher experimen in 3T3 cells.

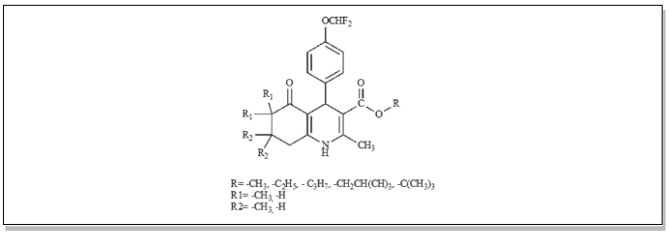

Figure 1. Alkyl 4-(4-(difluoromethoxy)phenyl))-2-methyl(2,6,6-trimethyl or 2,7,7-trimethyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

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[2] Anaikutti P, Makam P. Dual active 1, 4-dihydropyridine derivatives: Design, green synthesis and in vitro anti-cancer and anti-oxidant studies. Bioorganic Chemistry. 2020;105:104379. doi: https://doi.org/10.1016/j.bioorg.2020.104379

PP25- SYNTEHESIS AND SPECTROSCOPIC PROPERTIES OF TERT-BUTYL 4-(4-(DIFLUOROMETHOXY)PHENYL)-2,7,7-TRIMETHYL-5-OXO-1,4,5,6,7,8-HEXAHYDROQUINOLINE-3-CARBOXYLATE

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Inflammation is the natural and basic response of organism to signals from tissue damage or pathogenic infections. It has been found that chronic diseases occur through inflammation-mediated mechanisms. In this context, managing inflammatory mediators and inflammatory processes can be a treatment method for many chronic diseases. 1,4-dihydropyridine (1,4-DHP) and its condensed analogue hexahydroquinoline derivatives have importance due to their various biological activities [1]. In recent years, the inhibitory potentials of this group of compounds on inflammation mediators have also been proven. In this study, the compound having tert-butyl 4-(4-(difluoromethoxy)phenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate structure, which is expected to inhibit inflammation mediators, was synthesized [2]. The crystal structure of the title compound has been determined by single crystal X-ray diffraction method (Figure 1). The title compound, $C_{24}H_{29}F_2N\ O_4$, crystalizes in the monoclinic space group P21/c with a = 17.6062(11) Å, b = 9.7588(7) Å, c = 13.1509(9) Å, β= 95.905(2)°, V = 2247.5(3) $Å^3$, Z = 4 at low temperature [100(2) K], R_1 = 0.0458, $\Delta\rho_{max.}$=0.207 and $\Delta\rho_{min.}$=-0.262 e.$Å^{-3}$. In the crystal, the components are linked into a three-dimensional framework by intra- and intermolecular hydrogen bonds.

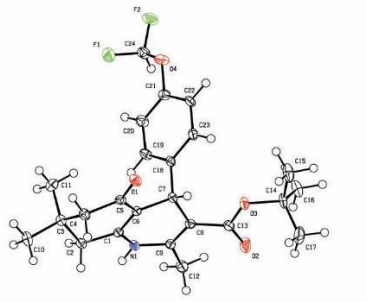

Figure 1. The molecular structure of the title compound. Displacement ellipsoids are drawn at the 50% probability level.

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PP26- Alternative Analytical Method and Validation to Pharmacopeia Methods for NDMA and NDEA Related Compounds of the Sartan Group Drug Product

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Nitrosamines are chemical compounds classified as probable human carcinogens on the basis of animal studies. EU regulators first became aware of nitrosamines in medicines in mid-2018 when nitrosamine impurities, including N-nitrosodimethylamine (NDMA), were detected in blood pressure medicines known as 'sartans'[1]. The EMA and the FDA reported a major issue regarding the detection of a genotoxic impurity, NDMA (N-nitrosodimethylamine), and subsequently NDEA (N-nitrosodiethylamine), in current lots of valsartan, an API used to manufacture generic angiotensin receptor blockers (ARBs). Most ARBs have a chemical structure that includes a tetrazole group.[2]

European Pharmacopoeia 2.5.42 N-Nitrosamine[3] in Actice Substances are three methods to analayze N-Nitrosamine. First method is LC-MS (liquid chromatography coupled with mass spectrometry), second method is GC-MS (gas chromatography coupled with mass spectrometry) and third method is GC-MS/MS (gas chromatography coupled with mass spectrometry). In this study, a new LC-MS method has been developed and validated for the simultaneous analysis of sartan group drug product and its NDMA, NDEA impurities, then its applicability in pharmaceutical preparations has been proven. In this method special QdA mass dedector is used.

In the developed method, XSelect CSH C18 (150 x 4.6 mm, 5 µm) column and 0.1% (v/v) Formic acid in water and 0.1 % (v/v) Formic acid in acetonitrile were used as stationary and mobile phases, respectively. Chromatographic separations were carried out at 40 °C column temperature, 10 °C autosampler temperature and samples were monitored by a QdA[4] detector with positive mode at 0.85 ml/min flow rate. Total analysis time was finalized as 17 minutes, NDMA retention time was approximately 3 minutes and NDEA retention time was approximately 7 minutes. According to validation results, the linearity range was obtained as 0.0000060 – 0.000192 mg/ml for NDMA, 0.0000054 – 0.000054 mg/ml for NDEA.
Sartan group drug product NDMA and NDEA impurities detailed analytical method validation study was conducted in the Ali Raif Pharmaceuticals according to the ICH guidelines[5] and pharmacopoeias.

Specificity, LOD, LOQ, linearity range, accuracy, precision, robustness and solution stability parameters were validated. All data obtained are within the acceptance criteria. This shows that the developed method is extremely suitable for the routine analysis of sartan group drug product NDMA and NDEA analysis especially in terms of speed and convenience.

Acknowledgement: This study was financially supported by Ali Raif İlaç Sanayi A.Ş. and completed in Ali Raif İlaç Sanayi A.Ş. R&D Analytical Laboratory.

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PP27- STANDARDIZED MEDICINAL AROMATIC PLANTS AND ESSENTIAL OILS BASED ON PHARMACOPOEIA STANDARDS

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The demand for medicinal and aromatic plants, which are important for human health and used in many fields, especially in medicine, food and cosmetics, is increasing day by day. In order to meet this increasing demand, efforts to obtain standardized and safe products are gaining momentum in direct proportion. Turkey has a very diverse flora and is home to many medicinal and aromatic plants. Despite having these valuable plants, medicinal and aromatic plants cannot contribute enough to the country's economy due to insufficient studies for obtaining standardized products supported by chemical and physical analyzes. The aim of this study is to produce safe and standardized herbal tea and essential oil from *Origanum vulgare* subsp. *hirtum* (Istanbul Thyme), *Salvia officinalis* (Sage) and *Melissa officinalis* (Lemon Balm) species that have an important place in the national economy. In this study, soil and water analysis of the determined land in Ankara province, Sincan district, Polatlar Village was made, the right plant species were selected, planting, harvesting and drying processes were carried out under appropriate conditions. All analysis including determination of heavy metal and mycotoxin levels were completed. After obtaining the essential oils from the plants, phytochemical content determinations and their suitability for Pharmacopoeia was verified. Harvests with high essential oil yield (Istanbul Thyme 5.07%, Sage 1.80% and Lemon Balm 0.65%) from four harvests made during two years were used to obtain essential oil. The content and component amounts of essential oils were determined using gas chromatography/mass spectrophotometry method. The major compounds of Istanbul Thyme is Carvacrol (72-78%); of Sage are α,β-Thujon (33-39%) and Camphor (%17.2); of Lemon Balm is Citral A,B (70-80%). The standardized plants produced after the analyzes were prepared to be presented to the market as herbal tea and essential oil. Among the further goals of the study is the production of cosmetic preparations that will contribute significantly to both human health and the country's economy by using plant extracts and essential oils.

Acknowledgement: This study is supported by Lokman Hekim University and Ankara Development Agency (Project No: TR51/21/KIRSAL/0004).

PP28- EVALUATION OF PHARMACISTS' PERSPECTIVES ON JOB SATISFACTION

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Individually, experiencing job dissatisfaction has negative effects on various parameters. It is often associated with poor mental health, especially stress and anxiety. The most decisive factors contributing to job satisfaction are defined as interest in the job field, a good work relationship with managers and colleagues, high-income and opportunities for career advancement [1]. This study aims to evaluate the perspectives of pharmacists working in different sectors on job satisfaction.

This study was conducted as a cross-sectional, online survey between December 2022 and January 2023. Pharmacists working in public institutions or in the private sector and having at least a bachelor's degree in pharmacy were included in the study. Our survey was adapted from a survey developed by the American Society of Health System Pharmacists (ASHP) to measure the job satisfaction of pharmacists working in the USA [2]. The relationship between risk factors that may have negative effects on job satisfaction and job satisfaction was evaluated comparatively and analysed.

A total of 169 pharmacists participated in the study. Most of the participants were female (69.8%) and worked in public institutions (67.5%). Among the pharmacists working in different sectors, fifty-four (32.0%) and forty pharmacists (23.7%) have the title of ‘Master of Science’ and 'Doctor or Specialist Pharmacist', respectively. Considering the intensive education process at the university, 74.6% of the pharmacists think that they are not given the value they deserve by the society. Workload satisfaction was similar among pharmacists working in the public institutions and private sectors [42 (36.8%) and 15 (27.3%), respectively; p=0.416]. When the physical conditions of the job field are evaluated; pharmacists working in the private sector were more satisfied than pharmacists working in the public sector [36 (65.6%) and 34 (29.8%); p<0.001].

Our findings suggest that pharmacists with postgraduate education have a more adequate vocational training (compared to pharmacists without additional education) and pharmacists would benefit from postgraduate education. In addition to education, it was found that the average salary (monthly) of pharmacists was variable, and a large proportion (73.4%) of pharmacists did not receive sufficient salary. As a result of our study, considering the qualified education of pharmacists, policy makers may think that policies affecting the pharmacists should be more inclusive and supportive. In addition, this will guide in shaping the perspectives of pharmacy faculty students who will be recently graduated.

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PP29- ANTICHOLINESTERASE PROPERTIES OF NOVEL PHTHALOCYANINES

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Alzheimer's disease (AD), a neurodegenerative disorder, is characterized by memory and cognitive decline. Although the etiology of the disease is not clarified, hypotheses, such as cholinergic neurotransmission, protein metabolism in amyloid plaque, and tau proteins have been suggested to try to explain the cause of AD [1]. Therefore, cholinesterase inhibition is an important therapeutic approach for AD. In recent years, phthalocyanines have been very attractive in both pharmaceutical and biological fields due to their anticancer, antioxidant, and enzyme inhibition properties etc. In this study, we aimed to investigate anticholinesterase properties of tetra-({6-[3-(diethylammonium)phenoxy)hexyl}oxy substituted zinc (II) and nickel (II) phthalocyanines (DE-C6-CN, DE-C6-ZnQ, and DE-C6-NiQ).

The acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE) inhibitory properties of the compounds were examined using spectrophotometric methods. Cytotoxic properties of the compounds were tested against SH-SY5Y human neuroblastoma cell line (ATCC, CRL-2266) using (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Molecular docking was performed using Glide (2021-2, Schrödinger LLC, New York, NY).

The IC_{50} values of DE-C6-ZnQ and DE-C6-NiQ were found as 0.83±0.26 µM and 0.61±1.05 µM on AChE, respectively. DE-C6-ZnQ and DE-C6-NiQ inhibited AChE and BuChE via competitive pathway. Based on the cell viability results, IC_{50} values of DE-C6-ZnQ and DE-C6-NiQ were found as 41.84±0.99 µM and 19.45±2.07 µM, respectively. Molecular docking predicted stronger affinity between DE-C6-CN and AChE than BuChE. The results indicated that the compounds have potential to be used in the treatment of AD. This hypothesis needs to be confirmed by further studies.

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PP30- IN VITRO INVESTIGATION OF BIOLOGICAL ACTIVITIES OF EPIMEDIM PUBIGERUM (DC.) C. MOREN & DECNE

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Lung cancer ranks among the highest in terms of morbidity and mortality among cancer types. The genus *Epimedium*, a member of the Berberidaceae family, is known as keşişkülahı in Turkey and is represented by 2 species in the Black Sea Region [1]. In this study, we aimed to investigate biological activities of *Epimedium pubigerum* (DC.) C. Moren & Decne using different methods.

The plant was collected during blooming period in Dernekpazari, Trabzon, Türkiye, in April 2022. In this context, firstly, the phytochemical content of the extracts were determined using LC-HR/MS and spectrophotometer. Then, DNA interaction were examined using agarose gel electrophoresis. To determine the cytotoxicity of the extracts on human lung cancer (A549) cells, MTT cell viability test and cell migration analysis were performed. Finally, the expressions of p53, caspase-3, and cytochrome c were examined using western blotting technique on A549 cells.

It revealed that fumaric acid is the most abundant compound for both extract. The total phenolic content of RME was 215.65 ± 8.11 mg GAE/g dry weight. RME had the highest protective effects against Fenton's reagent and singlet oxygen. Both extracts exhibited a dose-dependent cytotoxicity on A549 cells. The expression of p53, caspase-3, and cytochrome increased significantly in the presence of RME.

In the light of these results, it has been determined that the extracts have the crucial potential to be used in the treatment of lung cancer, but this hypothesis should be supported by further studies.

Acknowledgement: This work was supported by Office of Scientific Research Projects of Karadeniz Technical University. Project number: TYL-2022-10516.

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PP31- DEVELOPMENT OF THE FIRST GENERIC DRUG OF LYOPHILIZED CAPREOMYCIN SULFATE IN TURKEY

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Capreomycin is the active substance of Capastat commercialized by Akorn in 1971 in the US. This drug is used in the treatment of caused by Mycobacterium tuberculosis bacteria. The infection occurs in the respiratory tract and cough, chest pain, fatigue, weight loss, fever and night sweats are common symptoms of this infection. It is estimated that approximately 1/4 of the worldwide population has been infected by these bacteria but most of the people does not develop symptoms. The incidence of Tuberculosis infection in the world is 10 million people per year and the mortality is around 1.5 million people every year around the world. [1] In Turkey, the incidence of this disease is 14.1/100000 people per year. Regarding these numbers, this infection remains a global public health issue especially in third world countries. [2] Capreomycin is an aminoglycoside antibiotic produced by Sterptomyces capreolus and is thought to disrupt the bacterial homeostasis by inhibiting the protein synthesis. [3] It is used as a second line treatment concomitantly with other antituberculosis agents when the first line drugs (like isoniazid, rifampin, ethambutol, and pyrazinamid) have failed or showed toxic effects. The aim of this study was to develop the first generic drug of Capastat in Turkey. The first objectives were to find the appropriate API meeting the USP monograph's specifications and then to develop the lyophilized formulation of Capreomycin injection by optimizing the lyophilization process. After proving that the developed formulation meets the USP finished product monograph specifications, pilot batches were manufactured in order to follow the stability of the developed formulation. Stability studies were performed for long term and accelerated conditions. After 6 months of stability monitoring, the results show that the developed formulation is stable. With the collection of these data, an application was submitted to the TİTCK for a marketing authorization in Turkey.

Acknowledgement: For their contribution to realization of this project; we would like to thank Centurion İlaç.

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PP32- SINGLE-STEP EXTRACTION OPTIMIZATION STRATEGIES FROM PLASMA SAMPLE with EXPERIMENTAL DESIGN STRATEGIES for INTEGRATED METABOLOMICS AND LIPIDOMICS ANALYSIS by GC-MS and LC-MS

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A comprehensive analysis of intermediate molecular levels such as protein, metabolite, and lipid is necessary to illuminate direct causal and functional linkages between genotype and phenotype [1-3]. In this regard, multiple sample sets/aliquots and analytical methods are required to cover different intermediary molecular levels due to the dissimilarity of the physicochemical characteristics of biomolecules [4-5]. However, existing methods used for the simultaneous analysis of metabolites and lipids have not been thoroughly tested for reproducibility and wide applicability. Here, we developed and optimized comprehensive, reproducible, and robust metabolomics and lipidomics analysis from plasma samples. For this, we used experimental design strategies for developing a single-step extraction protocol and optimizing analytical protocols for GC–MS and LC-qTOF-MS analysis. The extraction efficiency of acetone, acetonitrile, ethanol, methanol, water, and combinations was tested for metabolites, whereas hexane, chloroform, dichloromethane, and methyl tert-butyl ether were tested for lipids. The methanol:water:chloroform (3:1:3, v/v/v) mixture was superior to the other extraction solvent combinations in all performance measures. We found that the derivatization efficiency increased with a higher concentration of methoxyamine hydrochloride (30 mg/mL in pyridine) and incubation time (at 37 °C for 120 min) with MSTFA + 1% TMCS. For LC-qTOF-MS, the reconstitution solution, and the column temperature was found critical for metabolomics and lipidomics analysis, respectively. This systematic optimization by integrated GC-MS and LC-qTOF-MS enables simultaneous, reproducible, and comprehensive analysis of metabolites and lipids from a single sample, making it a straightforward and practical approach for various sample types. By less than 30% CV, 50 metabolites were identified in GC-MS, 68 metabolites, and 353 lipids in LC-qTOF-MS analysis from plasma samples.

Acknowledgement: This study is supported by Hacettepe University Scientific Research Coordination Unit (Project Number: TSA-2020-18566).

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PP33- STUDIES ON THE SYNTHESIS OF SOME NOVEL BENZYL THIAZOLYL CARBAMATE COMPOUNDS AS HDAC INHIBITOR

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Cancer is a multi-stage disease with the effect of genetic and epigenetic factors and accumulation of hereditary or acquired mutations in cells [1]. Heritable changes that do not result from a change in the DNA nucleotide sequence but occur in the phenotype are called epigenetic changes [2]. Epigenetic rearrangements are achieved by DNA methylation or histone modifications. Histone modifications occur by adding acetyl, methyl and phosphorus groups to histone tails that are outside the nucleosome structure [3]. Histone acetylation is catalyzed by the two large enzyme families, histone acetyltransferase (HAT) and histone deacetylase (HDAC), which function in opposition to each other. Deregulation of histone acetylation leads to proliferation and increase of tumor-forming oncogenes [4]. Studies have shown that HDAC inhibitors significantly reduce tumor growth and metastasis, do not affect all organ systems, and have toxic effects only on tumor cells [5].

In this study, carbamate compounds were synthesized considering HDAC inhibitor proporties. The structures of the synthesized compounds have been elucidated; activity studies are continue.

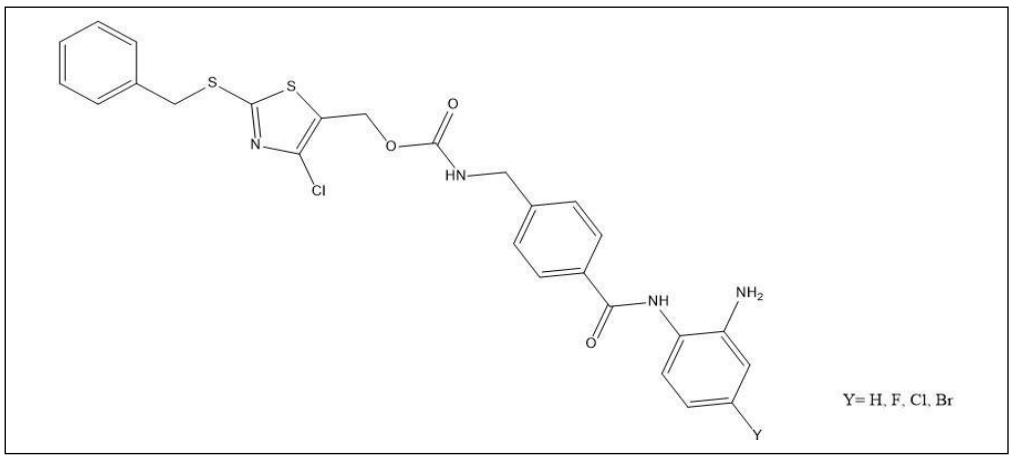

Figure 1. General formula of synthesized compounds..

Acknowledgement: This study is supported by TUSEB (Project No: 12220).

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PP34- STUDIES ON THE SYNTHESIS OF SOME NOVEL PHENYL TETRAZOLO THIAZOLYL CARBAMATE COMPOUNDS AS HDAC ENZYME INHIBITORS

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Cancer is caused by the somatically inherited dysregulation of genes. All human malignancies have epigenetic alterations, which are now understood to work in concert with genetic changes to influence the cancer phenotype[1]. Genetic control by elements other than an individual's DNA sequence is known as epigenetics. Genes can be turned on or off by epigenetic modifications, which also affect which proteins are expressed. Through altering gene transcription, chromatin remodeling, and nuclear architecture, posttranslational modifications of histones, may be a key factor in the initiation and spread of cancer[2]. Epigenetic modifications such as histone modifications can lead to gene mutations, and conversely, mutations are frequently seen in genes that modify the epigenome[3]. Histone acetyltransferases (HATs) and histone deacetylases (HDACs) compete with each other to govern the well-studied posttranslational histone modification known as histone acetylation[4]. HDACs change the transcription of oncogenes and tumor suppressor genes by reversing chromatin acetylation. Moreover, HDACs deacetylate a large number of nonhistone cellular substrates that control a variety of biological processes, such as the beginning and development of cancer[5]. Considering their ability to acetylate histones at lysine residues and to cause open chromatin conformation at tumor suppressor gene, HDAC inhibitors are potent therapeutic agents that can inhibit tumor growth[6].

In this study, based upon FDA approved benzamide derivative therapeutics, several benzamide derivative compounds were designed and synthesized considering the antineoplastic properties of HDAC inhibitors. The structures of the synthesized compounds have been elucidated; activity studies are ongoing.

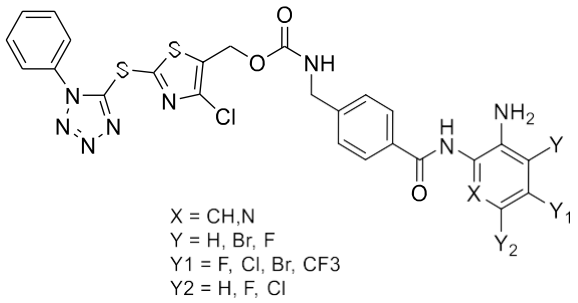

Figure-1: General formula of the synthesized compounds.

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PP35- NOVEL 3-AMINO-THIOPHENE-2-CARBOHYDRAZIDE DERIVATIVES AS POTENTIAL ANTI CANCER AGENTS: SYNTHESIS, CHARACTERIZATION, MOLECULAR DOCKING, DYNAMICS AND ADME STUDIES

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Breast cancer, colorectal cancer, and cervical cancer are the most common cancer seen in women and causes death according to global cancer statistics for 2022. Breast cancer constitutes 25% of cancer types seen in women and causes 15% of death. In addition, breast cancer was identified as the most diagnosed cancer type worldwide in 2022 [1].

In this study, 10 new arylidenehydrazide derivatives **(1-10)** were synthesized starting from 3-amino-thiophene-2-carboxylic acid methyl ester (Figure 1). All the synthesized compounds were characterized by spectroscopic methods such as NMR and HRMS. To determine inhibitory activities of synthesized compounds, they were tested against different cell growth factors, especially related with breast (HER-2 and EGFR) and colorectal (TGF-βII) cancer by *in silico* methods. Molecular dynamic studies were also performed to determine the stability of ligand-protein complexes which are the best-docked poses of molecular docking. In addition, *in silico* ADME parameters and drug similarities of all the synthesized compounds were evaluated [2].

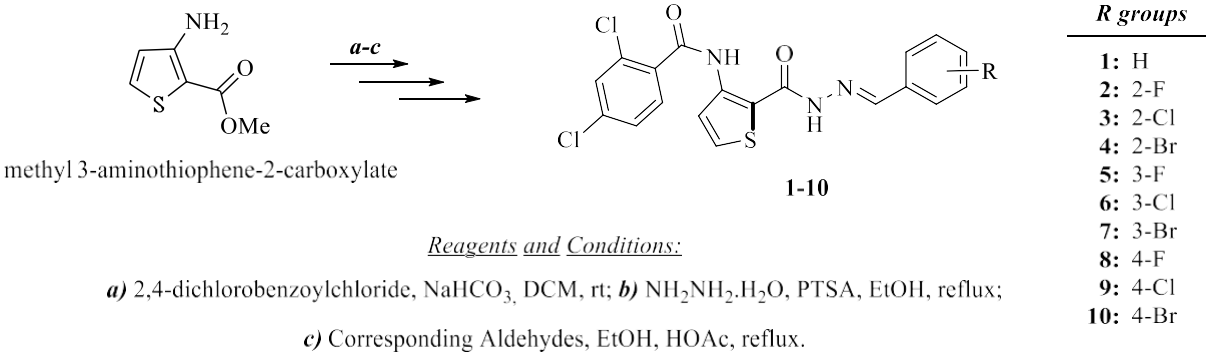

Figure 1. Synthesis of target compounds

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PP36- EVALUATION OF THE DRUG-DRUG INTERACTIONS IN PRESCRIPTIONS DISPENSED IN COMMUNITY PHARMACIES OF THE NORTHERN CYPRUS

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A drug interaction (DI) occurs when the pharmacological effects of one drug are altered by another drug, leading to an unintended clinical results [1-3]. This study was aimed to evaluate the drug-drug interactions (DDI) in prescriptions dispensed in community pharmacies of Northern Cyprus.

A prospective descriptive study of prescription analyses was conducted for a period of 5 months, from October 2021 to February 2022. A total of 750 prescriptions were collected from different community pharmacies in distinct regions of Northern Cyprus. The prescriptions were processed using the Drug Interactions Checker within the www.drugs.com database. The identified potential DDIs were categorized into three classes, major, moderate and minor, according to their level of clinical significance. In addition, the legibility of the prescription format and the availability of the information about the prescribed drugs were also investigated.

It was determined that 451 (60.1%) of the 750 prescriptions containing two or more drugs. Overall at least one DDI was found in 96 of 451 prescriptions (21.3%). When a total of 132 DDIs in prescriptions were analysed according to the severity; 10.6% of them was major where as 71.2% of them was classified as moderate interactions. The most frequently observed DDIs were paracetamol-hyoscyamine (n=5) and ciprofloxacin-ketoprofen (n=4). It was also determined that both major and moderate DDIs were frequently prescribed by the cardiologist. On the other hand, when those prescriptions were analysed according to the availability of the included information, it was found that patients age (94.9%) and the diagnosis (87.6%) were the least available information in prescriptions

DIs are commonly ignored or given inadequate consideration therefore DIs alone can have a significant role in the development of adverse drug reactions and adverse drug events. Because polypharmacy is one of the major causes of DDIs, a full review of the patient's health and medications should be undertaken prior to prescribing or adding more prescriptions to their present treatment regimen.

Key words: Drug interactions, Polypharmacy, Prescriptions, Interaction severity.

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PP37- SYNTHESIS, CHARACTERIZATION, MOLECULAR DOCKING, DYNAMICS AND ADME STUDIES OF NOVEL NIPAGIN DERIVATIVES AS POTENTIAL ANTI-INFLAMMATORY AGENTS

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Inflammation is a natural response of immune system against injury, infection, or irritation. Although inflammation is a necessary and important process, it can be harmful and contribute to various diseases, including arthritis, asthma, heart disease, and cancer. So, the discovery of new, powerful, and selective anti-inflammatory agents is important for the treatment of related diseases [1].

In this study, 10 new arylidenehydrazide derivatives **(1-10)** were synthesized starting from nipagin (Figure 1). All the synthesized compounds were characterized by spectroscopic methods such as NMR and HRMS. To determine inhibitory activities of synthesized compounds, they were tested against different proteins related to inflammation, such as TNF-α, iNOS, COX-2, by *in silico* methods. Molecular dynamic studies were also performed to determine the stability of ligand-protein complexes which are the best-docked poses of molecular docking. In addition, *in silico* ADME parameters and drug similarities of all the synthesized compounds were evaluated [2].

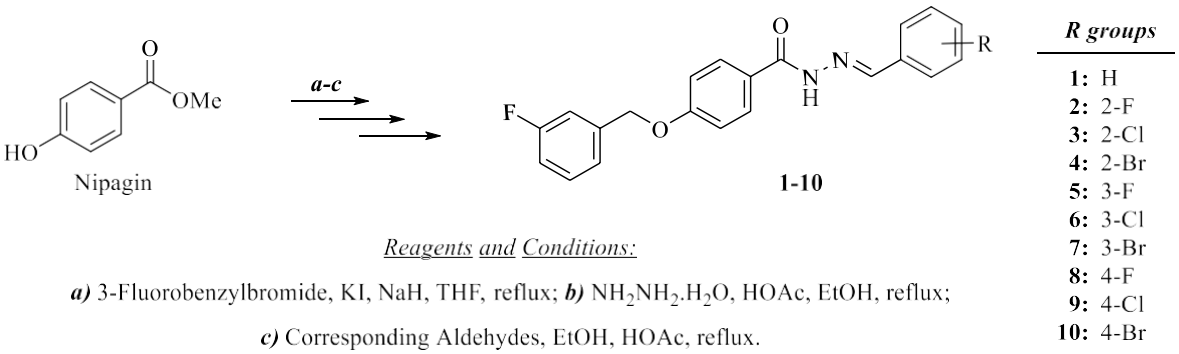

Figure 1. Synthesis of target compounds

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PP38- QUANTUM DOTS AS A SOLUTION FOR LEWY BODY DEMENTIA AND PARKINSON DISEASE

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Parkinson disease (PD) is the second-most common neurodegenerative disorder that affects 2– 3% of the population ≥65 years of age [1]. PD is caused by deterioration of the dopaminergic neurons in the extrapyramidal tract of the midbrain. There is also accumulation of a-synucleinproteins, known as Lewy bodies, in the central, autonomic, and peripheral nervous system. . Itis unknown what triggers the initiation of PD; however, most investigators point to a combination of genetic and environmental factors [2]. Lewy bodies are the inclusion bodies, mainly exhibits some abnormal aggregations of protein in the cells in brain that develops PD. Lewy bodies are seen in dementias and some other disorders. They are also seen in cases of multiple system atrophy, particularly the parkinsonian variant [3]. Amyloids are also in cell materials. Prion-like amyloids self-template and form toxic oligomers, protofibrils, and fibrils from their soluble monomers; a phenomenon that has been implicated in the onset and progressof neurodegenerative disorders such as Alzheimer's (AD), PD, Huntington's, and systemic lysozyme amyloidosis. All these health problem needs to be solved by in cell solubility enhancer. If the problematic protein can be solubilized enough or any in cell material can dissolve these proteins they can be used to treat all these mentioned diseases.

Quantum dots (QDs) are tinny fluorescencent nanoparticles (NPs). Nowadays, a great interest is given to the extensive use of theranostic-NPs for sensing, imaging, treatment, and drug delivery. The blood-brain barrier (BBB) protects the brain tissue [4]. Carbon quantum dots (CQDs) are able to help molecules to enhance solubility by menas of high surface area. A kind of CQDs tested for their ability to intervene in amyloidogenic (fibril-forming) trajectories. Hen-egg white lysozyme (HEWL) served as a model for amyloidogenic proteins [5]. Their results revealed that CQDs can be able to distrup fibril forming in te cells. This can be also used to inhibit Lewy body forming in the cells suggesting that CQD has the potential to intervene bothprophylactically and therapeutically in protein misfolding diseases.

In this study, CDQs were produced to be used against to these protein misfolding diseases. CQDs were formed in one step production. The production of CQDs was confirmed by UV light (365 nm). A bright blue or green ligth emitting CQDs were succesfully obtained. The procedure was optimized. Produced CQDs were proposed to be used for HEWL dissolving potential in in-vitro experiments. Oral administration of CQDs shwon to be possible [6]. Therefore oral administration of these CDQs were suggested to be used to reduce Lewy bodiesfor demanthia patients.

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PP39- DESIGN OF VITAMIN C LOADED PROLIPOSOME FORMULATION FOR ORAL USE

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Vitamin C is a strong antioxidant with multiple applications in the cosmetic and pharmaceutical fields. Nevertheless, the biggest challenge with vitamin C utilization is maintaining its stability and enhancing its distribution to the target area. Several methods have been developed for this purpose[1]. In this study, vitamin C has been loaded into a proliposomal system in order to formulate an oral formulation. Vitamin C-loaded proliposomal systems will resolve stability problems, increase bioavailability, and increase antioxidant activity.

A spectrophotometric method using multiple dissolution media has been developed for the estimation of vitamin C. Mentioned dissolution media are distilled water, 0.1M HCl[2], methanol[3], phosphate buffer (pH 6.8) and phosphate buffered saline (pH 7.4). Validation parameters were done according to “ICH Q2(R2) Validation of analytical procedures”. All validation parameters were applied to each dissolution medium, and a quantification method was developed.

Next step was developing a proliposome formulation [4]. For vitamin C, proper lipid/lipid combinations were determined. After that, the API-lipid ratio, solvent and hydration medium were determined. Liposomes created by the film hydration method underwent lyophilization and proliposomes were obtained. The ultimate formulation was chosen considering these parameter values: particle size and distribution, zeta potential, pH, viscosity, encapsulation efficiency, API release properties and redispersibility. In vitro release studies were conducted using a dialysis membrane bag with pH 1.2 and pH 6.8 phosphate buffer at 37°C and 100 rpm. Stability studies of the ideal formulation were studied at 5 ± 3 °C (refrigerated), 25 ± 5°C (room temperature), and 40 ± 5°C.

Acknowledgement: This study was supported and funded by TUBITAK as a part of their TUBITAK 2209-B Undergraduate Research Projects Support Program for Industry. We thank the DEVA Holding for the donation of ascorbic acid.

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PP40- CHARACTERIZATION OF DRY POWDER INHALER FORMULATIONS CONTAINING GEFITINIB-HSA NANOPARTICLES

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Non-small cell lung cancer is a common type of lung cancer, and the survival rate of patients is very low [1]. One of the most significant problems in the treatment of lung cancer is the occurrence of severe systemic side effects in orally or parenterally administered formulations, as well as the inability to deliver the desired level of drug to the tumor site. To overcome this problem, an inhaler formulation was developed in the form of a dry powder inhaler (DPI). DPI is more stable, easy to transport, does not require hand-inhalation coordination, delivers a higher amount of drug in a shorter period, and does not contain propellant gas. Gefitinib, a tyrosine kinase inhibitor commonly used in the treatment of lung cancer, was used as the active substance. To increase the efficacy and cellular uptake of this low-solubility active substance, nanoparticles smaller than 200 nm were produced using human serum albumin (HSA). The produced nanoparticles were surface-modified with hyaluronic acid for CD44 targeting to increase accumulation in tumor tissue.

The characterization of produced nanoparticles and DPI formulations was carried out through a range of analyses, including Fourier Transform Infrared Spectroscopy (FT-IR), Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), X-ray Diffraction (XRD), Transmission Electron Microscopy (TEM), and Brunauer–Emmett–Teller Surface Area Measurement (BET). It was observed that the encapsulated gefitinib in the developed DPI did not have any gefitinib functional group in FT-IR analysis, which was supported by the disappearance of the melting peak of the active substance in the DSC analysis. XRD analysis indicated an amorphous transition in the DPI formulation, which can enhance the solubility of substances but also carries a risk of moisture uptake. However, according to the results of TGA under accelerated stability conditions, the transition to an amorphous structure did not result in increased moisture. TEM images of HSA nanoparticles showed a spherical structure consistent with the literature [2]. In TEM images of DPI, nanoparticles were not visible due to the presence of the carrier and the trapping of the particles in the carrier as a result of the lyophilization process. However, BET analysis supported the production of highly porous powders with a high surface area by the lyophilization method and indicated that the presence of carriers increased the surface area of the formulation by more than six fold.

As a result, the analysis showed that amorphous DPI formulations containing gefitinib-HSA nanoparticles with low moisture and high porosity were successfully produced as desired.

Acknowledgement: This study was supported by a grant from TÜBİTAK (SBAG-120S895).

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PP41- STUDIES ON PREPARATION, CHARACTERIZATION AND STABILITY OF ELECTROSPUN PROLIPOSOMES

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Liposomes have been recognized as a prominent drug delivery system owing to their biocompatibility, prolonged circulation time, and availability to surface modifications [1]. However, their poor physical stability is a major limitation. Electrospinning is a versatile method that incorporates numerous drugs into polymeric nanofibers. Utilizing self-assembling liposomes obtained from nanofibers could be a beneficial approach to overcome the stability issues of the liposomes. In this research, soy phosphatidylcholine (PC) and PC/Cholesterol (Chol) pro-liposome nanofibers were produced using polyvinylpyrrolidone (PVP) through a one-step electrospinning method to obtain self-assembled liposomes in dry state. All formulations were effectively electrospun according to scanning electron microscopy (SEM) images. Differential scanning calorimetry (DSC), Fourier transform infrared spectroscopy (FT-IR), and X-ray diffraction (XRD) analyses were carried out. The hydration of PC/Chol-containing nanofibers resulted in liposomes of around 150 nm with a zeta potential of -23.5 mV and a polydispersity index (PDI) of 0.3. Self-assembled liposomes acquired through the hydration of nanofibers had very low PDI values without any extrusion or sonication steps. No vesicular structure was observed for PVP nanofibers without PC. Stability data for three months demonstrated that no significant change in characterization parameters was observed. It was concluded that self-assembled liposomes from nanofibers could be an innovative approach for many low-soluble and unstable drugs.

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PP42- AN ALTERNATIVE EVALUATION METHOD FOR PHYTOCOSMETICS, NUTRACEUTICALS AND MEDICINES

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C.elegans is a small, free-living soil nematode that lives in many parts of the world and survives by feeding on microbes, mainly bacteria. It is an important model system for biological research in many fields, including genomics, cell biology, neuroscience and aging. Many of the genes in the C. elegans genome have functional counterparts in humans which makes it an extremely useful model for human diseases.(1)
Vitis vinifera seed extract is widely used in antiaging products with its antioxidant properties. It helps to delay the signs of aging by protecting the skin against the damage of UV rays(2). P. pinaster bark extract contains polyphenolic compounds capable of producing diverse potentially protective effects against chronic and degenerative diseases(3). In this study the content of commercial extracts were determined. Major compounds detected. Then antioxidant activity of one by one extracts were compared with combination

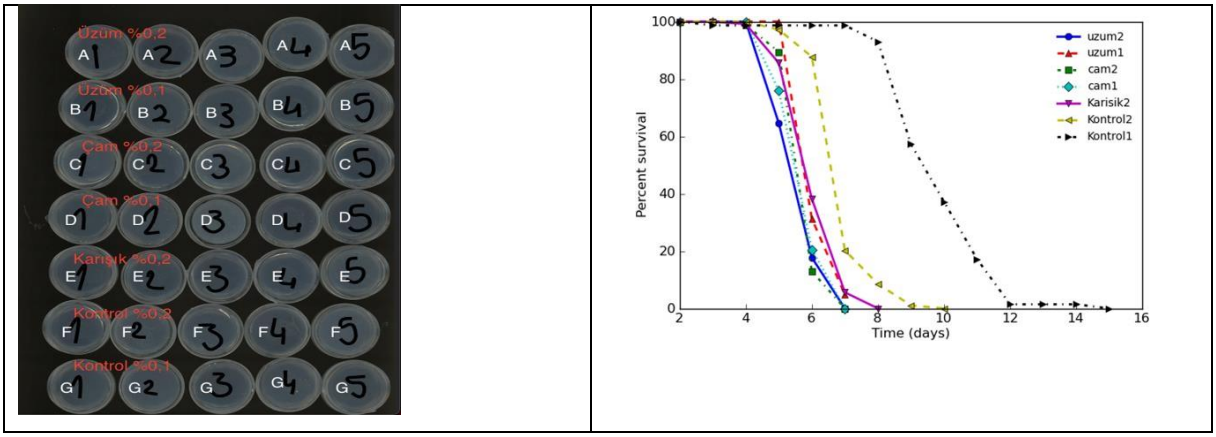

Figure 1 Experiment design for counting of nematodes and survival life cycle comparision aginst the extracts.

C. elegans is an established model organism for biological research, disease modeling, drug discovery and aging. This model may be an affordable solution for evidence-based product development and ingredient testing for both cosmetics and nutraceuticals. It is without cruelty and with less money and safety.

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PP43 -EFFECTS OF FACE MASKS ON THE SKIN IN THE COVID19 PANDEMIC

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During the COVID-19 pandemic, the use of masks has become mandatory to protect against the virus transmitted by breathing It has been stated that the rate of virus transmission is significantly lower in countries with mask mandatory requirements. Furthermore, it has been reported in studies conducted in different countries that the use of masks causes significant decreases in mortality rates (1,2)

API-100 skin analyzer is used in the scientific evaluation of Moisture, Elasticity, Pore, Melanin, Acne, Wrinkle and Sensitivity parameters on the skin according to categories of age, gender and race. According to to the device algorithm, the parameters can be measured with numerical values and compared with the average of parameters in same categories. Measurements taken from the same point are compared in order not to cause differences between the measured places.

Masks that cover the face increase the moisture on the skin surface due to their low breathability and cause sweat, dirt and oil to accumulate on the surface. Such being this case some adverse effects like acne, irritation, etc., can be seen especially in mask users with sensitive skin. It is aimed to monitor these effects with camera of the skin analyzer, to measure with numerical values, to record them and to evaluate them statistically.

In the study healthy subjects were ranged from 18 to 61 years old. Domestic and foreign students studying and working at Istinye University. Statistical evaluations were carried out in the SAS Version 9.4 program.

As a result of our research on the skin of 83 volunteers during the pandemic process, it has been seen that long-term use of surgical masks may have negative effects on the skin. The increase in the amount of pore can be caused by the damage of the skin cells that do not take air over time and the accumulation of oil and bacteria on the face. This can lead to the enlargement of skin pores and the formation of pimple, acne and blackheads. For this reason, it was observed that acne formation was significantly higher. The decrease in the elasticity parameter and the higher wrinkle parameter are related to each other. The increase in melanin pigment indicates increased darkening of the skin and demonstrates the potential of skin blemish (3)

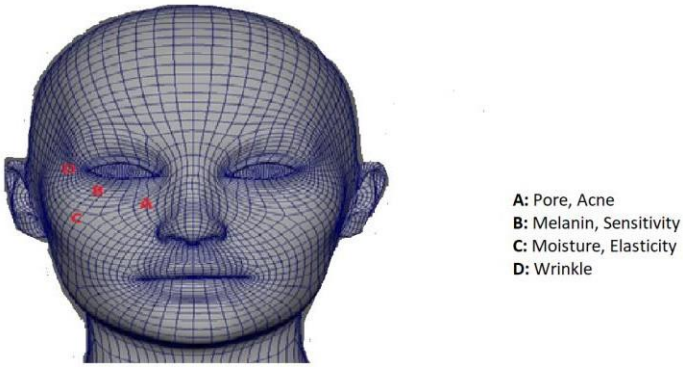

Figure 1 Analyze points for skin parameters

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PP44- HYALURONIC ACID AND CAFFEINE QUANTUM DOTS FOR WOUND HEALING AND SKIN REPARING IN PATIENTS HAVING NEURODEGENERATIVE DISEASES

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Neurodegenerative diseases are characterized by progressive loss of neuron functions and structural deterioration. This degeneration may occur coincidentally, by environmental effects, genetic predisposition or a combination of these. Due to the increase in the average life expectancy, the number of patients with neurodegenerative diseases is increasing day by day and these diseases are becoming a social problem [1]. Neuronal disorders including Alzheimer's disease, Parkinson's disease, and Prion's disease, caused by combination with multiple factors. These patients can not control their movements and they are highly facing some injuries. Their skin is also became pale incapabable to repair itself fast. HA systems have been increasingly reported in studies of diseases, replacement of tissue and organ damage, repairing wounds, and encapsulating stem cells for tissue regeneration. the last decade, hyaluronic acid (HA) has attracted an ever-growing interest in the biomedical engineering field as a biocompatible, biodegradable, and chemically versatile molecule. In fact, HA is a major component of the extracellular matrix and is essential for the maintenance of cellular homeostasis and tissue regeneration. Innovative experimental strategies in vitro and in vivo using three-dimensional HA systems have been increasingly reported.

The quantum dots are the zero-dimensional nanostructures with particle size of 2-10 nm, intermediary between bulk semiconductors and discrete molecules owing outstanding optical and electrochemical properties due to their characteristics like luminescence, photostability, electronic properties, high excitation capacity, size tunable emission. These features preserve their applicability in the diagnostics, bioimaging, biosensing and therapeutics etc. The quantum dots show their efficiency in diagnosing and treating the neurodegenerative diseases as they are capable of crossing blood brain barrier and biocompatible with the neuronal cells with low cytotoxicity [2].

Numerous reports over the years have described the positive effect of HA on tissue regeneration and wound healing. In this study, hyaluronic acid and caffeine CDQs were produced first time using an adopted method that was previously reported [3]. Hyaluronic acid and caffeine CQDs were prepared to be used against to skin wounds or damage. CQDs were formed in one-step production. The production of CQDs was confirmed by UV light (365 nm). A bright blue or green light emitting CQDs was successfully obtained. The procedure was optimized. Produced CQDs were proposed to be used topically. A Cream and gel formulation was prepared.

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PP45- SYNTHESIS AND CHOLINESTERASE INHIBITORY ACTIVITY STUDIES ON PYRIDINIUM DERIVATIVES

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Alzheimer's disease is a progressive neurodegenerative disorder and is mostly characterized by impaired cholinergic transmission. There are multiple hypotheses for the etiology of the disease, however, the cholinergic hypothesis, which can simply be explained as the inability to make enough use of the molecule acetylcholine (ACh) in the brain, is the most studied one. Acetylcholinesterase (AChE) inhibitors aim to increase the level of ACh in the synaptic cleft and improve cognitive functions [1]. While cerebral enzyme inhibition is crucial for the symptomatic treatment of Alzheimer's disease, peripheral enzyme inhibition is also targeted for the treatment of Myasthenia Gravis and glaucoma [2].

In this study, we have designed and synthesized novel benzylpyridinium derivative that target the acetylcholinesterase and butyrlcholinesterase inhibition. The final compound was synthesized in two steps. In the first step, 4-chloroacetophenone and 3-pyridinecarboxyaldehyde were reacted [3]. Then, the obtained compound was refluxed with benzylchloride to obtain benzylpyridinium derivative [4]. The AChE and BChE enzyme inhibitory activities of the final compound were measured by using slightly modified Ellman's method. [5].

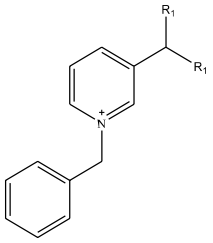

Figure 1. The structure of the final compound.

Acknowledgement: This project was supported by Ege University Office of Scientific Research Projects (Project Number: TS-LKP-2023-29580).

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PP46- SYNTHESIS AND BIOLOGICAL EVALUATION OF SOME N-(ARYLAMINOMETHYL)-BENZOXAZOLONE DERIVATIVES

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α-Glucosidase secreted from the epithelial membrane of the small intestine is the key enzyme which involved in the digestion of carbohydrates. With the inhibition of this enzyme, the conversion of carbohydrates to monosaccharides is suppressed reducing the glucose absorption from small intestine. Thus, postprandial hyperglycemia which is known to be damaging to the vital organs can be prevented. Based on this information, targeting α-glycosidase is thought to be an effective strategy in the treatment of type 2 diabetes mellitus (T2DM) [1]. T2DM is one of the most challenging diseases for pharmaceutical researchers in the 21st century. The development of more effective and safer compounds is needed due to the undesirable properties of current α-glycosidase inhibitors such as insufficient activity and gastrointestinal side effects, etc [2].

Heterocyclic rings are promising tools that have been studied extensively by medicinal chemists for the design and development of new agents [3]. In addition, there are many studies focused on Mannich bases, which are known to exhibit many biological activities. Also, Mannich bases add hydrophilic character to the molecule by aminomethylation process. In this respect, Mannich bases have importance in the design and synthesis of α-glucosidase inhibitors with a polar group and hydrophilic character [4]. In the light of this information, we synthesized some *N*-(arylaminomethyl)-benzoxazolone derivatives containing different polar groups on the aromatic amine. Structure of the final compounds were confirmed by spectral analyses (IR and ^{1}H NMR). α-Glucosidase inhibition studies were carried out spectrophotometrically in comparison to reference drug acarbose [5]. Based on biological activity results, tested compounds exhibited moderate to weak α-glucosidase inhibitory activity when compared to acarbose.

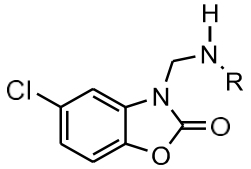

Figure 1. General structure of final compounds

Acknowledgement: This study was supported by grant from The Scientific and Technological Research Council of Turkey (TÜBİTAK, Project Number:1919B012202891).

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PP47- SYNTHESIS AND BIOLOGICAL EVALUATION OF SOME PHTHALIMIDE-MANNICH DERIVATIVES AS α-GLUCOSIDASE INHIBITORS

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Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder associated with high blood glucose levels that affects more than 400 million peoples worldwide. One of the therapeutic decorum in the treatment of T2DM is the inhibition of α-glucosidase enzyme, which is involved in carbohydrate metabolism [1]. As a result, the breakdown of polysaccharides into monosaccharides in the small intestines slows down, and thus the rapid increase postprandial hyperglycemia can be prevented [2]. Currently, three α-glucosidase inhibitors- acarbose, voglibose and miglitol- are known to exist in clinical use. Sugar-like molecular structure, gastrointestinal side effects and a multi-step and high-cost synthesis procedure of these drugs forced the researchers to discover small and effective molecules as promising α-glucosidase inhibitors [3].

The phthalimide ring is one of the important heterocyclic templates in the structure of many drug molecules with various biological activity including antidiabetic activity [4]. On the other hand, it is known that Mannich bases are important pharmacophores or bioactive precursors that are utilized in the synthesis of various potential agents of high medicinal value carrying aminoalkyl chains [5]. In line with this information, we aimed to synthesize and evaluate α-glucosidase inhibitor activity of four phthalimide-Mannich derivatives. IR ve ^{1}H NMR spectral analysis were used to confirm the structure of the target compounds. Biological activity studies were performed by spectrophotometrically in order to determine *in vitro* α-glucosidase enzyme inhibition and acarbose was used as reference compound [6]. As observed through biological data analysis, these derivatives emerged as lead compounds for future investigations.

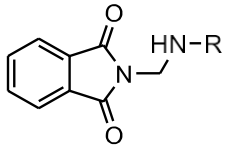

Figure 1. General structure of the synthesized compounds

Acknowledgement: This study was supported by grant from The Scientific and Technological Research Council of Turkey (TÜBİTAK, Project Number:1919B012206137).

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PP48- A REVIEW OF PATIENT COMPLIANCE IN THE TREATMENT OF PARKINSON'S DISEASE

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The aim of this study is to evaluate the current treatment approaches in the treatment of Parkinson's Disease (PD) from a patient compliance perspective. PD is an important disease that occurs with a degenerative disorder of the central nervous system and causes loss of brain cells. It is characterized by dyskinesia, akinesia, posture and balance disorders, cognitive and behavioral disorders, autonomic dysfunction, and dysatria symptoms [1]. PubMed, Scopus, Google Scholar, ScienceDirect, WHO ATC/DDD Index, FDA Orange Book, and Turkish Medicines and Medical Devices Agency (TİTCK) List of Licensed Medicinal Products for Human Use databases were searched to identify treatment options and patient compliance issues in PD. Today, treatments for PD are mostly aimed at controlling the symptoms of the disease. For treatment purposes, levodopa, which enables a small number of dopaminergic neurons to produce more dopamine; dopamine agonists (pramipexole, ropinirole, rotigotine), catechol-o-methyltransferase inhibitors (entacapone), which inhibit enzymes involved in the breakdown of dopamine and levodopa; monoamine oxidase B (MAO-B) inhibitors (rasagiline, selegiline) are used. One of the most important factors affecting patient compliance is polypharmacy. PD patients should use at least two drugs for their non-motor symptoms. For example, Levodopa has a very short plasma half-life and requires multiple daily doses to maintain plasma levels at therapeutic levels. This multiple daily dosing results in significant plasma drug concentration fluctuations. Other factors affecting patient compliance in PD are; cognitive impairment, mood disorders, complex drug regimens, lack of understanding of the disease and its therapeutic goals, disease stage, patient characteristics, education, age, gender, family support, and physical disabilities. Patient compliance is extremely important in the treatment of PD as it influences the effectiveness of the treatment and the quality of life of patients. An increase in the number of hospitalizations can be observed with withdrawal symptoms, dyskinesias, decreased mobility and greater fluctuations. As a result of the literature review, we identified the following approaches for enchancing patient compliance in the treatment of PD: once-daily drug formulations with extended-release drug systems [2] and use of active substances with a longer elimination half-life [3], different combinations of active substances in a single dosage form [4], orally disintegrating delivery systems, sublingual, transdermal and an intranasal administration [5].

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PP49- STUDIES ON SYNTHESIS OF NOVEL METHYL TETRAZOLO THIAZOLYL CARBAMATE DERIVATIVE COMPOUNDS AS ANTICANCER AGENT

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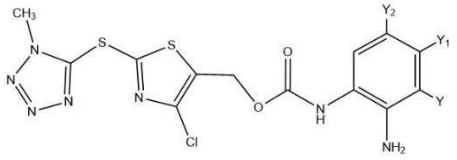
Cancer is an abnormal development of cells produced by various gene expression alterations that lead to cell proliferation, disruption, and cell death[1]. The condition in which genetic information in the form of DNA is arranged within a cell is defined by chromatin structure. The ability of genes to be activated or silenced is greatly influenced by the arrangement of the genome into a precise compact structure. Epigenetic is the study of heritable gene expression modifications irrespective of the basic DNA sequence. Most of these heritable alterations are created during differentiation and are stable over numerous cell division cycles, allowing cells to have separate identities while sharing genetic information. Epigenetic changes such as DNA methylation and histone posttranslational modifications make gene expression patterns heritable. Failing to maintain heritable epigenetic marks properly, can result in the incorrect activation or inhibition of numerous signalling pathways, leading to disease states such as cancer[2]. The equilibrium of histone acetylation and deacetylation is an epigenetic mechanism that is crucial for gene expression. Histone acetylation, which is induced by histone acetyltransferases (HATs), is related with gene transcription. Histone hypoacetylation, which is induced by histone deacetylase activity (HDAC), is related with gene silencing[3]. Changes in gene expression and mutations in genes that code for HDACs have been related to the development of cancers because they result in the incorrect transcription of genes that regulate essential cellular activities such as cell proliferation, cell cycle regulation, and cell death. Consequently, HDACs are among the most potential therapeutic targets for cancer therapy, and they have inspired the research and development of HDAC inhibitors[4].

In this study, a new series of carbamate compounds was synthesized considering HDAC inhibitor properties. The structures of the synthesized compounds have been elucidated and their activity studies are continued.



Y: H, Br
Y_1: H, F, Cl, Br, OCH_3
Y_2: H, F

Figure-1: General formula of synthesized compounds for this study.

Acknowledgements: This study is supported by The Scientific and Technological Research Council of Turkey (TUBITAK-221S947)

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PP50- STUDIES ON SOME 4-PHTHALIMIDOBENZENSULFONAMIDE DERIVATIVES AS POTENTIAL MTDL FOR THE TREATMENT OF AD AND T2DM

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Cumulative clinical and biochemical research studies over the past few decades have shown that hyperglycemia seen in type 2 diabetes mellitus (T2DM) may be associated with cognitive dysfunction in Alzheimer's Disease (AD) [1]. It also has been supported by many recent studies that insulin resistance, which occurs as a result of the insensitivity of insulin receptors in the central nervous system to insulin, is effective in the accumulation of amyloid beta and hyperphosphorylated tau protein, which is responsible for the pathogenesis of Alzheimer's disease and reduces synaptic plasticity [2]. From this point of view, researchers have turned to the multi-target directed ligand (MTDL) approach to design and synthesize new drug candidates that can interact with multiple targets involved in the pathogenesis of AD and T2DM [3].

Based on this information, in our pre-eliminary study, three 4-phthalimidobenzenesulfonamide derivatives containing the phthalimide scaffold and sulfonamide pharmacophore were synthesized as a multitargeted directed ligand that can be effective on AD and T2DM, which include common and multiple pathogenic mechanisms.The structure of the compounds were characterized by spectral analysis (IR and ^{1}H NMR), and *in vitro* determination of α-glucosidase, acetylcholinesterase, butyrlcholinesterase inhibitions were performed spectrophotometrically [4,5]. Most of them exhibited significant IC_{50} values which were comparable to the reference drugs acarbose and tacrine hydrochloride. Molecular docking studies provided informative clues for the ligand-enzyme binding interactions. In summary, all the studies confirmed that this kind of derivatives can be potential leads which are worth of further optimization for anti-AD and anti-diabetic drug development as MTDL.

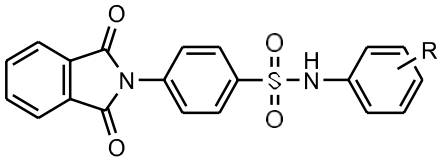

Figure 1. General structure of the synthesized compounds.

Acknowledgement: The authors thank to the Pharmaceutical Sciences Research Centre (FABAL) at Ege University, Faculty of Pharmacy for spectral analysis of the compounds.

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PP51- ASSESSMENT AND MANAGEMENT OF ADULT ASTHMATIC PATIENTS IN COMMUNITY PHARMACIES OF PORT SAID, EGYPT.

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Asthma is a long-term disease with complex syndrome which affect over 5% of world population. Despite a better understanding of the pathophysiology of asthma and associated therapeutic regimens, the disease continues to escalate in terms of prevalence and severity. The characteristic features of chronicity and remissions ensure a fertile ground for patient non-compliance. The protective measures taken by asthmatic patients play a significant role in boosting their quality of life. This study aimed to evaluate current knowledge and management of adult asthmatic patient in community pharmacies of Port Said, Egypt. A descriptive study was carried out from 15th February to 15 March 2022 in Port Said, Egypt. A validated questionnaire was used to collect data from adults asthmatic patients. A total of 150 questionnaires were distributed among which only 100 of them fulfilled our criteria and was included in the study. Data analysis was done by using SPSS version 20 and descriptive statistics were used to analyse the results of the study. Among 100 participant's majority (56%) were males. More than half of the respondents 53% had poor General knowledge of asthma. 57% of the respondents have good knowledge regarding symptoms and severity of asthma while 40% have low level of knowledge regarding treatment of asthma. A high proportion of respondents who have good knowledge of asthma and its treatment and good adherence to inhaler use may therefore have good control of asthma leading to reduced morbidity and mortality. This study concluded that the participants have good realization and understanding regarding knowledge of asthma, but still a significant number of respondents have low level of knowledge. Therefore, pre-service and in-service training and awareness programs regarding education of health problems affecting asthmatic patients should be arranged and pharmacists are highly advised to spread healthy habits and play their crucial role as health educators and managers.

Key Words: Asthma, community pharmacist, adult asthmatic patient, Egypt.

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PP52- COMBINATORIAL DUAL DRUG CARBON QUANTUM DOTS FOR LOCAL ANESTHESIA

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According to the data obtained from the General Directorate of Health Services, 4,704,094 surgeries were performed in Turkey in 2021. In an article published by Yorulmaz and his colleagues, the use of anesthetics in neurodegenerative patients may cause inflammation in nerve tissues and reveal dystonic disorders [1].

Local anesthetics, a part of anesthetic substances, which means that they cause numbness, provide reversible transmission of sensory, motor and autonomic nerve impulses [2]. It is often preferred in the clinic because it is much more stable and has less tendency to show allergic effects [3]. Bupivacaine, which starts slower than other local anesthetics of the amide group, but provides a much longer effect, is the most preferred powerful vasodilator anesthetic [4].

Quantum dots are very small in size with dimensions of one billionth of a meter [5]. They are the same size as biological structures and are used in diagnosis, treatment [6]. The diameters of quantum dots, which are one of the nano carrier systems, are usually 2-10 nano meters. Carbon quantum dots (CQDs) to be used for therapeutic purposes are often preferred due to their low toxicity, good biocompatibility, high resolution and stable photoluminescence [7]. According to the carbon quantum dot production method, their dimensions and surface properties can be changed [8].

A microwave pyrolysis method was preferred in this study. Bupivacaine and salicylic acid CDQs (Bupi-Sal-CQDs) were produced to be used against to pain. CQDs were formed in one step production. Bupi-Sal-CDQs were produced first time in the literature using an adopted method that was previously reported [9]. The production of CQDs was confirmed by UV light (365 nm). A bright blue or green light emitting CQDs were successfully obtained. The procedure was optimized. Produced CQDs were proposed to be used for pain management and local anaesthesia. Their cytotoxicity and anesthetic effect were tested. They were found to be more effective and nontoxic.

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PP53- CQD-CONJUGATED METFORMIN EFFECTS ON ALZHEIMER'S DISEASE

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According to WHO's estimation, the number of Alzheimer's disease (AD) is expected to reach 139 million in 2050.AD is a neurodegenerative disease associated with neuronal loss affecting the hippocampus and neocortical areas and is among the leading causes of dementia in the elderly.Carbon quantum dots (CQDots) are defined as hemispherical nanocrystals with a particle size of less than 10nm,with luminous photoluminescent properties[1].When CQDots are combined with drugs, the in-vivo and in-vitro properties of drugs can be positively altered.Metformin is a drug used in the treatment of diabetes due to its clinical efficacy, high safety and good tolerance.The researches show that the therapeutic effect is related to the activation of indirect 5' adenosine monophosphate-activated protein kinase(AMPK), which is the main regulator of cellular metabolism that controls lipid and protein homeostasis[2].This activation is associated cognitive status preservation.These results suggest that AMPK activation is an interesting target for intervention in AD[2].Specifically,metformin has been reported to modulate tau phosphorylation in primary neurons from wild-type and tau transgenic mice and in the hippocampus of insulin-resistant obese mice,according to the Targeting Aging with Metformin(TAME).Additional,metformin appears to prevent amyloid plaque deposition, increase adult hippocampal neurogenesis, restore neuronal insulin signaling, and inhibit AD-related pathological changes in neuronal cell lines under long-term hyperinsulinemic conditions[3].In this study; metformin,1-cysteine and distilled water were allowed to react at the appropriate temperature and time with the help of a microwave reactor. When the prepared CQDots were examined under UV light,it was observed that they exhibited blue fluorescence.By evaluating the therapeutic potential of metformin-CQDots,in-vivo examination of pharmacokinetic and pharmacodynamic properties was investigated.

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PP54- PRODUCTION OF COMPOSITE TISSUE SCAFFOLDS FOR CARTILAGE TISSUE ENGINEERING

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Cartilage tissue helps transfer mechanical load by reducing friction between subchondral bone surfaces. Currently, the treatment of cartilage tissue damage due to age and trauma is inadequate. Cartilage tissue damage is associated with tissue avascularity and low cell/matrix ratio. The observed low cell concentration and low proliferation of chondrocytes limit the regeneration ability of cartilage tissue [1]. Therefore, tissue engineering approaches have great potential in the treatment of cartilage tissue. Cartilage tissue engineering aims to treat cartilage damage by seeding chondrocytes or stem cells, their differentiation into chondrocytes on scaffolds and applying them to the damaged area [2].

This study aimed to produce a composite tissue scaffold that can mimic the extracellular matrix for cartilage tissue cells with increased mechanical strength by a polyelectrolyte complex formed using bacterial cellulose (BC), γ-polyglutamic acid (PGA) and chitosan.

BC was produced by *Komagataeibacter xylinus* ATCC 700178 strain in Hestrin & Schramm medium with 2% v/v inoculation under static culture conditions at 30°C for 7 days. The harvested BC membranes were purified under high temperatures and alkaline conditions, and then mechanically fragmented [3]. PGA-chitosan complexes formed in different ratios (70/30, 50/50, 30/70) were produced with 0.25% and 0.5% dry mass fragmented BC. The composite scaffolds were characterized by scanning electron microscopy (SEM), Fourier Transform Infrared Spectrometry (FTIR), water holding capacity, pore diameter distribution and compression testing. Cell viability and chondrogenic differentiation on the tissue scaffolds were evaluated (AlamarBlue and Alcian Blue).

As a result, BC membranes were produced in semi-opaque form and then fragmented. FTIR analysis of the composite scaffolds showed specific peaks for BC, PGA and chitosan. After the polyelectrolyte complex, it was observed that the water-holding capacity of the PGA and chitosan (50/50) scaffold of BC increased from 79±0.2% to 90±0.3%, and that of the PGA and chitosan (70/30) scaffold increased from 91±0.4% to 94±0.5%. Moreover, chitosan and PGA decreased the pore diameter distribution of BC (90-120 µm). At the same time, composites containing fragmented BC contributed to maintaining structural integrity. The polyelectrolyte complex increased the elastic modulus of fragmented BC (+66.7 kPa). All scaffolds obtained were non-toxic. Chondrogenic differentiation in some BC complexes (P50C70BC and P70C30BC) was higher at day 7 than in other scaffolds.

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PP55- A-GLUCOSIDASE INHIBITORY EFFECT OF AERIAL PARTS OF ENDEMIC ALKANNA TRICHOPHILA VAR. MARDINENSIS HUB.-MOR. ETHYL ACETATE EXTRACT

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Alkanna Tausch is, one of the largest genus members of Boraginaceae in Turkey, consisting of about 50 species and distributed in the region of Mediterranean and Irano Turanian. *Alkanna* species found in Turkey are represented by 40 taxa (34 species) 35 of which are endemic [1]. First records of medicinal usage of *Alkanna* species is reported by Hippocrates who used the plant roots in ulcer treatment. *Alkanna* roots are also used for various dermatological dissorders, cosmetic and beauty purposes for its red colour [2,3]. Previously it is been reported *Alkanna* species are rich sources for flavonoids, pyrolizidine alkaloids and naphtoquinones pigments [4]. Pure compounds isolated from *Alkanna* species and *Alkanna* extracts have been shown to possess antifungal, anti-inflammatory, antioxidant, radical scavenging, anti-tumor and enzyme inhibitory effects [3,5,6]. *Alkanna trichophila* var. *mardinensis* Hub.-Mor is an endemic species and its flowers are consumed as food in Mardin [7,8]. *Alkanna trichophila* var. *mardinensis* has been investigated for its enzyme inhibitory effects. Methanol and water extracts of aerial parts of *Alkanna trichophila* significantly showed α-amylase inhibitory activity [6]. In this study, *Alkanna trichophila* var. *mardinensis* was collected from Ergani, Diyarbakır. Ethyl acetate extract of aerial parts of plant was screened for its α-glucosidase inhibitory effect. *Alkanna trichophila* showed α-glucosidase activity significantly and IC_{50} value is calculated as 7.12 µg/mL

Keywords: Boraginaceae, *Alkanna trichophila* var. *mardinensis*, α-glucosidase inhibitory effect

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PP56- Synthesis And Cholinesterase Inhibitory Potential Of 2-Phenoxy-N-Substituted-Acetamide Derivatives

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Abstract
The research interest in the design of cholinesterase inhibitor molecules has led to the generation of diverse scaffolds. Many compounds among them provided bigger molecular weight structures with complex interactions at the active site of enzymes. Within this preliminary work, smaller organizations with an amide spacer have been assessed. Four compounds have been synthesized and their cholinesterase inhibitory potentials were measured through modified Ellman's method. Although the results displayed poorer characteristics of the molecules in terms of inhibition of cholinesterase in comparison to the activity of standard molecules, it has been displayed that amide function can be further optimized to obtain alternative structures.

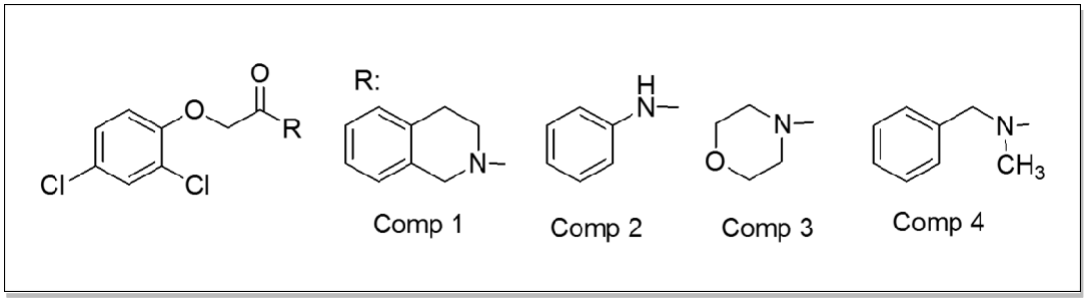

Figure 1. Title molecules

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PP57- PREPARATION OF EXPRESSION PLASMID FOR RECOMBINANT PRODUCTION OF TUMOR NECROSIS FACTOR ALPHA IN ESCHERICHIA COLI

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Tumor necrosis factor-alpha (TNF-α) is an inflammatory cytokine that belongs to the TNF ligand family[1]. İt is plays a major role in immune regulation, homeostatic function, and cellular organization. TNF-α is primarily secreted by activated monocytes and macrophages. It is also produced by a variety of cells, including natural killer (NK) cells, T lymphocytes, smooth muscle cells, and fibroblasts[2,3]. Recombinant human TNF-α (hTNF-α) is important both as a therapeutic product and for its use in biological tests performed for diagnostic and drug development studies. Recombinant human TNF-α is a soluble, 157 amino acid protein, which corresponds to the C-terminal extracellular domain of the full-length transmembrane protein[1]. In this project, the gene region encoding 77-233 aa of hTNF-α, which is the soluble form of the protein was cloned into the pET28a-expression vector for its recombinant production in *E. coli* bacteria.

For this, the cDNA sequence encoding this region was cloned into plasmid pET28a and the necessary expression plasmid was prepared for subsequent recombinant production studies.

Firstly, U937 monocyte cells were cultured under proper conditions and TNF-α secretion was induced by subsequent treatment of 16uM Phorbol-12-myristate-13-acetate for 16 hours and 10ng/mL lipopolysaccharide for 24 hours[4]. RNA isolation and cDNA synthesis were performed by following the manufacturers' instructions. We performed PCR amplification using the primer pair designed for amplification of hTNF-α (77-233). The PCR product was run on 1% agarose gel electrophoresis and purified using the Gel Extraction Kit. In the second step, The PCR product comprised of the sequence encoding the mature-soluble form of TNF- α was cloned into the pET28a vector by restriction enzyme digestion and ligation reactions sequentially. The expression plasmid was transformed to *E. coli BL21* and we checked positive transformants by colony PCR. The sequence of the cloned plasmid was confirmed by restriction enzyme digestion control on agarose gel electrophoresis and sanger sequencing[5].

In conclusion, we cloned the pET28a-TNF-α expression plasmid, which encodes soluble form of hTNF-α enabling its recombinant production in *E. coli* in future studies. The TNF-α expression plasmid cloned in this project will contribute to the production of recombinant TNF-α needed in biotechnological research.

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PP58- SALICYLIC ACID CARBON QUANTUM DOTS AS A NEUROPROTECTIVE DRUG

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Neuroinflammation has been known to play a critical role in the pathogenesis of neurodegenerative diseases (ND). One of the biggest obstacles with the medical treatment of neurodegenerative diseases is crossing the blood-brain barrier. Epidemiological studies in the literature have shown that long-term use of non-steroidal anti-inflammatory drugs (NSAIDs), particularly salicylic acid (SA) regarding this research, delays the onset of neurodegenerative diseases which makes salicylic acid a significant neuroprotective agent. Still, SA can not reach the brain in the desired concentration. To overcome this problem many nanoparticles and namely quantum dots have been proposed to be used [1].

In this research, it is aimed to make salicylic acid as carbon quantum dots itself (Sal-CQDs) and to use it as a neuroprotective formulation which can be able to bypass the blood-brain barrier (BBB). It is proposed to show a neuroprotective effect in a higher extent. Here, we designed and optimized Sal-CQDs that can cross the blood-brain barrier and then act as a neuroprotective agent. The formulation was also aimed at testing in cell cultures. The optimized one-step production method of Sal-CQDs involves using citric acid monohydrate and L-cysteine and heating in a microwave reactor. The resulting composite carbon quantum dots (Sal-CQDs) exhibit a strong blue fluorescence under UV light. The physical appearance, particle size, zeta potential, fluorescence, and quantum yield of the composite carbon quantum dots are characterized using zeta (Anton Paar Lite Sizer 500), while a spectrofluorimeter is used to determine the optical properties and quantum yields of composite carbon quantum dots. The quantum yield is calculated using the absorbance of the reference compound (quinine sulfate in sulfuric acid).

This is the first study in the literature that shows the neuroprotective effect of Sal-CQDs. Salicylic acid is also used for the first time to make composite CQDs. Here we proposed to prepare QDs from drug molecules contrary to conventional approaches. The nanoparticles are prepared first and then drug molecules are subjected to loading according to conventional approaches. This proposed method is found to be useful, and easy (in one step) to formulate with composite carbon quantum dots as it is more likely to cross the blood-brain barrier. The possibility of oral administration of CQDs has been shown to be possible [2]. Therefore the oral administration of Sal-CQDs is proposing the first time here. The effects of Sal-CQDs were also shown in cell cultures.

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PP59- DESIGN AND EVALUATION OF SURFACE-COATED PLGA NANOPARTICLES WITH POLOXAMER 188 AS A NEW DRUG CARRIER CONTAINING METHYLENE BLUE AND GALANTAMINE TO TREAT ALZHEIMER'S DISEASE

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Alzheimer's disease is a neurodegenerative disease that impairs cognitive function. Galantamine is an acetylcholinesterase inhibitor approved by the FDA [1]. Methylene blue is an anti-inflammatory, tau aggregation inhibitor and an acetylcholinesterase inhibitor [2]. This study aims to develop poloxamer 188 coated PLGA nanoparticles containing methylene blue and galantamine to increase therapeutic efficacy and patient compliance. For this purpose, empty PLGA nanoparticles, poloxamer 188 coated empty PLGA nanoparticles, PLGA nanoparticles containing galantamine-methylene blue, and poloxamer 188 coated PLGA nanoparticles containing galantamine-methylene blue were prepared by double emulsion method. For empty PLGA nanoparticles, PLGA was first dissolved in chloroform (oil phase). The first W_1/O emulsion was obtained using 40% amplitude 15 min ultrasonic probe (Bandelin, Germany) by adding the water phase (W_1) containing 1% polyvinyl alcohol (PVA) to the oil phase. Then the W_1/O emulsion was added to the other water phase (W_2) containing 2% PVA using 40% amplitude 10 min ultrasonic probe to obtain the $W_1/O/W_2$ double emulsion. Methylene blue was added to W_1, galantamine was added to the oil phase, and poloxamer 188 was added to mixture lastly and allowed to mix. The washing process was carried out by centrifugation at 13500 rpm for 30 min and washing with deionized water. The particle size distribution of the formulation was determined using Zetasizer (Malvern Instruments, Nano-ZS, USA). The results are given in Table 1.

Table 1. Particle size distribution and zeta potential of nanoparticles (n=3, mean±SD).

Nanoparticle Type	Particle Size (nm)	PDI	Zeta Potential (mV)
Empty PLGA nanoparticles	135.2 ±1.253	0.174± 0.017	4.540 ±0.501
Poloxamer 188 coated empty PLGA nanoparticles	141.5 ± 1.229	0.066± 0.012	-0.001± 0.007
Galantamine-methylene blue PLGA nanoparticles	165.5 ±1.557	0.042± 0.019	0.031± 0.035
Poloxamer 188 coated galantamine-methylene blue PLGA nanoparticles	201.6 ±1.709	0.049± 0.044	0.082± 0.049

It is known that nanoparticles play an important role in targeting many drugs to the brain and increasing their concentration in the brain. For easier passage through the blood brain barrier (BBB), the particle size is expected to be less than about 200 nm and generally neutral zeta

potential [3,4]. In our study, the particle size increased with the addition of each substance (active substance and surfactant). However, the particle size and PDI values of all obtained PLGA nanoparticles were smaller than about 200 nm and 0.2, respectively and the zeta potential was about neutral (Table 1). In conclusion, poloxamer188 coated PLGA nanoparticles containing methylene blue and galantamine with particle size smaller than 200 nm and neutral zeta potential show that the obtained nanoparticles can cross the BBB.

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PP60- PHARMACEUTICALS ROLES of HYDROGELS

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Hydrogels are polymer materials that can absorb and retain large amounts of water and biological fluids, with the help of their cross-linked hydrophilic structure. They can be synthesized from synthetic components by physical and chemical means and by cross-linking methods. There are covalent bonds between polymer chains in chemically cross-linked hydrogels, whereas there are physical interactions between polymer chains in physically cross-linked hydrogels. They can be obtained in two different ways; one-step synthesis; polymerization and parallel cross-linking of polyfunctional monomers. Multi-step synthesis; by reacting the polymers with suitable crosslinking agents [1].

Hydrogels have significant roles in pharmaceutical areas thanks to their tissue compatibility, easy manipulation and solute permeability, adjustable physical properties, water holding capacity, flexibility and controllable degradability [2,3]. They have important roles in different areas such as controlled drug releases, artificial blood vessels, soft tissue substitution and contact lenses. In addition, absorbable and degradable polymer matrices whose mechanical properties and degree of swelling are tailored to a particular application, since it can be prepared with a wide variety of properties. They are used in buccal, oral, vaginal and transdermal drug delivery systems [4,5].

In this study, it was aimed to give detailed information about hydrogels and their use in pharmaceuticals. For Buccal: such as limiting their release and penetration through the mucosa, For Oral: biocompatibility, adjustable properties, site-specific delivery, controlled release of synthetic drugs and biotherapeutics and embedding these drugs in their polymeric networks to protect them from the acidic conditions of the stomach, For vaginal: viral such as acting as a physical and therapeutic barrier against infections and restricting the spread of the virus through the vaginal mucosa, for Transdermal: due to the cross-link density; elasticity, non-allergenicity, ease of application, soft consistency and high water content.

Keywords: Hydrogels, Crosslinked Hydrogels, Controlled Drug Releases, Biocompatibility

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PP61- A NEW LOOK at MEDICINAL MUSHROOMS

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Fungi are important species that are essential for life on Earth. Mushrooms are epigeous fruiting forms of fungus which are visible to the naked eye. Although there are approximately 140,000 mushroom species fruiting forms on Earth, only around 10% ones (about 14,000 identified species) are known. Fungi interact with a range of species on earth through the mycelium, either forming a symbiosis or competing with resources as decomposers (saprobionts). Fungi make a variety of metabolites which are physiologically active substances helping them survive in the never-ending battle with other species. These substances can cause a variety of physiological responses in our bodies when mushrooms are eaten, resulting in mushroom poisoning, on the other side, convenient impacts on human health. As a result, medicinal mushrooms are defined as mushroom species that have a wide range of therapeutic actions and can aid in the treatment of different diseases.

There are over 50 different types of mushrooms, each with its own set of medicinal characteristics. These mushrooms provide mostly unexplored source of innovative pharmaceuticals. They have significant health benefits and a wide range of pharmacological activities such as *antidiabetic, antibacterial, antiviral, hepatoprotective, cytotoxic, anti-inflammatory, antioxidative, antiallergic, antidepressant, osteoprotective, antihyperlipidemic, antifungal, neuroprotective, immunomodulating, hypotensive*, and so on[1,2]. However, with the advent of recent evidence of mushrooms' health benefits, the processes behind their numerous benefits for human healths still need to be thoroughly investigated.

In this study, the therapeutic potential of mushrooms on a disease-treatment basis, their traditional values, and many clinical trials will be discussed.

Keywords: Medicinal Mushrooms, Mushrooms' Health Benefits, Therapeutic Mushrooms, Pharmacological Activity of Mushrooms

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PP62- DRUG USAGE of VEGAN PATIENTS

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The philosophy of veganism is a phenomenon that comes from the vegetarianism movement and in the last few decades, it has been adopted by the changing and developing world. Individuals who do not consume any animal-derived food and do not use any products made from animals, regardless of its species, are called vegan. There may be various reasons to choose this lifestyle such as animal rights, cruelty to animals, ecological balance and faith for better health[1]. It is argued that veganism is the best option for peoples' mental and physical health by rejecting the exploitation of animals and choosing a plant-based lifestyle by vegan people. As individuals who adopt this ideology in every aspects of their lives, they are also quite careful about health. Any medicinal product derived from an animal and any treatment method or drug that uses animals in the experiments during the discovery process are strictly protested and not used by vegans. It should be helped and advised to vegan patients with knowledge about diet, food supplements, nutritional problems and especially drug usage by pharmacists, who are the most accessible healthcare providers. They should be knowledgeable and up-to-date on non-animal-derived pharmaceutical products, vegan-friendly alternatives and formulations [2].

In this study, it is aimed to make a rewiew study on developing in drug usage of vegan patients and alternative ways. In accordance with this purpose, clinical trials and alternatives in which animals are used during drug production, animal-based products found in drug formulations and their alternatives, vegan equivalents of drugs for the health of vegan patients will be focused on.

Keywords: Vegan, veganism, vegan patients, drug usage of vegans

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PP63- CURRENT METHODS IN CANCER TREATMENT

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As a global issue, cancer has been causing millions of deaths annually both nationwide and worldwide. The global cancer prevelance statistics demonstrate that there were an estimated 19.3 million new cases of cancer in 2020 and almost 10 million of these cases resulted with death. According to 2020 cancer statistics in Turkey, it is shown that there appeared almost 234 thousand new cases and nearly 127 thousands of death. Cancer is a broad term and is described as a disease resulting from cellular changes in cells causing uncontrolled growth and division of cells. Cells which grow uncontrollably prevent the functioning of the organs where they reside or even other nearby organs[1]. The primary reason of cancer is DNA degredation due to either genetic or acquired factors. Nutrition, radiation, and maladaptive behaviors are some of the acquired factors causing cancer. Identification and treatment of cancer have always been a highly complex process due to the complexity of the disease. Currently, there are several new technologies under research in clinical trials. Some of these already have been approved.

In addition to providing definition, diagnosis, history, reasons of cancer, the main objective of the current study is to present a compact review of the both conventional such as chemotherapy, radiotherapy and surgery up to date treatments of the cancer[2].

In this study, the discussion of the update on recent advances and breakthroughs in treatment of cancer like immunotherapy[3], cancer growth inhibitor, stem cell therapy, gene therapy were rewieved, also current statistics regarding different parameters of the disease.

Keywords: Cancer, Traditional Cancer Treatment Methods, Current Cancer Treatment Methods

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PP64- RECENT DEVELOPMENTS in MOLECULAR DOCKING and CHALLENGES

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The area of pharmaceutical sciences has become more reliant on computer-aided medication design. The usage of computers has accelerated in automated industrial drug discovery processes. One of the applications is virtual screening of electronic chemical databases by using the structure of a key target protein [1]. Molecular docking is the technique of docking micro molecules into macromolecular structures to score their complementary values at binding sites. It is a thriving research field with the methods including structure-based drug design, lead optimization, biochemical pathway design [2].

Molecular docking, given a ligand molecule and a protein receptor predicts the ligand's binding mode (position) in the specific situation of the receptor, can monitor small molecules against a receptor and rank ligands according to their probability of being active, and anticipates the binding affinity of the two given a ligand molecule and a target receptor [3].

Drug development is a time-consuming and pricey field of study that necessitates collaboration among specialists. In this regard, computer-assisted procedures have the potential to significantly reduce a lot of time and cost spent on preclinical research.

Molecular docking, despite its benefits and the fact that it will undoubtedly continue to play a important role, is still far from being a complete success in terms of success rate. The challenges of ligand chemistry (tautomerism and ionization), receptor flexibility (single conformation of rigid receptor), and scoring function (differentiate genuine binding mode) remained. It is also incorrect in calculating binding energies because of the simplistic scoring systems use [4].

In this study, it was researched how molecular docking was first applied to aid drug discovery tasks, introducing protein-ligand docking methods used for structure-based drug design and other biological applications. It was discussed the challenges future research direction in these existing programs.

Keywords: Molecular Docking, Protein Flexibility, Scoring Functions, Algorithms, Drug Development, Polypharmacology, Deep Learning.

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PP65 – HETEROCYCLES IN ANTICANCER AGENTS

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Heterocyclic compounds have a cyclic structure that contains ring and different types of atoms such as nitrogen, oxygen, and sulfur called as heteroatoms. Heteroatoms provide heterocyclic compounds with physical and chemical characteristics that differ of their overall carbon circle resemblings. The capacity of heterocycles to participate in a wide hydrogen bond donor/acceptor ability, metal coordination links as well as dipole - dipole and hydrophobic interactions. Owing to the large range of ring widths and underlying modifications, heterocycles come in a wide range of figures and lengths, allowing them to fit the diverse main range of compound limiting pockets.

Heterocyclic compunds have a wide range of application. They are predominantly used as pharmaceuticals, as agrochemicals and as veterinary products [1]. They also find applications as sanitizers, developers, antioxidants, as corrosion inhibitors, as copolymers, dye stuff. Heterocyclic compounds have been commonly used to compose many of the cancer drugs, currently. They can be found in different structures due to their ability to simultaneously participate in various intracellular activities in nature and easily bond with other structures. Thanks to these properties, they have important role in the production of anti-cancer drugs. Their adaptability allows them to target numerous metabolic activities and biological functions in tumor pathophysiology that may become vulnerable to heterocyclic substructure medicines. According to the findings of several investigations, The N-heterocyclic structure mechanism is a key structure in a lot of synthetical drugs, with steroidal heterocyclic derivatives and thiophene derivatives showing diverse bioactivities [2].

In this study, it was examined that the heterocyclic compounds in the structure of anti-cancer drugs which administered to cancer patients. The common heterocyclic rings in anticancer active compounds will be summarized and it will be tried to establish a relationship between the mechanism of action of the anticancer active compound and the heterocyclic structure it contains.

Keywords: Heterocyclic Compounds, Structure of Heterocylics, Anti-cancer.

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PP66 – New 1,3,4-Oxadiazole Derivatives: Synthesis and Cytotoxic Activity

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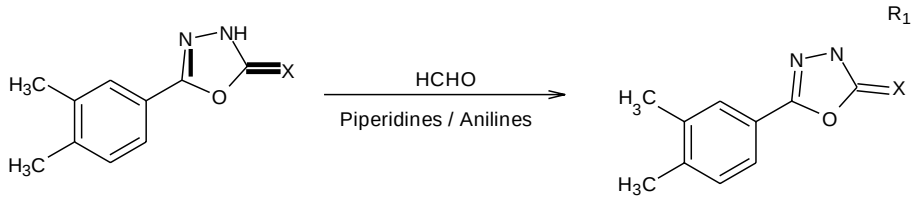
Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer-related death among women worldwide. The future burden of breast cancer is predicted to increase to over 3 million new cases and 1 million deaths in 2040 [1-3]. Therefore, new anticancer compounds with low toxicity, easy availability, and high efficiency have been a research hotspot in related fields.
Various drugs carrying the oxadiazole structure show different pharmacological effects with its lipophilic nature, ability to form hydrogen bonds, and its capacity to inhibit different enzymes. Zibotentan with a 1,3,4-oxadiazole core, is an important anticancer agent and a lead compound for developing new 1,3,4-oxadiazole-based anticancer agents [4].

In this study, two sets of novel 1,3,4-oxadiazole-2-on or thione derivatives were designed and synthesized by Mannich Reaction either in conventional or microwave-assisted method. The structural characterizations of compounds were performed by FT-IR, ^{1}H-NMR, ^{13}C-NMR spectra and purities were checked by HPLC.



Compound 1, X= O
Compound 2, X= S

R_1 = 4-phenyl; 4-OH, 4-phenyl; 4-benzyl; 4-(4-morpholinyl)piperidines
or 2-Cl; 4-Cl; 4-CH_3; 2,3-diCH_3; 2,6-diCH_3anilines

Figure 1. Structure of targeted compounds

The compounds, synthesized and characterized, were tested for their cytotoxic capabilities on MCF-7 human breast cancer cell line and MCF-12A human mammary epithelial cell line using MTT assay. Based on the IC_{50} values, calculated selective effectiveness was obtained as well. Those chosen as biologically active were further analyzed for their anti-proliferative and anti-migrative effects using growth rate and horizontal migration assay on MCF-7 cells.

Acknowledgement: This project was partially supported by The Scientific and Technological Research Council of Turkey (TUBITAK, Project no: 1919B01200614).

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PP67 –INVESTIGATION OF THE IMMUNE REGULATORY EFFECT OF PROPOLIS

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Propolis is a resinous, waxy substance that bees create by mixing their saliva with beeswax and compounds from various plants [1]. Although its effects on tissue healing are known, its effect on immune cells is unknown. There is data that macrophages are essential for wound healing and that macrophage deprivation creates problems in tissue regeneration. There are different types of macrophages (such as M0, M1, M2) involved in inflammation and tissue regeneration [2]. In the region of chronic inflammation, M1 macrophages are found in high numbers, while M2 macrophages are found in lower numbers, which causes the wound to remain in an inflammatory state. Increasing the number of M2 cells trigger tissue healing and accelerate tissue regeneration [3]. In this study, the anti-inflammatory effect of propolis was examined. Commercially purchased propolis (Idapolis, Turkey) solution was applied to macrophages of different phenotypes at 4 different dilutions. Cell viability was measured by MTT analysis at 24 hours.

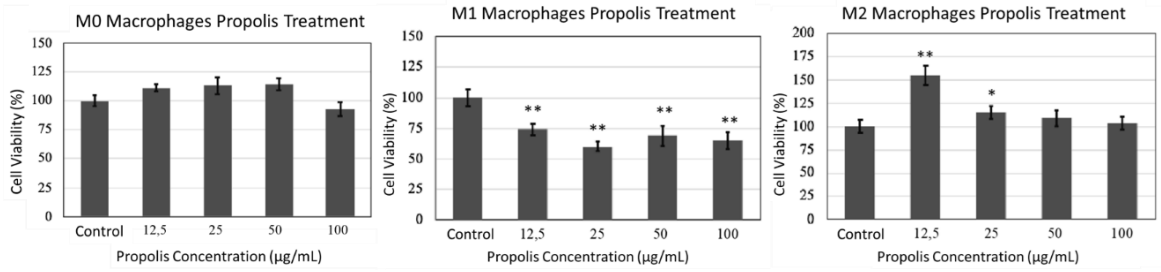

Figure 1. Cell viability data 24 hours after propolis treatment (n=6, $p > 0.01$, *$p < 0.05$, **$p < 0.01$).

It has been shown that propolis has a cytotoxic effect on M1 cells at doses of 25 µg/mL and above, while it significantly increases cell viability of M2 cells at 25 µg/mL and 12.5 µg/mL concentrations. In order to quantitatively demonstrate the differentiation of macrophages, TNF-α (pro-inflamatuary), TGF-β and IL-10 gene(anti-inflammatory) expressions were examined.

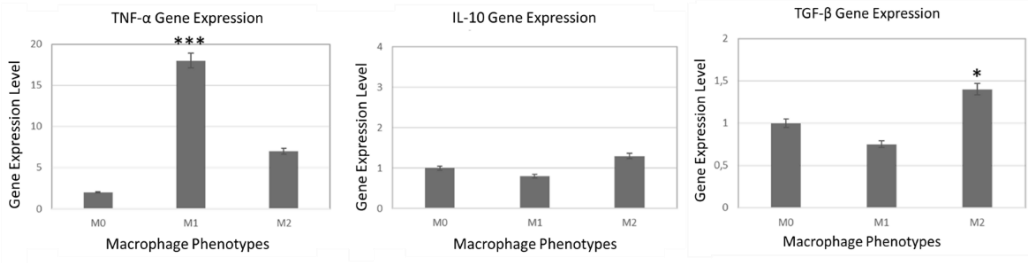

Figure 2. Gene expression levels (n=6, *p < 0.05, **p < 0.01).

It has been observed that propolis decreases the number of M1 macrophages and increases the number of M2 macrophages. Thanks to this feature, it is thought that propolis has an anti-inflammatory effect and has a feature that will accelerate wound healing and complete tissue repair. This feature of propolis may lead to new treatment approaches with more exclusive research in the future.

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PP68 – DEVELOPMENT AND CHARACTERIZATION OF QUERCETIN-LOADED FOLATE-PLGA NANOPARTICLE FORMULATIONS AND IN VITRO EVALUATION IN BREAST CANCER

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Breast cancer is the most commonly diagnosed type of cancer in women. Today, conventional treatments suffer from drawbacks like severe side effects, short half-life, fast clearance, and reduction in cellular uptake. For this reason, drug carrier polymer systems have gained importance and herbal compounds with anticancer properties are needed. Quercetin (QRC) is an essential flavonoid molecule with pharmacological effects such as antioxidant, antiviral, antimicrobial, antiinflammatory and anticancer [1]. However, its application has been limited due to intense initial metabolism in the liver, short biological half-life, instability in physiological environments before reaching the systemic circulation, its low absolute bioavailability and low solubility in water, gastric and intestinal fluid. To both overcome anticancer molecule quercetin's limitations and effectively treat breast cancer, the objective of this research is to develop, characterize and evaluate quercetin-loaded folate-polylactic-co-glycolic acid (PLGA) nanoparticles. The active molecule, quercetin, was encapsulated into the PLGA nanoparticle by using nanoprecipitation technique. First, the effect of the determined different ratios of PLGA, quercetin and surfactant on size, zeta potential and polydispersity index (PDI) was evaluated and optimized formulation. For targeting to cancer cells, the optimized PLGA nanoparticles were conjugated with folate and quercetin was loaded into Folate-PLGA [2]. Fabricated NPs were characterized by dynamic light scattering (DLS), SEM & TEM, FTIR, drug release profiles, in vitro uptake studies and MTT cytotoxicity assay on MCF-7 breast cancer cell line. Based on the DLS, SEM VE TEM results, the average sizes of FL-QRC-PLGA and QRC-PLGA nanoparticles basically range from 177.5 nm to 196.6 nm. Additionally, NPs showed a sustained release of quercetin. FTIR results showed that folic acid successfully conjugated PLGA nanoparticles. According to MTT assay, quercetin-loaded nanoparticles have more toxic effects than nanoparticles that do not contain active substance. Uptake studies revealed that FL-QRC-PLGA NPs penetrated more into breast cancer cells than QRC-PLGA NPs.Moreover, the cytotoxicity was evaluated with the MTT (3-(4,5-dimethylthiazol-2-yl)-2,5 diphenyltetrazolium bromide) assay in breast cancer cells and it was shown that the prepared naoparticles reduced substantially cell viability. When all the results were evaluated together, quercetin could be successfully encapsulated into polymeric drug delivery system, its extended release and its anticancer activity in breast cancer cells were determined. Future studies include in vivo therapeutic studies of the NPs.

Acknowledgement: This study is supported by Lokman Hekim University (Project No: THIZ-2022-26).

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PP69 – PREPARATION AND CHARACTERIZATION STUDIES OF THE NANOPARTICLE FORMULATIONS OF THE PHARMACEUTICAL PART OF THE RADIOPHARMACEUTICAL TO BE DEVELOPED FOR USE IN THE DIAGNOSIS OF ALZHEIMER'S DISEASE

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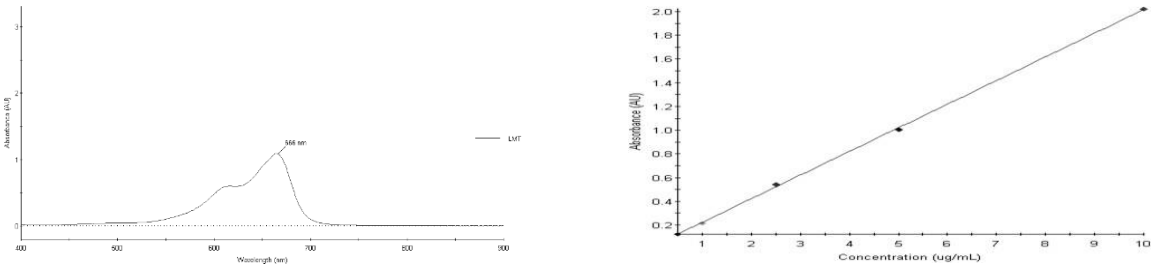
Alzheimer's disease is a neurodegenerative disease that is more common in older individuals in the community. The brains of individuals with Alzheimer's disease have more tau protein than the brains of healthy individuals. With abnormal phosphorylation of tau proteins, neurons collapse, and insoluble aggregations occur. The active substance of leuco methylonium bis (hydromethane sulfonate) (LMT) targets the pathological aggregation of tau protein in Alzheimer's patients and protects the functionality of neurons. Although it is not approved for clinical use, it is a candidate molecule that is used in the treatment of Alzheimer's. In this study, nanoparticle systems containing LMT have been prepared. Nanoparticles containing LMT are planned to form the pharmaceutical part of radiopharmaceuticals to be used to diagnose of Alzheimer's disease. There are no studies on nanoparticles containing LMT active substance in Alzheimer's disease that can be targeted to the region. In this study, lipid-chitosan-based nanoparticles containing LMT were developed by experimental methods. For the ideal formulation/formulations to pass the blood-brain barrier among these nanoparticles, formulations with particle size below 500nm and positive zeta potential were selected. Chitosan nanoparticles were prepared with an LMT/chitosan ratio of 1:1, 1:2, 1:5, 1:10, and 1:20. Then, span 80 (0.5-2%), acetone and glutaraldehyde were added in a magnetic stirrer. A method for the quantification of LMT with a UV spectrophotometer has been developed. For this study, the wavelength (λ max) at which the maximum absorbance of the LMT was obtained was determined (Figure 1A). Then, a series of solutions at different concentrations (0.5, 1, 2.5, 5, 10 ppm) were prepared, and 6 standard solutions were prepared for each concentration and their absorbance at λ max was read. Each concentration and the absorbance values corresponding to this concentration were plotted, and a calibration line was drawn with the help of regression analysis, and a calibration curve was drawn to be used in all analyses, and the line equation was created (Figure 1B).



A **B**

Figure 1. A: The wavelength (λ max) at which the maximum absorbance of the LMT. B: Calibration line of LMT

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PP70 – DISCOVERY OF NOVEL EGFR KINASE INHIBITORS: SYNTHESIS, IN SILICO AND BIOLOGICAL STUDIES

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Nowadays, cancer which is the top cause of death worldwide, is the major threat to human health and more than 27% of deaths are caused by cancer yearly [1]. Lung cancer is still the second most common kind with the highest mortality rate (18%) and approximately 85% of which is non-small cell lung cancer (NSCLC) [2]. EGFR which is a receptor tyrosine kinase, is extremely stimulated at NSCLC and EGFR inhibitors have been used to treat NSCLC and other lung cancers for years [3]. However, because of resistance develops to these drugs over time, new drug candidates are still needed.

1,2,4-Triazole is a exclusive scaffold that demonstrated a various pharmacological activities and one of the most exciting and critical biological activities of the compounds containing 1,2,4-triazole ring is undoubtedly its anticancer effect. We have previously reported studies on 1,2,4-triazole-based condensed heterocyclic compounds with anticancer activity [4,5]. In this study, we designed thiazolo[3,2-b][1,2,4]triazole derivates by combining 1,2,4-triazole and thiazolidinone rings which have been expected to show EGFR inhibition activity. In silico studies of compounds were investigated by structure-based methods on EGFR ATP binding site and ligand-based methods on commercially known EGFR inhibitors. The anti-growth activities of the compounds were tested in various cell lines and the EGFR inhibition activities of some compounds were investigated by western blot assay. Additionally the selected compounds have been shown to increase the efficacy of Etoposide which is a well known topoisomerase II inhibitor. In conclusion, thiazolo[3,2-b][1,2,4]triazole compounds may be promising candidates for combined therapy and to prevent the development of resistance in lung cancer.

Acknowledgement

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PP71 – SYNTHESIS AND BIOLOGICAL ACTIVITIES OF SOME BENZAZOLE DERIVATIVES

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Sphingomyelin (SM) is a phospholipid that is a prominent structural component of the nerve cell membrane and is hydrolyzed by sphingomyelinase (SMase) to ceramide which is involved in cellular proliferation, growth, and apoptosis. The SMase enzymes in the SM pathway are classified according to their optimal pH activity. Especially the neutral SMase2 (nSMase2) enzyme is involved in many disease pathologies besides physiological processes [1]. Recent studies showed that upregulated nSMase2 activity, elevated ceramide level, and consequence neuronal exosomes were implicated in the spread of Alzheimer's disease (AD) pathology [2]. Therefore, the nSMase2 enzyme has become a new target for AD treatment.

In this study, we performed in vitro nSMase2 inhibitory activity screening with selected compounds from the in-house chemical library at 50 µM concentration and found that out of the evaluated compounds, 1,3-benzoxazol-2(3H)-one demonstrated 39% inhibitory activity. Based on these results, we synthesized some benzazole-2-thiole derivatives (Figure 1). Among the synthesized compounds, 1,3-benzoxazole-2-thiol exhibited 65% inhibitory activity, while nSMase2 inhibitor Cambinol, used as a reference compound, showed 97% inhibitory activity.

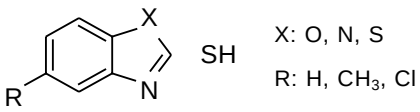

Figure 1. General structures of the synthesized compounds

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PP72 – NANOPARTICLE-BASED CARNOSINE SURFACE FOR TARGET CELL LINE

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Dipeptide L-carnosine (β-alanine-histidine, βAH); While allowing it to react directly with oxidized carbohydrates and lipids, it can also bind to transition metal ions thanks to the histidine (H) residue (Hamley, 2017). Carnosine (Car) is a cyclopentadiene structure with CH group (N3 and N1 regions), with the imidazole ring replaced by N and NH. It makes a strong bond with gold with a lone electron pair from the N3 region (Gatchell et al., 2018).In this study; Electrochemical techniques DPV, CV and EIS will be used to analyze the changes in the chemical structure of the AuNP-Car bioconjugate on the electrode surface.
X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM) will be used for the topography and composition of the bioconjugate formed on the electrode surface. In directing AuNP-Car immobilization to the targeted cancer cell (A549) on the carbon electrode surface, the differentiation of the current value as a function of concentration will be examined. It will also evaluate whether it can open new avenues in cancer cell imaging and targeted therapy for cancer intervention that inhibits metabolism.

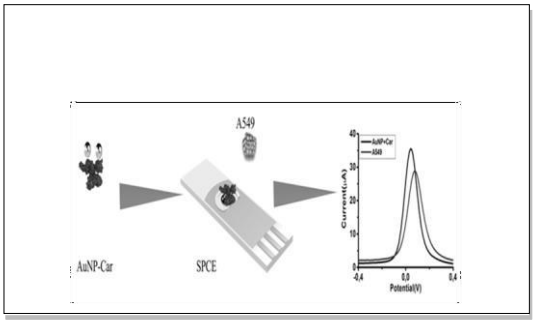

Figure 1. The arrangement of the designed electrochemical sensor

Acknowledgement: I would like to thank my professors Figen ZİHNİOĞLU, Suna TİMUR and Dilek DEMİRKOL for their help during my doctoral studies. Surface analysis were done in EGE MATAL.

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PP73 – A NEW PRIVACY-PRESERVING BLOCKCHAIN-BASED INTEGRATION PLATFORM FOR TRACEABILITY OF RARE DISEASES

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The fact that the number of people with rare diseases is very low and the symptoms vary according to people with rare diseases prevents specialists from making a correct diagnosis. Centralizing data in a single structure can provide consistency but lead to inefficiency and is highly susceptible to system failures, attacks, and especially manipulations. When we consider these problems, problems arise in the diagnosis and diagnosis, follow-up and traceability of rare diseases. In addition, there must be a significant degree of trust between the parties sharing the data in the data recorded by traditional methods. Patients may be more reluctant to share data due to data breaches.The use of innovative technical support and system is very important for the early diagnosis and diagnosis of these diseases. Therefore, blockchain technology, which is a decentralized technology, can provide unique and innovative solutions to many of these challenges [1]. This paper proposes a blockchain-based privacy-preserving proof-of-concept for healthcare-5.0-integrated rare disease traceability. We provide a balance between privacy and traceability. We also offer low-cost, high-performance architecture with off-chain integrated event-based smart contracts. We ensure privacy and security by using existing cryptographic protocols in the off-chain. In addition, we provide real-time data tracking.

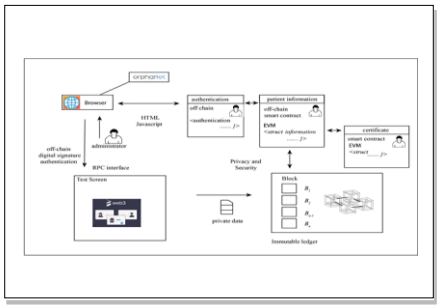

Figure 1. The general concept of architecture

Acknowledgement: Supported by TÜBİTAK–2209-A University Students Research Projects Support Program for 2023.

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PP74 – NOVEL 1,3,4-OXADIAZOLE OXIME HYBRIDS: DESIGN, SYNTHESIS, and CHARACTERIZATION

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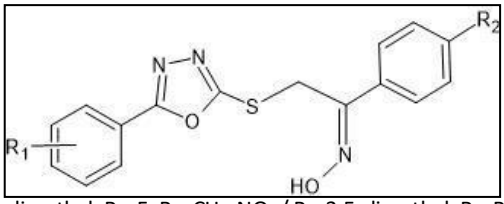
Nonsteroidal anti-inflammatory drugs (NSAIDs) are among the most commonly prescribed drugs worldwide due to their anti-inflammatory, antipyretic and analgesic properties. However, their use is hampered by gastrointestinal (GI) toxicity, which is the most common drug-related side effect in industrialized countries. Many studies have proven that not only inhibition of gastroprotective progaglandins inhibition but also the free carboxylic functional group in the chemical structure of NSAIDs is responsible for local GI tract irritation. Therefore, different strategies such as replacing the free carboxylic functional group with heterocyclic biosisosters such as 1,3,4 oxadiazole, 1,2,4-triazole and 1,3,4 thiadiazole have been adopted to obtain a safer anti-inflammatory agent devoid of GI side effects [1-3]

In addition, designing NSAIDs that release nitric oxide (NO), known as a gastric protective agent, is another promising strategy. Many studies have shown that NO-NSAID hybrids have strong anti-inflammatory activity and a high safety profile [4, 5]. Based on the literature evaluation, we synthesized a series of oxadiazole/oxime hybrids starting from two different 1,3,4-oxadiazole-2-thiones. Stirring of them with previously prepared α-bromoacetophenone derivatives in acetonitrile and then reaction with hydroxylamine hydrochloride in presence of anhydrous sodium acetate gave the corresponding oximes (Figure 1). Structures of purified compounds were characterized with FT-IR, ^{1}H-NMR, ^{13}C-NMR spectroscopy and purities were controlled by HPLC.



(R_1:3,4-dimethyl, R_2: F, Br, CH_3, NO_2 / R_1: 3,5-dimethyl, R_2: Br, NO_2)

Figure 1. Structures of designed 1,3,4-oxadiazole oximes

Acknowledgement: This project was partially supported by The Scientific and Technological Researh Council of Turkey (TUBITAK 2209A, Project no: 1919B012208737).

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PP75 – CITICOLINE QUANTUM DOTS IN THE TREATMENT OF NEURODEGENERATIVE DISEASE GLAUCOMA

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Glaucoma is one of the irreversible causes of blindness, responsible for 12% of all blindness cases worldwide. There are currently 80 million glaucoma patients worldwide. Blindness can be prevented by early diagnosis and appropriate treatment. Glaucoma can occur as a result of ocular trauma, various systemic diseases, complicated eye surgeries. In all cases it is mainly caused by a high intraocular pressure that leads to damage to the optic nerve. With glaucoma causing optic neuritis, optic nerve damage results from inhibition of retinal ganglion cells. Citicoline, on the other hand, inhibits excitotoxicity associated with glaucoma-related retinal ganglia loss.

Citicoline (cytidine 5-diphosphocholine) is a chemical that naturally occurs in the body. Citicoline is involved in phospholipid and phosphatidylcholine synthesis, cell membrane synthesis and repair. It possesses neuroprotective and nootropic activity. It reduces glutamate excitotoxicity and oxidative stress. It increases the release of neurotransmitters. It is used to improve memory and brain function. In addition, it is neuroprotective in hyperglycemic conditions. It is thought that cytocholine has a glaucomatous neurodegeneration effect with increased intraocular pressure due to insulin resistance. Through the dopaminergic system in the visual pathway, citicoline increases visual acuity and contrast sensitivity in patients with ischemic optic neuropathy.

Especially in recent studies, findings have been found that nanostructures such as quantum dots can increase retinal penetration. The amount of citicoline determined for this study was reacted with distilled water in a microwave reactor at the specified temperature and time. At the end of the reaction, citicoline CQD was obtained. Citicoline CQD was observed to fluoresce blue under 365 nm UV light.

Acknowledgement: This work was supported by Biruni University.

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PP76 – COST-EFFECTIVE PLASMONIC BIOSENSOR PLATFORM FOR LABEL-FREE VIRUS DETECTION

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Rapid diagnostic kit development is crucial for the early detection and treatment of infectious illnesses [1,2] In this study, a portable biosensor platform that uses a plasmonic chip based on nanohole arrays integrated into a lens-free imaging framework was presented for label-free virus detection [3]. The biosensor platform was used to observe the diffraction field patterns of nanohole arrays when they were uniformly illuminated by a spectrally-tuned LED source that was specifically designed to excite the plasmonic mode supported by the nanohole arrays. The portable biosensor enabled reliable label-free detection of H1N1 virus and produced results at levels appropriate for clinical settings. An easy-to-use kit was developed to prepare the plasmonic chip surface for binding analytes, such as virus-antibody complexes. A graphical user interface (GUI) based on Python was also developed, providing the user with easy access to the biosensor hardware, capturing and processing diffraction field images, and displaying virus information to the end-user. The portable biosensor platform utilizes nanohole arrays and lens-free imaging to achieve remarkably accurate virus detection with an LOD of 10^3 $TCID_{50}$/mL. The developed platform can rapidly adapt to capture and identify other distinct viral diseases, such as COVID-19 or flu, by simply coating the plasmonic chip surface with an antibody possessing affinity to the virus type of interest.

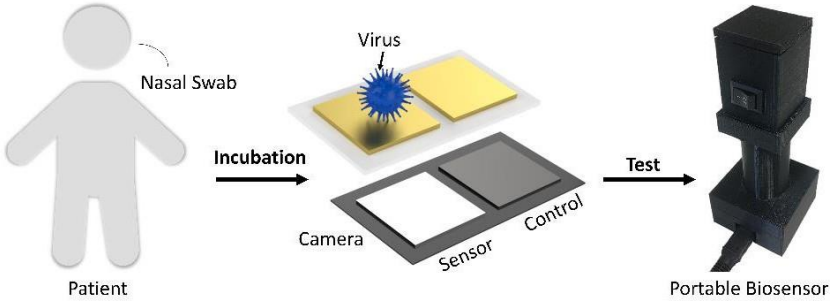

Figure 1. Portable biosensor platform for virus detection and quantification.

Acknowledgement: A.E.C. acknowledges. The Scientific and Technological Research Council of Turkey (TUBITAK) 2232 – Career Integration Fellowship (Project No. 119C002), and BAGEP Award of the Science Academy, Turkey.

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PP77 – REFRACTIVE INDEX SENSING BASED PLASMONIC PLATFORM FOR MONITORING OF SINGLE CELL GROWTH

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In order to determine the biophysical characteristics of cells and their response to drug therapies, it is essential to assess cell growth on adhesive substrates. However, microfluidic technologies rely on cell suspension, and optical techniques have low sensitivity and variable reliability depending on the cell type. To address these limitations, we developed a plasmonic functional assay platform that can rapidly and accurately measure adherent cell weight and dynamic changes. Our platform can map the growth profile of a population by determining the growth rates of individual cells within 10 minutes. The platform is capable of evaluating subpopulations with different growth profiles and determining heterogeneity in the growth profiles of populations. As proof of concept, we investigated the growth profile of MCF-7 cells and the effect of two intracellular metabolisms that are essential for their proliferation. Firstly, we investigated the negative effect of serum starvation on cell growth, and then we studied ornithine decarboxylase (ODC) activity. As a result, we successfully distinguished the growth profiles of MCF-7 cells and their ODC-overproducing variants, which have strong resistance to the detrimental effects of low osmolarity. We further demonstrated that putrescine was able to rescue cells from the effects of ODC inhibition under low osmotic pressure conditions. Our platform not only enables the determination of therapeutic behaviors of cancer cells in response to pharmacological treatments but also allows access to intracellular activities through ex vivo measurements. In this study, we investigated the antitumor effects of DFMO, which inhibits ODC activity in MCF-7 cells. Our findings indicated that MCF-7 cells were also susceptible to drug treatment, while the DFMO-resistant subpopulation could remain viable in the presence of the antigrowth agent. Because of the platform's ability to rapidly evaluate cell growth kinetics in small samples, our platform has the potential to be used in both research and clinical settings.

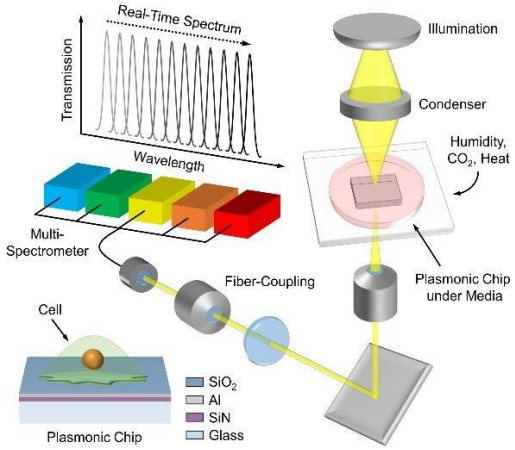

Figure 1. Refractive Index Sensing Based Plasmonic Platform.

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PP78 – EVALUATION OF RIVAROXABAN CRUSHED TABLET SUSPENSION WITH NASOGASTRIC TUBE APPLICATION BY IN VITRO ANALYSIS

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Enteral nutrition is a form of nutrition in which the nutrients needed daily are given to the patient with the help of a probe. Enteral nutrition is administered via nasogastric, nasoduodenal, gastrostomy and jejunostomy. The most common application is the nasogastric tube (NG). Nasogastric tube is applied to hundreds of thousands of hospitalized patients every year for diagnostic, preventive or therapeutic purposes as a complement to medical and surgical applications.

The aim of the experiments conducted in vitro study is to simulate the use of patients using a nasogastric tube.The study was performed with Voxaban® and Xarelto® tablets containing 20 mg of rivaroxaban. These tablets were crushed and mixed with 50 ml of water and 50 ml of apple juice. The resulting suspension was passed through Nasogastric tubes.

In this study, two different types of 16 FR nasogastric tubes were used as silicone tube and PVC tube. Dissolution, sedimentation volume, quantification and impurity analyzes were performed from the suspensions passed through a nasogastric tube. The tablets were crushed and suspended in 50 mL of water as recommended. All particle size data at D10, D50 and D90 levels are provided for crushed product powders for administration via a nasogastric (NG) tube.

The study examined potential issues such as aggregation, adhesion, and clogging in the tube and syringe. Analyzes of Voxaban® and Xarelto ®crushed tablet suspensions were compared. f2 was calculated according to the results of the dissolution analysis.Standard operating procedures were followed for sedimentation, particle size and recovery testing and the results of the tablets were compared. As a result, the applications of Voxaban® and Xarelto® tablets showed similar analysis results when compared. Overall, this study showed that crushed rivaroxaban tablets can be administered with enteral nutrition via nasogastric tubes without significant problems. The results show that there is no significant difference in the performance of different brands of rivaroxaban tablets when used.

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PP79 – DETERMINATION OF POLYMORPHISM IN RAMAN SPECTROSCOPY

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Most active pharmaceutical ingredients (APIs) are solid in nature and could exist in many forms that vary significantly in their properties, leading to different physical, chemical, mechanical, and biopharmaceutical properties. Solid forms of APIs can exist as crystalline forms, including polymorphs, hydrates, solvates, cocrystals, and salts, as well as amorphous forms. Eltrombopag is a non-peptide TPO receptor agonist in the form of the bismonoethanolamine (olamine) salt that increases platelet production by interacting with the transmembrane domain of the bioavailable thrombopoietin (TPO) receptor. There are different crystalline porlymorphic forms of Eltrombopag, namely Forms I, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV and XVI. Raman spectroscopy provides rapid identification of the phases of pharmaceuticals. It is a powerful technique for characterizing and screening polymorphs and distinguishing crystal forms [1]. The present work demonstrates the use of Raman vibrational spectroscopy to distinguish between polymorphs.

The above passage describes the use of Raman vibrational spectroscopy to distinguish between different crystalline polymorphic forms of Eltrombopag. The study aimed to analyze the Raman scattering in the region of 0-2000 cm^{-1} to identify the different forms of Eltrombopag. Overall, the study demonstrated the utility of Raman vibrational spectroscopy in distinguishing between different polymorphic forms of pharmaceuticals and in identifying the stability of the products under different storage conditions.

Raman scattering in the region (0–2000 cm^{-1}) was analyzed. With the aforementioned analyses, polymorphic follow-up of oral dosage forms containing Form I porlymorphic form in different series in 25°C-30°C-40°C stability chambers was carried out. These samples have been subdivided by modelling.

The active ingredient, which is a component of oral dosage forms in different series, different dosage and stability chambers chamber, was compared with the Form I active ingredient spectrum and it was seen that they overlapped with each other. The overlap of the spectra shows that the active ingredient polymorphs in the analyzed test products are the same. The coincidences with the spectrum of the Form I active ingredient show that this polymorph type is Form I. It has been shown that there is no form transformation in the products in the stability chambers.

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PP80 – THE EFFECTS OF VORTIOXETINE ON TLR4 EXPRESSION AND TNF-α LEVELS IN ROTENONE-TREATED ENTEROGLIAL CELLS

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Enteroglial cells (EGCs) within the enteric nervous system are activated under inflammatory conditions and trigger proinflamatory signalling pathways via Toll-like receptors (TLRs) [1]. Gastrointestinal disruptions and depression are accepted as earliest findings in Parkinson's disease. In this study, we aimed to investigate the effects of vortioxetine, a serotonergic antidepressant, on TLR4 expression and TNF-α levels in rotenone-treated EGCs. Rat-derived enteroglial cells were treated with rotenone (10 µM) and/or vortioxetine (5 µM or 1 µM) for 24 h. Control, rotenone (ROT), vortioxetine high-dose (5 µM, V1), vortioxetine low-dose (1 µM, V2), ROT+V1 and ROT+V2 groups were formed. TLR4 levels were measured using RT-qPCR and TNF-α levels were measured using ELISA. RT-qPCR results showed that EGCs internally express high levels of TLR4. Rotenone, a mitochondrial complex inhibitor, significantly decreased the TLR4 expression ($p<0.05$). Interestingly, vortioxetine also significantly decreased TLR4 mRNA expression ($p < 0.05$) compared to the control group. Concomitant use of high dose vortioxetine with rotenone caused a significantly higher decrease in TLR4 expression in the ROT+V1 group ($p<0.05$). No differences were detected between the rotenone and vortioxetine-only groups. ELISA results revealed that rotenone significantly impairs EGCs function and decreases the TNF-α release compared to control and vortioxetine-only groups ($p<0.05$). In the combination groups (ROT+V1 and ROT+V2), TNF-α levels were still significantly lower than control and vortioxetine-only groups. No differences were detected between the control and vortioxetine-only groups. This study indicates that rotenone administration disrupts the immune responses and impairs appropriate proinflammatory cytokine production, possibly via increased damaged cells via inhibition of the mitochondrial respiratory chain. Interestingly, vortioxetine seems ineffective in restoring this damage in a short period.

Keywords: Enteroglial cells, rotenone, vortioxetine TLR4, TNF-α.

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PP81 – THE EFFECTS OF THYMOQUINONE ON IL-1B LEVELS IN LIPOPOLYSACCHARIDE-STIMULATED MONONUCLEAR CELLS

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Thymoquinone is an active ingredient of Nigella sativa, also known as black seed, which has antidiabetic, antihyperlipidemic, antitumor, analgesic, and anti-inflammatory properties. The aim of this study is to evaluate the effects of thymoquinone on proinflammatory interleukin (IL)-1β secretion in lipopolysaccharide (LPS)-treated human peripheral blood mononuclear cells and to compare these responses with those of dexamethasone, a well-known anti-inflammatory agent. Mononuclear cells were isolated from the blood samples of 20 healthy donors using concentration-gradient centrifugation. The cells were exposed with LPS for 3 hours. Control, LPS (100 ng/ml), high-dose thymoquinone (100 µM, T1), low-dose thymoquinone (10 µM, T2), dexamethasone (1 µM, D), LPS+T1, LPS+T2, and LPS+D groups were formed. Interleukin IL-1β levels were measured using ELISA and RT-qPCR methods. According to ELISA results, there was no significant increase in IL-1β levels between control and LPS groups after 3 hours of LPS exposure, but paradoxically, a significant increase was observed in the group that received LPS and dexamethasone together (LPS+D) compared to the control group ($p<0.05$). Thymoquinone administration resulted in a significant decrease in IL-1β levels in LPS+T1 and LPS+T2 groups compared to L+D group ($p<0.05$). According to RT-qPCR results, IL-1β mRNA levels showed a nearly two-fold increase in the LPS-treated group, which significantly decreased with both high-dose (LPS+T1) and low-dose thymoquinone administration (LPS+T2) ($p<0.05$). In the dexamethasone group, there was no paradoxical increase, but there was no significant inhibition compared to the control group. Our study showed that thymoquinone suppresses IL-1β production in healthy human peripheral blood mononuclear cells in a dose-dependently manner. Therefore, thymoquinone can be a useful agent in situations where proinflammatory cytokines need to be suppressed through its effects on cellular and humoral immune responses.

Keywords: Interleukin-1 beta, lipopolysaccharide, peripheral blood mononuclear cells, thymoquinone.

PP82 – INVESTIGATION OF THE ANTICANCER ACTIVITY OF PLATINUM (II) COMPLEXES WITH CISPLATIN ANALOGOUS

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Cancer is the largest cause of mortality in the globe, accounting for over 10 million deaths in 2020, or approximately one out of six. It is estimated that by 2030, there will be 26 million new cancer diagnoses and 17 million cancer deaths each year. The expected increase will be driven primarily by population growth and aging, and will be greatest in low- and middle-income countries [1,2].

Since the discovery that cisplatin (cis-diamminedichloroplatinum(II)) promotes cancer cell death by binding to DNA, thousands of platinum complexes have been synthesized and screened in the last 30 years. Among these complexes, only carboplatin and oxaliplatin have received worldwide approval so far, nedaplatin, loboplatin and heptaplatin have gained regionally limited approval [3]. The replacement of ammine groups can result in different structural and formational alterations in target DNA, which may affect the character of biological effects of the analogues. It has been shown that increasing cytotoxicity of cisplatin analogues, in which NH_3 groups were replaced by more hydrophobic amine ligands, correlated with growing hydrophobicity of these analogues [4]. The benzimidazole and imidazole ring carrying the heteroaromatic ring system which is closely related to the biological system is of importance in medicinal discoveries.

In this study, as an extension of the investigation on the probable anticancer activity of platinum complexes with 2-substituebenzimidazole/imidazole ligands, four platinum(II) complexes with the structures [[Pt(**L1**-**L4**)$_2$Cl$_2$] (**C1**-**C4**), bearing benzimidazole (**L1**), imidazole (**L2**), 2-phenylbenzimidazole (**L3**) and 2-phenylimidazole (**L4**) as carrier-ligands were evaluated for their in vitro cytotoxic effects against MCF-7 (breast cancer) cell line using MTT method [5].

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PP83 – SYNTHESIS OF PLATINUM (II) COMPLEXES WITH SUBSTITUTED AZOLE DERIVATIVES AS CARRIER LIGANDS AND INVESTIGATION OF THEIR ANTICANCER ACTIVITY

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Cisplatin was accidentally discovered in 1965, and by 1978, the FDA had approved it for use in the treatment of several cancers, namely testicular, ovarian, head and neck, colon, bladder, stomach, and lung cancer. However, there are two considerable problems associated with clinical cisplatin usage: intrinsic or acquired resistance and side effects including nephrotoxicity, ototoxicity, nausea and emetogenicity [1]. However, intrinsic or acquired resistance and side effects like nephrotoxicity, ototoxicity, nausea, and emetogenicity are two important problems with the clinical use of cisplatin. By replacing the carrier ammonia ligand in the cisplatin structure with different heterocyclic ligands, new platinum(II) complex anticancer drugs are designed which are more effective than cisplatin. Benzimidazole and imidazole ring, which is a heteroaromatic ring system recognized by the biological system and found in drugs with different pharmacological activities, is of great importance for Medicinal Chemists [2].

In this study, a novel platinum(II) complexes with the structures of $[Pt(L1)_2Cl_2]$ (**Complex 1**) and $[Pt(L2)_2Cl_2]$ (**Complex 2**) (L1=1H-benzo[d]imidazole and L2= 1-methyl-1H-1,3-diazole carrier ligands) were synthesized and elucidated by FT-IR, ESI-MS, ^{1}H-NMR and elemental analysis. The cytotoxic effects of **Complex 1** and **Complex 2** were tested against L929 (Mouse fibroblast), HeLa (Cervical cancer) and Capan-1 (Pancreatic cancer) cell lines by MTT method. According to the test results, **Complex 1** and **2** had similar activity values with cisplatin against L929 and Capan-1 cell lines, while **Complex 1** was found to be the most effective compound against Hela cell line.

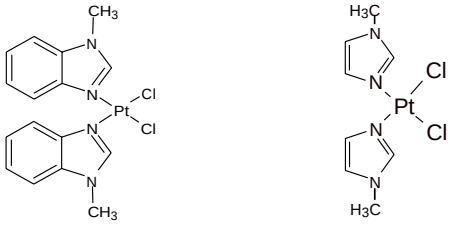

Figure 1. Chemical structures of **Complex 1** and **2.**

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PP84 – SYNTHESIS OF PLATINUM(II) COMPLEXES WITH 2-(1-HYDROXYETHYL)BENZIMIDAZOLE AS CARRIER LIGANDS

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Cisplatin was discovered in 1965 by Barnett Rosenberg et al., in an experiment to investigate the effects of electric current on cell division, by chance that the complex with the closed formula cis-$[Pt(NH_3)_2Cl_2]$ (cis-diammindichloroplatin (II)) formed at the electrode prevented DNA replication and inhibited cell division [1].

Clinical trials began in 1971 and were approved by the U.S. Food and Drug Administration in 1978 as the first platinum compound for use in testicular and ovarian cancers. It is still a widely used chemotherapy drug in the treatment of a wide variety of solid tumors, including head and neck, lung, testicular, ovarian and bladder cancers [2]. The development of resistance to chemotherapy in patients treated with cisplatin and the occurrence of side effects such as nephrotoxicity, neurotoxicity, ototoxicity, hepatotoxicity, cardiotoxicity, and gastrointestinal toxicity limits the use of cisplatin. New platinum(II) complex anticancer drugs that are more effective than cisplatin are designed by replacing the carrier ammonia ligand in the cisplatin structure with different heterocyclic ligands [3].

The functional and structural similarity between the active site of the enzyme and the model compound to be selected is an important issue to be considered. Therefore, the presence of the selected carrier ligand in the structure of physiologically active components or recognition by cells is important in the design of new platinum complex anticancer drugs. The similarity of the benzimidazole ring, which is a ring system recognized by the biological system, to purine bases and vitamin B_{12} is of great importance for Medicinal Chemists [4].

This study involves the synthesis and ^{1}H-NMR elucidation of two new platinum(II) complexes, $[Pt(L1)_2Cl_2]$ (**Complex 1**) and $[Pt(L1)_2I_2]$ (**Complex 2)** with 2-(1-hydroxyethyl)benzimidazole as carrier ligands.

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PP85 – DESIGN AND SYNTHESIS OF 4-THIAZOLIDINONE-2-METHYLBENZENESULFONAMIDES AS POTENTIAL ANTITUMOR CAIX/VEGFR-2 DUAL INHIBITORS

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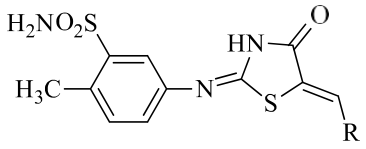
Cancer is a deadly disease in which multiple mechanisms are involved in its formation. In recent years, significant progress has been made in the diagnosis and treatment of cancer by elucidating the molecular and cellular mechanisms that play a role in tumor formation[1]. The studies revealed that tumor angiogenesis can play an important role in tumor metastases and causing transformation of a benign into malignant tumor. VEGFR-2 plays a critical role in the regulation of tumor angiogenesis and the formation of new blood vessels supplying nutrition and oxygen for tumor growth[2]. The overexpression of CA-IX specifically in hypoxic cancer cells makes the enzyme an important therapeutic target and biomarker for cancer[3]. In light of these findings, CA-IX and VEGFR-2 has been identified as highly important targets for developing anticancer agents. Benzene sulfonamide plays an important role in drug design, especially in the development of anticancer agents[4]. There are many studies in the literature on various compounds bearing benzene sulfonamide with anticancer activity particularly CAIX inhibitor and VEGFR-2 inhibitor[5]. In addition, the 4-thiazolidinone, an important group, is found in the structure of drugs that showed potent anticancer activity by inhibiting CA-IX and VEGFR-2 enzyme[6]. In this study, a series of novel 5-((5-substitute-4-oxothiazolidin-2-ylidene)amino)-2-methyl benzene sulfonamides (**3a-3m**) were designed and synthesized as new dual CA-IX and VEGFR-2 inhibitors. **3a** (phenyl), **3i** (4-ethoxyphenyl), **3l** (4-ethylphenyl) showed high inhibition against CA-IX with IC_{50} values of 0.056, 0.12 and 0.073 µM, respectively. In addition, these compounds showed inhibitory activity with IC_{50} values ranging from 0.061 to 0.116 µM against VEGFR-2. Finally, these results can promote to design of lead compounds in the search for potent and selective antitumor agents.



R = phenyl, 4-OC_2H_5 phenyl, 4-C_2H_5 phenyl

Figure 1. Compounds 3a, 3i and 3l

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PP86 – PREPARATION AND EVALUATION OF LOPERAMIDE-CONTAINING NANOFIBER TABLET FORMULATIONS

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Loperamide is an FDA-approved and low-dose effective drug, which used in the treatment of acute and chronic diarrhea. Loperamide has low bioavailability due to its low water solubility. Electrospinning is used in the production of micro/nano scale fibers from natural and synthetic polymers and provides many modifications. Due to the advantages of nanofibers in terms of finished products (such as increase in porosity, increase in specific surface area), studies on nanofiber-based dosage forms in the pharmaceutical field are increasingly continuing [1]. In this study, it was aimed to produce loperamide nanofibers, which has low solubility, using hydrophilic polymers and solubility enhancing agents to increase solubility, and then to compress under low pressure to form orally fast dispersible nanofiber-tablets. Polyvinylpyrrolidone (PVP), polyethylene oxide (PEO) and polyvinyl alcohol (PVA) were used as hydrophilic polymers, Soluplus® and KolliphorTM TPGS, were used as solubility enhancers. Loperamide containing PVP-KolliphorTM TPGS, PEO-Soluplus® and PVA-Soluplus® nanofiber formulations were compressed into nanofiber-tablet in a tablet pressing machine using a 12 mm punch. It was observed that the nanofiber structure was preserved by taking both surface and cross-section SEM images of the prepared nanofiber-tablets. The physicopharmaceutical properties of the produced nanofiber-tablets were investigated and all formulations were found to have disintegration times of less than 1 minute. In dissolution studies, it was observed that loperamide was released more slowly from nanofiber-tablet formulations compared to nanofibers. In conclusion, loperamide was successfully loaded into nanofibers and its solubility was increased, and a dosage form was developed that can be easily used by patients with swallowing difficulties, including pediatric and geriatric patients, by turning it into orally fast dissolving nanofiber-tablets.

Acknowledgement: This study was supported by TUBİTAK (Project No: 121S386).

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PP87 – ELECTROCHEMICAL DETERMINATION OF ALFUZOSIN HYDROCHLORIDE FROM PHARMACEUTICAL DOSAGE FORMS USING POLY(ALLURA RED AC) MODIFIED GLASSY CARBON ELECTRODE

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Benign prostate hyperplasia is an age-related and androgen-related disease with low urinary tract syndromes such as urgency, daytime frequency, nocturia, incontinence, dysuria etc. [1,2]. Alfuzosin hydrochloride (ALZ) is an orally used α_1-adrenergic-receptor antagonist for the treatment of low urinary tract syndromes [1]. Sensitive determination of ALZ is important to reduce or prevent side effects such as dizziness, headache, upper respiratory tract infection, and stomach pain that often occur during treatment.

In this study, first of all, glassy carbon (GC) electrode was electrochemically modified with poly(Allura Red AC) for the determination of ALZ. Electrochemical oxidation behavior of ALZ was investigated with the polymer film modified GC electrode using cyclic voltammetry (CV) and differential pulse stripping voltammetry (DPSV) methods. ALZ gave an irreversible anodic peak at about 817 mV in Britton-Robinson buffer at pH 5.0. Scan rate study showed that the oxidation reaction of ALZ was adsorption-controlled on the polymer modified GC electrode. Operational parameters were optimized for the DPSV method. The calibration plot showed linearity in the concentration range of 0.06-6 µM with a detection limit of 1.11 nM. Recovery experiments were performed using pharmaceutical dosage forms of ALZ and resulted in quantitative recovery of 100.24% with a relative standard deviation of 0.63%.

As a result, a sensitive, selective, and fully validated DPSV method for the determination of ALZ was developed and successfully applied to spiked pharmaceutical samples.

Acknowledgement: This study was funded by Karadeniz Technical University Scientific Research Foundation (Project Number: FBA-2018-7456).

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PP88 – PREPARATION OF A CATIONIC NANOEMULSION FOR VACCINE DELIVERY OF TOXOPLASMA GONDII pDNA

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Abstract:

The obligate intracellular parasitic protozoan *Toxoplasma gondii* is causing toxoplasmosis. A large family of surface antigen-1 related sequence (SRS) proteins of the parasite is known to be involved in host cell attachment and immune subversion during chronic infection. The stable and immunogenic SRS13 protein was investigated as a vaccine delivery candidate against chronic toxoplasmosis. After optimizing the SRS13 codon according to mammalian codon usage, SRS13 was synthesized and cloned into the FDA-approved DNA vaccine vector pVAX1 to construct the DNA vaccine [1,2]. For that purpose a cationic nanoemulsion (CNE) formulation was prepared and characterized for the delivery of SRS13 plasmid DNA (pDNA). CNEs are a promising approach for vaccine delivery because of being stable and forming a complex with the negatively charged nucleic acids via electrostatic interactions [3]. The CNE was prepared with microfluidization durations of 1, 2 and 3 minutes and characterized in terms of droplet size, polydispersity index (PDI), zeta potential (ZP) and complexation capacity with pDNA by electrophoresis. As a cationic agent didodecyldimethylammonium bromide (DDAB) was used. The droplet size of CNE slightly decreased from 140 nm to 137 nm and slightly increased to 146 nm with increasing microfluidization duration from 1 to 2 and 3 minutes. The PDI increased from 0.12 to 0.15 and finally to 0.18, all representing a very narrow size distribution. The ZP increased from 32.1 mV to 50.8 mV and decreased to 39.6 mV with increasing microfluidization duration. To sum up, the CNE after microfluidization of 2 minutes had the smallest droplet size (137 nm), the highest ZP (50.8 mV) and a narrow size distribution (PDI 0.15). Thus, this CNE was used for further complexation studies with pDNA.The prepared CNE was able to form a complex with pDNA in a ratio of 1:10 (pDNA: CNE, 1:10 diluted), which is a prerequisite for a successfull delivery of nucleic acids as vaccine.

Keywords:

cationic nanoemulsion, microfluidization, complexation, stability, DNA vaccine, toxoplasmosis, **Acknowledgement**:Special thanks to Prof. Dr. Özgen Özer from Department of Pharmaceutical Technology for her support during the particle characterization by Zetasizer Nano ZS.

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PP89 – LIPOSOMES FOR VACCINE DELIVERY OF TOXOPLASMA GONDII pDNA

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The disease toxoplasmosis is caused by the obligate intracellular parasite Toxoplasma gondii, which is responsible for the infection of a third of world's population. Surface antigen-1 related sequence (SRS) proteins of the parasite are known to be involved in host cell attachment and immune subversion during chronic infection. The SRS13 protein was investigated as a vaccine delivery candidate against chronic toxoplasmosis by synthesizing and cloning into the FDA-approved DNA vaccine vector pVAX1 to construct the DNA vaccine, after optimizing the SRS13 codon according to mammalian codon usage [1,2]. For that purpose an appropriate vaccine delivery system is needed to deliver SRS13 plasmid DNA (pDNA). Thus, using didodecyldimethylammonium bromide (DDAB), a cationic liposome formulation was prepared by film hydration method following ultrasonication. Liposomes are a promising approach for vaccine delivery because of being stable for a long period of time and being able to form a complex with the negatively charged nucleic acids like pDNA via electrostatic interactions [3]. The liposome formulation was investigated and characterized in terms of droplet size, polydispersity index (PDI), zeta potential (ZP) by dynamic light scattering and complexation capacity with pDNA by electrophoresis. The droplet size of the liposome was about 99 nm with a PDI of 0.4 and a ZP of 44 mV at the day of preparation. The prepared liposome was able to form a complex with pDNA in a ratio of 1:9 (pDNA:liposome), which is a prerequisite for a successfull delivery of nucleic acids as vaccine.

Keywords:liposomes, complexation, stability, DNA vaccine, toxoplasmosis,

Acknowledgement:Special thanks to Prof. Dr. Özgen Özer from Department of Pharmaceutical Technology for her support during the particle characterization by Zetasizer Nano ZS.

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PP90 – DEVELOPMENT AND CHARACTERIZATION OF NANOFIBER STRIP CONTAINING SERTRALIN FOR BUCCAL APPLICATION

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Sertraline is one of the selective serotonin reuptake inhibitors indicated in major depressive disorder (1). Schizophrenia is a mental disorder with frequent depressive symptoms. Sertraline is thought to be useful for the treatment of depressive symptoms in schizophrenia (2). The aim of this study is to develop nanofiber strips containing sertraline which can be easily dispersed by the buccal route, suitable for the use of schizophrenia patients. In this study, sertraline-containing nanofibers were prepared using the electrospinning method. The reason for choosing the electrospinning method is the high wettability and porosity of the prepared nanofibers, hence easily dispersible strips can be prepared (3).
Here, various ratios (%5, %7.5 and %10) of polyvinyl pyrrolidone (PVP) polymer solutions were prepared, and electrical conductivity, viscosity and surface tension characterization studies were performed on polymer solutions. After characterization studies, a polymer solution containing 5% PVP was selected to prepare nanofibers. The surface tension and conductivity of the polymer solution were measured as 25.95±0.31 mN/m and 13.12±1.86 µS/cm, respectively. Nanofibers were obtained by using the electrospinning method, each strip (3x2 cm in size) containing 5 mg sertraline. The mechanical properties of nanofibers were investigated. Furthermore, in vitro release study was performed on Franz diffusion cells using a dialysis membrane. The permeability coefficient and flux of the sertraline from nanofibers were 0.0065±0.0007 and 20.66±2.17, respectively. As a result of the drug release study, more drug release was observed from the nanofiber compared to the polymer solution and plain sertraline solution. (Figure 1). In this study, electrospun nanofibers containing sertraline were successfully obtained. The results showed that sertraline nanofiber strips can be used to treat symptoms of schizophrenia.

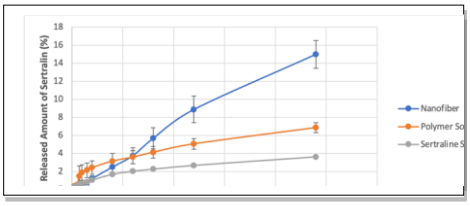

Figure 1. In vitro release profiles of the Sertaline nanofiber, Polymer Solution (PVP and Sertraline) and Sertraline Solution.

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PP91 – INVESTIGATION OF ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF MUSCARI ARMENIACUM

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Muscari armeniacum H.J. Veitch, a member of the Asparagaceae family, is known in Anatolia as Arabian grass, Arabian hyacinth, Arabian locust, Gavur bulb and false hyacinth [2] . Traditionally, the bulbs of the plant are used as food [4], and the aerial parts are used externally for the treatment of eczema and as a skin moisturizer [1]. M. armeniacum contains flavonoids, mucilages, saponins, alkaloids and different active substances [3]. Anthocyanins, which give plant flowers their blue color, are also known to reduce the risk of cancer, diabetes, cardiovascular and neurological disorders [5]. M.armeniacum has anticancer potential due to flavonoids and antiviral, antidiabetic and antiobesity potential due to prolizidine alkaloids [3]. Therefore, the aim of this study is to obtain different extracts (petroleum ether, chloroform and ethanol) from the aerial parts and bulbs of the plant by maceration method, respectively, and to examine the antioxidant and antimicrobial activities of these extracts. The antioxidant activity of the extracts was compared with DPPH, FRAP and CUPRAC methods. In addition, the total phenolic contents of the extracts were determined by FCR method. In this study, the antimicrobial activity of the extracts was determined by agar well diffusion method. According to the findings, it was determined that plant bulbs had the highest CUPRAC and DDPH activity potential. It was determined that the aerial parts of the plant exhibited higher iron (III) reduction activity compared to the plant bulbs.

Key words: Muscari armeniacum, antioxidant activity, antimicrobial activity
Acknowledgement: This study was supported by The Scientific and Technological Research Council of Turkey (2209/A, Project no: 1919B012209006).

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PP92 – INVESTIGATION OF NEUROREGENERATIVE EFFECTS THE OF GRAPHENE IN IN VITRO SPINAL CORD INJURY MODELS

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Mechanical injury model was created by a pipette tip and the different concentration of alpha kainic acid (α -KA) was applied for chemical injury[1,2]. The effect of graphene with different concentrations α -KA in an in vitro spinal cord scratch model with mechanical and chemical injury were investigated. Dual (mechanical and chemical injury) models were applied on NSC-34 cells. Immunohistochemical staining was performed at the end of the 3rd day for the model in which mechanical, chemical and both mechanical and chemical injury was applied on NSC-34 cells. Neuroprotective and neurodegenerative effects of graphene were investigated. Different concentrations of α-KA were applied on NSC-34 cells for chemical injury model and observed under light microscopy. Immunohistochemical stainings for choline acetyltransferase (ChAT), neurofilament (NF-H D9) and synaptophysin (SYP) were applied for the detection of motor neurons and the determination how the expression of the neurotransmitter change after three models of in vitro spinal cord injury. The closure of scratching completed after the 3rd day in the mechanical injury model. Graphene applied onto KA treated group showed neuroregenerative effects at 0.05 mg/mL concentration by MTT assay. The neuroprotective effect of graphene was obtained 0.05% dose of graphene. This is the first time NSC-34 motor neuron-like cells were used in in vitro spinal cord injury models and different concentrations of α-kainic acid were applied on NSC-34 cells for chemical injury model. The dual (mechanical and chemical) injury models provide more realistic tools for mimicking the spinal cord injury in vitro. This study will provide useful knowledge on in vitro spinal cord injury model and the neuroregenerative effects of graphene.

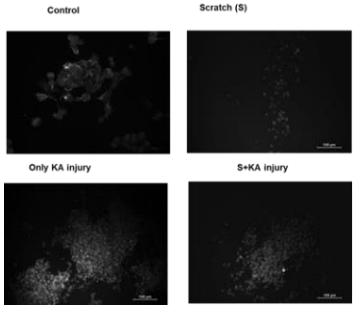

Figure 1. Neurofilament immunohistochemistry for control, scratch, only KA injury and scratch+ KA injury.

Acknowledgement: This study was supported by Ege University Scientific Research Projects (BAP, Project no: 22125).

Keywords: chemical injury; graphene; in vitro spinal cord injury; mechanical injury; α-kainic acid (KA).

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PP93 –DEVELOPMENT AND VALIDATION OF AN HPLC-DAD METHOD FOR DETERMINATION OF DONEPEZIL HYDROCHLORIDE IN BULK AND TABLET DOSAGE FORM

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Donepezil hydrochloride is an acetylcholinesterase inhibitor most commonly used for the treatment of Alzheimer disease and dementia [1]. The aim of this study was to develop a high-performance liquid chromatography with an diode array detector (HPLC-DAD) method for the determination of donepezil hydrochloride in bulk and pharmaceutical dosage form. Following the optimizied of several chromatographic conditions, the suggested method was validated in accordance with International Conference on Harmonization guidelines. The chromatographic analysis was performed at 30 °C with a Nova-Pak C18 column (3.9 x 150 mm; 4 µm). The mobile phase consisted of acetonitrile: buffer (50 mM sodium dihydrogen phosphate); (70/30; v/v). The run time was 5 min at a flow rate of 0.7 mL/min. Wavelength was selected as 268 nm. The calibration plot was linear over a concentration range of 0.5-50 µg/mL with correlation coefficient, 0.9999. The LOD and LOQ values were found to be 30.49 ng/mL and 92.40 ng/mL, respectively. The relative standard deviation (RSD) values of precision for the method was below 0.02% and 1.40%. Mean recovery values were between 97.47% and 98.65%. The proposed method was successfully applied to the analysis of the drug in bulk, spiked synthetic urine and tablets with good accuracy and precision.

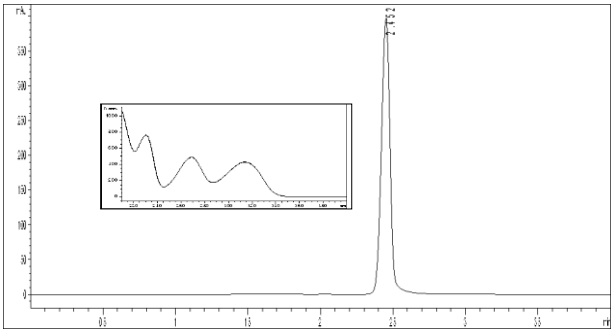

Figure 1. Chromatogram (λ:268 nm) and absorbance spectra of standard solution (50 µg/mL) of donepezil hydrochloride.

Acknowledgement: This study was supported by The Scientific and Technological Research Council of Turkey (2209/A, Project no: 1919B012209676).

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PP94 – CASTICIN INHIBITS LIPOPOLYSACCHARIDE-INDUCED ACTIVATION OF SIGNALING PATHWAYS IN MICROGLIAL CELLS IN VITRO

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Microglia are primary immune cells residing in the central nervous system.The play key roles in homeostasis, inflammatory responses and tissue repair in brain. Microglial activation is closely associated with neuroinflammation which plays an important role in the neurodegenerative diseases [1,2]. Mitogen activated protein kinases (MAPKs) and IκB signaling pathways are involved in the production of inflammatory cytokines. Activation of microglia results in the induction of these intracellular signalling pathways leading to changes of genes that are related to inflammation. Flavonoids are naturally occurring polyphenolic compounds that are known to have neuroprotective effects. Casticin is an active component of Vitex agnus-castus. It is a polymethylflavone which has been shown to have anticancer and antioxidant activities [3-5]. In the present study, we investigated the effect of casticin on the lipopolysaccharide (LPS)-activated activation of p38 MAPK and IκB pathways in microglial cells in vitro. N9 mouse microglial cells were used in the study. The cells were treated with 0.1, 0.5 and 1 µM of casticin for 24 h and the viability of cells was determined using WST-1 assay. N9 cells were pretreated with 0.1 and 0.5 µM of casticin for 1 h and then incubated with 1 µg/mL of LPS for 4, 8 and 24h. LPS-induced phosphorylation levels of p38 MAPK and of IκB-α were analyzed by Western blotting. The viability of cells incubated with 0.1 and 0.5 µM of casticin did not show significant differences compared to untreated cells, whereas 1 µM of casticin decreased cell viability to 89.3% at 24 h. Phosphorylation of p38 MAPK and of IκB-α were induced after LPS incubation at 2, 4 and 8 h compared to control cells. Casticin decreased LPS-induced phosphorylation of p38 MAPK at concentrations of 0.1 and 0.5 µM at 4 h and at the concentration of 0.5 µM at 8 h. Casticin also inhibited LPS-induced phosphorylation of IκB-α at concentrations of 0.1 and 0.5 µM at 4 h. Our results demonstrate that casticin could regulate inflammation by inhibiting phosphorylation of p38 MAPK and IκB-α in a time- and dose-depent manner. These findings suggest a neuroprotective effect and promising therapeutic potential of casticin for neuroinflammation.

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PP95 – ELECTROCHEMICAL DNA BIOSENSOR APPLICATIONS WITH NEWLY DEVELOPED ELECTRODE SURFACES BASED ON CARBON AND METAL OXIDE NANOPARTICLES

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In this study, graphene oxide (GO), Gd-ZnO, Cu-ZrO_2, Gd-ZrO_2, zeolitic imidazolate framework (ZIF-8), water-soluble myofibrillar protein (MP) and chitosan (CH) (MP-CH) nanomaterial modified Pencil graphite electrode (PGE) was designed for DNA biosensor applications and their performance was investigated. Nanomaterials was synthesis at the laboratory conditions by using different production parameters. The effect of nanomaterials use on signal enrichment was determined by using cyclic voltammetry (CV), or differential pulse voltammetry (DPV) techniques based on guanine signal. Electrochemical activation techniques were applied to electrode surfaces, and several pH ranges were used to get high responses from each nanomaterial modified electrodes. It was observed that the activation procedure applied to the Gd-ZnO, Cu-ZrO_2, ZIF-8 modified electrodes has effects on signal enrichment. It was also found that GO, Gd-ZrO_2, MP-CH nanomaterials not responses to some pretreatment processes.

Here, in order to evaluate the performance of newly created electrode surfaces containing nanomaterials, it is based on whether these surfaces can precisely detect the DNA signal. As a result, the Gd-ZnO nanomaterial modified biosensor exhibited a %40, Cu-ZrO_2 nanomaterial modified biosensor %67, ZIF-8 nanomaterial modified biosensor %37 higher sensitivity performance compared to the bare PGE electrode in terms of guanine oxidation signal obtained at about 1.0V. [1] [2]

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PP96 – INVESTIGATION OF BIOLOGICAL ACTIVITIES OF ARNEBIA DENSIFLORA

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Arnebia densiflora, common in Anatolia, belongs to the Boraginaceae family. It is known that the roots of the Boraginaceae family are used not only in the treatment of burns and skin diseases in the Far East and Europe, but also as a red dye in the pharmaceutical, cosmetic and textile industries [1]. Two naturally occurring isomeric compounds, alkannin (L-form) and shikonin (R-form), found in the roots of some species of this plant family are known as natural colorants in the isohexenylnaphtazarin structure. *Arnebia densiflora* is used as a wound healer in wounds and burns.and contains β,β-dimethyl-acryl-alkannin, teracrylalkannin and isovalerilalkannin + α-methyl-n-butylalkannin [2]. Therefore, the aim of this study is to obtain different extracts (petroleum ether, chloroform and methanol) from the aerial parts plant by maceration method, respectively, and to examine the antioxidant, anti-urease and antimicrobial activities of these extracts. The antioxidant activity of the extracts was compared with DPPH, FRAP and CUPRAC methods. In addition, the total phenolic contents of the extracts were determined by FCR method. In this study, the antimicrobial and anti-urease activities of the extracts was determined by agar well diffusion and indophenol methods respectively. According to the findings in this study, it was determined that the plant's methanol extract had a stronger activity potential compared to other extracts.

Keywords: *Arnebia densiflora, antioxidant activity, antimicrobial activity, anti-urease activity*
Acknowledgement: This study was supported by The Scientific and Technological Research Council of Turkey (2209/A, Project no: 1919B012222188).

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PP97 –SORAFENIB LOADED ZIF-8 METAL-ORGANIC FRAMEWORKS AS A MULTIFUNCTIONAL NANO-CARRIER OFFERS EFFECTIVE HEPATOCELLULAR CARCINOMA THERAPY

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Hepatocellular carcinoma (HCC) is a primary malignant neoplasia of the liver and sorafenib is one of the most commonly used drugs in the treatment of HCC[1]. Due to undesirable nature and side effects of sorafenib, nano-drug delivery systems are being developed[2-3]. A member of metal-organic frameworks (MOFs), ZIF-8 offers a very suitable platform for drug transport and controlled drug release due to its zinc content and pH-sensitive, biodegradable in an acidic environment[4].

In the present study, sorafenib was encapsulated in ZIF-8 material with 53.8% efficiency and 58% loading capacity (SRF@ZIF-8). Structural characterizations of synthesized ZIF-8 and SRF@ZIF-8 system were investigated in details. Drug release analysis exhibited a faster release profile at pH 5.0 compared to that of pH 7.4. The cytotoxic effects of sorafenib and zinc were investigated in HepG2 and HuH-7 cell lines in vitro. The results demonstrated that in addition to sorafenib, ZIF-8 provided zinc to the environment with its biodegradable structure resulted in an effective cytotoxic effect on HCC cells. The findings showed that a formulation combining zinc and sorafenib together was more effective in HCC treatment compared to sorafenib itself.

Figure 1. Graphical Abstract

Acknowledgement: The study was supported by The Scientific & Technological Research Council of Turkey (TUBITAK, Project number, KBAG–119Z023).

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PP98 –DEVELOPMENT AND CHARACTERIZATION OF SPRAYABLE THERMOSENSITIVE BENZYDAMINE GELS FOR DERMAL APPLICATION

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Benzydamine hydrochloride (BZD) is a non-steroidal anti-inflammatory drug and has analgesic and anti-inflammatory activities [1]. Thermosensitive systems are aqueous solutions and turn into gel form under physiological temperature after administration [2]. In this work, it was aimed that develop new sprayable thermosensitive gel formulations containing BZD to relief of pain and inflammation in muscles and joints.

Thermosensitive gels were prepared by a cold method using Poloxamer 188, Poloxamer 407 and HPMC. Within the scope of preliminary studies, 33 gels without BZD were prepared and suitable formulations were selected in terms of the results of their viscosity and gelling temperature studies. Drug loaded gel formulations were prepared as the previous method. BZD (5%) was added at the last stage. The clarity, gelation temperature and gelation capacity of the gels were determined. Sprayability of the gels was investigated a handmade method using a texture analyser and camera. Viscosity of the gels were determined with a rotational viscometer (Brookfield DV2T-RV) at 4, 25 and 32^{o}C). In addition, a glass plate (20x20 cm^2) was used for measuring the spreadability of gels at 32^{o}C and pH of the gels was measured at room temperature using a pH meter (Hanna HI83141).

Preliminary studies were showed viscosity values lower than 350 mPa.s and gelation temperature values lower than 34^{o}C were suitable for sprayability of thermosensitive gels (Table 1). Addition of BZD to the formulations was not caused a significant change in pH values, however it was caused significant increases in gelation temperatures and decreases in viscosity. The sprayability of gels showing lower viscosity was better than the gels with higher viscosity.

Table 1. Composition of BZD loaded thermosensitive gel formulations

Formulation	P407 (%)	P188 (%)	HPMC K4M (%)	BZD (%)
F11	18	0	0.25	5
F16	18	12	0	5
F17	18	12	0.25	5
F18	18	12	0.5	5
F19	20	0	0	5
F20	20	0	0.25	5
F21	20	0	0.5	5
F23	20	6	0.25	5
F30	18	9	0.5	5
F32	20	9	0.25	5

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PP99 –THE EFFECTS OF EARLY LIFE STRESS ON THE KYNURENINE PATHWAY ENZYMES IN RATS

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Tryptophan, an essential amino acid, is the precursor of serotonin and melatonin. The kynurenine pathway, which is responsible for 95% of tryptophan degradation in mammals, and the kynurenins, the metabolites of this pathway, play important roles in many physiological and pathological processes. The effects of kynurenines on the central nervous system and brain development are remarkable [1]. Dexamethasone (Dex), a synthetic glucocorticoid, is used to induce early life stress in rodents [2]. The aim of our study is to examine the gene expressions of enzymes involved in the kynurenine pathway, including tryptophan 2,3-dioxygenase (TDO2), indoleamine 2,3-dioxygenase 1 and 2 (IDO1 and 2), kynurenine aminotransferase 2 (KYAT2), and kynurenine 3-monooxygenase (KMO), in the cerebral cortex of in rats exposed to early life stress. From gestation day 14 to 21, pregnant rats were injected daily with Dex at a dose of 100 µg/kg (early life stress group) or saline (control group). At 3 months after birth, male rats were decapitated (n=5) and cortexes were dissected. Total RNA was isolated from cortexes and used for cDNA synthesis. Gene expressions were conducted with real-time PCR using the comperative ΔΔCT method. The statistical differences between groups were analyzed by the Mann-Whitney test. Level of $p<0.05$ was considered to be statistically significant. In our study, early stress induced by dexamethasone significantly increased the expression of IDO1, TDO2, and KYAT2 in the cerebral cortex of male rats, but caused a significant decrease in the expression of KMO ($p<0.01$) compared to the control. No significant difference was found between the control and early life stress groups regarding the gene expression levels of IDO2 (Fig. 1). The findings revealed that early stress affects the mRNA levels of the enzymes involved in the kynurenine pathway, which is responsible for tryptophan degradation, and may cause changes in the levels of kynurenines, which are neuroactive substances.

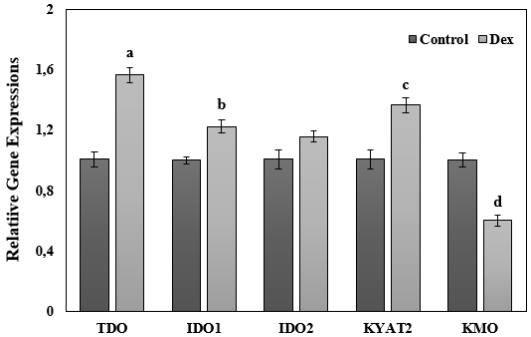

Figure 1. Relative gene expression levels of TDO2, IDO1, IDO2, KYAT2, and KMO in the control and early life stress groups. The results were given mean ± S.E. (n=5, $^{a,b,c,d}p<0.01$ *vs control*).

Acknowledgement: This study was supported by a grant of TUBITAK (2209-A, 2021/1).

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PP100 –INVESTIGATION OF MOLECULAR MECHANISM FOR CHROMATOGRAPHIC RESOLUTION IN KIRAL ETHANOL ESTER DERIVATIVES

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Previously, racemic 1-(phenyl/4-chlorophenyl)-2-(1H-triazol-1-yl)ethanol ester derivatives having a stereogenic center in their structure were synthesized, investigated for their anticonvulsant activity and separated to enantiomers by HPLC using chiral stationary phase containing amylose tris(3,5-dimethylphenylcarbamate) on silica gel (Chiralpak® AD) with the methanol/n-hexane as mobile phase [1,2].

In chromatographic separations, the basis of chiral recognition mechanism is the formation of transient diastereomeric complexes between chiral analytes and CSPs mediated via hydrogen bond or ionic, ion-dipole, dipole-dipole, van der Waals as well as π-π interactions. The carbamate groups of phenylcarbamate derivatives of amylose are probably the most important adsorption sites for the chiral recognition. The NH and C=O groups interact with the functional groups of the racemate through hydrogen bonding in addition to dipole-dipole interaction of the C=O group (Figure 1).

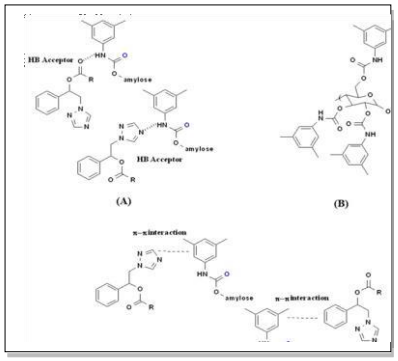

Figure 1. (A) Proposed interactions of hydrogen bonds acceptor of the compounds with amylose CSP, (B) structure of amylose tris(3,5-dimethyphenylcarbamate) and (C) Proposed interactions of π-π bonds with the compounds between amylose CSP.

In this study, the molecular mechanism behind the possible chiral recognition was discussed based on the experimental and theoretical results of the enantiomeric separation and molecular dynamics studies.

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PP101 –COMPARISON OF ONLINE DRUG INTERACTION PROGRAMS IN TERMS OF DRUG-DRUG INTERACTIONS IDENTIFIED IN A PALLIATIVE CARE CLINIC

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Background: Drug-drug interactions are a significant issue when patients with multi-drug use are considered due to high potential of adverse effects. Especially, palliative care clinics need special attention in terms of drug-drug interaction and its effects since they generally provide healthcare services for geriatric patients suffering from specific diseases such as Alzheimer, cancer and advanced organ failure. The aim of this study is to compare two frequently preferred online drug interaction programs (Lexicomp® and Micromedex®) in terms of potential drug-drug interactions identified in patients receiving medical care in a palliative care clinic.

Methods: Within the scope of the study, two clinical pharmacists examined drug treatments of the patients receiving medical care in the palliative care clinic of a state hospital located in Eskisehir on March 9th 2023. All potential drug-drug interactions and their severity between the drugs listed in the patients' orders for the date specified above were determined by using Lexicomp® and Micromedex® drug interaction programs.

Results: A total of 34 patients receiving medical care in the palliative care clinic on that specified date were included in the study. The average value (± st deviation) calculated for the ages of these patients was 80 ± 8.9 years. In total, 252 drug-drug interactions were identified by Lexicomp® while Micromedex® revealed 113 drug-drug interactions. The number of interactions identified in Lexicomp® reduced to 109 when recurring interactions were removed from the list. Of these 109 interactions, 6 were at X level, 9 at D level and 80 at C level and 14 at B level. No interactions were identified at A level. As for the interactions determined in Micromedex®, the results revealed 3 contraindicate, 45 major, 16 moderate and 1 minor interactions, which amount to 65 interactions in total. The most frequent drug-drug interaction determined in Lexicomp® was furosemide-quetiapine (23.85%, n=26), and haloperidol-quetiapine (18.46%, n=12) was the most frequent drug-drug interaction in Micromedex®.

Conclusions: Online drug interaction programs play a significant role in providing comprehensive information and guidance for healthcare service providers. However, these programs might sometimes present different results when it comes to drug-drug interactions. Therefore, information obtained only from online drug interaction programs might not be adequate and reliable. It is essential to interpret information obtained from these programs so that clinically significant drug-drug interactions could be determined and effective solutions could be created accordingly. In conclusion, it is crucial that clinical pharmacists should collaborate with physicians as a multidisciplinary team in order to make the most effective and efficient patient-oriented decisions in terms of drug management.

PP102 –ANTIDEPRESSANT-LIKE EFFECTS OF NEW THIADIAZOLE DERIVATIVES

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In this study, based on the activity potentials of 1,3,4-thiadiazole derivatives on the central nervous system, possible antidepressant-like effects of some newly synthesized 1,3,4-thiadiazole derivatives were investigated. In order to examine the antidepressant-like effects of test compounds, tail suspension and modified forced swimming tests were performed [1]. The effects of test compounds on motor coordination of mice were evaluated by Rota-rod tests. In the series, compound **3g** shortened the immobility time of mice in tail suspension and modified forced swimming tests. Furthermore, compound **3g** increased climbing and swimming times of mice in the modified forced swimming test. These findings indicated that compound **3g** had an antidepressant-like effect and this effect might be associated with serotonergic and catecholaminergic neurotransmissions. In the Rota-rod test, unchanged falling latencies of mice from the rotating mill revealed that obtained findings were not related to any change in the motor coordinations of mice. After determining the antidepressant-like effect, p-chlorophenylalanine methyl ester (PCPA), α-methyl-para-tyrosine methyl ester (AMPT) and naloxone were used to elucidate possible mechanisms mediating this effect. PCPA, AMPT and naloxone pretreatments reversed the anti-immobility effect of compound **3g**. These findings suggested that the antidepressant-like effect of compound **3g** was associated with serotonergic, catecholaminergic and opioidergic mechanisms.

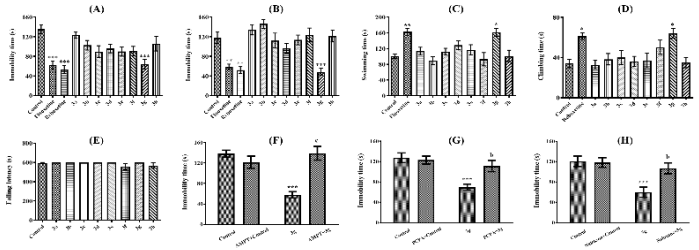

Figure 1. The effects of compounds **3a-3h** (30 mg/kg) on the (A) immobility times of the mice in the TST, on the (B) immobility, (C) swimming and (D) climbing times of the mice in the MFST, and on the (E) falling latency of mice in the Rota-rod test. Significance against control group $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$; One way analysis of variance followed by Tukey HSD multiple comparison test, n = 7.

Effects of (F) AMPT, (G) PCPA, and (H) naloxone pre-treatments on compound **3g-**induced decrease in immobility time in the TST. Significance against control group $^{***}p<0.001$, significance against **3g** administrated group $^{b}p<0.01$, $^{c}p<0.001$; Two way analysis of variance followed by Tukey HSD multiple comparison test, n = 7.

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PP103 –ANTIDEPRESSANT-LIKE EFFECTS OF SOME PIPERAZINE DERIVATIVES

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In this study, 12 original piperazine derivative compounds (**2a**-**2l**) were synthesized and the possible antidepressant-like effects of these compounds were examined. The chemical structures of the synthesized compounds were elucidated using methods such as IR, 1H-NMR, 13C-NMR and mass spectroscopy. Effects of the compounds on motor coordination of mice were assessed by Rota-rod method; while their antidepressant-like effects were evaluated by tail suspension and modified forced swimming tests [1]. None of the compounds in the series produced a significant change in the motor performance of the mice. On the other hand, compounds **2b**, **2d**, **2g**, **2h**, **2i** and **2j** significantly shortened the immobility times of the mice in the tail suspension and modified forced swimming tests with respected to the immobility times of the control group. The same compounds prolonged the swimming behavior of mice in the modified forced swimming test. Obtained data indicated that the compounds **2b**, **2d**, **2g**, **2h**, **2i** and **2j** have antidepressant-like activity. This study supported the findings of previous studies pointing to the antidepressant activity potential of piperazine derivative compounds and brought new drug candidate molecules to the literature.

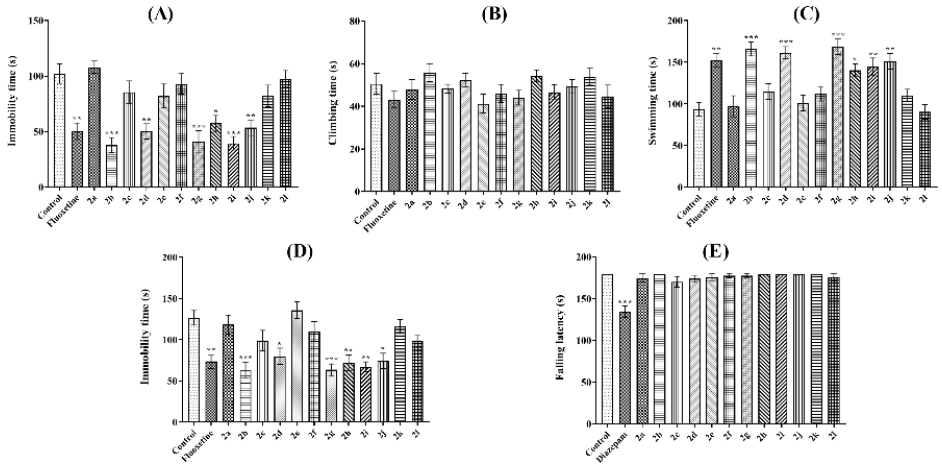

Figure 1. Effect of the test compounds (**2a**-**2l**) on the (A) immobility time (in MFST), (B) climbing time (in MFST), (C) swimming time (in MFST), (D) immobility time (in TST) and (E) falling latency (in Rota-rod) of mice. Values are given as mean ± S.E.M. Significance against control values, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$, One way ANOVA, post-hoc Tukey's test, n=8.

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PP104 –BENEFICIAL EFFECT OF SCHINUS MOLLE L. ESSENTIAL OIL INHALATION ON SCOPOLAMINE-INDUCED IMPAIRMENTS IN SPATIAL LEARNING AND MEMORY PERFORMANCE OF RATS

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Schinus molle L. (Anacardiaceae) is an evergreen tree, also known locally as black pepper, pink pepper, American pepper, California pepper, or molle de Peru. This plant, which is mostly found in the Izmir region in Turkey, has traditional use against various diseases. Based on the cognitive enhancing potentials of aromatherapy practices [1], we investigated the anti-amnesic activity potential of S. molle essential oil, in this study. Experimental amnesia model was induced using scopolamine. Spatial learning and memory performances of rats were investigated using Morris water maze tests. The effect of essential oil inhalation on the motor performance of rats was evaluated by Rota-rod experiments. Obtained findings revealed that scopolamine administrations diminished learning and memory parameters of rats, while piracetam and essential oil (1% and 3%) treatments (14 days) improved these impaired cognitive performances (Figure 1). Essential oil administrations did not change the motor coordination's of the animals (data not shown). Results of this study revealed for the first time that S. molle essential oil showed significant anti-amnesic activity and indicated that this oil may have the potential for aromatherapeutic use in patients with cognitive impairment.

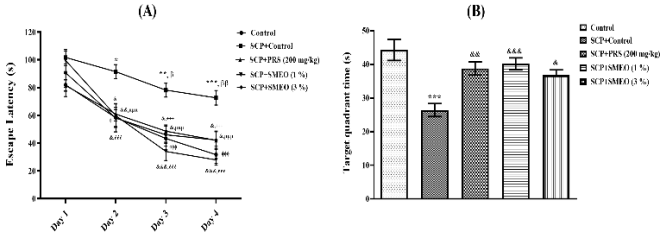

Figure 1. (A) Escape latency values of healthy rats (Control), control solution (SCP + Control), 200 mg/kg piracetam (SCP + PRC) or essential oil (1% and 3%) (SCP + SMEO) administered amnesic rats in the Morris water maze tests. Significant difference against to the corresponding day of the control group $^{*}p<0.05$, $^{**}p<0.01$,$^{***}p<0.001$; to the corresponding day of the SCP+control group $^{\&}p<0.05$,$^{\&\&}p<0.01$, $^{\&\&\&}p<0.001$; to the day 1 $^{\varphi}p<0.05$, $^{\varphi\varphi\varphi}p<0.001$; $^{\beta}p<0.05$, $^{\beta\beta}p<0.01$; $^{+++}p<0.001$; $^{ééé}p<0.001$; $^{\mu\mu\mu}p<0.001$. Two-way repeated variance analysis followed by Bonferroni multiple comparison test, n=8 (B) Target quadrant time values of healthy rats (Control), control solution (SCP + Control), 200 mg/kg piracetam (SCP + PRC) or essential oil (1% and 3%) (SCP + SMEO) administered amnesic rats in the Morris water maze tests. Significant differences compared to the control group $^{***}p<0.001$; Significant difference compared to the SCP+control group $^{\&}p<0.05$,$^{\&\&}p<0.01$, $^{\&\&\&}p<0.001$; One way analysis of variance followed by Tukey HSD multiple comparison test, n=8.

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PP105 –EFFECTS OF SUBACUTE IVERMECTIN ADMINISTRATION ON THE EMOTIONAL BEHAVIOR OF RATS

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Ivermectin is a macrocyclic lactone widely used in humans and animals for the treatment of nematode infections. It exhibits poor penetration into the central nervous system (CNS) but conditions that weaken the blood-brain barrier increase the penetration of this drug. However, probable psychotoxic effects of this drug in situations that increase this penetration have not been investigated so far. Therefore, effects of subacute ivermectin exposure on the behaviors of rats were investigated in this study. Ivermectin was administered in 1, 5 and 10 mg/kg/day for 21 days. Depression and anxiety levels of animals were evaluated by modified forced swimming test (MFST) and elevated plus maze test, respectively [1]. The results revealed that ivermectin prolonged immobility time of the rats in the MFST, whereas it shortened the durations of climbing and swimming behaviors. Moreover, it significantly reduced both the percentages of open-arm entiries and the percentages of open-arm durations of rats in the plus maze test. These findings revealed that 3 weeks of ivermectin administration (5 and 10 mg/kg) induced depression-like and anxiety-like behaviors in animals. These results may have clinical importance as they indicate that the patient's mood should be monitored while giving ivermectin therapy.

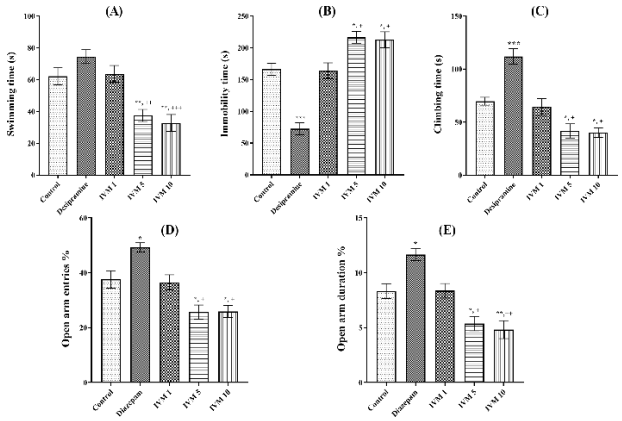

Figure 1. The effects of subacute ivermectine (IVM) administrations on (A) swimming time in the MFST, (B) immobility time in the MFST, (C) climbing time in the MFST, (D) open arm entries % in the plus maze tests, (E) open arm duration % in the plus maze tests. Significant difference from control group $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$; significant difference from IVM 1 group $^{+}p<0.05$, $^{++}p<0.01$, $^{+++}p<0.001$. One-way ANOVA followed by Tukey's test, n=8.

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PP106 –ANTI-INFLAMMATORY EFFECT OF SYRINGIC ACID: IN VIVO AND IN SILICO RESULTS

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In this study, it was planned to investigate anti-inflammatory effects of syringic acid based on its efficacy potential against inflammation. For this purpose, carrageenan-induced inflammation test was used. In addition, the activity-meter test was performed to evaluate locomotor activities of the animals. Syringic acid administered at doses of 50 and 100 mg/kg showed significant anti-inflammatory effects, significantly reducing paw edema of rats in the carrageenan-induced inflammation test at 2nd and 3th hours. In the activity-meter test, syringic acid did not change the horizontal and vertical movements of the animals. In silico studies were carried out to investigate the interactions of syringic acid with cyclooxygenase (COX) and lipoxygenase (LOX) enzymes, which are closely related to inflammatory processes. Molecular docking and molecular dynamics simulation studies have shown that syringic acid successfully couples with COX-2 and 5-LOX enzymes and exhibits high affinity and sustained interactions with both of them.

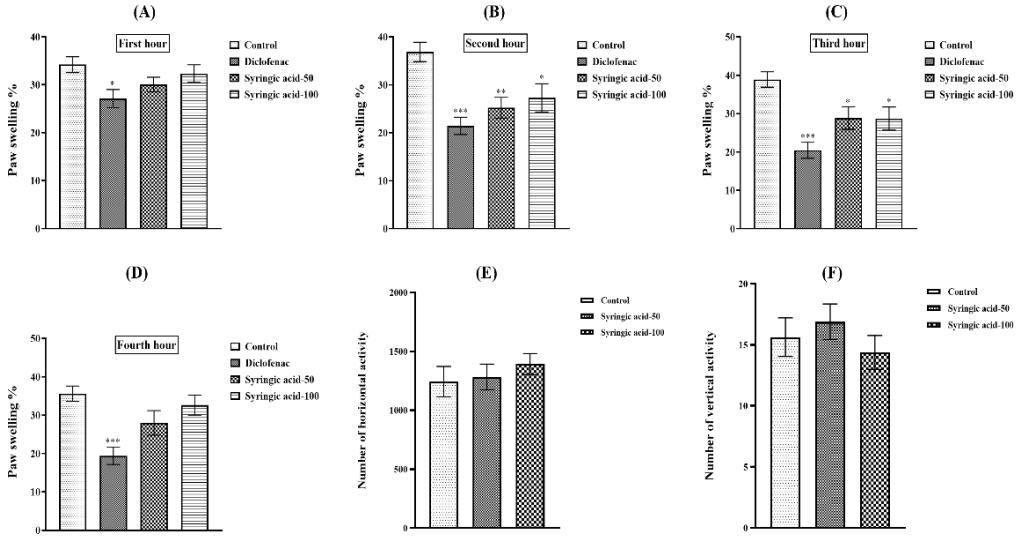

Figure 1. Syringic acid induced alterations in paw swelling % values of rat at (A) 1th , (B) 2nd, (C) 3th, (D) 4 th hours of carrageenan-induced inflammation tests. Syringic acid-induced changes in the (E) horizontal and (F) vertical locomotor activities of animals in the activity-meter tests. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$, One way ANOVA, post-hoc Tukey's test, n=8.

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PP107 –ANXIOLYTIC-LIKE EFFECTS OF SOME PIPERIDINE DERIVATIVE COMPOUNDS CONTAINING BENZIMIDAZOLE RING IN THEIR STRUCTURE

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In this study, anxiolytic-like effects of some new piperidine derivative compounds including benzimidazole ring in their structures were investigated, based on the activity potentials of these pharmacophores on central nervous system [1]. Anxiolytic-like activities of the test compounds were investigated by hole-board experiments. Moreover, possible effects of the test compounds on the motor coordination of the mice were investigated by Rota-rod tests. In the hole-board tests, compounds **2d**, **2f**, **2g** and **2h** shortened the time to first head-dipping behavior of mice (latency to first head dipping). The same compounds increased the total number of holes explored and total number of head dipping's. There was no difference in falling latencies of the animals from the rotating mill of Rota-rod device. Obtained findings indicated that compounds **2d**, **2f**, **2g** and **2h** had anxiolytic-like activity comparable to the reference drug diazepam, and that these pharmacological effects were not affected by any changes in the motor coordinations of the experimental animals.

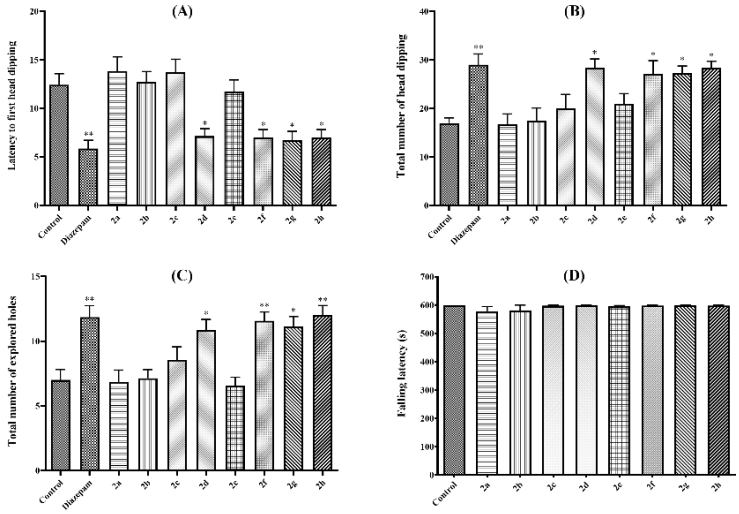

Figure 1. The effects of compounds **2a**-**2h** on (A) latency to first head dipping in the hole-board test, (B) total number of head dipping in the hole-board test (C) total number of holes explored in the hole-board test (D) falling latencies of the animals in the Rota-rod test. Significant difference from control group $^{*}p<0.05$, $^{**}p<0.01$. One-way ANOVA followed by Tukey's test, n=7.

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PP108 –THE EFFECTS OF FORMULATION PARAMETERS ON THE CHARACTERISTICS OF PROLIPOSOMAL DRUG DELIVERY SYSTEMS

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The concept of proliposomes which was first introduced by Payne (1986), represents an alternative to conventional liposomal formulations [1]. Proliposomes are characterized by their dry, free-flowing characteristics, and liposomes are formed by contact with biological fluids in vivo or can be formed in vitro prior to administration using a suitable hydration fluid [2]. Proliposome technology is a low-cost and large-scale production to produce commercial-size liposomes. Being in dry powder form provides advantages in distribution, transportation, and measurement [3]. This study focused to investigate the formulation process parameters affecting the characteristics of proliposomal formulations. A series of proliposome formulations (F1-F18) were prepared by using soy/egg phosphatidylcholine, cholesterol, and maltodextrin with different particle size distributions. Film dispersion and film deposition-freeze drying methods were used in order to evaluate the effect of preparation methods. The production yield, consolidation properties and morphologic properties the proliposomes were evaluated. Proliposome-derived liposomes were analyzed for size distributions and zeta potentials. Formulated liposomes had a size range between 600 nm and 1350 nm. Zeta potentials are found at about -60 mV. Proliposomal powder had good consolidation and fluidity properties with Hausner index and Carr's index found less than 1.25 and 20 respectively. As a result of studies, it is observed that the drying process and film deposition-freeze drying method had a positive effect on proliposome characteristics. Further studies are going with active ingredient-loaded proliposome production.

Note: This study is supported by TÜBİTAK in the scope of 2209-A.

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PP109 –SIMULTANEOUS HPLC DETERMINATION OF RUSCOGENIN, NEURUSCOGENIN AND TRIMEBUTINE IN THE PRESENCE OF THE PARABENS

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Ruscogenin, neuruscogenin, and trimebutine are the most commonly used compounds in hemorrhoidal disorders. The stability of pharmaceutical preparation may be increased using parabens. If there are any preservatives in the dosage forms, their levels must be monitored during stability studies. However, there wasn't a method for the simultaneous analysis of parabens and ruscogenin, neuruscogenin, and trimebutine. Therefore, an HPLC method was needed for the simultaneous determination of the parabens (methyl paraben and propyl paraben) and active ingredients in pharmaceutical semisolid dosage forms. The chromatographic separation was achieved on a C18 column ACE-121-2546 (250x4.6 mm) using a mobile phase consisted of 20 mM phosphate (pH=3.9) (A) and ACN (B). The injection volume was 10 µL and UV detection was set as 200 nm. The ruscogenin, neuruscogenin, trimebutine, methyl paraben and propyl paraben peaks are separated from each other with high resolution (2.86) at optimal conditions. The developed HPLC method has been validated according to the International Conference on Harmonization guidelines (ICH Q2R). The linear ranges of compounds analyzed in the developed method are 1- 150 µg/mL for methyl paraben, ruscogenin, 5- 200 µg/mL for propyl paraben, neuruscogenin, and 10-200 µg/mL for trimebutine. The detection limit of the method was 0.07, 0.28, 0.07, 0.45, 0.02 µg/mL respectively for methyl paraben, trimebutine, propyl paraben, neuruscogenin and ruscogenin. The recovery of the method was between 98.65%-102.48% and the accuracy and precision of the method for all compounds were 0.02% and 0.21 respectively. The method was successfully applied the pharmaceutical dosage form.

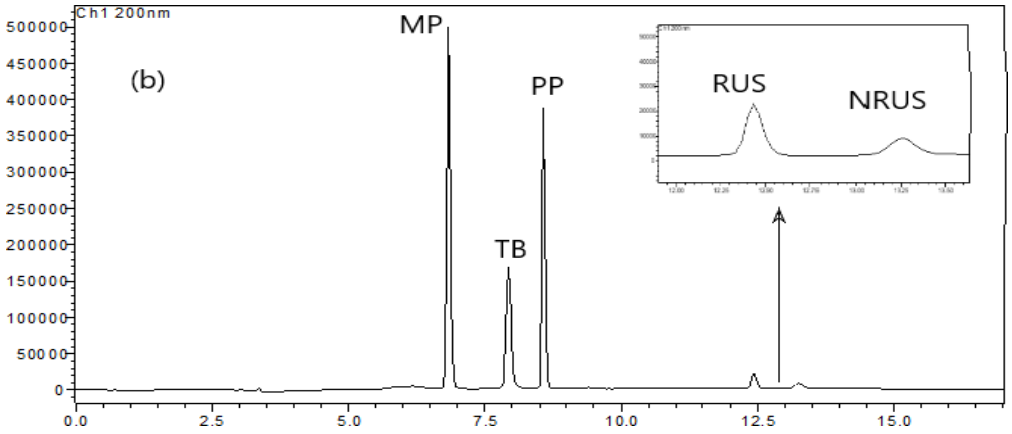

Figure 1. Chromatogram of methyl paraben (MP), trimebutine (TB), propylparaben (PP), neuruscogenin (NRUS) and Ruscogenin (RUS) standard solutions (50 µg/mL) at optimal conditions.

PP110 –PHYTOTHERAPY IN ONCOLOGY

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Cancer is a disease of unrestricted cell proliferation. Even tough considered a disease of genetic origin, researchs over the last years has shown that various epigenetic/environmental factors play an important role in preventing from the development and/or progression of cancer [1,2]. There is considerable advancement in treatment options, yet cancer cases continue to increase [3]. Therefore, attention is being focused on prevention as an ultimate strategy for the management of cancer. The focus is shifted to dietary and positive life changes. For this study, a systematic research was done about the topics of “cancer”, “phytotherapy”, “medicinal plants”, “medicinal plants in dietary”. Studies with plant active substances that can be used in cancer treatment have been examined in the literature. As a result of these studies, so far nearly 25,000 different phytochemicals have been identified in fruits and vegetables that have anticancer properties [4]. With the use of phytochemicals, the health status of cancer patients gradually improves. Although clinical trials of phytochemicals need more research to come to a firm conclusion, they could be used to treat cancer.

Acknowledgement: I would thank to Gülnur Gül’s patience and efforts for this work.

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PP111 –REGULAR CHANGES THE MAGNETIC CHARACTERISTICS OF LIVING SYSTEMS UNDER STRESS FACTORS

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Structural-functional changes and new physico-chemical properties that occur during stress in various living systems were investigated by us. As a result of studies conducted by the method of Electron Paramagnetic Resonance (EPR) spectroscopy, it was found that new magnetic properties are created in living systems during stress factors [1,2].

Identification of EPR spectra of dried samples of different plant and animal organisms recorded in a wide range of magnetic field (500-5500 G) showed that stress factors lead to the formation of nanophase iron oxide particles [3,4].

In our research, the leaves and seeds of various types of tree and shrub plants, which are widely distributed in Absheron, as well as the sprouts of various types of plant seeds germinated in laboratory conditions as a model system, were studied by the EPR method.

In the recorded EPR spectra, in addition the signals of iron ions (g=4.3) and free radicals (g=2.0023), was also observed characteristic broad EPR signals of iron oxide nanoparticles (g=2,32; ΔH=320 G) detected by us for the first time in various organs of plants. Depending on the influence of stress factors, the regular change of the intensities of these signals was observed. In order to make sure the universality of the obtained results, we continued our research with the study of animal organisms. Among animal organisms, grape snails with shell (Helix pomatia) and laboratory rats (Wistar albino) (control and irradiated) were studied. [5,6].

It has been known that stress factors cause the formation of magnetic properties in living systems. The obtained results were confirmed by the Transmission Electron Microscope [7].

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PP112 – THE QUALITATIVE AND QUANTITATIVE ANALYSIS OF PHENOLIC COMPOUNDS OF TEUCRIUM CHAMAEDRYS SUBSP. CHAMAEDRYS AND TEUCRIUM DIVARICATUM SUBSP. VILLOSUM PLANTS BY HPLC-DAD

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Teucrium chamaedrys L. (Lamiaceae) is a widely used ethnobotanical species. It is known by the people with names such as short mahmut grass (Bilecik), mayasil herb (Kayseri), pain herb (Niğde) and has been used for many years in diseases such as diabetes, intestinal colic, abdominal pain, hemorrhoids, rheumatism and colds. It is known that there are six subspecies of *T. chamaedrys* in the flora of Turkey (Bagci et al., 2010; Tuzlaci 2006). *Teucrium chamaedrys* subsp. *chamaedrys* plant is already widely used by the public as food and in the treatment of diabetes. It also has such anti-inflammatory, antioxidant, antipyretic, antirheumatic, aperitif, digestive, diuretic, carminative, choleretic, sedative, stomachic, tonic effects (Alpinar, 2015). It is known that the flower part of the *Teucrium divaricatum* plant is used ethnobotanically as an antipyretic and tonic, as well as stomach disorders, diabetes and hemorrhoids (Sarac ve Ugur 2017). In the scientific literature reviews, it has been determined that the phytochemical analysis studies on the aerial part of these two species are limited. Therefore, it is aimed to make qualitative and quantitative analyzes of the phenolic compounds contained in the ethanol extracts obtained from the aerial parts of these two species grown in our country and used in traditional treatment, using HPLC-DAD. Ethanol extracts were obtained from the aerial parts of the plants using the maceration method. The phenolic compounds contained in the obtained extracts were analyzed by HPLC-DAD. According to the analysis results, it was determined that both species contained quinic acid, luteolin and rutin compounds.

Keywords: *Teucrium chamaedrys* subsp. *chamaedrys, T. divaricatum* subsp. *villosum,* HPLC-DAD

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PP113 –PREFORMULATION STUDIES OF SEMI-SOLID LIPID NANOPARTICLES FOR TOPICAL APPLICATION

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Solid Lipid Nanoparticles (SLNs) are lipidic colloidal systems with an inner structure based on pure solid lipids [1, 2]. The latest member of SLNs is semi-solid SLNs and have many advantages over classic SLNs. Semi-solid SLNs prepared with high concentration of lipids exhibit a semi-solid formulation-like structure and retain the colloidal size [3]. The objective of the present study was to develop semi-solid SLNs for the encapsulation of sunscreen active agents and screen the lipids and surfactants to obtain the appropriate characteristics. The semi-solid SLNs were prepared by high shear homogenization technique using Compritol 888 ATO (C888), cetyl palmitate, Precirol® ATO5 and Dynasan® as lipids; Tween 80 (Tw80), Tw20 and lecithin as surfactants. The melted lipid (80-85ºC) was dispersed, in an aqueous solution of surfactants (80-85ºC) using a high-speed homogenizer at a speed of 20,000 rpm for 5 min and kept for one day before analysis. Particle size (PS), polydispersity index (PI) and zeta potential (ZP) were measured by Photon Correlation Spectroscopy. The PS was greatly influenced by the change of the surfactants and lipids. The ZP values were found to be between -24 and -43 mV. As a result, F4 (Tw80:Tw20:C888), F7 (Tw80:Tw20:Precirol), and F11 (Tw80:lecithin:Precirol) formulations were chosen as the optimum formulations. The light microscope images of the formulations revealed that the particles were homogenously dispersed throughout the lipid matrix (Figure 1). The pH values were found to be between 5.6-6.0. The viscosity of formulations were measured using a Brookfield viscometer and found to be suitable for sunscreens. Mechanical properties were evaluated with textural analysis using a Software-controlled penetrometer. Obtained results revealed that optimum semi-solid SLNs with suitable properties concerning homogeneity, PS, PI, ZP, pH value, viscosity and mechanical properties could be an alternative dosage form for future sunscreen formulations.

F4 **F7** **F11**

Figure 1. The optical microscope images of the optimum formulations

Acknowledgement: This study was supported by İzmir Kâtip Çelebi University Scientific Research Projects Coordination Unit (Project number 2021-GAP-ECZF-0050). The authors are also thankful to Gattefossé (France) for kindly gifting lipids.

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PP114 –PREPARATION AND CHARACTERIZATION OF GELS CONTAINING LINEZOLID LOADED NANOPARTICLE FOR DIABETIC FOOT TREATMENT

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Definition of diabetic foot includes all pathologies that occur in the foot either directly due to Diabetes Mellitus (DM) or indirectly as a result of chronic complications. Foot infections in diabetic patients are usually caused by gram-positive cocci that are resistant to most antibiotics. Linezolid (LZD) is active against these pathogens and is at least as effective as aminopenicillin/β-lactamase inhibitors in the treatment of foot infections in diabetic patients [1]. It is an antibiotic drug recommended for the treatment of deep skin infections in diabetic patients [2]. The objective of this study was to develop a suitable gel formulation containing LZD loaded nanoparticle (NP) and to perform in vitro characterization studies. A validated UV spectrophotometer method was used for determining the amount of LZD (r^2=0.9999). NPs were prepared by spontaneous emulsification technique [3]. 2.5% Eudrajit RS 100 and 0.6% LZD were dissolved in 25 mL ethanol. While 50 mL of distilled water was stirred with a magnetic stirrer at 800 rpm, this mixture was added dropwise (3 mL/min). NP were further stirred for 48 hours at room temperature. Particle size (PS), polydispersity index (PDI) and zeta potential (ZP) were measured by Photon Correlation Spectroscopy at 25°C. The PS, PI and ZP values of LZD loaded NP were found 195.27±5.42 nm, 0.214±0.019 and 20.57±0.35 mV, respectively. HPMC and carbopol were used at 1-2-3% to prepare the gel formulations. The gels were evaluated for clarity, pH and mechanical properties. The pH values of the gels were observed in the range of 5.0-7.5. LZD loaded NPs were dispersed in the optimum gel formulation and characterization studies were performed. The results obtained revealed that the optimum gel containing LZD loaded NP with suitable properties in terms of homogeneity, PS, PDI, ZP, pH value, viscosity and mechanical properties could be an alternative dosage form for future use in diabetic foot treatment.

Acknowledgement: The authors would like to thank to Scientific and Technological Research Council of Turkey (TUBITAK–2209-A) for their support of the project.

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PP115 – DEVELOPMENT, CHARACTERIZATION AND IN VITRO EVALUATION OF NANOPARTICLE BASED GENE THERAPY APPROACH FOR THE TREATMENT OF PROSTATE CANCER

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According to the World Health Organization, cancer is one of the leading causes of death worldwide with approximately 10 million deaths in 2020, and in the same year, 1.41 million people were diagnosed with prostate cancer, the fourth most common cancer (1). Genetic differences, such as loss of PTEN (phosphatase and tensin homologous deleted gene on 10th chromosome) function in prostate cancer, are promising targetable genes for the treatment of this disease. When the expression of the tumor suppressor PTEN gene in cells is decreased or deleted, the phosphorylation effect on the PI3K/Akt signaling pathway decreases, the function of the signaling pathway increases accordingly, and it supports the uncontrolled growth and spread of the cell (2).In this study, the development of a genetic-based treatment approach with the help of a nanocarrier systems such as SLN and liposome for prostate cancer were investigated. It was aimed to give plasmid DNA that can express PTEN (pDNA-PTEN) to the cell in order to increase the PTEN protein level that decreases during and after cancer formation. For this purpose, SLNs developed by the microemulsion dilution method and evaluated for clarity, stability, DNA binding capacity, protection from DNase and cytotoxicity. Since sustainable data could not be obtained for developed SLNs, liposome based carrier systems were used. The liposome was obtained by the film hydration method and positively charged nanocarriers below 200 nm were obtained. Moreoever, the formulation remained stable up to 30 days. Complex formation of liposome with pDNA-PTEN was observed by gel retardation studies and mobility of pDNA-PTEN in the obtained complexes was investigated by agarose gel electrophoresis method (3). The optimum liposome:pDNA complex ratio for the liposome was determined as 1:1 (v/v). With the DNase protection assay, the ability of the plasmid to be protected from DNases in the serum, was investigated. According to the result, it was determined that while the naked DNA treated with DNase was completely degraded, the pDNA-PTEN complexed with the liposome was protected for the same time interval. Cytotoxicity experiments carried out to find the safe application dose of liposome. Empty liposome formulation was applied on both L929 mouse fibroblast and DU-145 prostate cancer cell lines and cytotoxicity test was performed in accordance with the alamar blue test kit protocol. At the end of 24 hours, doses above 70% viability were determined as 10, 20 and 40 µl/mL for L929 and 10 and 20 µg/ml for DU-145 cells.As a result, the PTEN-expressing plasmid-loaded nanocarrier based treatment approach for the replacement of PTEN gene deficiency, showed promising results for prostate cancer, which can be extended to other cancer types.

Acknowledgement: This study has been financially supported by TUBITAK (The Scientific and Technological Research Council of Turkey) 2209-A programme.

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PP116 –PIPERIDINE / PIPERAZINE HYDRAZIDE DERIVATES as DONEPEZIL ANALOGS and EVALUATION of CHOLINESTERASE INHIBITORY ACTIVITIES

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Alzheimer's disease (AD) is a neurodegenerative disorder characterized by loss of memory, cognitive impairment, behavioral changes and loss of functional abilities [1]. The prevalence of all-cause dementia is expected to increase from 50 million people in 2010 to 113 million by 2050 worldwide [2].

A number of cholinesterase inhibitors have been developed. Donepezil, galantamine, rivastigmine and memantine are the four drugs used to treat AD currently available on the market. However, the efficacy of these drugs is limited, and these drugs have shown various dose-associated side-effects, particularly at higher doses [3]. Donepezil is a piperidine-based, reversible acetylcholinesterase inhibitor, that is chemically unrelated to other cholinesterase inhibitors [4]. The drug is well-tolerated with mild and transient cholinergic side effects which are related to the gastrointestinal and nervous systems [5].

In this project, following the reaction of ethyl piperidine-4-carboxylate or ethyl piperazine-1-carboxylate and substituted benzyl chlorides, piperidine-4 hydrazide or piperazine-1-hydrazide compounds are obtained. The cholinesterase inhibitory activity of the compounds was determined using slightly modified Ellman method.

This study is supported by TÜBİTAK.

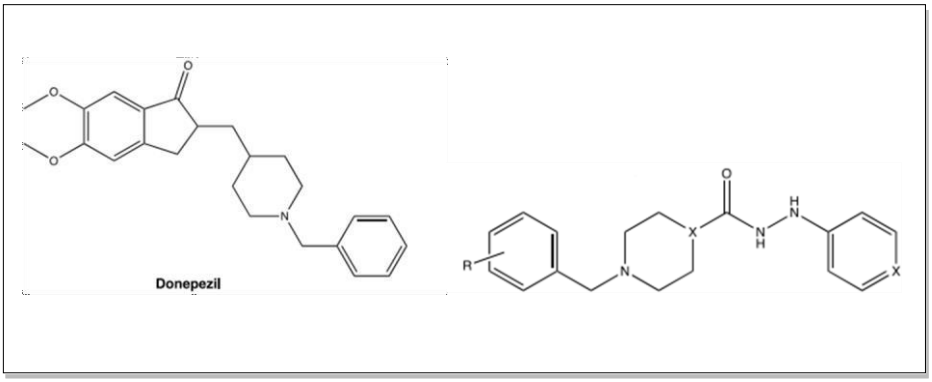

Figure 1. Donepezil and general formula of compounds synthesized with in the scope of the project

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PP117 –MICROSPHERE FORMULATIONS LOADED WITH TOFACITINIB CITRATE FOR INTRA-ARTICULAR ADMINISTRATION

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Rheumatoid arthritis (RA) is a systemic, chronic, autoimmune disease of unknown etiology that affects not only the joints, but also the muscles, connective tissues, tendons, fibrous tissues and many other organs in the body [1]. Tofacitinib citrate (TOFA) is a selective JAK inhibitor used orally in the treatment of RA [2]. Oral administration of TOFA has many disadvantages such as serious systemic side effects and low bioavailability at the affected site. In the treatment of RA, intraarticular (IA) injection allows the therapeutic agents to be delivered directly to the joint at higher concentrations and reduces systemic toxicity due to limited uptake into circulation. In this context, TOFA loaded microsphere (MS) formulations for IA administration were developed using emulsion chemical cross-linking method [3]. For the preparation of drug loaded MSs, 50 mg TOFA was added to chitosan and Tween 80 solution. The codes, contents and preparation parameters of MSs were given in Table 1. The MSs were characterized in terms of particle size and distribution, morphological properties, encapsulation efficiency and in vitro drug release. Quantification of TOFA in PBS buffer and 0.1 N Ethanol-HCl solution were performed with a validated UV spectrophotometric method. The particle size and distribution of MSs were determined by laser-light scattering and the results showed that D_{90} value of the MS-1 and MS-2 formulations were 84.233±0.321 µm and 118±0 µm, respectively. The encapsulation efficiency % of TOFA in MS-1 and MS-2 formulations were calculates as 12.38%±0.99% and 14.05%±2.95, respectively. The release profile of MS-1 and MS-2 formulations indicated that nearly 100% of TOFA was released within 6 and 7 hours, respectively. The results of characterization studies showed that TOFA loaded MS formulations might be considered as a promising system for intraarticular treatment of RA and it was decided to perform further studies.

Table 1. Codes, contents and preparation parameters of microsphere formulations

Formulation Code	*TOFA (mg)*	*Chitosan (%)*	*Tween 80 (%)*	*Paraffin (mL)*	*Span 85 (mL)*	*Glutaral (mL)*	*Stirring (rpm)*
MS -1	*45.45 mg*	*3*	*10*	*20*	*2*	*1.5*	*15 min 1400 rpm; 3 h 1400 rpm*
MS -2	*45.45 mg*	*3*	*10*	*20*	*1*	*0.5*	*15 min 1400 rpm; 3 h 1400 rpm*

Table 2. *Particle size and distribution of microsphere formulations*

Formulations Code	*Dx 1 (µm, ± S.D.)*	*Dx 10 (µm, ± S.D.)*	*Dx 50 (µm, ± S.D.)*	*Dx 90 (µm, ± S.D.)*	*Dx 99 (µm, ± S.D.)*
MS -1	*0.466±0.007*	*0.797±0.011*	*23.700±1.212*	*84.233±0.321*	*125.667±0.577*
MS -2	*0.609±0.004*	*1.313±0.012*	*67.500±0.173*	*118±0*	*154±0*

Acknowledgements

This study was supported by The Scientific and Technological Research Council of Turkey (TUBITAK, Project number: 119S639).**References:**[1] Aletaha D, Smolen JS. Diagnosis and Management of Rheumatoid Arthritis: A Review. JAMA. 2018;320(13):1360-1372. doi:10.1001/jama.2018.13103[2] Prasad P, Verma S, Surbhi, Ganguly NK, Chaturvedi V, Mittal SA. Rheumatoid arthritis: advances in treatment strategies. Mol Cell Biochem. 2023;478(1):69-88. doi:10.1007/s11010-022-04492-3[3] Thakkar H, Sharma RK, Mishra AK, Chuttani K, Murthy RS. Efficacy of chitosan microspheres for controlled intra-articular delivery of celecoxib in inflamed joints. J Pharm Pharmacol. 2004;56(9):1091-1099. doi:10.1211/0022357044166

PP118 –PHARMACOGNOSIC STUDIES ON CAPPARIS SPINOSA

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There are about 250 species in the world belonging to the genus Capparis, which is in the Capparaceae family. In our country, there are 2 species belonging to the genus Capparis as Capparis spinosa and Capparis ovata. The Capparis spinosa (caper) plant is a perennial thorny shrub. Since the caper plant is a salt and drought resistant plant, it grows in arid and semi-arid regions [1,2,3]. In our country, Capparis ovata species grows in the inner regions and Capparis spinosa species grows in the south and west coasts [4]. In addition to being preferred as a complementary medicine or as a food additive, Capparis spinosa is also used in the traditional medicine. In addition, the plant in the Mediterranean cuisine is used as a spice for pickles and seasonings. Studies have shown that this plant has analgesic, anti-inflammatory, neuroprotective, antioxidant, antitumor, antifungal, hepatoprotective, antihypertensive, antihyperlipidemic, antidiabetic and antibacterial effects. It contains furans, flavonoids, pyrroles, glucosinolates, terpenoids, alkaloids and phenolic acids as secondary metabolites that are effective in showing these pharmacological activities, as well as many minerals and vitamins [1]. The aim of this study is to determine the total phenolic content of Capparis spinosa as evidence of antioxidant activity. The plant used in the study was collected from Beydağ, İzmir in June-July 2022. The leaves and fruit parts of the plant were dried and crumbled under suitable conditions and ground into powder in the mill. The powdered leaves and fruit were extracted with 80% ethanol with a linear shaker. Each extract obtained was removed from its solvent in a rotavapor at low pressure to dryness. Total phenolic content analysis on the prepared extracts was made according to the Folin-Ciocalteu method, which is a common method [5]. Total phenol content according to the gallic acid calibration curve obtained is given as gallic acid equivalents. Total phenolic content was determined as 16,272 ± 1.38 for leaf extract and 16,575 ± 1.98 mg GAE/g dry weight for fruit extract. The obtained values showed that the total phenolic content of both extracts was significantly higher and when compared, the fruit extract had a higher total phenolic content than the leaf extract.

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PP119 – INDUCTION OF PTEN EXPRESSION WITH LIPOSOME:PDNA-PTEN COMPLEX FOR THE TREATMENT OF BREAST CANCER TREATMENT : IN VITRO PRE-EVALUATION STUDIES

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Breast cancer is ranked first among the types of cancer seen in women. The incidence of breast cancer worldwide is estimated to be 40-50 people per 100,000 [1]. During the formation process of breast cancer, differences occur in various gene levels. Among the most common of these differences is the reduction in PTEN gene expression. PTEN is a lipid phosphatase that phosphorilizes the phosfatidylinositol (3-5)-trifosphate (PIP3) located on 10q23 chromosome. PTEN protein is also a tumor suppressant gene with the tasks of providing inhibition of the PI3K/Akt signal pathway, stopping apoptosis and the G1 cell cycle [2]. Studies have shown that PTEN suppresses tumor formation by inhibiting cell proliferation and increasing apoptosis
Liposomes are composed of phospholipid biomolecules that can deliver nucleic acid-based drugs to the body through fusion with cell membranes, encapsulate lipid and water-soluble drugs. Liposome formulations have advantages such as drug targeting, high bioavailability, reducing drug toxicity, and overcoming drug resistance [3]. Within the scope of our study, liposomes from non-viral vectors, whose importance has increased with the development of nanotechnology, were chosen as the carrier system.
For the induction of PTEN expression in cancer cells, the PTEN-expressing plasmid system (pDNA-PTEN) has been applied via liposome-based carrier system. The liposomes were prepared by the film hydration method, characterized physicochemically. Nanocarrier systems were created that are able to make complexes with pDNA-PTEN, protect it from the degrading effects of DNase I and release it when necessary. The cytotoxicity studies of the newly developed formulation have been evaluated on 2 different cell lines, including healthy fibroblast (L929) and breast cancer (MCF-7) cell lines. In addition, the transfection efficiency of the system has been demonstrated in vitro on MCF-7 cells. Thus, pDNA-PTEN-loaded liposome formulations with the desired characterization properties (size under 200 nm and PDI lower than 0.3), with ability of gene loading and protection, low toxicity and effective transfection have been obtained. This developed system is promising for treatment of other types of cancer in addition to breast cancer.

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PP120 –ANALYSIS OF THE INTERACTION OF AN ANTI-DIABETIC DRUG WITH DNA BY ELECTROCHEMICAL METHODS

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In recent years, electrochemical sensors have been frequently used in many areas such as quantitative analysis, medical applications, ecological and environmental monitoring, forensic analysis [1,2,3]. The interaction of drugs with DNA can be analyzed by electrochemical methods. Electrochemical methods can provide information about the binding affinity, binding constant, and the mode of binding of the drug with DNA. Electrochemical methods are useful tools for analyzing the interaction of drugs with DNA, and can provide valuable information for drug development and optimization. Linagliptin is a drug used in the treatment of type 2 diabetes. Revealing its influence on DNA is important in understanding its medicinal effects. Determining its effects on DNA may lead to the use of the drug for other purposes as well as elucidating the mechanism of action of the drug.

In this presentation, we will introduce the drug Linagliptin and its use in treating type 2 diabetes. Then, we will explain why it is important to study the drug's influence on DNA, as doing so can help to better understand its medicinal effects. Last, we will present potential benefits that could arise from determining the effects of the drug on DNA, such as expanding its use for other purposes and gaining more insight into its mechanism of action. As experimental, the electrochemical properties of Linagliptin were first characterized with Differential Pulse Voltammetry (DPV) and Cyclic Voltammetry (CV). Then, the interaction of Linagliptin and DNA performed in solution phase. The changes in the oxidation signal of adenine bases of DNA before and after the interaction were investigated. After the interaction, the oxidation signals of adenine were significantly decreased which confirmed that Linagliptin interacted with DNA. The toxicity (S%) of Linagliptin on DNA was calculated using the adenine oxidation signals before and after the interaction. The %S was found to be lower than 50% which indicated that Linagliptin could be toxic to DNA [4]. This effect shows that Linagliptin could be used for different purposes in addition to its current use in treatment.

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PP121 –ANTIMICROBIAL AND ANTI-BIOFILM ACTIVITIES OF KOJIC ACID DERIVATIVES AGAINST BACTERIA AND FUNGI

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Due to the flexible chemical structure and strong biological activity potential of kojic acid, it has attracted considerable attention. Many molecular modifications including Mannich reaction used to synthesize a wide number of compounds having pharmacological activities such as antibacterial, antifungal, antiviral, anticancer, antioxidant, anticonvulsant and antityrosinase activities [1]. All of these data led us to focus on halogen substituted benzylpiperazine derivatives for further evaluations. The aim of this study was to investigate the antimicrobial and anti-biofilm activities of kojic acid the halogen substituted benzyl piperazine derivatives against against S. aureus, E. faecalis, E. coli, P. aeruginosa and C. albicans.

Antimicrobial activities of the compounds were investigated by disk diffusion test and broth microdilution method. Anti-biofilm activity was investigated by spectrophotometric microplate method.

The inhibition zone diameters were determined to be in the following ranges: 7.33-13.67 mm for S. aureus, 8.00-16.67 mm for E. faecalis, 7.67-13.00 mm for E. coli, 7.67-10.00 mm for P. aeruginosa and 7.67-17.00 mm for C. albicans. C11 and G40 compounds were found to have the highest inhibition zone diameters against S. aureus while ALM6 had the highest inhibition zone diameters against E. faecalis. KX4 had the highest inhibition zone diameters against C. albicans. The MIC values of the compounds against bacterial and fungal strains were detected as the following ranges: 16->1024 µg/ml for S. aureus, 32-1024 µg/ml for E. faecalis, 32-512 µg/ml for E. coli, 64-512 µg/ml for P. aeruginosa and 16->1024 µg/ml for C. albicans. C11 was found to have greater inhibitory effects against S. aureus, E. coli, P. aeruginosa and C. albicans. The growth of E. faecalis was inhibited in the presence of C11 and G39PR. C11 showed inhibitory effect on biofilm production of S. aureus, E. faecalis, E. coli and P. aeruginosa. It was noteworthy that the biofilm production of E. coli were reduced even in the presence of the compound at low concentration (10 µg/mL). The high concentration (1000 µg/mL) of C11 showed inhibitory effect on mature biofilms of E. faecalis, E. coli and P. aeruginosa while C11(10 µg/mL) had no significant effect on mature bacterial biofilm structure Additionally, C11 showed no significant effect on biofilm production and mature biofilm of C. albicans.

C11 was the most prominent compound among the halogen-substituted benzylpiperazine derivatives, with its potential antibacterial, antifungal and antibiofilm effects. C11 was the most active derivative against bacterial strains. The inhibitory effects of C11 on biofilm production of the strains was higher than its effects on mature biofilm structure. In the presence C11 at high concentration (1000 µg / mL), the biofilm production capacities of S. aureus, E. faecalis, E. coli P. aeruginosa strains was inhibited by 77.0%, 46.4%, 89.1% and 81.3%, respectively. C11 demonstrated a higher inhibitory effect on the biofilm production of gram negative bacteria than gram positive bacteria. Further studies on the possible antibacterial and antibiofilm effects of halogen-substituted benzylpiperazine derivatives of kojic acid will be beneficial both for the development of new bioactive agents and to discover their potential effects.

Keywords: Antimicrobial activity, anti-biofilm activity, kojic acid derivates, Gram-positive bacteria, Gram-negative bacteria, Candida albicans

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PP122 –THE EFFECT OF PRENATAL STRESS ON THE EXPRESSION OF SCHIZOPHRENIA CANDIDATE GENES IN THE CEREBRAL CORTEX

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Schizophrenia is a neurodevelopmental, progressive disease characterized by negative symptoms, positive symptoms, and cognitive dysfunction that negatively affects the social and occupational functionality of an individual. Although the mechanism of development of the disease has not been clearly explained, studies show that genetic factors, maternal stress, and environmental factors exposed in early life contribute to the progression of the disease [1]. Dexamethasone (Dex), a synthetic glucocorticoid, is used to induce stress in rats [2]. The aim of our study is to observe the changes in the expressions of schizophrenia candidate genes, including dystrobrevin binding protein 1 (Dtnbp1), neurogulin 1 (Nrg1), G-protein signaling regulator 4 (Rgs4), and disrupted-in-schizophrenia-1 (Disc1), in the prenatal stress model induced by Dex [3]. From gestation day 14 to 21, pregnant rats were injected daily with Dex at a dose of 100 µg/kg (prenatal stress group) or saline (control group). At 3 months after birth, male rats were decapitated (n=5) and cortexes were dissected. Total RNA was isolated from cortexes and used for cDNA synthesis. Gene expressions were conducted with real-time PCR using the comperative ΔΔCT method. The statistical differences between groups were analyzed by the Mann-Whitney test. Level of $p<0.05$ was considered to be statistically significant. In the prenatal stress group, cortical mRNA expression levels of Rgs4 increased significantly ($p<0.01$) compared to the control. No significant difference was found between the control and prenatal stress groups regarding the gene expression levels of Disc1, Dtnbp1, and Nrg1 (Fig. 1). The results of this study showed that prenatal stress induced by Dex caused significant changes in the cortical expression levels of Rgs4, which is a schizophrenia candidate gene that is involved in the inhibition of signal transduction pathways initiated by G protein-coupled receptors.

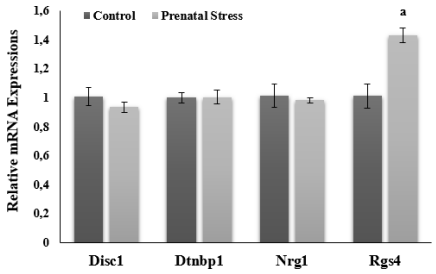

Figure 1. Relative mRNA expression levels of Disc1, Dtnbp1, Nrg1, and Rgs4 in the control and prenatal stress groups. The results were given mean ± S.E. (n=5, [a]p<0.01 vs control).

Acknowledgement: This study was supported by a grant of Izmir Katip Celebi University (2018-ONAP-ECZF-0001).

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PP123 –PRENATAL STRESS HAS AN IMPACT ON THE GENE EXPRESSION OF FATTY ACID BINDING PROTEIN-4 IN PERIPHERAL TISSUES

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Fatty acid binding protein-4 (FABP-4) is a lipid chaperone expressed in adipocytes and macrophages that regulates lipid trafficking in cells. Studies have shown that the expression of FABP-4 paves the way for the development of insulin resistance, diabetes mellitus, dyslipidemia, hypertension, and atherosclerosis [1]. FABPs are able to be employed as a therapeutic target in metabolic diseases due to research on the cell biology and lipid metabolism of FABPs. [2]. Dexamethasone (Dex), a synthetic glucocorticoid, is used to induce prenatal stress in rats [3]. We conducted this study to investigate the levels of mRNA expression of FABP-4 in peripheral tissues such as the heart, liver, and kidney in rats exposed to prenatal stress. From gestation day 14 to 21, pregnant rats were injected daily with Dex at a dose of 100 µg/kg (prenatal stress group) or saline (control group). At 3 months after birth, male rats were decapitated (n=5) and peripheral tissues were collected. Total RNA was isolated from tissues and used for cDNA synthesis. Gene expressions were conducted with real-time PCR using the comperative ΔΔCT method. The statistical differences between groups were analyzed by the Mann-Whitney test. Level of $p<0.05$ was considered to be statistically significant. There was a significant increase in the expression of FABP-4 mRNA in the heart tissues and significant decreases in the kidney and liver tissues of the rats in the prenatal stress group compared to the control group. As a result, rats exposed to prenatal stress may be more susceptible to heart diseases or metabolic problems depending on the alterations in the mRNA levels of FABP-4 in peripheral tissues.

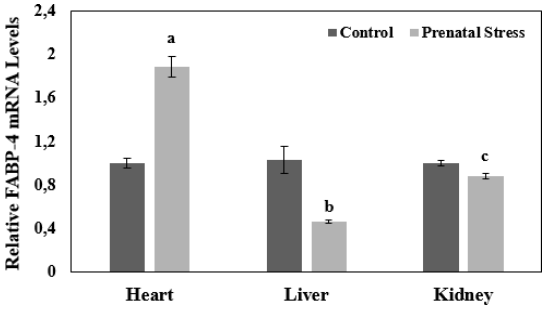

Figure 1. FABP-4 mRNA expression levels in heart, liver and kidney tissues in the control and prenatal stress groups. The results were given mean ± S.E. (n=5, [a,b,c]$p<0.01$ vs control).

Acknowledgement: This study was supported by a grant of Izmir Katip Celebi University (2018-ONAP-ECZF-0001).

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PP124 –SYNTHESIS OF PHENALENONE-BASED PROBES AND INVESTIGATION OF THEIR OPTICAL PROPERTIES

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The use of dyes with fluorescent properties has become more common day by day in various fields of science, especially in chemistry, biology, and medicine. In recent years, chemosensors have become an important alternative to analytical methods that require sophisticated equipment due to their high analyte selectivity and sensitivity, easy applicability, and reproducible results. In addition, with recent developments in optical imaging systems (high resolution, availability, and ease of use) fluorescent molecules have started to play key roles in the diagnosis of several diseases at their early stages [1-3].

The main skeleton of a chemosensor comprises receptor and reporter units. The reporter units which are basically called fluorophores may display different photophysical properties (eg excitation/emission wavelength), which can be crucial for on-purpose applications. Although some of these fluorophores (rhodamine, coumarin, BODIPY) are of great interest, there are still fluorophores that need to be examined in more detail and brought to the literaturę [4,5].

In this study, we synthesized n-amino-phelenone derivatives, which have not been much used in chemosensor design until now, and scrutinized their photophysical properties. In addition, we further investigated their potential use as an acid/base sensor in organic and aqueous solutions.

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PP125 –DEVELOPMENT OF A NEW FLUORESCENT PROBE FOR THE SELECTİVE DETECTION OF FE3+ IONS

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Small molecules with tuneable fluorescence properties have attracted the great attention of the scientific community in designing chemical sensors for a wide range of analytes. These chemical sensors have become significant alternatives to classical analytical methods due to their advantages such as ease of synthesis, high selectivity, sensitivity, low operational cost, and simplicity [1,2].

The general skeleton of a chemosensor comprises a reporter and receptor unit. Recently, various fluorescent molecules such as coumarin, BODIPY, cyanine, and rhodamine have been used as reporter units of chemosensors to detect anions, metal cations, and many other biologically important molecules [3-5].

In addition to these fluorescent molecules, there is still an urgent need to develop new fluorescent dyes for chemosensor design.In this study, we presented the design, synthesis, and spectra characterization of a new phenalenone-based fluorescent probe. Phenalenones are natural products from the phytoalexins family and can be extracted from plants or obtained synthetically. Herein, we decorated the phenalenone dye with the 2-aminopyridine unit and investigated its performance in detecting Fe^{3+} ions in aqueous solutions.

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PP126 –INVESTIGATION OF ANTIBACTERIAL, ANTIFUNGAL AND ANTIBIOFILM ACTIVITIES OF ORIGANUM ONITES L. PLANT EXTRACTS

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Unnecessary and misuse of antimicrobial agents have caused microorganisms to become multiple resistant to antimicrobials. Antimicrobial resistance causes the rapid spread of microorganisms and causes an increase in diseases, deaths and treatment costs. The biofilm layer acts as a protective shield that protects the microorganism from external factors, adapts to different stress conditions caused by antimicrobials and causes antimicrobial resistance. Considering the resistant microorganisms and the current use of antimicrobials, researchers are looking for new and alternative treatment methods. Treatment with herbal medicines known since the beginning of humanity is attracting attention again. It has been reported that the essential oil extracted from Origanum onites exhibits antifungal, antimicrobial, antioxidant insecticidal and hepatoprotective activities. The aim of this study was to prepare ethanol extract of Origanum onites L. species and to investigate the antimicrobial and antibiofilm activities of the prepared extract against bacterial and fungal strains. In this study, antibacterial and antifungal effects of the extract were investigated by disc diffusion test, agar diffusion method and microdilution method. Antibiofilm activity assays were investigated by spectrophotometric microplate method using crystal violet. According to the results of disk diffusion test, mean inhibition zone diameters with ethanol extract were 23, 21 and 30 mm against S. aureus, E. coli and C. albicans, respectively. Mean inhibition diameters were 36 mm against S. aureus, 28 mm against E. coli and 35 mm against C. albicans according to the results of agar diffusion method. Minimum inhibitory concentration (MIC) values of the extract were 64 µg/mL against S. aureus and 128 µg/mL against E. coli and C. albicans according to the microdilution method. Additionally, biofilm production levels of S. aureus were also inhibited (5.9%) in the presence of the extract at MIC values. On the other hand, biofilm production levels of E. coli and C. albicans were induced in the presence of the ethanol extract at MIC values. In conclusion, antimicrobial potential of ethanol extracts of Origanum onites L. plant were investigated on Gram-positive/negative bacterial and yeast strains, and it was shown that the studied extract have antimicrobial and anti-biofilm activity against S. aureus strain in this study. In addition to the inhibitory effects on S. aureus, the extract inhibited the growth of E. coli and C. albicans at MIC concentrations. We believe that targeting of bacterial and fungal biofilm structures may have important role in the control of infectious diseases. Further antimicrobial activities with supra-MIC concentrations on the growth and biofilm structures were planned to investigate the effects of the extracts on different standard strains and clinical isolates. We also planned to investigate the synergistic effects of the extracts and antimicrobial agents against standard strains and clinical isolates of bacteria and fungi.

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PP127 –INVESTIGATION OF ANTIMICROBIAL AND ANTIBIOFILM ACTIVITIES OF HYPERICUM PERFORATUM L. PLANT EXTRACTS AGAINST BACTERIA AND FUNGI

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Resistant microorganisms spread rapidly and cause an increase in cases such as disease, death, and treatment costs. Antimicrobial drug options are limited and the discovery of new molecules and alternative treatment strategies are necessary in the treatment of infections. Due to the resistance problem that occurs with biofilm in bacteria and fungi, the susceptibility of many drugs remains low. It has been reported that natural herbs, spices and essential oils with some antimicrobial effects prevent biofilm formation in different microorganisms. In litarature, it has been shown that Hypericum perforatum L. Extracts are effective against fungal and bacterial strains. The aim of this study is to investigate the antimicrobial effects of the prepared ethanol extract against standard bacterial and fungal strains and to determine the effect of the extracts on biofilm production. It was also aimed that to investigate the antimicrobial photodynamic activities of extracts against biofilm production levels. In this project, antimicrobial effects of the extract against bacterial and fungal strains were investigated by disc diffusion test, agar diffusion method and microdilution method. Antibiofilm activity assays were investigated by spectrophotometric microplate method using crystal violet. Antimicrobial photodynamic activities of extracts against biofilm production levels in the strains were also investigated by spectrophotometric microplate method. According to the results, mean inhibition zone diameters with ethanol extract were 13 and 7,67 mm against S. aureus and C. albicans by disk diffusion test. Mean inhibition diameters were 20 mm against S. aureus, 12 mm against E. coli and 13 mm against C. albicans according to the results of agar diffusion method. Minimum inhibitory concentration (MIC) values of the extract were 256 µg/mL against S. aureus and 1024 µg/mL against E. coli and C. albicans strains according to the microdilution method. Biofilm production levels of S. aureus and E. coli were also inhibited (13.4% and 26.9%) in the presence of the extract at MIC values. According to the results of antimicrobial photodynamic therapy (APDT) experiments, biofilm production levels of S. aureus (27.8% inhibition), E. coli (24.9% inhibition) and C. albicans (19.2% inhibition) were also inhibited. In conclusion, antimicrobial effects of Hypericum perforatum L. ethanol extract were determined on Gram-positive/negative bacterial and yeast strains. It was shown that the studied extract have antimicrobial and anti-biofilm activity against S. aureus and E. coli strains in this study. In addition, the extract also inhibited the biofilm production of studied bacteria with or without APDT experiments. Interestingly, inhibition of the biofilm production levels was detected in the presence of the extract in APDT experiments while the extract did not show any effect alone against the biofilm production levels of C. albicans. We believe that targeting of bacterial and fungal biofilm structures with alternative treatment methods including APDT may have important role in the control of infectious diseases. Further studies were planned to investigate the effects of the extracts on clinical isolates, and we also planned to investigate the photodynamic activities of the extracts on clinical bacterial and fungal isolates.

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PP128 –NEUROPROTECTIVE EFFECT OF VENLAFAXINE AGAINST LPS-INDUCED INFLAMMATION IN SH-SY5Y CELLS

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With its high oxygen consumption and relatively low antioxidant defence system, the brain is a susceptible tissue against oxidative stress (OS). It has been determined that the increase in OS leads to depression by causing neuroinflammation and neurodegeneration in the brain tissue [1]. Peroxiredoxin (PRDX) enzymes are a family of multifunctional enzymes that have antioxidant and anti-inflammatory effects in cells with their peroxidase effects and are essential in regulating cell homeostasis [2]. Studies show that antidepressants may reduce OS and have neuroprotective effects [3]. Venlafaxine is a serotonin-norepinephrine reuptake inhibitor antidepressant molecule widely used in treating various psychiatric diseases, especially mood disorders [4].

In this study, human neuroblastoma (SH-SY5Y) cells were used to investigate the neuroprotective effect of the antidepressant venlafaxine against LPS-induced neuroinflammation and oxidative stress. Cells were pretreated with venlafaxine (0-100 µM) for 12 hrs, followed by a 4-hrs LPS exposure (1 µg/mL); after treatments, cell viability and ROS generation were assessed [5]. Also, the possible effects of venlafaxine on PRDX-5 expression levels were determined [6].

In the obtained findings, it was determined that the administration of venlafaxine caused a significant decrease in LPS-induced cell death and the level of intracellular ROS compared to the control. In the same manner, it was also observed that venlafaxine treatment leads to a significant increase in the protein and mRNA levels of PRDX-5 expression in SH-SY5Y cells. The first preliminary findings were obtained that the venlafaxine molecule, which is one of the most commonly prescribed antidepressant molecules in mood disorders, has a neuroprotective effect and is effective on PRDX-5 expression in neuronal cells.

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PP129 –USE OF CLICK CHEMISTRY IN DRUG DEVELOPMENT APPLICATIONS

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Click chemistry (CC) is defined as a modular chemical reaction that practical and uniquely useful chemical conversions [1]. This idea primarily depends on creating carbon-heteroatom bonds using with spring-loaded reactants under mild reaction conditions [2]. Due to its reliability, selectivity, and biocompatibility, the copper(I)-catalyzed 1,2,3-triazole-combining reaction between azides and terminal alkynes has emerged as the foremost of click chemistry [3]. Triazole molecules, which are widely found in pharmaceuticals and bioactive compounds, are easily prepared using copper-catalyzed azide-alkyne cycloaddition (CuAAC) click chemistry (Figure 1), which offers a facile and selective synthetic tool [4].

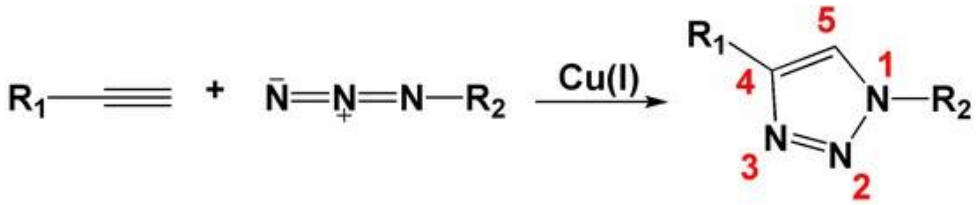

Figure 1. 1,3-Dipolar cycloaddition reaction between azide and alkyn

Numerous drug discovery fields have found use for click chemistry, including computational chemistry calculations, lead optimization followed by SAR development using organic and combinatorial chemicals, target-template in situ chemistry, DNA, proteomics, and nanoparticle research [5].

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