NATIONAL TISHK PHARMACEUTICAL CONFERENCE (6th NTPC-2026)

Theme: **"Sustainable Development Perspectives in Cancer Care: Emerging Global Trends and Therapeutic Advancements"**

موضوع :

آفاق التنمية المستدامة في رعاية السرطان: الاتجاهات العالمية الناشئة والتقدم العلاجي

مەجار :

دیدگاکانی گەشەپێدانی بەردەوام لە چاودێری شێرپەنجەدا: ڕەوتە جیهانییە سەرهەڵداوەکان و پێشکەوتنە چارەسەرییەکان

APRIL 13-14, 2026, ERBIL, IRAQ

ABSTRACTS BOOK

6th NTPC-2026

Abstract Book

6th NATIONAL TISHK PHARMACEUTICAL CONFERENCE

Theme: **"Sustainable Development Perspectives in Cancer Care: Emerging Global Trends and Therapeutic Advancements"**

April 13-14, 2026
Erbil, Kurdistan Regional Government, Iraq

Conference Link: https://conferences.tiu.edu.iq/ntpc/

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April 2026

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6TH NATIONAL TISHK PHARMACEUTICAL CONFERENCE (NTPC 2026)

ABOUT CONFERENCE

The 6th National Tishk Pharmaceutical Conference (NTPC 2026), which will be hosted by the Faculty of Pharmacy at Tishk International University in Erbil, Iraq, is dedicated to exploring the transformative effects of advanced cancer therapies on health, economic resilience, and environmental sustainability. With the theme "*Sustainable Development Perspectives in Cancer Care: Emerging Global Trends and Therapeutic Advancements,"* the conference will emphasize the integration of cutting-edge pharmaceutical research with the United Nations Sustainable Development Goals. The 6th NTPC 2026 will serve as a vibrant platform for scientific exchange, policy dialogue, and collaborative innovation, aiming to promote equitable healthcare and foster interdisciplinary partnerships within the pharmaceutical sciences.

OBJECTIVES OF 6th NTPC 2026

NTPC 2026 is a forward-thinking initiative that pushes the boundaries of pharmaceutical science, with a strong emphasis on sustainable development. The conference is designed to achieve the following objectives:

- ✓ **Promote Scientific Exchange and Innovation:**
  Encourage the sharing of authoritative insights and groundbreaking ideas among leading scientists in both traditional and modern drug discovery, with a focus on translational research and therapeutic innovation.
- ✓ **Advanced Cancer Therapeutics for Sustainable Health:**
  Emphasizing the transformative impact of advanced cancer therapies in achieving *Good Health and Well-Being (SDG-3)*, while exploring their potential contributions to economic resilience and environmental sustainability.
- ✓ **Catalyze National Scientific Collaboration:**
  Bringing together scientific experts from across the nation to share cutting-edge research findings, foster interdisciplinary dialogue, and stimulate collaborative efforts in drug development and cancer treatment.
- ✓ **Strengthening cross-cultural and regional networks:**
  Offering a dynamic platform for building cross-cultural relationships and regional partnerships that enhance scientific understanding and promote inclusive innovation.
- ✓ **Bridge Science and Policy (Partnerships for the Goals (SDG-17)):**
- Encourage inclusive multisectoral collaboration that effectively integrates scientific research, policy development, and community engagement to accelerate therapeutic innovation.
- Address structural inequities and access barriers that limit the availability and affordability of advanced cancer treatments, particularly for marginalized and underserved populations.
- Promote fair development and allocation of new treatments through strategies that ensure equal access, guaranteeing that scientific progress leads to significant health benefits for all patients.

Collectively, these strategic actions affirm the commitment of NTPC 2026 to strengthening resilient healthcare systems and fostering inclusive scientific networks, in line with the principles of Sustainable Development Goal 17: Partnerships for the Goals.

THE SCOPE OF NTPC 2026

The National Tishk Pharmaceutical Conference (NTPC 2026) offers a comprehensive and interdisciplinary platform for advancing pharmaceutical sciences, with a central focus on therapeutic innovation in cancer care and its alignment with the United Nations Sustainable Development Goals (SDGs). This conference is designed to convene leading experts from academia, industry, and clinical practice to explore:

- Advanced cancer therapies and their role in promoting health, economic sustainability, and environmental stewardship
- Innovations in drug discovery and development, including targeted therapies, biologics, and personalized medicine
- Cutting-edge pharmacological regimens and their translational potential in oncology and chronic disease management
- Medicinal chemistry and molecular design for next-generation therapeutics
- Natural products and phytopharmaceuticals as emerging contributors to cancer treatment and drug innovation
- Interdisciplinary collaboration across pharmaceutical, clinical, and policy domains to foster equitable access and global health impact
- By showcasing pioneering research and fostering cross-sectoral dialogue, NTPC 2026 aims to accelerate scientific progress, strengthen collaborative networks, and catalyze sustainable, patient-centered solutions in pharmaceutical care.

OUTCOMES OF NTPC 2026

After participating in this conference, participants will be able to:

- Recognize and evaluate emerging therapeutic strategies in cancer treatment and pharmaceutical innovation.
- Strengthen collaborative networks between academic institutions and the pharmaceutical industry to foster translational research.
- Articulate the stages and dynamics of the drug discovery cascade, from target identification to clinical application.
- Distinguish between traditional and contemporary approaches in drug discovery, highlighting methodological evolution.
- Assess the impact of modern tools and technologies such as AI, high-throughput screening, and molecular modelling on drug development.
- Explore current trends, innovations, and challenges in drug formulation and targeted drug delivery systems related to cancer therapy.

TARGETED PARTICIPANTS

NTPC 2026 welcomes a diverse range of participants from across the pharmaceutical and healthcare ecosystem, including:

- Academic staff from pharmacy and health sciences disciplines
- Scientists engaged in pharmaceutical research and development
- Undergraduate and postgraduate pharmacy students
- Ph.D. scholars in medical and paramedical fields
- Practicing pharmacists and clinical professionals
- Experts from the pharmaceutical industry and manufacturing sectors
- Professors and educators in medical and allied sciences
- Clinical data scientists, analysts, and laboratory specialists
- Representatives from pharmaceutical companies and associations
- Healthcare analysts, pathologists, and regulatory professionals

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6th NATIONAL TISHK PHARMACEUTICAL CONFERENCE

(6th NTPC-2026) 13-14 April 2026 Erbil, Iraq

Event Agenda (Day One)		
Date	**Hour**	**Event**
13th April	09:00-10:00	*Registration and Welcoming*
	10:00	*Opening Ceremony*
	10:05	*Introducing the Event*
	10:10	*National Anthem both*
	10:15-10:25	*Welcome Speech by* ***Assistant Prof. Dr. Idris Hadi,*** *Head of Board of Trustees,*
	10:25-10:35	*Welcome* ***speech by Prof. Dr. Sultan Abu-Orabi,*** *The President, Tishk International University*
	10:35-10:45	*Welcome* ***speech by Assistant Prof. Dr. Abdul Samad, Dean,*** *Faculty of Pharmacy, The President, Tishk International University*
	10:45-11:25	*First Session starts, 1st Keynote Speaker,* ***Dr Reem Abou Assi*** *(Offline)*
	11:25-12:05	*Second Speaker, 2nd Keynote Speaker,* ***Dr. Zjwan M. I. Housein*** *(Offline)*
	12:05-12:45	*Coffee break (Rest)*
	12:45-1:15	*3rd Keynote Speaker* ***Dr. Najmaddin Khoshnaw****, (Online)*
	01:15-01:35	*4th Speaker* ***(Dr. Jaafaru Sani Mohammed),*** *Offline*
	01:35-01:50	*5th Speaker,* ***(Dr. Subasini Uthirapathy),*** *Offline*
	01:50-02:10	*6th Speaker* ***(Dr. Javed Ahamad),*** *Offline*
	2:10-02:30	*7th Speaker* ***(Dr. Mohammad Aslam),*** *Offline*
	02:30-02:50	*8th Speaker* ***(Dr. Ahmad Hamdy Ibrahim),*** *Offline*
	02:50-03:10	*9th Speaker* ***(Dr. Peshawa Osw),*** *Offline*
	03:10-3:30	*10th Speaker* ***(Dr. Rojan Arif),*** *Offline*
	03:30-03:50	*11th Speaker* ***(Dr. Dania Awni),*** *Offline*
	03:50-04:10	*12th Speaker* ***(Dr. Shajwan Salar),*** *Offline*
	04:10- 04:30	*13th Speaker* ***(Dr. Alaa Amer),*** *Offline*
Event Agenda (Day Two)		
14th April	09:50-10:00	*Opening Ceremony*
	10:00-10:30	*First Session starts, 14th Speaker (4th Keynote Speaker)* ***Dr. Faheem Hayder*** *(Online)*
	10:30-11:00	*15th Speaker (5th Keynote Speaker* ***Dr. Ahmad Nawzad Hassan,*** *(Online)*
	11:00-11:30	*16th Speaker,* ***(Dr. Hazha Omer),*** *(Online)*
	11:30-12:00	*17th Speaker,* ***(Sawsan S. AbdulHameed Al-Rawi),*** *(Online)*
	12:00-12:30	*18th Speaker,* ***(Dr. Beriwan Abdulqadir),*** *Online*
	12:30-01:00	*19th Speaker, 6th Keynote Speaker* ***Dr. Nawsherwan Sadiq Mohammad****, (Online)*

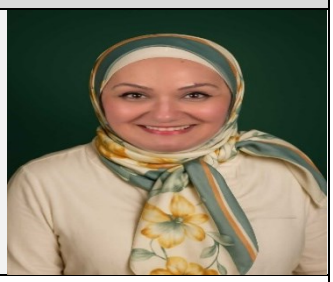
	01:00-02:00	*Lunch Break*
	02:00-02:30	*20th Speaker,* ***(Dr. Halmat Jaafar),*** *Online*
	02:30-03:00	*21st Speaker,* ***(Dr. Alan Riyadh),*** *Online*
	03:00-3:15	Vote of thanks and Closing Ceremony

KEYNOTE & INVITED SPEAKERS
Biography & Abstract

Keynote Speakers biography

Name of the Speaker: Dr. Reem Abou Assi

Job Title of the Speaker: Scientist, Head of the Occupational Safety and Health Unit, Al-Qabas College, Mosul - Iraq.



Biography

Dr. Reem Abou Assi is a pharmaceutical scientist specializing in nanomedicine and transdermal drug delivery. She earned her PhD from Universiti Sains Malaysia (2024) and has authored more than 25 peer-reviewed publications at Q1/Q2, with thousands of citations. As Principal Investigator and Co-Investigator, she has secured >$65,000 in grants from international and national funders to invest in research that is contributing to Iraqi University reputation. Currently based in Iraq, she leads the EDEN Research Group at Al-Qabas College, while serving on the Executive Committee of the Global Young Academy (Germany), the International Advisory Board of Rhine-Main Universities (Germany), and a member of Global Universities Ranking working group of CoARA (Brussels). She has supervised 2 PhD, 2 MSc, and 15+ undergraduate researchers to completion. Outside the campus she employed her unique experience in building collaboration between Global Organizations, invest in turning thesis to products by leading a technology incubator in a post-conflict setting, and serving as an intergovernmental reviewer for United Nations Environment Programme (UNEP) GEO-7

Name of the Speaker: Dr. Zjwan Mohammed Ismail Housein
Job Title of the Speaker: Assistant Professor, Technical Health and Medical College, Department of Medical Laboratory, Erbil Polytechnic University, Erbil, Iraq.

Biography

Assistant Professor Dr. Zjwan M. I. Housein earned her PhD in Molecular Physiology from Salahaddin University–Erbil and a Master's in Biomedical Science from Radboud University Nijmegen, The Netherlands. During her postgraduate studies, she investigated chromatin remodeling in human spermatids and conducted research at Imperial College London on the impact of heavy metals on epigenetic regulation. Her academic career centers on tumor biology, molecular physiology, and epigenetics, with a strong commitment to advancing biomedical science. Dr. Housein has published numerous articles in high-impact international journals, contributing significantly to the understanding of molecular mechanisms underlying disease.

Title of presentation: Papillary Thyroid Carcinoma: From Epidemiological Trends to Molecular and Hematological Biomarkers.

Abstract

Papillary thyroid carcinoma (PTC) represents the most prevalent form of thyroid malignancy. Although most cases demonstrate favorable clinical outcomes, a subset exhibits aggressive behavior, highlighting the need for reliable molecular biomarkers for early diagnosis and prognosis. This study investigated the expression and diagnostic potential of four cancer-related genes—BRAF, MET, XRCC1, and TGFBR3—in PTC tissues. Thyroid tissue samples were obtained from 44 patients (16–70 years) undergoing thyroid surgery and categorized into malignant (n = 22) and non-malignant (n = 22) groups. Total RNA was isolated and reverse-transcribed to complementary DNA. Gene expression levels were quantified using quantitative real-time polymerase chain reaction (qRT-PCR). Hormonal parameters, including Thyroid-stimulating hormone (TSH), Triiodothyronine (FT3), and Thyroxine (FT4), were retrieved from clinical records. Statistical analyses, including correlation analysis and Receiver operating characteristic curve evaluation, were performed to determine diagnostic performance. Significant differential expression was observed between malignant and non-malignant tissues. BRAF and MET were markedly upregulated in malignant samples, indicating their potential role in tumor initiation and progression. XRCC1 demonstrated moderate upregulation, suggesting involvement in DNA repair mechanisms, whereas TGFBR3 was significantly downregulated, supporting its function as a tumor suppressor. Hormonal profiling revealed differences in TSH, FT3, and FT4 levels between groups, suggesting additional diagnostic relevance. Correlation analysis further demonstrated strong associations among BRAF, MET, and XRCC1 expression patterns.

Name of the Speaker: Dr. Nawsherwan Sadiq Mohammad
Job Title of the Speaker: Assistant Professor, College of Medicine, Department of Basic Sciences,
Hawler Medical University, Erbil, Iraq.

Biography

Dr. Nawsherwan Sadiq Mohammad Jabari is an Assistant Professor and Consultant in Hematopathology and Laboratory Medicine at the College of Medicine, Hawler Medical University, Erbil, Iraq. He is a Fellow of the Iraqi Board for Medical Specialization (FIBMS) in Pathology 2006, with subspecialty expertise in hematopathology. With nearly two decades of academic and clinical experience, Dr. Jabari has played a central role in advancing hematology education and diagnostic practice in the Kurdistan Region. He has extensive teaching experience at undergraduate and postgraduate levels, covering a wide spectrum of hematology topics including leukemias, lymphomas, hemoglobinopathies, hemostasis, thrombosis, and transfusion medicine. Dr. Jabari has supervised more than 20 postgraduate theses and has contributed to the training of numerous specialists in hematopathology and laboratory medicine. His leadership roles include serving as Head of the Pathology Department and currently as Head of the Pathology and Anatomy Department at Hawler Medical University, as well as Program Director of Hematopathology at the Kurdistan Higher Council for Medical Specialties.

His research interests focus on malignant and molecular hematology, immunophenotyping, minimal residual disease (MRD), bone marrow pathology, and platelet function disorders. He has published multiple scientific papers in regional and international journals and is an active member of several professional organizations, including the Kurdistan Society of Pathology, Iraq Society of Hematology and European Society of Hematology. Dr. Jabari regularly participates in international conferences and specialized workshops, with advanced training in flow cytometry and coagulation disorders. He remains actively engaged in clinical diagnostics, academic development, and research initiatives aimed at improving hematological care and education.

Title of presentation: Reasons of treatment switching from first generation to second and third generations of TKIs among CML patients in Iraq -Kurdistan region from 2014-2024.

Abstract

Chronic myeloid leukemia (CML) is one of the myeloproliferative disorders with a characteristic cytogenetic abnormality resulting in the BCR-ABL fusion gene. Imatinib Mesylate is an effective agent for treating patients in all stages of CML. Imatinib directly inhibits the constitutive tyrosine kinase activity. Imatinib binds to the BCR-ABL kinase domain by preventing the transfer of a phosphate group to tyrosine on the protein substrate and the subsequent activation of phosphorylated protein. This cross-sectional study included 90 CML patients at the outpatient clinic of a reference hospital in the Kurdistan Region of Iraq, between 2014 and 2024. The questionnaire was divided into two categories: the first part comprised patients' demographic characteristics, which include sex, age, residency, and

chronic disease at the time of diagnosis (D.M., HTN, hypothyroidism, asthma, and IHD). The second part consisted of the duration of exposure to imatinib, clinical adverse effects at the time of switching, blood characteristics, renal function tests (RFT), liver function tests (LFT), quantitative PCR at the time of switching, and the reason for switching. This study shows that the outstanding effectiveness of imatinib was highest in 11-20 months, which was 41(45.56%), followed by 1-10 months 19 (21.11%), and the lowest rate was found in 31-40 months, which was 8(8.89%). The most frequent imatinib-related AEs (any grade) occurring in 45% of total patients were Diarrhea 10(11.11%), Myalgia 7(7.78%), Epigastric pain 5(5.56%), Multiple skin lesions 4(4.44%), and Fatigue 2(2.22%). Furthermore, the effect of long-term TKI treatment on kidney function and the incidence and prognosis of chronic kidney disease (CKD) in CML patients, 86 (95.56%) have normal renal function tests (RFT) an only 4(4.44%) has increasing urea and creatinine. On the other hand, 83 (92.22%) have normal liver function tests and only 1 (1.11%) has elevated total bilirubin, 1(1.11%) increasing 1fold, 4(4.44%) patients increasing 2folds and 1(1.11%) increasing 3-fold. In this study, imatinib showed superior efficacy and a favorable safety profile in patients with newly diagnosed chronic-phase CML. Furthermore, TKI intolerance should not be called failure anymore; it encourages an immediate change of TKI therapy. Failure refers to situations where physicians or patients switched TKIs due to toxicities, believing that reducing the dose would compromise treatment effectiveness.

Name of the Speaker: Dr. Ahmad Nawzad Hassan
Job Title of the Speaker: Department of Medical Laboratory Technology, Erbil Technical Health & Medical College, Erbil Polytechnic University

Biography

Born on May 07, 1983, in Erbil, Iraq. I started my undergraduate studies in the biology department, College of Science, at Salahaddin University from 2002 to 2006 to obtain a bachelor's degree in science. Then I studied again in the translation department at the College of Languages, Salahaddin University, from 2006 to 2010 to earn a bachelor's degree in arts. I worked as a teaching assistant at the Medical Technical Institute until 2013, when I began my post-graduation studies to get a master's degree in biology (molecular genetics) in 2016 from the College of Science at Salahaddin University. I got a Ph.D. degree in medical genetics at the MLT department at Erbil Technical Health and Medical College-EPU. I am currently a lecturer and assistant dean at Erbil Technical Health & Medical College.

Name of the Speaker: Dr. Najmaddin Khoshnaw (FRCP-London (UK), FKBMS (Board), EHE-Netherlands, HDCH, M.B.Ch.B)
Job Title of the Speaker: Hematologist and clinical researcher based in Sulaymaniyah, Iraq,

Biography

Dr. Khoshnaw graduated from the College of Medicine at the University of Sulaimani in 2001. He began his professional career in hematology in 2004, completing a two-year full-time High Diploma in Clinical Hematology in 2007. Subsequently, he became a Fellow of the Kurdistan Board for Medical Specialties in Clinical Hematology (2015–2020). In 2019, he successfully passed the European Hematology Examination in the Netherlands, and in 2023, he was elected Fellow of the Royal College of Physicians of London (UK).

He currently serves as a lecturer at the College of Medicine, University of Sulaimani, and practices at Hiwa Cancer Hospital and Anwar Sheikh Medical City. Dr. Khoshnaw has authored 45 scientific publications, which have collectively received 692 citations on Google Scholar.

Title of presentation: Comparative effects of vaping and cigarette smoking on hematological parameters in young male university students.

Abstract

Smoking and vaping tobacco present substantial health hazards. Nevertheless, the precise impact of vaping and cigarette smoking on hematological indicators, such as complete blood count (CBC) and erythrocyte sedimentation rate (ESR), is still uncertain. This study was conducted to examine the impacts of vaping and smoking on hematological parameters on young, physically fit male university students. A cross-sectional study was carried out that included 102 male students from Komar University of Science and Technology. The study was conducted between February and June 2024. Standard techniques were employed to collect and analyze blood samples for CBC and ESR. Out of the 102 participants, with an average age of 21 years, 71 were smokers and 31 were nonsmokers. Smokers exhibited significantly higher red blood cell (RBC) count, hemoglobin (HGB) levels, and hematocrit (HCT) compared to nonsmokers. The platelet count was lower in smokers in compare to nonsmokers. On the other hand, vapers demonstrated the highest RBC count among the subgroups, followed by those who smoked both cigarettes and vapes. Furthermore, there were no notable disparities detected in ESR and other CBC values between the participant groups. The study revealed that smoking significantly elevates RBC count, HGB, and HCT levels while reducing platelet counts. Among vapers, RBC levels were highest, but no significant differences were observed in platelet counts nor ESR. Therefore, smoking and vaping have an impact on the characteristics of RBCs; this signifies that additional research is required to investigate the long-term impacts of smoking and vaping on hematological parameters.

Name of the Speaker: Dr. Faheem Hayder Potto
Job Title of the Speaker: Assistant Professor in the Department of Pharmacology at Imam Abdulrahman Bin Faisal University, KSA. Email: fhpottoo@iau.edu.sa

Biography

Dr. Faheem Hyder Pottoo is an Assistant Professor in the Department of Pharmacology at Imam Abdulrahman Bin Faisal University, with a strong academic and research background in pharmacology and pharmaceutical sciences. He earned his Ph.D. in Pharmacology from the University of Kashmir and has developed extensive expertise in neuropharmacology, drug repurposing, and advanced drug delivery systems. According to his Google Scholar profile, Dr. Pottoo has an extensive publication record, with over 150 research articles, reviews, and book chapters, and thousands of citations, reflecting a significant impact in his field. His research primarily focuses on neurological disorders, including epilepsy, depression, and neurodegenerative diseases, with particular emphasis on molecular mechanisms and innovative therapeutic strategies. He has contributed to numerous peer-reviewed studies on topics such as the role of natural compounds (e.g., thymoquinone and curcumin) in neurological disease treatment and the development of nanotechnology-based drug delivery systems to enhance therapeutic efficacy. In addition to his research, Dr. Pottoo is actively engaged in teaching and mentoring students in pharmacology and clinical pharmacy. His work combines experimental, computational, and translational approaches, contributing to advancements in drug discovery and improving treatment outcomes for central nervous system disorders.

Title of presentation: CAR-T and CAR-NK cell therapies to target and destroy cancer.

Abstract

The integration of Chimeric Antigen Receptor (CAR) technology into T cells and Natural Killer (NK) cells has revolutionized cancer immunotherapy by enabling the precise targeting of malignant cells. While CAR-T cell therapy has achieved significant clinical success and multiple FDA approvals for hematological malignancies, it is often limited by high production costs, lengthy manufacturing times, and severe side effects such as Cytokine Release Syndrome (CRS). Conversely, CAR-NK cell therapy is emerging as a promising "off-the-shelf" alternative, offering a superior safety profile, reduced risk of Graft-versus-Host Disease (GvHD), and innate multi-antigen recognition. This paper examines the distinct mechanisms, clinical advantages, and current challenges—including the immunosuppressive tumor microenvironment—of both modalities. By comparing their efficacy in blood cancers versus solid tumors, we highlight how these "living drugs" are shifting the paradigm of personalized oncology toward more accessible and safer cellular therapeutics.

Name of the Speaker: Dr. Jaafaru Sani Mohammed
PhD. Medical Biotechnology.
Job Title of the Speaker: Asst. Prof. Medical Analysis Department, Faculty of Applied Science, TIU, Erbil.

Biography

Dr. M. S. Jaafaru is an Assistant Professor in the Medical Analysis Department, Faculty of Applied Science, Tishk International University, Erbil, Iraq. He obtained a BSc. Biochemistry from Ahmadu Bello University, Nigeria, MSc. Biotechnology from UCSI University, Malaysia, and a Ph.D. in Medical Biotechnology (Neurochemistry) from the University Putra Malaysia. His research interests include Neurochemistry, Molecular Biology, Phytomedicine, Neurodegenerative diseases, Nutrigenomics, Cancer, systematic reviews, meta-analysis, and Drosophila melanogaster as a model for human diseases. He is a member of many local and international scientific communities and a fellow of the African Science Literacy Network (ASLN). He attended and presented papers at several local and international conferences and workshops; he had a patent to his name and published more than 40 peer-reviewed scientific articles in reputable Journals at local and international levels.

Title of presentation: Colorectal Cancer Care for the Future: Insight to Epidemiology, Molecular Pathology, and Sustainable Treatment Innovations.

Abstract

Colorectal cancer (CRC) remains among the leading causes of cancer-related morbidity and mortality worldwide, with a steadily rising incidence in both developed and developing regions. It is a multifactorial disease driven by genetic mutations, epigenetic alterations, chronic inflammation, and environmental risk factors such as dietary patterns, obesity, smoking, and physical inactivity. Molecular pathways, including chromosomal instability, microsatellite instability, and CpG island methylator phenotype, play major roles in tumor initiation and progression. Advances in screening strategies, including fecal immunochemical testing and colonoscopy, have significantly improved early detection and prevention through polyp removal. In recent years, modern diagnostic approaches such as circulating tumor DNA, next-generation sequencing, and molecular biomarker profiling have enhanced precision in disease characterization. Targeted therapy, immunotherapy, and personalized treatment regimens are reshaping CRC management and improving patient outcomes therapeutically. This presentation highlights epidemiological trends, molecular mechanisms, innovative CRC diagnosis and treatment aimed at reducing disease burden and improving long-term cancer care.

Name of the Speaker: Dr. Subasini Uthirapathy
Job Title of the Speaker: Asst. Prof. Pharmacology and Toxicology Department, Faculty of Pharmacy, TIU, Erbil.

Biography

Dr. Subasini Uthirapathy is a Professor of Pharmacology and Toxicology Department at the Faculty of Pharmacy, Tishk International University, Erbil, Iraq, with over 18 years of international academic and research experience spanning India, Singapore, Malaysia, and Iraq. She holds a Ph.D in Pharmacology and Toxicology from SASTRA University (India) and an M.Pharm in Phytomedicine and Pharmacognosy, providing her with a uniquely integrated foundation in both conventional pharmacology and natural product science. With 157+ peer-reviewed publications, an H-index of 20 (Google Scholar), 10 international book chapters with CRC Press and Bentham Science, and two authored textbooks, Dr. Uthirapathy brings exceptional scholarly depth to this project. Her research portfolio spans food bioactive compounds, metabolic disorders, toxicology, and phytomedicine areas that sit at the heart of this book's scope. She has previously co-authored book chapters on food bioactive compounds, extraction and isolation techniques, mass spectrometry in food authentication, and oleoresins in food spices, all published with CRC Press/Taylor & Francis, demonstrating direct, proven expertise in the exact subject domain of *Minerals and Heavy Metals from Food Products*. Her clinical experience as a ward pharmacist managing Type II Diabetes and Coronary Heart Disease patients at KK Hospital, Singapore, further informs her understanding of the therapeutic and toxicological dimensions of dietary minerals. As a Fellow of the Indian Association of Biomedical Scientists (FABMS), a recipient of the Dr. Yellapragada Subba Rao Memorial Award for best research, and a holder of a PCT patent, Dr. Uthirapathy combines scientific rigour with translational vision making her ideally placed to author a text that bridges nutritional science, toxicology, and therapeutic application.

Title of presentation: Breast Cancer: Pathophysiology, Early Detection, and Modern Treatment Strategies.

Abstract

Breast Cancer remains one of the most prevalent malignancies and a leading cause of cancer-related mortality among women worldwide. Its pathophysiology involves complex interactions of genetic mutations, hormonal influences, epigenetic alterations, and dysregulated cellular signaling pathways that drive uncontrolled proliferation, invasion, and metastasis. Key molecular subtypes—including hormone receptor-positive, HER2-positive, and triple-negative breast cancer—demonstrate distinct biological behaviors and therapeutic responses, emphasizing the importance of molecular characterization in disease management. Early detection plays a critical role in improving prognosis and survival, with screening modalities such as mammography remaining foundational, while adjunctive tools including breast ultrasound, MRI, and emerging AI-assisted imaging enhance diagnostic sensitivity in selected populations. Modern treatment strategies have evolved from conventional surgery and chemotherapy toward personalized multimodal approaches integrating breast-conserving surgery, radiotherapy, endocrine therapy, targeted therapies, antibody-drug conjugates, and

immunotherapy. Advances in genomic profiling and precision oncology now enable individualized treatment planning based on tumor biology and predictive biomarkers, significantly improving clinical outcomes. This presentation aims to provide an updated overview of breast cancer pathophysiology, highlight the significance of timely detection, and discuss contemporary therapeutic innovations shaping the future of breast cancer care.

Name of the Speaker: Dr. Javed Ahamad
Job Title of the Speaker: Assistant Professor, Department of Pharmacognosy, Faculty of Pharmacy, Tishk International University, Erbil, Iraq. Email: javed.ahamad@tiu.edu.iq

Biography

Javed Ahamad is an Assistant Professor at the Department of Pharmacognosy, Faculty of Pharmacy, Tishk International University, Erbil, Iraq. He received his Doctorate in Pharmacognosy & Phytochemistry from the School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi (India) in 2015. He has more than 13 years of experience in academia and industry. He has worked as a Junior Research Fellow (JRF) and Senior Research Fellow (SRF). He has published >100 high-quality research articles in peer-reviewed journals of international repute. He is the author/editor of 6 books (Bioactive Phytochemicals: Drug Discovery to Product Development, Bentham Science Publisher, UAE, 2021; Text Book of Advanced Pharmacognosy and Natural Products. 1st Edition, 2021; Mahi Publication, Ahmedabad, India; Analysis of Food Spices: Identification and Authentication, CRC Press, Taylor & Francis Group, USA, 2023; Bioactive Compounds of Edible Oils and Fats: Health Benefits, Risks, and Analysis, CRC Press, Taylor & Francis Group, USA, 2024; and Bioactive Compounds of Edible Fruits and Berries: Health Benefits, Nutritional Importance, and Analysis, CRC Press, Taylor & Francis Group, USA, 2025; Bioactive Cucurbitacins: Therapeutic Benefits, Toxicity, and Analysis. CRS Press, Taylor & Francis Group, USA, 2026) and authored 77 book chapters for edited books and book series. His current h-index is 23 and i10-index 51 with the total number of citations of his publications >1890. He is a reviewer of many peer-reviewed journals of international repute. His current research interest lies in quality control, phytochemistry, ethnomedicine, and natural products.

Title of presentation: Role of Kurdish Ethnomedicinal Plants in Cancer Care.

Abstract

The Kurdistan region is a geographical area in the Middle East that spans parts of Iraq, Turkey, Iran, and Syria. The Kurdistan region in Iraq is surrounded by several mountains, and these mountains are a rich source of medicinal and aromatic plants. Kurdish medicinal plants have been reported for their role and potential in the prevention and treatment of many diseases like Olive (psoriasis, diabetes, CVD, etc.), Sumac (hypertension), Rhubarb (constipation), Parsley (kidney stone, anemia), Eucalyptus (cough & antiseptic), Spearmint (digestive), Basil (fever, digestive problems), Chicory (diabetes), etc. Besides providing health benefits these medicinal plants have role in achieving sustainable developments goals such as tackling climate change, protecting biodiversity and preserving ecosystems, empowering local economies and decent work, and advancing quality education and indigenous knowledge. Many Kurdish medicinal plants have been reported for their potent anticancer effects like rosemary, eucalyptus, neem, olive, pistacia, rhubarb, and many others. The present study aims to present the anticancer benefits of Kurdish medicinal plants.

Name of the Speaker: Dr. Mohammed Aslam

Job Title of the Speaker: Assistant Professor, Department of Pharmaceutics, Faculty of Pharmacy, Tishk International University, Erbil, Iraq

Biography

Dr. Mohammed Aslam is an accomplished academic and researcher in the field of pharmaceutics, currently serving at the Department of Pharmaceutics, Tishk International University. He earned his Ph.D. and Master's degrees from Jamia Hamdard, a leading institution in pharmaceutical education and research. Dr. Aslam brings diverse international academic experience, having worked as a Research Scientist and Professor at BBS Institute of Pharmaceutical Sciences and Allied Health Sciences and as a Guest Faculty member at Delhi Institute of Pharmaceutical Sciences and Research. He also served as a faculty member at Jamia Hamdard between 2018 and 2019, gaining over 3 years of teaching experience at Al Hawash Private University, Homs, Syrian Arab Republic. He qualified for the GATE examination in 2008 with a 97 percentile and has authored more than 50 publications in peer-reviewed journals. Dr. Aslam has actively supervised postgraduate students and contributed to innovative experimental research. His research interests focus on nano-ophthalmic drug delivery systems, nanostructured lipid carriers for transdermal applications, and solid lipid nanoparticles for ocular delivery.

Title of presentation: Theranostic Agents: A Transformative Paradigm in Precision Cancer Diagnosis and Targeted Therapy.

Abstract

Theranostic agents have emerged as a groundbreaking innovation in precision oncology, integrating diagnostic and therapeutic functionalities into a single, targeted platform. This dual capability enables clinicians to identify, visualize, and treat malignancies with enhanced specificity. This is followed by the administration of therapeutically active isotopes that deliver cytotoxic radiation directly to cancer cells, sparing surrounding healthy tissue. Such approaches have demonstrated significant success in cancers like prostate cancer and neuroendocrine tumors, validating the clinical utility of radiotheranostics. The paradigm supports specificity, thereby improving clinical outcomes while minimizing systemic toxicity. Unlike conventional approaches that separate diagnosis and treatment, theranostics employs molecularly targeted agents that bind selectively to tumor-associated biomarkers, facilitating both imaging and therapy through closely related compounds or isotopes. A central feature of theranostic strategies is the use of radiolabeled ligands, where diagnostic isotopes enable high-resolution imaging to assess tumor distribution, receptor expression, and disease burden. a personalized medicine framework by allowing patient selection based on molecular profiling and real-time monitoring of therapeutic response. This reduces ineffective treatments and enhances treatment precision. Furthermore, theranostics offers the potential for adaptive treatment strategies, where therapy can be modified based on imaging feedback, ensuring optimal dosing and efficacy. Despite its promise, challenges remain, including limited availability of suitable molecular targets, high costs, infrastructure requirements, and regulatory complexities. Ongoing researches are focused on expanding the range of targetable

biomarkers, developing novel radionuclides, and integrating theranostics with emerging modalities such as immunotherapy and nanomedicine. In conclusion, theranostic agents represent a transformative shift in cancer management, bridging diagnosis and therapy into a unified approach. As technological and clinical advancements continue, theranostics is poised to play a central role in the future of precision cancer care, offering more effective, individualized, and less toxic treatment options.

Name of the Speaker: Dr. Peshawa Shafiq Osw
Job Title of the Speaker: Assistant Professor, Department of Pharmacy, Tishk International University, Erbil, Iraq.

Biography

Dr. Peshawa is an Assistant Professor of Organic Chemistry, born on July 1, 1983, in Erbil, Kurdistan Region, Iraq. He graduated first in his class with a BSc in Chemistry from Salahaddin University-Erbil in 2006, followed by an MSc in Natural Products Chemistry in 2011. In 2022, he completed his PhD in Organic Chemistry–Synthesis through a prestigious split-site program between Salahaddin University-Erbil and the University of Pavia, Italy, with research focused on the design and synthesis of novel π-extended conjugated molecules for organic solar cells. He currently serves as a faculty member in the Pharmacy Department at Tishk International University, Erbil, where he brings extensive expertise in phytochemistry, organic synthesis, and organic photovoltaics. He has authored and co-authored over a dozen peer-reviewed articles in high-impact international journals. In 2019, he was honored with the Thieme Poster Prize at the OMCOS20 international conference in Heidelberg, Germany. Dr. Osw has also been the recipient of multiple prestigious awards and scholarships, including the HCED Scholarship from the Iraqi Government and a CICOPS Fellowship from the University of Pavia, Italy.

Title of presentation: The Anticancer Secret of Kurdish Wildflowers: A Phytochemical Journey through *Anchusa* Species.

Abstract: The Iraqi Kurdistan Region, encompassing botanically diverse highland ranges such as Qandil, Halgurd-Sakran, Kodo, Safeen and Hawraman, serves as a rich natural repository of wild medicinal plants. Among the therapeutically valuable flora of this region, the genus *Anchusa* (Boraginaceae) has emerged as a subject of growing pharmacological interest. Species such as *Anchusa italica* and *Anchusa strigosa* harbor bioactive secondary metabolites, including flavonoids, polyphenols, and phenolic acids, notably rosmarinic acid, caffeic acid and the isolated glycoside kaempferol 3-O-rutinoside. These constituents collectively confer significant antioxidant and free radical-scavenging activities. Beyond oxidative protection, *Anchusa* extracts demonstrate potent concentration-dependent antiproliferative effects against human breast, colorectal, and pancreatic cancer cell lines. The underlying anticancer mechanisms involve apoptosis induction, suppression of malignant cell migration and downregulation of integrin β1 and cyclooxygenase-2 (COX-2) expression. These findings establish *Anchusa* species as a promising natural template for anticancer drug discovery.

Name of the Speaker: Dania Awni Kamal
Job Title of the Speaker: Assistant Lecturer, Department of Pharmacy, Tishk International University, Erbil, Iraq.

Biography

Dania Awni Kamal is an Assistant Lecturer at Tishk International University (TIU). She holds a Master's degree in Molecular Biology from Erbil Polytechnic University. Her research interests span tumor biology, molecular biology, diabetes, and microbiology, reflecting a strong interdisciplinary focus on both fundamental mechanisms and clinical relevance.

She has contributed to the academic community through publications addressing key aspects of molecular and cellular processes, with emphasis on cancer biology and metabolic disorders. Her work integrates experimental and applied perspectives, aiming to advance understanding of disease pathways and potential therapeutic approaches.

Title of presentation: Genomic Profiling of Gastric Adenocarcinoma: The Diagnostic and Therapeutic Potential of XRCC1, IL-8, and Bcl-2 in the Kurdistan Region.

Abstract

Gastric cancer (GC) remains one of the most lethal malignancies globally due to its high capacity for invasion and metastasis. In the Kurdistan region of Iraq, it is frequently diagnosed at advanced stages, making the identification of reliable molecular markers essential. This study aimed to evaluate the expression levels of three critical regulatory genes—the DNA repair gene *XRCC1*, the proinflammatory cytokine *IL-8*, and the antiapoptotic gene *Bcl-2*—in Kurdish patients with gastric adenocarcinoma. Tissue samples were collected from 110 individuals, including 29 patients with confirmed gastric adenocarcinoma and 21 healthy controls. Analysis was performed using real-time quantitative polymerase chain reaction (RT-qPCR) to measure the relative expression of the target genes. Clinical variables, including *H. pylori* status, age, and gender, were also analyzed. The findings revealed a statistically significant upregulation of all three target genes in GC tissues compared to the healthy control group: *XRCC1* ($P < 0.05$), *IL-8* ($P < 0.01$), and *Bcl-2* ($P < 0.001$). Interestingly, while *H. pylori* infection was prevalent in patients with gastric inflammation, it was absent in the adenocarcinoma samples within this cohort. The significant elevation of *XRCC1*, *IL-8*, and *Bcl-2* suggests they play a pivotal role in the progression of gastric adenocarcinoma in this population. Targeting these specific gene pathways represents a promising and novel strategy for the development of more effective cancer treatments.

Name of the Speaker: Mrs. Sawsan S. Al-Rawi
Job Title of the Speaker: Assistant Lecturer, Biology Education Department, Faculty of Education, Tishk International University, Erbil, KRG, Iraq.

Biography

Sawsan Al-Rawi is a lecturer at Tishk International University. She is passionate about exploring the natural products properties in treating disease. Her research interest goes beyond that to explore the antioxidants, pharmacological and biological properties of medicinal plants, as well as the antiangiogenic and anticancer efficacy of natural and synthetic products. She has a track record of numerous publications in esteemed journals and is well-regarded as an invited speaker at national and international conferences. Furthermore, she serves as an editor and reviewer for several prestigious journals such as BMJ Open, Pharmacological Research & Natural Products and other.

Title of presentation: A Natural Therapeutic Approach as a Potential Intervention in Ovarian Cancer.

Abstract

Ovarian cancer remains one of the most aggressive gynecological cancers, largely due to late detection and the development of chemoresistance. This comprehensive review explores the potential of medicinal plant extracts prepared from roots, stems, leaves, and seeds as a natural therapeutic approach for intervention in ovarian cancer. A systematic literature search was conducted using Web of Science, Elsevier, PubMed, and ScienceDirect databases, covering studies published up to April 2026. The keyword search terms included combinations of "medicinal plants," "plant extract," "ovarian cancer," "root extract," "stem extract," "leaf extract," "seed extract," "anticancer activity," "cytotoxicity," and "apoptosis." We summarized current preclinical and in vitro studies evaluating crude and fractionated extracts for their cytotoxic, pro-apoptotic, anti-angiogenic, and anti-metastatic effects on ovarian cancer cell lines and animal models. Emphasis is placed on how different plant parts contribute distinct bioactive profiles: root extracts are often rich in alkaloids and saponins that promote cancer cell death, stem and bark extracts contain tannins and phenolics that suppress tumor growth, leaf extracts provide polyphenols that modulate oxidative stress and angiogenesis, and seed extracts supply bioactive oils and peptides with anti-metastatic effects. We also review extraction methods, dose-dependent outcomes, and evidence of synergistic effects when plant extracts are paired with standard chemotherapy. Evidence suggests that whole-plant and plant-part extracts may serve as adjuvant or complementary strategies to improve treatment efficacy and reduce adverse effects. Further research should focus on controlled clinical trials, identification of active constituents from each plant part, and development of standardized extraction protocols to support clinical translation.

Name of the Speaker: Dr. Shajwan Nanakali
Job Title of the Speaker: Department of Pharmacy, Tishk International University, Erbil, Iraq.

Biography

Dr. Shajwan Nanakali is a pharmacist and public health academic with a Master of Public Health (MPH) in Global Public Health from the University of Nottingham, United Kingdom, and a bachelor's degree in Pharmaceutical Sciences from Hawler Medical University, Iraq. Her academic background also includes training in Civil Liberties, Law, and Social Justice at the University of Texas at Austin, as well as pedagogical training in competency-based and student-centered education. Her teaching and research interests focus on integrating health promotion, human rights, social justice, and health equity into pharmacy and public health education, with attention to contemporary and emerging global health challenges such as communicable diseases, migration health, and social determinants of health. She is currently a Lecturer and Scientific Coordinator at Tishk International University, where she is committed to preparing socially responsible, ethically grounded health professionals.

Title of presentation: Breast Cancer in young women under 40: 10 Years of Insights from Iraqi Secondary Data.

Abstract

Breast cancer is one of the most prevalent types of cancer in Iraq. Its high incidence and mortality rates make it a significant public health concern. Despite this, research focusing specifically on younger women in Iraq remains limited. This retrospective study was conducted using secondary data from the annual reports of the Iraqi Cancer Registry (Ministry of Health) covering the period from 2014 to 2024. The study focused on female breast cancer cases, particularly those involving women under 40 years of age. Data were analyzed based on the total number of cases, as well as proportions and geographical distributions within Iraq. Descriptive statistical analysis was employed to evaluate trends over time. Over the ten-year period, the total number of cancer cases showed an overall increase of 7.6% with 73,336 registered cases. There was a general upward trend rising from 5,032 cases in 2014 to 8,899 in 2024, with the highest annual incidence recorded in 2024. While the number of cases in women aged 0–39 generally increased, their proportion relative to the total population showed a gradual decline. In 2014, the 860 cases accounted for 17.09% of all diagnoses; by 2024, although the raw case number rose to 1,147, the proportion declined to 12.88%. The Annual Percentage Change (APC) calculation indicates that while the general population saw a 7.6% increase in cases, the under-40 cohort experienced a 3.3% increase. This confirms that while breast cancer is rising in younger women, it is rising at a more rapid rate in older demographics in Iraq. Expanding diagnostic centers and annual mammography starting at the age of 40, focusing on Clinical Breast Examinations (CBE) and raising awareness for younger women to perform Breast Self-Examination (BSE) is essential to ensure earlier detection. Furthermore, developing the national registry data with further patient details is essential to address the rising incidence and regional disparities.

Name of the Speaker: Dr. Alan Riyadh Mohammed

Job Title of the Speaker: Specialist Clinical pharmacist at Rizgary Teaching Hospital, Assistant Lecturer at Tishk International University, Erbil, Kurdistan Region, Iraq

Biography

Dr. Alan Riyadh is a Specialist Clinical pharmacist. Graduated from the College of Pharmacy, Al-Mustansiriya University, Baghdad, Iraq. He earned his M.Sc. in clinical pharmacy from Hawler Medical University, Erbil, Kurdistan Region, Iraq (2015). He was the Head of the clinical pharmacy unit at Rizgary teaching hospital for about 10 years, and now he is a pre-final board trainee in clinical pharmacy at Kurdistan Higher Council of Medical Specialties. He was a speaker at many conferences. He supervised the graduation projects of college of pharmacy students and presented several training courses and workshops.

Title of presentation: Recent and Novel pharmacological therapeutics for breast cancer.

Abstract

Breast cancer remains one of the most common malignancies worldwide, with significant advances in pharmacological therapy over the past decade. This presentation highlights recent and novel therapeutic strategies that have reshaped the treatment landscape, including targeted agents such as CDK4/6 inhibitors (e.g., palbociclib, abemaciclib), PI3K inhibitors, and AKT inhibitors in hormone receptor-positive disease, as well as newer anti-HER2 agents such as trastuzumab deruxtecan and tucatinib-based regimens in HER2-positive tumors. Additionally, the role of immune checkpoint inhibitors in selected triple-negative breast cancer cases and emerging antibody–drug conjugates are discussed.

Name of the Speaker: Dr. Hazha Omar Othman

Job Title of the Speaker: Assistant Professor in the Department of Chemistry, College of Science, Salahaddin University-Erbil, and academic staff in the Pharmacy Department at Tishk International University

Biography

Dr. Hazha Omar Othman is an Assistant Professor in the Department of Chemistry, College of Science, Salahaddin University-Erbil, and also serves as academic staff in the Pharmacy Department at Tishk International University. Her research is strongly focused on nano/analytical chemistry, with particular emphasis on the design and application of nanomaterials for drug delivery, cancer therapy, and gene targeting, including recent work on carbon quantum dots for gene delivery and nanomaterial-based sensors and biosensors for biomedical diagnostics and applications. Chemosensors for chemical applications. She is actively engaged in developing nanomaterial-based systems for targeted drug delivery, bioimaging, and cancer-related therapies, as well as AI-assisted and advanced analytical approaches for biomedical and environmental applications. She obtained her B.Sc. in Chemistry in 2009, graduating third in her class, and completed her M.Sc. in Analytical Chemistry in 2018. She is currently finalizing her Ph.D. in Nano Chemistry/Analytical Chemistry at Salahaddin University-Erbil. Her main teaching and supervision fields include Analytical Chemistry, Molecular and Atomic Spectroscopy, Automated Analysis, Nanotechnology, General Chemistry, Natural Products, and Food Chemistry.

Title of presentation: Nanomaterials and Artificial Intelligence Techniques in Drug Delivery Systems.

Abstract

The traditional drug delivery technologies have serious limitations such as ineffective solubility of the drug, non-specific delivery, and less than optimal therapeutic responses. This review examines how artificial intelligence (AI) methods can be used to incorporate nanomaterial platforms, such as lipid nanoparticles, polymeric carriers, dendrimers, inorganic nanostructures, peptides, and hybrid systems to allow rational design and optimization of novel drug delivery. The AI models of supervised learning, deep neural networks, generative models, and reinforcement learning are used to overcome the classical methods of empirical exploration to conduct high-throughput screening, predicting biodistribution, tumor targeting efficacy, and controlled release kinetics. Among the most notable uses are in cancer therapy, delivery of genes (mRNA/siRNA), and stimuli-responsive systems, and improved delivery efficiency and performance in therapy have been shown in preclinical studies. There are still certain obstacles in the data standardization, model decipherability, manufacturing scalability, and regulatory endorsement, and joint endeavors are needed in the direction of clinical translation of AI-optimized nanomedicines. This is a synthesis of how AI can transform nanomedicine from a trial-and-error field to a predictive design that will enable precision therapeutics to be created and constructed to meet the most critical unmet needs in disease management.

Name of the Speaker: Dr. Rojan Arif
Job Title of the Speaker: Assistant Lecturer, Pharmacy Department at Tishk International University

Biography

Rozhan Arif Muhammed is an Assistant Lecturer at Tishk International University with over a decade of experience in the academic sector. She earned her undergraduate degree from Hawler Medical University in 2008 and later completed her Master's degree in Pharmaceutics from the same institution's Pharmacy Faculty in 2019. Since transitioning into higher education leadership and teaching in 2019, Rozhan has focused her research efforts on the field of pharmaceutics, contributing several studies to the advancement of pharmaceutical sciences. Her career at Tishk International University, which began in 2010, reflects a long-standing commitment to academic excellence, student development, and innovative research.

Title of presentation: Liposomal delivery system in cancer therapy.

Abstract

Liposomes are spherical vesicles composed of one or more lipid bilayers, primarily phospholipids, enclosing an aqueous core. In oncology, they serve as versatile "nanocarriers" designed to protect therapeutic agents and deliver them directly to tumor sites. By encapsulating potent chemotherapeutics (like Doxorubicin), liposomes minimize exposure to healthy organs (e.g., reducing cardiotoxicity). They can carry both hydrophilic drugs (in the aqueous core) and lipophilic drugs (within the lipid bilayer). Liposome utilizes the Enhanced Permeability and Retention (EPR) effect. Tumors often have "leaky" vasculature and poor lymphatic drainage, allowing liposomes to accumulate in cancerous tissue more than in healthy tissue. Also Involves surface modification with ligands (e.g., antibodies, peptides, or folate) that bind to specific receptors overexpressed on cancer cell membranes. Development of Theranostics (combining therapy and imaging in one liposome) and personalized lipid signatures to overcome multi-drug resistance (MDR).

Name of the Speaker: Dr. Alaa Ameer Mohammad
Job Title of the Speaker: Lecturer, Pharmacy Department at Tishk International University

Biography

Alaa Ameer Mohammad is a biomedical researcher and lecturer. She graduated from Hawler Medical University, College of Health Sciences, in 2016. Driven by a deep interest in molecular biology and metabolic disorders, Alaa pursued her master's studies at Gaziantep University in Turkey, focusing on the genetic mechanisms of obesity. Currently, she is a PhD student at Hawler Medical University, where her research explores the effects of adipose-derived mesenchymal stem cells on cancer and aging. Her work, which is ongoing in Italy, aims to uncover innovative therapeutic approaches and deepen scientific knowledge in regenerative medicine, oncology, and age-related diseases. In addition, she works as a lecturer in the Pharmacy Department at Tishk International University.

Title of presentation: Exploring the Role of microRNAs in Adipose Tissue–Colorectal Cancer Crosstalk.

Abstract

The relationship between obesity and colorectal cancer (CRC) is established through a complex interplay of systemic inflammation, metabolic reprogramming, and epigenetic modifications. This briefing document synthesizes current research identifying visceral adipose tissue (VAT) as a primary biological driver in CRC pathogenesis. Key findings indicate that VAT serves as a dynamic endocrine organ that facilitates a "permissive niche" for tumor growth through the secretion of proinflammatory cytokines (IL-6, TNF-\alpha) and the metabolic support of Cancer-Associated Adipocytes (CAAs). Furthermore, recent evidence highlights specific epigenetic signatures, including FTO gene polymorphisms and the significant downregulation of microRNAs such as miR-146a and miR-215, as critical links in the obesity-CRC axis. These insights suggest that targeting the tumor microenvironment (TME) and utilizing miRNA-based diagnostic tools offer promising avenues for early detection and targeted therapy in obese populations.

Name of the Speaker: Dr. Beriwan Ali
Job Title of the Speaker: Medical Microbiologist,
Erbil Polytechnic University, Pharmacy Department,
Tishk International University, Erbil, Iraq

Biography

Dr. Beriwan Ali is a Medical Microbiologist and the most highly cited researcher at Erbil Polytechnic University. She earned her PhD in Medical Microbiology from the University of Manchester, United Kingdom. Her research areas include Medical Microbiology, Molecular Biology, antibiotic resistance, epidemiology, and Global Burden of Disease studies. Dr. Beriwan is also a senior Global Burden of Disease collaborator with the Institute for Health Metrics and Evaluation (IHME) at the University of Washington School of Medicine, Seattle, USA.

Title of presentation: Quantifying the Global Burden of Infection-Associated Cancers: A GBD and Epidemiological Perspective.

Abstract

Infection-associated cancers represent a significant yet preventable proportion of the global cancer burden. Pathogens such as Helicobacter pylori, human papillomavirus (HPV), hepatitis B and C viruses (HBV, HCV), and Epstein–Barr virus (EBV) contribute substantially to malignancies worldwide, particularly in low- and middle-income countries. Despite advances in prevention and treatment, the interplay between microbial infections, carcinogenesis, and antimicrobial resistance (AMR) remains insufficiently addressed at the population level.

Name of the Speaker: Dr. Ahmad Hamdy Ibrahim
Job Title of the Speaker: Lecturer, Department of Pharmacy,
Tishk International University, Erbil, Iraq.
Email: ahmad.hamdy@tiu.edu.iq

Biography

Dr. Ahmad H. Ibrahim is a distinguished Iraqi scholar in molecular pharmacology and a lecturer at the Faculty of Pharmacy, Tishk International University. He holds a Ph.D. in Molecular Pharmacology from Universiti Sains Malaysia (2015), where he developed advanced expertise in gene cloning, neuropharmacology, and cellular signaling. His research portfolio reflects a strong commitment to addressing complex biomedical challenges, particularly in neurodegenerative disorders, cancer biology, immunology, and molecular genetics, with an emphasis on innovative therapeutic strategies. Dr. Ibrahim combines academic excellence with impactful leadership experience. During his tenure at the University of Zakho, he played a pivotal role in academic development through leadership positions in medical education, international relations, and curriculum coordination. His contributions significantly enhanced institutional quality and academic standards. An active researcher, Dr. Ibrahim has co-authored over 50 publications in reputable international journals, covering areas such as drug discovery, toxicology, and natural product pharmacology. He is also a dedicated educator, delivering specialized courses while promoting critical thinking and modern, student-centered learning approaches. His ongoing contributions continue to advance pharmaceutical sciences and higher education both regionally and internationally.

Title of presentation: Investigating Natural Compounds from Agarwood (*Aquilaria malaccensis*) for Cancer Activity: A Combined In Vitro and In Silico Study of Limonene, Myristicin, and Caryophyllene.

Abstract

Natural products continue to play an important role in drug discovery, especially in the search for safer and more effective anticancer agents. Agarwood (*Aquilaria malaccensis*) is a rich source of bioactive compounds, including limonene, myristicin, and caryophyllene, which have shown promising pharmacological effects. These compounds are believed to influence key processes in cancer progression, particularly apoptosis and angiogenesis, through targets such as COX-1, VEGF, and HIF. This study aimed to investigate the anti-proliferative and anti-angiogenic potential of agarwood extracts using both in vitro and in silico approaches. The stem bark was extracted via supercritical fluid extraction (SFE), and its cytotoxic activity was evaluated against HCT116 colon cancer and MCF7 breast cancer cell lines using MTT and colony formation assays. Morphological changes were observed under an inverted phase-contrast microscope. In parallel, molecular docking was performed to explore the interaction of the major compounds with selected cancer-related proteins. The results demonstrated strong biological activity of the extract, including complete inhibition of angiogenesis and a significant reduction in cancer cell viability. Colony formation assays confirmed a clear anti-clonogenic effect, while microscopic observations showed suppression of micro vessel growth. Chemical analysis identified (D)-limonene as a major constituent. Docking studies revealed favorable binding interactions between the compounds and key targets such as COX-

1, VEGF, HIF, and EGF, suggesting possible mechanisms underlying the observed effects. Although individual compounds showed moderate activity compared to 5-fluorouracil, their combined presence in the extract appeared to enhance overall efficacy. In conclusion, agarwood-derived compounds exhibit promising anticancer potential by targeting apoptosis and angiogenesis pathways, supporting their further development as complementary therapeutic agents.

Name of the Speaker: Dr. Halmat M. Jaafar
Job Title of the Speaker: Lecturer in Clinical Pharmacy at Hawler Medical University/ College of Pharmacy/ Department of Clinical Pharmacy/Erbil, Iraq

Biography

Dr. Halmat M. Jaafar is a licensed clinical pharmacist, academic lecturer, and healthcare professional with over 16 years of multidisciplinary experience spanning clinical practice, academia, and the pharmaceutical industry. He was also an active academic clinical pharmacy department coordinator at the pharmacy college in Hawler Medical University, Erbil, Iraq.

He currently serves as a lecturer in clinical pharmacy at Hawler Medical University, where he is actively involved in teaching advanced therapeutics, clinical pharmacokinetics, and hospital-based pharmacy training. Dr. Halmat Jaafar holds an MSc in Clinical Pharmacy and a BSc in Pharmacy, both from Hawler Medical University. His academic career is complemented by extensive clinical training across major hospitals, including oncology, pediatrics, emergency care, and general medicine. In parallel, he has held key leadership roles in the pharmaceutical sector, including Sales and Marketing Manager at Novartis and Country Operations Head for multiple pharmaceutical companies, demonstrating strong expertise in strategic planning, business development, and market expansion. He is an active researcher with several peer-reviewed publications focusing on immunology, oncology, inflammatory diseases, and metabolic disorders. His work includes clinical trials and translational research in conditions such as rheumatoid arthritis, systemic lupus erythematosus, and diabetes. Dr. Halmat Jaafar regularly participates in international medical congresses across Europe, the USA, and the Middle East, contributing to continuous medical education and global scientific exchange.

Title of presentation: Contemporary Perspectives on Molecular Drivers, Diagnostic Advances, and Precision Therapeutics in Prostate Cancer.

Abstract

Prostate cancer remains a leading malignancy among men worldwide, with its clinical management increasingly shaped by advances in molecular oncology and precision-based care. This review critically examines recent progress in the field, with emphasis on emerging insights into disease biology, evolving diagnostic modalities, and the expanding landscape of targeted therapies. Particular attention is given to the dynamic role of androgen receptor signaling, alongside key genomic alterations—including defects in DNA repair pathways such as BRCA mutations—that contribute to disease progression and therapeutic vulnerability. In parallel, the tumor microenvironment has gained recognition for its role in modulating immune responses and influencing treatment outcomes. From a diagnostic perspective, the integration of multiparametric magnetic resonance imaging with biomarker-driven approaches, including circulating tumor DNA analysis, has improved both early detection and risk stratification. Therapeutic strategies have similarly advanced, with the introduction of agents such as PARP inhibitors, prostate-specific membrane antigen (PSMA)-directed radioligand therapies, and selected immunotherapeutic approaches. Despite these

developments, the emergence of resistance mechanisms and the intrinsic heterogeneity of the disease continue to present significant clinical challenges. Taken together, these advances reflect a shift toward more individualized treatment paradigms. Ongoing translational research will be essential to refine patient selection, overcome resistance, and further integrate molecular insights into routine clinical practice.

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PARTICIPANTS ABSTRACTS

A Comprehensive Review on The Role of Phytochemicals with Antiaging Effects

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Abstract

Aging is a complex biological process characterized by the progressive decreasing of cellular physiological functions, derived by 12 interconnected hallmarks such as genomic instability, deregulated nutrient-sensing, and chronic inflammation. This review explores the role of phytochemicals as proactive therapeutic agents for anti-aging. These natural compounds function as multi-target modulators that influence critical signaling pathways, mainly through activation of AMPK, sirtuins, and Nrf2, alongside the suppression of the mTOR and NF-κB axes. The review identifies that these phytochemicals mitigate age-related pathologies by restoring cellular homeostasis: they improve insulin sensitivity and GLUT4 translocation in diabetes, promote adipose tissue browning and inhibit lipogenesis in obesity, protect against "inflammaging" and vascular calcification in cardiovascular diseases, and induce apoptosis and cell cycle arrest in malignant cells. In neurodegenerative disorders, such as Alzheimer's and Parkinson's, these compounds facilitate the clearance of neurotoxic aggregates like amyloid-β, and *tau*-proteins through enhanced autophagy and mitophagy. While phytochemicals have significant potential for extending health-span, their clinical application is currently limited due to low systemic bioavailability, making it necessary for the development of advanced nanoformulations and further long-term human clinical trials to confirm optimal dosing and safety. The review synthesizes quantitative evidence making significant physiological improvements across multiple experimental models. The collective results confirm that phytochemicals effectively shift biological markers from age related decline toward metabolic and cellular rejuvenation, validating their role in extending human health-span.

Keywords: aging, phytochemicals, cancer, diabetes, neurodegenerative disorders, cardiovascular diseases.

A Comprehensive Review of Traditional Uses, Phytochemistry, and Pharmacological Significance of *Rosmarinus officinalis* L.

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Abstract

Rosmarinus officinalis L. (Rosemary) is an aromatic evergreen plant from the Lamiaceae family. It originally comes from the Mediterranean region, but now it grown in many places around the world, including the Kurdistan region of Iraq. Rosemary has been used for long time in traditional medicine and in cooking by different cultures such as Kurdish, Mediterranean, Middle Eastern, Indian, Chinese, and North African people. The essential oil of Rosemary contains important compounds like 1,8-cineole, camphor, *α*-pinene, and borneol. These bioactive compounds are responsible for many of Rosemary's health benefits. Many studies have shown that Rosemary oil can fight different types of bacteria such as *Staphylococcus aeruginosa, Escherichia coli,* and *Pseudomonas aeruginosa*, as well as fungi like *Candida ablicans.* It also has other effects like antioxidant, anticancer, antidiabetic, and liver-protective properties. However, after looking at previous studies, it seems that there is no research about the antimicrobial activity of rosemary oil from Kurdistan region of Iraq. Most studies were done in other countries, and there is not enough information about how different concentrations of Rosemary oil affect specific microorganisms. So, this project aims to compile updated information of traditional uses, phytochemistry and pharmacological significance of *Rosmarinus officinalis* L.

Keywords: *Rosmarinus officinalis,* Rosemary, essential oil, antimicrobial activity, Kurdistan.

Influence of Surfactant Charge on Microemulsion Formulation Characteristics: A Comparative Study

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Abstract

Microemulsions (MEs) represent a thermodynamically stable colloidal dispersion that includes four essential components: oil, water, surfactant, and cosurfactant. They are characterized by their isotropic nature, which is widely used to overcome the solubility limitations of lipophilic drugs. The stability of these systems is fundamentally controlled by the interfacial properties and the electrical charge of the incorporated surfactants. This study provided a comparison of the influence of surfactant charge on the physicochemical properties of microemulsions. MEs with different surfactants were prepared using the spontaneous aqueous titration method. Tween 80, Sodium Dodecyl Sulphate (SDS), and Chlorhexidine Gluconate (CHG) were used as nonionic, anionic, and cationic surfactants, respectively. The range of ratios of MCT oil to Smix (surfactant and cosurfactant mixture) is from 9:1 to 1:80. Then, pseudo-ternary phase diagrams were constructed to identify the microemulsion regions and identify the optimal oil to Smix ratio. The characterization study was performed by using ZetaSizer to determine droplet size, polydispersity index (PDI), and zeta potential. The results showed that Tween 80 formulations achieved high uniformity with the smallest droplet size of 159 nm and a zeta average of -8.2 mV. In addition, SDS formulations showed a significant inverse correlation between water content and droplet size, reaching a droplet size of 189 nm and a zeta average of -31.7 mV. In contrast, CHG formulations produced a larger droplet size of 236 nm, but with a strong positive surface charge of +45.3 mV. Across all MEs, PDI values remained below 0.4, indicating acceptable homogeneity. Also, the macroscopic observations confirmed that increased transparency was directly associated with reduced droplet size. In conclusion, the type and charge of the surfactant play a significant role in determining the physicochemical characterization of MEs. Nonionic MEs showed superior uniformity and the smallest droplet size, indicating efficient interfacial stabilization despite low zeta potential. On the other hand, anionic and cationic MEs showed enhanced electrostatic stabilization with zeta potential values more than 30 mV. These findings assist in the rational selection of surfactants to design MEs for specific delivery needs.

Keywords: microemulsion; surfactant charge; nonionic surfactant; cationic surfactant; anionic surfactant.

Current Strategies in Prevention and Management of Chemotherapy-Induced Cardiotoxicity

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Abstract

Chemotherapy-induced cardiotoxicity represents one of the most clinically consequential complications of modern cancer therapy, contributing substantially to long-term morbidity and mortality among an expanding global population of cancer survivors. The widespread use of anthracyclines, HER2-targeted agents, vascular endothelial growth factor inhibitors, and immune checkpoint inhibitors has transformed oncological outcomes; however, each of these drug classes carries a distinct cardiovascular risk profile that may result in left ventricular dysfunction, heart failure, myocarditis, arrhythmia, or accelerated atherosclerosis, collectively defined as cancer therapy-related cardiac dysfunction (CTRCD). This systematic review evaluates the most recent evidence on the prevention and management of chemotherapy-induced cardiotoxicity, based on literature published between 2020 and 2026. It examines the mechanistic basis of cardiotoxicity across major drug classes, appraises pharmacological cardioprotective strategies including neurohormonal blockade, and assesses the efficacy of statins as demonstrated in the landmark STOP-CA randomised trial. The roles of dexrazoxane, liposomal anthracycline formulations, and emerging agents such as sodium-glucose cotransporter-2 inhibitors and angiotensin receptor-neprilysin inhibitors are also discussed. The review highlights that individualized, risk-stratified cardioprotection guided by the Heart Failure Association-International Cardio-Oncology Society framework, and implemented through a multidisciplinary cardio-oncology approach, represents the current standard of care.

Keywords: Chemotherapy-induced cardiotoxicity; cardio-oncology; cardioprotection; anthracyclines; cancer therapy-related cardiac dysfunction (CTRCD).

Current Strategies in Management of Neurodegenerative Disease with Focus on Targeting Oxidative Stress

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Abstract

Neurodegenerative diseases (NDs) are a heterogeneous group of chronic, progressive disorders characterized by the selective loss of neurons in the central and peripheral nervous systems, leading to cognitive decline, motor dysfunction, and severe disability. Major conditions such as Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, and Huntington's disease represent an increasing global health burden, particularly in aging populations worldwide. Despite extensive research, current therapeutic approaches remain largely symptomatic and do not effectively halt disease progression. Among the multiple pathogenic mechanisms involved, oxidative stress has emerged as a central contributor to neurodegeneration. It arises from an imbalance between the production of reactive oxygen species and antioxidant defense systems, resulting in damage to lipids, proteins, and nucleic acids. Neurons are particularly vulnerable due to their high metabolic demand and limited regenerative capacity. Oxidative stress is closely associated with mitochondrial dysfunction, neuroinflammation, and protein misfolding, which are key features of neurodegenerative pathology. Targeting oxidative stress has gained significant attention as a therapeutic strategy. Current approaches include natural and synthetic antioxidants, mitochondrial-targeted therapies, and gene-based interventions. In addition, advanced drug delivery systems, particularly nanotechnology-based platforms, are being explored to enhance the efficacy and specificity of these therapies. This review critically evaluates current management strategies for neurodegenerative diseases, with a specific focus on oxidative stress, and highlights emerging therapeutic approaches and future directions for the development of disease-modifying treatments.

Keywords: Neurodegenerative diseases; oxidative stress; neuroinflammation; mitochondrial dysfunction; antioxidants; neuroprotection; drug delivery systems.

A Review of Microneedling in Clinical and Cosmetic Dermatology

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Abstract

Microneedling, also known as Percutaneous Collagen Induction Therapy (PCIT), has transitioned from a niche aesthetic procedure to a mainstream dermatological intervention. By creating controlled micro-injuries in the skin, it triggers a natural wound-healing cascade without damaging the epidermis, making it a versatile tool for various skin types and conditions. This review evaluates the physiological mechanisms, evolving technologies, and the expanding therapeutic landscape of microneedling in both regenerative and rehabilitative dermatology.

Methods: We analyzed current clinical trials and comparative studies focusing on the efficacy of different microneedling modalities—including manual rollers, automated pens, and radiofrequency (RF) microneedling—as standalone treatments and in combination with topical "glide" actives. The evidence confirms that microneedling effectively stimulates the release of growth factors and the synthesis of Type I and III collagen. Key clinical outcomes include: Scar Management, Significant improvement in atrophic acne scars and hypertrophic scarring, Anti-Aging: Notable reduction in fine lines, wrinkles, and skin laxity through dermal remodeling, Pigmentary Disorders: Enhanced clearance of melasma when used as a delivery vehicle for tranexamic acid or vitamin C, Drug Delivery: A drastic increase in the skin's permeability, allowing high-molecular-weight compounds to bypass the *stratum corneum*. Microneedling is a minimally invasive, cost-effective, and low-risk procedure with high patient satisfaction. Future advancements in "hollow" and "dissolvable" microneedle technology are poised to redefine the boundaries of transdermal drug delivery and localized immunotherapy.

Keywords: Microneedling. Collagen Induction Therapy, Percutaneous Penetration, Dermatological Surgery, Acne Scars.

A Comprehensive Review of Liposomes in Skin Therapy

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Abstract

The skin, while an accessible route for drug delivery, presents a formidable barrier via the *stratum corneum*, often limiting the efficacy of conventional topical treatments. Liposomes—microscopic phospholipid vesicles—have emerged as a transformative solution to bypass these limitations, offering a biocompatible and versatile platform for targeted dermatological therapy. This review explores the evolving role of liposomes in skin therapy, evaluating their mechanisms of action, structural variations, and clinical applications in treating both localized and systemic conditions. We synthesize current research on liposomal formulations, focusing on the transition from classical liposomes to advanced "second-generation" vesicles, including ethosomes, transfersomes, and niosomes, which are specifically engineered for enhanced skin penetration. The literature indicates that liposomes significantly improve the stability and solubility of both hydrophilic and lipophilic active ingredients. Key findings highlight their success in Enhancing Permeation: Utilizing chemical similarities to skin lipids to "soften" the barrier, Targeted Delivery: Reducing systemic side effects by concentrating drugs within specific skin layers (e.g., the epidermis or hair follicles), Clinical Efficacy: Proving effective in the management of acne, psoriasis, atopic dermatitis, and skin carcinomas, as well as in aesthetic applications for anti-aging and hydration. Liposomes represent a cornerstone of modern nanomedicine in dermatology. While challenges regarding long-term stability and large-scale manufacturing persist, the integration of smart, responsive liposomal systems promises a new era of personalized and highly efficient skin therapy

Keywords: Liposomes, Nanomedicine, Vesicular Delivery Systems, Lipid Nanoparticles.

Public Acceptance of AI-Based Skin Analysis Application and AI-Generated Skincare Product Recommendations: A Contemporary Review and Quantitative Cross-Sectional Survey

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Abstract

The rapid growth of artificial intelligence (AI) has led to substantial changes in healthcare, notably in dermatology and skincare. AI-powered skin analysis applications and skincare product recommendations have emerged as novel methods to improve diagnostic support and enable tailored skincare solutions. Despite these technological breakthroughs, there are still issues about user trust, data privacy, and the trustworthiness of AI-driven outcomes. This study aims to evaluate public awareness, perception, acceptability, and trust in AI-based skin analysis tools and AI-generated skincare recommendations, with a particular emphasis on their role in modern dermatological treatment. A quantitative cross-sectional study concerned 457 participants, the majority of whom were undergraduate students from Tishk International University and other universities. The study analyzes AI usage trends, skincare decision-making preferences, and attitudes toward the use of AI technologies in dermatology. The findings show that, while there is some awareness of AI-based solutions, actual use remains very low. Participants continue to rely heavily on traditional healthcare experts, such as dermatologists and pharmacists, to address skin-related issues. Furthermore, the findings indicate a cautious attitude toward AI technology, with a sizable proportion of participants expressing concerns about the reliability and safety of AI-generated recommendations. Concerns about data privacy, image sharing, and the lack of human interaction have been identified as significant hurdles to adoption. Differences in acceptance were observed across demographic groups, with younger and more educated people showing greater receptiveness to AI integration. Given these findings, concerted initiatives are needed to increase public trust and adoption of AI in dermatology. To promote AI adoption, it is critical to emphasize openness, improve user education, ensure data security, and integrate AI as a supporting tool alongside healthcare professionals. While AI-based dermatological applications have significant promise to improve personalized skincare and clinical decision-making, their effective implementation is dependent on addressing user concerns and instilling trust in these technologies. Collaboration among healthcare practitioners, researchers, and technology developers will be critical to fully realizing the benefits of AI in dermatology.

Keywords: Artificial Intelligence, Skin Analysis, Dermatology, Skincare Recommendations, Public Acceptance, Data Privacy, Digital Health, Quantitative Study.

Glucose-6-Phosphate Dehydrogenase (G6PD) Deficiency: A Comprehensive Review of Epidemiology, Pathophysiology, Diagnosis, and Management

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Abstract

One of the most prevalent inherited enzyme disorders worldwide, glucose-6-phosphate dehydrogenase (G6PD) deficiency affects an estimated 400 million people and carries a high risk of hemolytic anemia, newborn hyperbilirubinemia, and other complications. The disorder, first identified in the 1950s, is caused by mutations in the X chromosome's G6PD gene, which reduces enzyme activity and impairs red blood cells' defense against oxidative stress. This study aims to study etiology, epidemiology, genetic inheritance, pathophysiology, clinical symptoms, diagnostic techniques, and management options of G6PD deficiency. A Comprehensive literature review was conducted across major databases, including PubMed, Scopus, Research Gate, and Google Scholar, using keywords such as "glucose-6-phosphate dehydrogenase (G6PD) deficiency," "glucose-6-phosphate dehydrogenase (G6PD) deficiency," and "Contemporary issues and new challenges in glucose-6-phosphate dehydrogenase (G6PD) deficiency. Related articles were chosen for their relevance to the role of conventional and contemporary drugs related to the treatment of glucose-6-phosphate dehydrogenase (G6PD) deficiency Diseases. The selected articles were then reviewed for significant findings and perspectives. Reduced G6PD activity makes erythrocytes more vulnerable to oxidative damage by interfering with the pentose phosphate cycle, reducing NADPH synthesis, and decreasing glutathione recycling. Clinical manifestations can range greatly, from asymptomatic people to acute hemolytic anemia, neonatal jaundice, and chronic non-spherocytic hemolytic anemia, which is frequently brought on by infections, specific drugs, or fava bean consumption. Enzyme activity assays are the main method used for diagnosis, but more recent developments, such as biosensor-based methods, are being investigated to increase accessibility, speed, and accuracy. Avoiding oxidative triggers, providing supportive care during hemolytic crises, and using phototherapy or other treatments for newborn jaundice are the main goals of management. New studies that focus on small-molecule activators and protein–protein interactions hold promise for improving the stability and activity of enzymes. Public health initiatives, such as screening programs and awareness campaigns, are essential for early detection, preventing complications, and lowering disease-related morbidity.

Keywords: Glucose-6-phosphate dehydrogenase, G6PD Deficiency, G6PD treatment, Hemolytic anemia.

Next-Generation Cancer Therapeutics (2009–2025): A Comprehensive Literature Review of Mechanisms, Efficacy, and Sustainable Access

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Abstract

Cancer remains the second leading cause of global mortality, with conventional chemotherapy constrained by systemic toxicity, non-selective targeting, and treatment resistance. The period from 2009 to 2025 has witnessed a fundamental paradigm shift from cytotoxic to precision-based oncological interventions, driven by advances in genomic profiling, immunology, and molecular biology. Aligning with Sustainable Development Goal 3 (Good Health and Well-Being), these therapeutic innovations carry significant implications for global health equity and sustainable cancer care. This literature review aims to comprehensively evaluate the evidence base for six major next-generation cancer therapeutics — immune checkpoint inhibitors, CAR-T cell therapy, targeted molecular therapies, therapeutic cancer vaccines, gene editing technologies, and bispecific antibodies — assessing their mechanisms of action, clinical efficacy, safety profiles, limitations, and socioeconomic implications. A systematic narrative literature review was conducted encompassing peer-reviewed clinical trials, regulatory approval data, and real-world outcome studies published between 2009 and 2025. Evidence was synthesized across six therapeutic categories, with analysis of molecular mechanisms, clinical trial outcomes, resistance patterns, combination strategies, health economic data, and equity considerations in low- and middle-income countries. All six therapeutic modalities demonstrated superior efficacy and reduced toxicity relative to conventional chemotherapy in selected patient populations. Immune checkpoint inhibitors achieved durable responses across previously refractory tumor types. CAR-T cell therapy yielded complete remission rates exceeding 80% in certain haematological malignancies. Targeted therapies addressed oncogenic drivers in over 30% of advanced solid tumors. Personalized mRNA cancer vaccines reduced melanoma recurrence by 44% in phase II trials. CRISPR-edited T-cell approaches produced complete responses in otherwise untreatable malignancies. However, therapeutic resistance, treatment costs reaching USD 500,000 per course, and inaccessibility in low- and middle-income countries — where 70% of cancer deaths occur — remain critical barriers to equitable implementation. The convergence of precision genomics, artificial intelligence-driven treatment algorithms, and next-generation immunological and cellular therapies is repositioning cancer from an acute, lethal illness to a chronic, potentially curable condition for many patients. Realizing the sustainable development potential of these advances requires urgent action on resistance mechanisms, equitable access frameworks, and cost reduction strategies to ensure that therapeutic progress translates into meaningful health benefits across all populations.

Keywords: cancer therapeutics, immunotherapy, CAR-T cell therapy, precision medicine, targeted therapy, cancer vaccines, bispecific antibodies, sustainable development.

In Silico Exploration of Novel GPR119 Agonist as Potential Oral Antidiabetic Agents

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Abstract

Diabetes mellitus is a long-term metabolic illness that causes impaired insulin secretion and glucose homeostasis. This can lead to serious long-term problems. G protein-coupled receptor 119 (GPR119) has become an attractive therapeutic target because it helps the pancreas make more insulin, release more GLP-1, and work better and live longer. The goal of this study was to find new compounds that bind to the GPR119 receptor better than standard drugs and to see if they may be used as oral antidiabetic treatments. Method: Using PyRx and AutoDock Vina, we screened and docked a library of 1014 ligands from the Enamine database and PubChem. Open Babel was used to prepare the ligands. The structure of the receptor was obtained from the RCSB PDB. Discovery Studio was used to look at ligand-receptor interactions, while pkCSM was used to predict pharmacokinetic parameters. The docking results showed that 10 of the best compounds had higher binding affinities than both the conventional medication Vanoglipel (−12 kcal/mol) and the co-crystallized ligand GSK-1292263 (−12.6 kcal/mol). Our top first compound had a binding affinity of −13.6 kcal/mol. Interaction study showed that crucial residues were strongly bound by hydrogen bonds, halogen interactions, π–π stacking, and hydrophobic contacts. All our top 10 compounds very well followed the Lipinski's rule of 5 and passed the ADMET filters of pkcsm. The discovered compounds exhibited enhanced binding affinity, advantageous pharmacokinetic characteristics, and consistent interaction profiles in comparison to conventional medicines. These results indicate that the chosen compounds could be potential oral antidiabetic agents aimed at GPR119. Nevertheless, additional in vitro and in vivo investigations are necessary to confirm their therapeutic efficacy.

Keywords: GPR119, molecular docking, ADMET, T2DM, anti-diabetic, beta cell functions, vanoglipel.

Integrating Nutrition and Economics: The Multifaceted Importance of Flaxseed (*Linum usitatissimum* Linn.)

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Abstract

Flaxseed (*Linum usitatissimum* Linn.), or linseed, is a plant in the family Linaceae, historically valued for fiber and now recognized as a functional food with broad health benefits. It is the richest botanical source of α-linolenic acid (ALA), an essential omega-3 fatty acid that supports cardiovascular health. Flaxseed also contains abundant lignans, notably secoisolariciresinol diglucoside (SDG), metabolized into phytoestrogens. Soluble mucilage fibers aid digestion, while proteins rich in arginine and glutamine rival soy. Phenolic acids further enhance antioxidant capacity, reinforcing their therapeutic potential. Pharmacologically, flaxseed supports cardiovascular function by lowering blood pressure and reducing cholesterol deposition, regulates hormonal balance with potential benefits against hormone-related cancers and menopausal symptoms, and exhibits anti-inflammatory activity through cytokine inhibition, relevant in arthritis. Its fiber content improves glycemic control and insulin sensitivity, aiding metabolic health and Type 2 diabetes management. Economically, flaxseed is a globally significant crop, with Canada, Kazakhstan, and Russia as major producers. Linseed oil serves as a vital industrial drying oil in paints, varnishes, and linoleum, while flax fibers are used in linen production, a sustainable textile. The expanding nutraceutical market for flaxseed oil, meal, and fortified products underscores its transformation into a multibillion-dollar industry. Collectively, flaxseed's nutritional, therapeutic, and economic versatility highlights its dual role as a functional food and agricultural commodity.

Keywords: Flaxseed, *Linum usitatissimum*, α-linolenic acid, anti-inflammatory, functional food, Superfood

Therapeutic and Economic Insights into the Phytochemical Profile of *Vitis vinifera* Grape Seeds

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Abstract

Natural products remain pivotal in drug discovery, particularly for cancer and inflammatory disorders. Among these, *Vitis vinifera* (Red Globe) grape seeds constitute a valuable reservoir of bioactive phytochemicals with notable therapeutic promise. Rich in polyphenolic constituents—including oligomeric proanthocyanidins, catechin, epicatechin, and diverse phenolic acids—these seeds exhibit potent antioxidant and anti-inflammatory properties. Their pharmacological activity is mediated through multifaceted mechanisms: inhibition of NF-κB signaling, attenuation of pro-inflammatory cytokines such as TNF-α and IL-6, and suppression of cyclooxygenase (COX) and lipoxygenase (LOX) enzymes. Consequently, grape seed extracts exert broad-spectrum effects, encompassing cardioprotective, hepatoprotective, anti-diabetic, and anticancer actions. Despite promising in vitro efficacy, clinical translation is hindered by challenges in bioavailability and stability, underscoring the need for advanced phytopharmaceutical formulations and delivery systems to optimize pharmacokinetics. Economically, grape seeds represent an abundant agricultural by-product, offering a sustainable and cost-effective source of therapeutic agents. Their valorization not only mitigates waste but also supports local agriculture, providing affordable healthcare solutions particularly relevant to low- and middle-income regions. Integrating phytochemistry with pharmacological insights highlights grape seed extracts as a versatile resource in preventive and complementary medicine. Their development aligns with global priorities for sustainable, accessible, and evidence-based healthcare systems, reinforcing the importance of natural products in modern therapeutics.

Keywords: *Vitis vinifera* grape seeds, Polyphenolic compounds, Antioxidant and anti-inflammatory activity, Phytopharmaceutical formulations, Sustainable healthcare solutions.

Functional Food Potential of Pumpkin Seeds: Phytochemistry, Pharmacology, and Industry Applications

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Abstract

Cucurbita pepo, commonly known as pumpkin, is a widely cultivated member of the Cucurbitaceae family. Its seeds, referred to as pepitas, are increasingly recognized as a functional food due to their rich nutritional and therapeutic profile. Phytochemical profiling reveals that pumpkin seeds are abundant in unsaturated fatty acids, particularly linoleic and oleic acids, which contribute to cardiovascular health. They also contain high-quality proteins with essential amino acids, vitamins such as vitamin E, and minerals including magnesium, zinc, and iron. Importantly, pumpkin seeds are a significant source of phytosterols, phenolic compounds, and carotenoids, which provide antioxidant and anti-inflammatory properties. Pharmacologically, pumpkin seeds support cardiovascular function by lowering cholesterol and blood pressure, enhance immune activity through zinc, and improve prostate health, particularly in benign prostatic hyperplasia (BPH). Their antioxidant activity mitigates oxidative stress, while dietary fiber aids digestion, glycemic control, and insulin sensitivity, offering benefits for Type 2 diabetes management. Economically, *Cucurbita pepo* is a globally important crop. Pumpkin seeds are utilized in the food industry as snacks, oil sources, and nutraceutical ingredients, while pumpkin seed oil finds applications in cosmetics and pharmaceuticals. The rising demand for plant-based, health-promoting products has elevated their commercial value, positioning pumpkin seeds as both a functional food and a versatile agricultural commodity.

Keywords: *Cucurbita pepo*, pumpkin seeds, Phytochemical profiling, Unsaturated fatty acids, Antioxidant and anti-inflammatory activity, Nutraceuticals.

Phytochemical Composition and Health Benefits of *Trigonella foenum-graecum* in Sustainable Healthcare

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Abstract

Trigonella foenum-graecum (fenugreek) is a medicinal herb widely utilized in traditional and modern phytotherapy due to its diverse bioactive constituents and pharmacological potential. Fenugreek seeds are particularly rich in secondary metabolites, including alkaloids, flavonoids, saponins, tannins, and phenolic compounds, which collectively contribute to their therapeutic efficacy. Phytochemical profiling was conducted using established qualitative and quantitative analytical methods to identify and characterize the principal constituents within seed extracts. Results confirmed the abundance of flavonoids, saponins, and phenolic substances, highlighting the complex phytochemical matrix that underpins fenugreek's biological activity. Beyond its phytochemical richness, fenugreek demonstrates notable pharmacological attributes. Its bioactive compounds support cardiovascular health by modulating lipid metabolism and reducing cholesterol deposition. The seeds also exhibit hypoglycemic effects, improving glycemic control and insulin sensitivity, thereby offering potential benefits in the management of Type 2 diabetes. Additionally, fenugreek's protein and fiber content enhance digestive function and metabolic regulation. Economically, fenugreek is an important crop cultivated across Asia, the Middle East, and parts of Europe, with applications in food, nutraceuticals, and pharmaceuticals. Its natural availability, therapeutic effectiveness, and safety profile position fenugreek as a promising candidate for sustainable healthcare solutions and functional food development, reinforcing its value as both a medicinal plant and agricultural commodity.

Keywords: *Trigonella foenum-graecum*, Phytochemical profiling, Cardiovascular and metabolic health, Functional foods and nutraceuticals.

Ethnobotanical and Pharmacological Insights into *Silybum marianum, Salvia officinalis, Cichorium intybus,* and *Rheum ribes*

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Abstract

This review examines the distinct phytochemical constituents and therapeutic modalities of four pharmacologically significant botanical species: *Silybum marianum*, *Salvia officinalis*, *Cichorium intybus*, and *Rheum ribes*. Drawing upon ethnomedicinal traditions and contemporary research, the discussion highlights the chemical signatures and mechanistic pathways that define their clinical relevance. *Silybum marianum* (Milk Thistle) is primarily characterized by the silymarin flavonolignan complex, a benchmark hepatoprotective agent known for stabilizing hepatocyte membranes and stimulating protein synthesis. *Salvia officinalis* (Sage) contains volatile oils and phenolic compounds, notably thujone and rosmarinic acid, which contribute to antioxidant, antiseptic, and cognitive-enhancing properties. *Cichorium intybus* (Chicory) is distinguished by its high inulin content and sesquiterpene lactones, compounds that regulate gastrointestinal health and metabolic balance. *Rheum ribes* (Rhubarb) is recognized for its anthraquinone and flavonoid reservoir, which underpins its antihyperlipidemic and hypoglycemic effects. Each plant is analyzed independently to emphasize its unique phytochemical profile and therapeutic contribution, while collectively reinforcing its value in modern phytotherapy. At a broader level, this review validates ethnobotanical knowledge and establishes these species as key resources for developing plant-based medicinal products. Their integration into the pharmaceutical and nutraceutical industries underscores the enduring importance of botanical research in advancing sustainable healthcare solutions.

Keywords: *Silybum marianum, Salvia officinalis, Cichorium intybus, and Rheum ribes*, Phytochemical profiling, Ethnobotanical relevance.

Ethnobotanical Significance and Pharmacological Relevance of Olive and Lavender in the Kurdistan Region

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Abstract

Olive (*Olea europaea*) and lavender (*Lavandula angustifolia*) are two medicinal plants long valued in traditional medicine and increasingly studied for their phytochemical richness and therapeutic potential. This review synthesizes ethnobotanical knowledge, phytochemical profiling, and pharmacological evidence, with particular reference to practices in the Kurdistan Region. Olive is characterized by phenolic compounds such as oleuropein, flavonoids, and triterpenes, which underpin its antioxidant, cardioprotective, and antihypertensive properties. Lavender, in contrast, is dominated by essential oils including linalool and linalyl acetate, complemented by glycosides and resinous components, supporting its anxiolytic, sedative, and antimicrobial effects. Findings from the literature validate traditional uses of both plants, highlighting their relevance in cardiovascular health, stress management, and infection control. The phytochemical diversity of olive and lavender provides a strong foundation for their integration into natural medicine and functional food development. While olive oil remains a cornerstone of dietary and therapeutic applications, lavender continues to hold importance in aromatherapy and medicinal formulations. Overall, this review underscores the therapeutic promise of olive and lavender, affirms their ethnobotanical significance in the Kurdistan Region, and supports sustainable applications in modern phytotherapy. Their dual role as culturally rooted remedies and scientifically validated resources reinforces their importance in advancing integrative and plant-based healthcare.

Keywords: Olive *(Olea europaea*) and lavender (*Lavandula angustifolia*), Kurdistan Ethnobotany, Oleuropein, Aromatherapy.

Cytokeratin as Serum Tumor Markers in Ovarian Cancer

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Abstract

An essential cytoskeletal component for epithelial cell shape and function is cytokeratin (CK). In addition to its several essential roles in cellular proliferation, apoptosis, migration, adhesion, and molecular signaling, CKs are crucial in determining epithelial structural integrity under stressful situations. Among female urogenital neoplasms, ovarian cancer has the greatest death rate and is referred to as the silent killer. Ovarian cancer is one of the possible malignancies for which CK might serve as a biomarker since its expression in epithelial cells changes with diverse diseases and tumor types. Researchers have looked at CK as a serum tumor marker in ovarian cancer; it might help with prognosis assessment, efficacy detection, and early identification. Ovarian cancer and other gynecologic malignancies are difficult to identify and treat with current methods; therefore, researchers are looking for new biomarkers. It is possible to ascertain the histological tumor type and the direction of tumor differentiation with the use of suitable CK by analyzing different cytokeratin group. This data has many potential applications, including early detection of ovarian cancer, real-time monitoring of treatment effects, prognosis assessment, and chemotherapy regimen selection. To conclude, CK has the ability to help with early diagnosis, effectiveness detection, and prognosis assessment; it is a hopeful serum tumor marker for ovarian cancer.

Keywords: Cytokeratin (CK), Ovarian Cancer Biomarker, CK Group Analysis, Gynecologic Cancer Management.

Triadic carrier-free nanomedicines: natural product-based nonarchitectures for cancer therapy

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Abstract

Triadic carrier-free nanomedicines are an emerging class of anticancer nano-assemblies in which therapeutic efficacy derives solely from the self-assembly and/or prodrug behavior of natural-product building blocks, without exogenous carriers. This review aims to systematically evaluate the design principles, assembly mechanisms, biological activities, pharmacokinetics, safety, and translational status of natural-product-based triadic systems composed of two phytochemicals and a third functional modulator (peptide, nucleic-acid fragment, or secondary drug), emphasizing how their multicomponent architecture enables tumor-microenvironment-responsive release and synergistic pathway modulation. We summarize current in vitro and in vivo evidence showing that such systems can achieve markedly enhanced cytotoxicity, improved tumor accumulation, and reduced off-target toxicity compared with conventional carrier-based nanomedicines, while highlighting preclinical models in breast, lung, colorectal, liver, and multidrug-resistant cancers. The novelty of this work lies in providing the first focused framework that integrates molecular self-assembly forces, multi-stimuli responsiveness, and mechanistic crosstalk among three natural-product-derived components, and in identifying key barriers to manufacturability, long-term biodistribution and toxicity, and clinical translation pathways that must be addressed to advance triadic carrier-free nanomedicines toward human cancer therapy.

Keywords: carrier-free nanomedicines, triadic systems, natural product-based, self-assembly, tumor microenvironment, anticancer therapy, preclinical evaluation.

Salvia cryptantha Montbret & Aucher ex Bentham, Newly Recorded from Safeen Mountain, Iraq: A Comprehensive Review of Essential Oil Composition and Biological Activities

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Abstract

The genus *Salvia* L. (Lamiaceae) represents one of the most pharmacologically significant aromatic plant genera worldwide, with numerous species valued for their rich essential oil profiles and diverse biological activities. Among its members, *Salvia cryptantha* Montbret & Aucher ex Bentham (syn. *Salvia absconditiflora* Greuter & Burdet) is reported herein for the first time from Iraq, based on specimens collected from Pungina Village, Safeen Mountain, Erbil, Kurdistan Region. This perennial aromatic herb, previously known from the calcareous rocky slopes of Turkey and the broader Irano-Turanian region at altitudes of 700–2,500 m, has been well characterized in Turkish phytochemical literature. Published GC-MS analyses consistently reveal a 1,8-cineole and camphor-dominant essential oil chemotype, with α-pinene, camphene, and borneol as major co-constituents. These volatile compounds underpin the well-documented antimicrobial, antioxidant, anti-inflammatory, and hepatoprotective activities reported across closely related *Salvia* species. Future work on the newly recorded Iraqi material will focus on essential oil extraction via hydrodistillation, comparative chemical profiling against international populations, and systematic antimicrobial and antioxidant evaluation, aiming to establish the pharmacological identity of *S. cryptantha* within the medicinal flora of Iraq.

Keywords: *Salvia cryptantha*; Safeen Mountain; essential oils; GC-MS; antimicrobial activity; antioxidant activity.

Novel Cefotaxime-Based Derivatives via *p*-Bromophenacyl Bromide and *p*-Chlorobenzoyl Chloride: Synthesis, Characterization, Computational Studies, and Biological Prospects

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Abstract

Cefotaxime, a third-generation cephalosporin antibiotic, serves as a valuable synthetic precursor for the development of novel pharmacologically active derivatives, particularly when repurposed from expired pharmaceutical stocks. In the present study, two new cefotaxime derivatives were successfully synthesized: the first via alkylation with *p*-bromophenacyl bromide, and the second through acylation with *p*-chlorobenzoyl chloride, under optimized reaction conditions. Reaction progress was monitored by thin-layer chromatography, and the crude products were purified by column chromatography to yield analytically pure compounds. Structural confirmation of both derivatives was achieved through FTIR, ^{1}H-NMR, and ^{13}C-NMR spectroscopic analyses. To further predict the pharmacological potential of the synthesized compounds, computational investigations including molecular docking and *in silico* ADME profiling will be performed to evaluate binding interactions with target proteins and drug-likeness parameters. Future experimental work will focus on systematic biological evaluation, including antimicrobial, antioxidant, and cytotoxic activity assays, aiming to establish the synthesized derivatives as promising candidates within the cephalosporin-based drug discovery framework.

Keywords: Cefotaxime; cephalosporin derivatives; synthesis; molecular docking; ADME; antimicrobial activity; drug repurposing.

SUMOylation networks drive glioblastoma stemness, microenvironmental remodeling, and resistance

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Abstract

Glioblastoma multiforme (GBM) is the most aggressive primary brain tumor, characterized by poor prognosis, high intratumoral heterogeneity, and pronounced therapy resistance, primarily driven by glioma stem cells (GSCs). SUMOylation, a reversible post-translational modification, has emerged as a critical regulator of GBM progression and therapeutic response. By modifying transcription factors, SUMOylation enhances oncogenic transcriptional programs, contributing to chemoresistance and retinoid resistance. RNA-binding proteins are also affected, influencing exosomal microRNA sorting, invasion, and vasculogenic mimicry. Additionally, SUMOylation of metabolic and cell cycle regulators supports glycolysis, proliferation, and GSC maintenance, highlighting its role in metabolic rewiring. Dysregulation of tumor suppressors through small ubiquitin-like modifier (SUMO)-mediated mechanisms, such as SENP1-dependent deSUMOylation of HIF-1α and β-catenin, promotes stemness and immune evasion. SUMOylation further intersects with angiogenesis, immune regulation, and epigenetic modifiers, including histone deacetylases and zeste homolog 2, shaping tumor plasticity and therapy resistance. Preclinical studies indicate that pharmacological inhibition of SUMOylation with agents like TAK-981, topotecan, or Paromomycin reduces tumor growth, reverses therapy resistance, and enhances radiosensitivity. Moreover, SUMO-related enzymes, such as UBA2, SENP1, and SUMO2/3, may serve as prognostic biomarkers. Understanding SUMOylation in GBM offers insights into tumor biology and identifies potential therapeutic targets to improve patient outcomes.

Keywords: Glioblastoma multiforme, glioma stem cells, SUMOylation, deSUMOylation, TAK-981, topotecan, or Paromomycin.

The Effect of Cynaropicrin, A Sesquiterpene Lactone, on The Migratory Properties of Triple-Negative Breast Cancer Cells and The Underlying Mechanisms

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Abstract

Triple-negative breast cancer (TNBC) is the most metastatic type of breast cancer. Cynaropicrin, a sesquiterpene lactone, shows potential anticancer effects. This study evaluated cynaropicrin's impact on metastasis and angiogenesis in TNBC cells. MDA-MB-231 and MDA-MB-468 cell lines were exposed to incrementing concentrations of cynaropicrin. The proliferation of the cell lines was assayed using the MTT method. A wound scratch technique was chosen to appraise the migratory properties of cells following cynaropicrin treatment. The transcript levels of epithelial-mesenchymal transition (EMT) and pro-angiogenic factors were quantified via quantitative polymerase chain reaction. The western blotting technique estimated the amount of E-cadherin, N-cadherin, Fibronectin, Vimentin, and VEGFA. The proliferation of MDA-MB-231 and MDA-MB-468 cells was significantly lowered due to cynaropicrin in a concentration-associated way. Results of the wound healing method uncovered that cynaropicrin could mitigate the migration of breast-derived MDA-MB-231 and MDA-MB-468 cells. Cynaropicrin also upregulated E-cadherin and hindered the protein expression of N-cadherin, Vimentin, Fibronectin 1, and VEGFA in breast-derived MDA-MB-468 and MDA-MB-231 cells. The present findings indicated the anti-metastatic capacity of cynaropicrin against TNBC by a mechanism that implicated the inhibition of the EMT and pro-angiogenic factor VEGFA. These outcomes suggest cynaropicrin as an anti-metastatic and anti-angiogenic sesquiterpene lactone against TNBC.

Key Words: Triple-negative breast cancer Migration, Epithelial-mesenchymal transition, Angiogenesis, Cynaropicrin.

Pharmacological Assessment of Bioactive Agent from Palmitic Acid in Tissue Repair: Role of Inflammatory and Biochemical Mediators

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Abstract

Wound healing is a dynamic process that depends on a delicate balance between inflammation, oxidative stress, and tissue regeneration. When this balance is disturbed, healing can be delayed or impaired. In recent years, bioactive compounds derived from fatty acids, such as palmitic acid, have gained attention for their potential to support tissue repair by modulating inflammatory and biochemical pathways. This study aimed to evaluate the wound healing potential of a palmitic acid–derived bioactive compound using an in vivo model. Thirty male Wistar rats were randomly assigned to four groups: untreated control, vehicle-treated, standard treatment, and compound-treated. A full-thickness excision wound was created under anesthesia, and treatments were applied topically once daily for 14 days. Wound closure was monitored at regular intervals, and tissue samples were collected for biochemical and histological analysis. All experimental procedures were carried out in accordance with approved ethical guidelines for animal care and use. The treated group showed a clear improvement in wound healing compared to controls, with faster wound contraction and better overall recovery. Histological examination revealed enhanced re-epithelialization, reduced inflammatory cell infiltration, increased fibroblast activity, denser collagen formation, and improved blood vessel development. These findings were supported by biochemical results indicating reduced inflammatory response and improved oxidative balance. In summary, the palmitic acid–derived compound demonstrated notable wound healing activity, likely through its ability to regulate inflammation and oxidative stress while promoting tissue regeneration. These results suggest that it may serve as a promising candidate for future therapeutic strategies in wound care.

Keywords: Wound Healing, Palmitic Acid Derivative, Tissue Regeneration, Antioxidant Defense, and Inflammatory Modulation.

Pharmacological Evaluation of a Palmitic Acid Derivative in Wound Healing and Tissue Regeneration

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Abstract

Wound healing is a finely balanced process involving inflammation, oxidative stress, and tissue regeneration. When this balance is disrupted, healing can slow down and lead to complications. Recently, bioactive compounds derived from fatty acids, including palmitic acid, have drawn interest for their potential role in supporting tissue repair by influencing key biological pathways. In this study, we explored the wound healing potential of a palmitic acid–derived bioactive compound using an in vivo rat model. Thirty male Wistar rats were divided into four groups: untreated control, vehicle-treated, standard treatment, and compound-treated. A full-thickness excision wound was created under anesthesia, and treatments were applied topically once daily for 14 days. Wound closure was monitored over time, and tissue samples were collected for biochemical and histological evaluation. All procedures were conducted in line with established ethical guidelines for animal research. The treated group showed faster wound contraction and more effective healing compared to controls. Histological findings revealed improved re-epithelialization, reduced inflammation, increased fibroblast activity, enhanced collagen deposition, and better formation of new blood vessels. These observations were supported by biochemical results indicating a reduction in inflammatory response and improved oxidative balance. Importantly, safety assessment showed that the compound did not cause any significant changes in liver or kidney biochemical parameters at the tested doses, suggesting good tolerability. Overall, the findings indicate that this palmitic acid–derived compound can promote wound healing by modulating inflammation and oxidative stress while supporting tissue regeneration, making it a promising candidate for future wound care strategies.

Keywords: Wound Healing, Palmitic Acid Derivative, Tissue Regeneration, Antioxidant Defense, and Inflammatory Modulation.

Phalerin Promotes Wound Repair by Balancing Inflammation and Oxidative Stress in an In Vivo Model

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Abstract

Wound healing is a complex and tightly regulated process involving inflammation, oxidative balance, and tissue repair. When these processes are disrupted, healing may be delayed and may progress to chronic wounds. *Phaleria macrocarpa*, a medicinal plant rich in bioactive compounds, has attracted attention for its anti-inflammatory and antioxidant properties. However, the role of its key compound, phalerin, in wound healing remains insufficiently explored, particularly in relation to inflammatory and oxidative stress pathways in vivo.

This study evaluated the effect of phalerin using an excision wound model in rats. Thirty animals were randomly assigned to five groups, including controls and two treatment groups receiving phalerin (2.5% and 5%). All experimental procedures were conducted in accordance with approved institutional ethical guidelines and internationally accepted standards for laboratory animal care. Wound healing was monitored over 15 days, followed by histological and biochemical analyses. Phalerin, particularly at 5%, significantly accelerated wound contraction and improved tissue repair. These effects were associated with reduced inflammatory markers, decreased lipid peroxidation, and increased antioxidant enzyme activity. Histological observations showed improved collagen deposition, enhanced fibroblast proliferation, reduced inflammatory cell infiltration, and increased angiogenesis. In addition, acute toxicity assessment revealed no significant changes in liver or kidney biochemical parameters, suggesting that phalerin is well tolerated. In conclusion, phalerin enhances wound healing, likely through modulation of inflammation and oxidative stress, while demonstrating a favorable safety profile. These findings support its potential as a promising candidate for wound management.

Keywords: Wound Healing, Phalerin, Oxidative Stress, and Inflammation.

Investigating Natural Compounds from Agarwood (*Aquilaria malaccensis*) for Cancer Activity: A Combined In Vitro and In Silico Study of Limonene, Myristicin, and Caryophyllene

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Abstract

Natural products continue to play an important role in drug discovery, especially in the search for safer and more effective anticancer agents. Agarwood (*Aquilaria malaccensis*) is a rich source of bioactive compounds, including limonene, myristicin, and caryophyllene, which have shown promising pharmacological effects. These compounds are believed to influence key processes in cancer progression, particularly apoptosis and angiogenesis, through targets such as COX-1, VEGF, and HIF. This study aimed to investigate the anti-proliferative and anti-angiogenic potential of agarwood extracts using both in vitro and in silico approaches. The stem bark was extracted via supercritical fluid extraction (SFE), and its cytotoxic activity was evaluated against HCT116 colon cancer and MCF7 breast cancer cell lines using MTT and colony formation assays. Morphological changes were observed under an inverted phase-contrast microscope. In parallel, molecular docking was performed to explore the interaction of the major compounds with selected cancer-related proteins. The results demonstrated strong biological activity of the extract, including complete inhibition of angiogenesis and a significant reduction in cancer cell viability. Colony formation assays confirmed a clear anti-clonogenic effect, while microscopic observations showed suppression of microvessel growth. Chemical analysis identified (D)-limonene as a major constituent. Docking studies revealed favorable binding interactions between the compounds and key targets such as COX-1, VEGF, HIF, and EGF, suggesting possible mechanisms underlying the observed effects. Although individual compounds showed moderate activity compared to 5-fluorouracil, their combined presence in the extract appeared to enhance overall efficacy. In conclusion, agarwood-derived compounds exhibit promising anticancer potential by targeting apoptosis and angiogenesis pathways, supporting their further development as complementary therapeutic agents.

Keywords: Anticancer, Angiogenesis, In Silico, COX-1, VEGF, Agarwood Extract.

Pharmacological Potential of *Ziziphus jujuba*: A Comprehensive Literature Review

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Abstract

Ziziphus jujuba Mill. (family: Rhamnaceae), often known as jujube or Chinese date, is a traditional medicinal plant widely utilized in Asian and Middle Eastern medicine. The plant includes several bioactive components such as flavonoids, polysaccharides, triterpenoids, alkaloids, and phenolic acids that contribute to its unique pharmacological characteristics. Recent studies (2020–2025) have showed that *Ziziphus jujuba* exhibits considerable antioxidant, anti-inflammatory, neuroprotective, hepatoprotective, antibacterial, anticancer, and antidiabetic properties. These biological effects are mainly attributable to its phytochemical contents which control different molecular pathways including oxidative stress reduction, neurotransmitter regulation, and immune system modulation. In addition, experimental and clinical investigations have demonstrated potential advantages in improving sleep quality, lowering anxiety, and enhancing cognitive performance. Modern pharmacological investigations have also revealed its involvement in modulating GABAergic and serotonergic pathways, explaining its sedative and anxiolytic properties. This study includes the latest literature (2020–2025) on phytochemistry, pharmacological activities, mechanisms of action, and medicinal applications of *Ziziphus jujuba.* Understanding these pharmacological potentials may contribute to the development of innovative plant-based medicines and functional foods.

Keywords: Ziziphus jujuba, pharmacological activity, phytochemicals, antioxidant, anxiolytic, medicinal plants.

Behavioral and Neuropharmacological Assessment of *Ziziphus jujuba* Leaves for Anxiolysis in Mice

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Abstract

Anxiety disorders are widely widespread and often treated with benzodiazepines, which can generate adverse effects such as drowsiness and motor impairment. Traditional medicinal plants may offer safer alternatives. Ziziphus jujuba (Rhamnaceae)-Sidr leaves has been long used for its soothing and sedative characteristics, but rigorous study of its anxiolytic and motor effects is limited. The anxiolytic and motor coordination effects of ethanolic extracts of *Z. jujuba* leaves were tested in albino wistar mice. Mice were separated into control, standard (diazepam 2 mg/kg), and treatment groups receiving *Z. jujuba* extract at 250 mg/kg and 500 mg/kg orally for one day. Anxiety-like behavior was examined using the Elevated Plus Maze (EPM), evaluating percentage of open arm entries and duration spent in open arms. Motor coordination and balance were tested using the Rota Rod apparatus. Data were evaluated using one-way ANOVA followed by post hoc testing. Administration of *Z. jujuba* extract significantly enhanced open arm entrances and time spent in open arms in the EPM compared to control ($p < 0.05$), suggesting anxiolytic-like effects. The 500 mg/kg dose exhibited effects comparable to diazepam. Rota Rod performance indicated significant changes in motor coordination, indicating that the extract showed impair locomotor function. The data imply that *Z. jujuba* leaves exert dose-dependent anxiolytic action inducing motor impairments. The anxiolytic effect may include regulation of the central GABAergic system, similar with conventional assertions of sedative action. Ethanolic extract of *Z. jujuba* leaves demonstrates substantial anxiolytic effects in mice while preserving motor coordination, underlining its potential as a natural treatment agent for anxiety. Further investigations are needed to identify active ingredients and understand underlying neuropharmacological processes.

Keywords: Ziziphus jujuba, anxiolytic, Elevated Plus Maze, Rota Rod, motor coordination, mice.

Evaluating the Safety Profile of Panduratin A: An In Vivo Study on Liver and Kidney Function

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Abstract

Before any natural compound can be considered for therapeutic use, it is essential to understand its safety and potential effects on vital organs. Panduratin A, a plant-derived bioactive compound with growing pharmacological interest, was investigated in this study to determine its acute safety profile, particularly in relation to liver and kidney functions in rats. In this experiment, rats were divided into three groups, including a control group receiving 10% Tween 20 and two groups treated with panduratin A at doses of 30 mg/kg and 300 mg/kg. After administration, key biochemical markers were analyzed to evaluate liver and kidney health. Liver function was assessed through enzymes such as ALP, ALT, and AST, along with total bilirubin, protein, and albumin levels. Kidney function was evaluated by measuring electrolytes (sodium, potassium, and chloride), as well as urea and creatinine levels. The findings showed that there were no meaningful differences between the treated groups and the control group in any of the measured parameters. All values remained within normal physiological limits, suggesting that panduratin A did not negatively affect liver or kidney function, even at the higher dose. The stability of both hepatic and renal markers indicates good tolerability of the compound under the conditions tested. Overall, the results suggest that panduratin A is safe in acute exposure and does not produce toxic effects on major organs such as the liver and kidneys. This supports its continued investigation as a promising natural compound for future therapeutic applications.

Keywords: Panduratin A safety, Liver and kidney health, Acute toxicity evaluation, Natural compound tolerability.

Structure-Based Virtual Screening of Novel PARP-1 Inhibitors: An SAR-Guided Molecular Docking Study Against the PARP-1 Catalytic Domain

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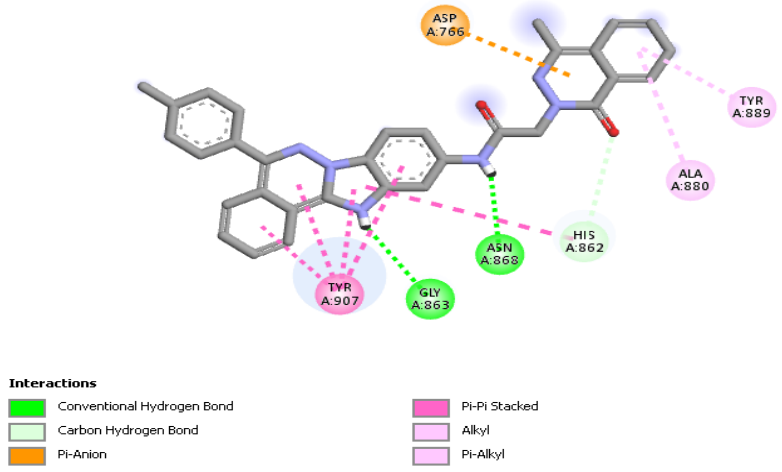
Abstract

Given that cancer is amongst the deadliest of diseases, and it not having a definitive cure, we decided to aim our study at finding molecules with the potential of curing cancer. Among all of the enzymes, receptors, and biochemical factors involved in the development of cancer, Poly(ADP-ribose) polymerase-1 (PARP-1) is considered one of the important enzymes involved in DNA repair. PARP-1 plays a catalytic role in repairing DNA damage through PARylation and is considered as a very important target in the treatment of cancer. The aim of our study was to identify compounds with the potential to inhibit PARP-1 and evaluate their binding affinity through molecular docking. Researchers have shown that Olaparib, which is an approved PARP-1 inhibitor, has the potential to be used as an anti-cancer agent. It exerts its anti-cancer effects by inhibiting the PARP-1 enzyme on cancer cells. That is why we chose Olaparib as a reference in our study and decided to dock 1500 compounds from the MolPort database on the PARP-1 receptor using docking software, to try and find compounds that have the ability to block the PARP-1 receptor. In the end, we found and demonstrated 10 molecules that came out on top in regards to their binding affinity for the PARP-1 receptor, and individually discussed how they interact with the receptor. Among these molecules, MolPort 000-736-481 showed the highest binding affinity (−14.6 kcal/mol) better than the olaparib (-13 Kcal), and exhibited favorable receptor interactions, suggesting its potential as a candidate for further preclinical investigation.

Keywords: Cancer, PARP-1, Olaparib, Molecular Docking, MolPort Database



The top molecule (MolPort 000-736-481) shows interaction with PARP1.