

ICIALH 2026

2nd International Conference on Interdisciplinary
Approaches in Life Sciences and Healthcare



17th–18th June, 2026



Jakarta, Indonesia

Organized by



IFERP[®] Life Sciences
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IFERP Life Sciences–Formerly Bioleagues





2nd International Conference on Interdisciplinary Approaches in Life Sciences and Healthcare
(ICIALH-2026), Jakarta, Indonesia

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Conference Theme



**Integrating Life
Sciences and
Healthcare for
Transformative
Innovation**



Preface

We are delighted to extend a warm welcome to all participants attending 2nd International Conference on Interdisciplinary Approaches in Life Sciences and Healthcare (ICIALH-2026) organized by IFERP Life Sciences-Formerly Bioleagues taking place in Jakarta, Indonesia on June 17th-18th, 2026. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in Transformative Innovation on Life Sciences and Healthcare. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for ICIALH-2026 contain the most up-to-date, comprehensive, and globally relevant knowledge in the field of educational research & various fields. All submitted papers were subject to rigorous peer-reviewing by 2-4 expert referees, and the papers included in these proceedings have been selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results in Innovation on Life Sciences and Healthcare but also serve as a valuable summary and reference for further research in this field.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the many professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also extend our appreciation to the external reviewers for providing additional support in the review process and to the authors for contributing their research results to the ICIALH-2026.

We express our gratitude to the keynote and individual speakers and all participating authors for their dedication and hard work. We also sincerely appreciate the efforts of the technical program committee and all reviewers, whose contributions made this conference possible. Finally, we extend our thanks to all the referees for their constructive comments on all papers, and we express our deepest gratitude to the organizing committee for their tireless work in making this conference a reality.

About ICIALH 2026

The 2nd International Conference on Interdisciplinary Approaches in Life Sciences and Healthcare (ICIALH-2026) is a premier global forum that brings together scientists, healthcare professionals, technologists, educators and policy makers to explore the transformative potential of interdisciplinary research.

With the theme “Integrating Life Sciences and Healthcare for Transformative Innovation”, the conference emphasizes the critical role of collaboration across disciplines in advancing human health, developing sustainable solutions and driving innovation in life sciences and healthcare systems.

Objectives

- **Promoting Interdisciplinary Scientific Collaboration** Unifying experts from life sciences, healthcare, biotechnology, and environmental sciences to formulate integrated solutions for global health challenges.
- **Bridging Research With Healthcare Practice** Transforming scientific knowledge into real-world clinical, biomedical, and public health applications.
- **Advancing Research Aligned With the UN SDGs** Highlighting innovations that contribute to SDGs such as Good Health & Well-Being, Clean Water & Sanitation, Gender Equality, and Climate Action.
- **Empowering Emerging Scientists & Healthcare Leaders** Providing a global platform for students, young researchers, and early-career professionals to develop skills and expand networks.

About IFERP Life Sciences

IFERP Life Sciences—Formerly Bioleagues is a globally recognized professional association meant for research, innovation and development in the field of life sciences and medical sciences . It serves to propel and fuel all innovative works of research with immense potential in the fields of Healthcare, Life Sciences, Pharmaceutical Sciences, Medical Sciences, Food & Nutrition, Environmental Science, Oncology, Cardiology, Nursing, Microbiology, Physiotherapy, Dentistry and many more. IFERP Life Science has been directly responsible for a significant amount of the revolutionary developments that have taken place in these fields over the past few decades.

IFERP Life Science is a specialized platform that supports life science and medical professionals in advancing their careers and research impact. Our tailored solutions include international conferences, Faculty Development Programs, Webinars, author services, membership and scientific communications, designed to foster collaboration and knowledge-sharing within the global medical community.

Our Mission

- Promote global research, innovation and development in life science, medical science, environmental science, pharmaceutical science and health care, to attain sustainable development goals (SDG's) for universal benefit.
- Advance Life Science & Medical Science for societal service.
- To facilitate knowledge exchange and growth through our professional activities and scientific conferences.

Our Vision

- An inclusive global scientific community promotes excellence in life science and medical events, author services, membership, informed decisions, and actions worldwide.

From Director, IFERP



Managing Director & Founder,
IFERP, Technoarete Group,
India

On behalf of Institute For Educational Research and Publications (IFERP) & the organizing Committee, I express my hearty gratitude to the Participants, Keynote Speakers, Delegates, Reviewers and Researchers.

The goal of the 2nd International Conference on Interdisciplinary Approaches in Life Sciences and Healthcare (ICIALH-2026) is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from the academia and industries of Life Sciences and Healthcare.

This conference creates solutions in different ways and to share innovative ideas in Life Sciences and Healthcare. ICIALH-2026 provides a world class stage to the Researchers, Professionals, Scientists, Academicians and Students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

ICIALH-2026 will explore the new horizons of innovations from distinguished Researchers, Scientists and Eminent Authors in academia and industry working for the advancements in Nursing & Medical fields from all over the world. ICIALH-2026 hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in the Life Sciences and Healthcare fields.

From CEO, IFERP



CEO & Founder,
IFERP, Technoarete Group,
India

IFERP is hosting the 2nd International Conference on Interdisciplinary Approaches in Life Sciences and Healthcare (ICIALH-2026) this year in month of June, 2026.

The main objective of ICIALH-2026 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions.

The sessions serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader.

I express my hearty gratitude to all my Colleagues, Staffs, Professors, Reviewers and Members of Organizing Committee for their hearty and dedicated support to make this conference successful.

I am also thankful to all our delegates for their pain staking effort to make this conference successful.

About Keynote Speaker



Associate Professor,
University of Naples Federico II,
Italy

In October 2014, Alessandro Di Minno graduated in Pharmacy (110/110) at Federico II University, Naples with an experimental thesis on the role of cAMP and cGMP in the regulation of gas-transmitters with emphasis on hydrogen sulphide (H₂S). In the frame of his PhD program in Experimental and Clinical Pharmacological Sciences in Milan University (November 2014– November 2017), he joined the Unit of Metabolomics and Cellular Biochemistry of Atherothrombosis at Centro Cardiologico Monzino IRCCS in Milan. There, he actively worked on targeted and untargeted metabolomics and on oxidative stress markers and the Arg/NO metabolome. After his PhD graduation (January 2018), he joined the Unit of Metabolomics and Cellular Biochemistry of Atherothrombosis at Centro Cardiologico Monzino Milan, Italy as Research Associate (3–yr position). In December 2018 he got a 3–yr position as Assistant Professor of Technical Sciences of Laboratory Medicine at the Department of Pharmacy, Federico II University, Naples. In October 2025 he got a position as Associate Professor of Technical Sciences of Laboratory Medicine at the Department of Pharmacy, Federico II University, Naples. He is a member of the faculty of the Master entitled “Nutraceutical products: from research and development to marketing”. On November 2018 he won the XXIII International Award “Nunzio e Adriana Pascale”. On November 2019 he won the best poster at 51 National Congress SIBIOCLaboratory Medicine. On September 2022 he won the Eberhard F Mammen Seminars in Thrombosis and Hemostasis 2022 Most popular article Awards for the ‘open access’ category for the article entitled “COVID-19 and venous thromboembolism: a meta-analysis of literature studies.” *semin thromb hemost.* 2020 oct; 46(7):763–771. On December 2025 he won the prize Guelfo Marcucci. He is listed in the Stanford/Elsevier Top 2% Scientists List 2024 and 2025.

About Keynote Speaker



Professor,
University of the Balearic Islands (UIB),
Spain

Full Professor of Biochemistry and Molecular Biology at the University of the Balearic Islands (UIB). He holds a double degree in Biology and Biochemistry and a PhD in Molecular Nutrition (cum laude, European mention). He is a member of the Community Nutrition and Oxidative Stress research group at UIB, as well as the Health Research Institute of the Balearic Islands (IdISBa), CIBEROBN (Pathophysiology of Obesity and Nutrition, ISCIII) and the University Institute for Research in Health Sciences (IUNICS). He has served as Principal Investigator in several publicly funded research projects and has participated as senior researcher in some European initiatives. He has also supervised competitive research contracts focused on environmental and nutritional health. His research spans nutritional epidemiology, oxidative stress and inflammation, metabolic health, physical activity biochemistry and ecotoxicology. He is the author of 287 original research articles, 89 reviews and 15 book chapters (over 15,000 citations; Scopus H-index 75, Scopus ID: 57201867677), and has been recognized as a Highly Cited Researcher by Clarivate (2022–2024). He has supervised nine PhD theses (with several ongoing), completed multiple international research stays, and regularly contributes to international conferences as an invited speaker.

About Keynote Speaker



Professor,
Universitas Gadjah Mada,
Indonesia

Prof. Dr. Christantie Effendy, known as Prof. Tantie, is a Professor at the Department of Medical-Surgical Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada Yogyakarta. She earned her Doctorate from Radboud University Medical Center Nijmegen, Netherlands. She is a promoter of the PMDSU program for nursing. Her research interests are palliative care, oncology care, cancer wound management, and entrepreneurship in the health sector, and often uses qualitative research methods, mixed methods & Delphy methods for her studies. She is a Palliative Educator and a member of the Palliative Care team at the Academic Hospital of Universitas Gadjah Mada, Yogyakarta. In 2018, she started her independent practice clinic, Lotus Care for wound care and palliative care services at home (<https://lotuscarejogja.com/>). She is the chairperson of the Indonesian Palliative Nurses Association (INPANA) and is also a member of IAHPC, APHN, and the Indonesian Palliative Association (MPI). She is active as an author of books in health and nursing and also as a reviewer in several high-impact journals. She is a member of the editorial team on the Nature series for BMC Geriatrics.

About Keynote Speaker



Professor,
University of DAIM,
United States

Dr. J. Somasekar completed a Ph.D. in Computer Science and Engineering from JNTUA and an M.Tech. from the National Institute of Technology (NIT) Karnataka, India, followed by Postdoctoral research at the University of South Florida, USA. He is currently a Professor and Program Head of CSE (AIDD) at JAIN University, Bangalore, and a Research Fellow at INTI International University, Malaysia. Additionally, he serves as the Head of the Department of AI & Data Science at the University of DAIM in the United States, in a remote role. He is a globally certified professional in Data Science by Oracle.

He has delivered over 270 Keynote and Invited Talks across 13 countries worldwide in emerging technologies. With over 18 years of teaching experience, he has published more than 50 research articles in leading journals, authored three books, contributed seven textbook chapters, and edited one textbook. He has guided two PhD scholars and is currently guiding six PhD research scholars in the CSE department. He achieved an All-India Rank of 43 in the GATE exam. He also received the prestigious International Travel Grant from DST, Government of India, to participate in the IEEE conference as a Keynote Speaker in Alexandria, Egypt.

He has been honored with the 'Innovative Collaborative Researcher' Award in Medical Imaging for his joint research with Dr. Ching-Hao Lai, Taiwan. In 2025, he received the 'Global Academic Excellence' Award for his keynote contributions in Malaysia, Egypt, and Singapore. He has also been recognized with the Best Outstanding Speaker Award and several Best Paper Awards at international conferences. Furthermore, he served as a Visiting Professor for the Data Science PG program at Kannur University, Kerala, and is currently a Visiting Professor at FIBS, Nigeria. His research interests include AI, Machine Learning, Image Processing, Data Science, and Cybersecurity.

About Keynote Speaker



Universiti Kebangsaan Malaysia,
Malaysia

Ts. Dr. Nurul Aqilah Mohd Zaini is a Senior Lecturer in the Department of Food Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia (UKM). Her expertise lies in food microbiology, food biotechnology, and fermentation technology, with research interests in microbial conversion, food waste utilisation, and pre- and probiotics. She focuses on developing sustainable and innovative food systems through microbial-based approaches.

She obtained her PhD in Food Science and Nutrition (Food Bioprocessing and Biotechnology) from the University of Reading, United Kingdom, and holds both Master's and Bachelor's degrees in Food Science and Technology from Universiti Putra Malaysia. Her academic background supports a multidisciplinary approach combining microbiology, sustainability, and food innovation.

Dr. Nurul Aqilah has published extensively in international journals, particularly in areas such as lactic acid fermentation, bacterial cellulose, functional foods, and food safety. Her research often emphasises the valorisation of agro-industrial waste into high-value products, contributing to circular economy initiatives.

In addition to research, she is actively involved in teaching, supervision, and curriculum development. She is also a frequent invited speaker and contributes to professional and regulatory committees related to food safety in Malaysia. Her work has been recognised through various awards, reflecting her dedication to advancing food science and its societal impact.

About Keynote Speaker



Dr. Sulistyawati

Professor, Faculty of Public Health,
Universitas Ahmad Dahlan,
Indonesia

Prof. Sulistyawati is a distinguished professor at the Faculty of Public Health, Universitas Ahmad Dahlan, Yogyakarta, Indonesia, with over 14 years of experience in public health research and education. Her expertise lies in epidemiology, particularly in the study of infectious diseases and health systems research. Throughout her career, she has contributed significantly to understanding disease patterns and public health challenges, focusing on the dynamics of communicable diseases in both local and global contexts. Her research has helped shape public health policies and interventions to improve population health outcomes.

About Plenary Keynote Speaker



Shahid Beheshti University of
Medical Sciences, Iran

Dr. Fatemehsadat Mirmohammadmakki received her Ph.D. in Food Industrial Engineering and Science – Food Chemistry from the Islamic Azad University, Science and Research Branch, in 2021. She is currently a Postdoctoral Researcher at the Medical Ethics and Law Research Center, Shahid Beheshti University of Medical Sciences. Her research focuses on food safety, agricultural products, edible oils, natural extracts, and biosorbents for the reduction of heavy metals in food, soil, and wastewater. In addition, she has extended her studies to food security ethics. Dr. Mirmohammadmakki has published many articles, authored several books and book chapters, and presented at more than 50 national and international conferences.

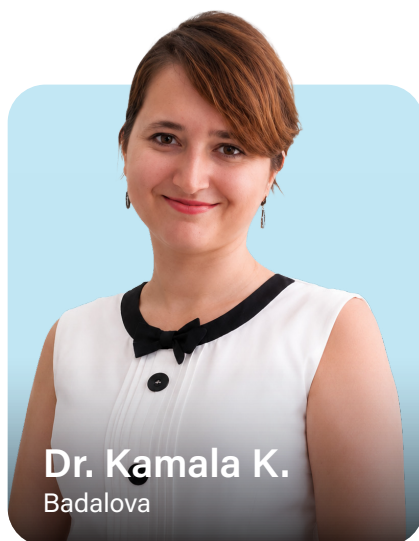
About Session Speaker



Rutgers University,
United States

I'm a chemist, researcher, and educator with experience spanning academic research, industry, and the classroom. My work focuses on building practical analytical and sensing tools that translate chemistry from the lab bench to real-world health and environmental applications. Along the way, I've had the chance to mentor students, collaborate across disciplines, and turn complex data into clear, meaningful stories about something I genuinely enjoy both in research and in teaching. I'm excited about making chemistry accessible, impactful, and a little fun

About Session Speaker



Dr. Kamala K.
Badalova

Azerbaijan Medical University,
Azerbaijan

Badalova Kamala Kamal kizi, studied at the bachelor's level of the chemistry faculty of Baku State University in 2000–2004. In 2006, she completed the master's level of the same faculty in the specialty "Organic Chemistry" with a "distinction" diploma and an honorary diploma. She is an assistant professor at the Pharmaceutical toxicology and chemistry department of Azerbaijan Medical University. She gives practical lessons and lectures in several subjects with students of pharmacy and dentistry in the multidisciplinary department in azerbaijani, russian and english languages.

She is closely involved in the scientific research and social work of the department and the faculty. She is the head of the Student Scientific Association at the department, as well as a member of the organizing committee of the Student Scientific Society of the Faculty of Pharmacy. In addition, the students she led through the Student Scientific Society at the Faculty of Pharmacy have repeatedly been awarded prizes in various nominations with their posters and oral presentations.

She is the coordinator of international relations at the department.

More than 65 scientific works (11 articles, 54 theses, 1 Eurasian patent, 2 study guides) have been published in Q1, Q4 quartile reputable scientific journals and conference proceedings included in WoS, PubMed, Scopus databases, and have made poster and oral presentations at several local and international (Greece, Pakistan, United Arab Emirates, Turkey, etc.) symposiums and conferences. She is an editor and member of the editorial board of several international scientific journals. She has been a speaker, moderator, member of scientific and organizing committees at a number of international conferences, symposiums and congresses, as well as chaired them.

She is a very prepared, hardworking, enterprising, professional teacher. She constantly improves her pedagogical level, applies innovative elements and modern programs in the teaching process.

In 2016–2017, she received a grant from the Erasmus Mundus Medea project and completed a 6-month doctoral internship at the University of Santiago de Compostela in Spain.

Her research field chemical-toxicological analysis of some toxic heavy metal compounds, Bakuchanges in the structural elements of liver under the action of toxic copper compounds. I investigated organic compounds isolated from plants.

She is an Adjunct Professor at the University of Lahore, Pakistan.

She speaks Azerbaijani, Russian, English, Turkish, and Spanish.

Interested areas: Medicinal chemistry, Organic chemistry, Nanochemistry, Biochemistry.

About Session Speaker



Universiti Malaysia Kelantan,
Malaysia

Dr. Mardhiah Kamaruddin is a Senior Lecturer at the Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan (UMK), Malaysia. She completed her Bachelor's degree in Statistics in 2014, followed by a Master of Science in Medical Statistics. In 2022, she earned her Ph.D. in Biostatistics, further solidifying her expertise in statistical methodologies applied to health and medical research. Dr. Mardhiah has demonstrated her leadership in the research field by successfully securing few national grants as the principal investigator. Her research primarily focuses on biostatistics, particularly in developing statistical techniques for analyzing health data to improve public health outcomes. Her work contributes to the broader understanding of medical data analysis, with a focus on precision and accuracy.

About Session Speaker



Associate Professor,
Universiti Teknologi MARA,
Malaysia

Dr Mohd Idzwan Mohd Salleh is an Associate Professor at Universiti Teknologi MARA for more than 15 years. He is currently served as the Deputy Dean (Academic Affairs) at the Faculty of Information Science. Prior to this, he had been attached to the Deputy Vice-Chancellor (Academic & International) as the Head of Academic Policy and Information Management for five years. His research interests are health informatics, electronic health records, digital records management, digital education, academic governance, and teaching evaluation. He published related articles in various local and international indexed journals. He also had acquired research grants at national and international levels, particularly on evaluating the impact and direction of higher education policies and initiatives. He is actively involved, participating in innovation awards, and has won many awards at the university and in national and international competitions. At the university level, he is actively involved in designing, implementing, and monitoring academic policies, academic governance, teaching methods, delivery, and teaching evaluation.

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Effectiveness of a Structured Teaching Program on Knowledge Regarding Postpartum Psychosis Among Primipara Mothers in a Selected Hospital, Chennai

Dr. G. Karpagavalli

Sri Venkateswarara Nursing College, Redhills, Chennai, Tamil Nadu, India

Abstract:

Postpartum psychosis is a rare but severe psychiatric emergency that can significantly affect maternal and infant well-being if not identified and managed promptly. Despite increasing attention to maternal mental health, awareness regarding postpartum psychosis among primipara mothers remains inadequate. This study aimed to assess the effectiveness of a Structured Teaching Program (STP) on knowledge regarding postpartum psychosis among primipara mothers in a selected hospital.

A quantitative research approach with a pre-experimental one-group pretest-posttest design was adopted. The study was conducted among 100 primipara mothers selected through convenient sampling. Baseline knowledge was assessed using a structured questionnaire, followed by the implementation of the STP and a post-test evaluation.

The findings revealed that before the intervention, 40% of mothers had adequate knowledge, 35% had average knowledge, and 25% had poor knowledge regarding postpartum psychosis. Following the STP, 80% of participants demonstrated adequate knowledge, 15% had average knowledge, and only 5% had poor knowledge. Paired t-test analysis indicated a statistically significant improvement in knowledge scores ($p < 0.05$). Significant associations were found between post-test knowledge and selected demographic variables, including age, education, monthly income, source of health information, family history of mental illness, and participation in maternal health programs.

The study concludes that the Structured Teaching Program was highly effective in enhancing knowledge and awareness regarding postpartum psychosis among primipara mothers, emphasizing the importance of educational interventions in promoting maternal mental health.

Index Terms:

Postpartum Psychosis, Maternal Mental Health, Primipara Mothers, Structured Teaching Program, Knowledge, Postpartum Period

Zebrafish as a Translational Neurobehavioral Model for Parkinson's Disease

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Sardar Bhagwan Singh University Balawala, Dehradun, Uttarakhand, India

Abstract:

Parkinson's Disease (PD) is a progressive neurodegenerative disorder characterized by the loss of dopaminergic neurons, leading to motor dysfunction and behavioral abnormalities. The present study explores the utility of zebrafish (*Danio rerio*) as a translational neurobehavioral model for investigating Parkinson's disease and evaluating potential therapeutic interventions. Parkinsonian symptoms were induced in zebrafish, followed by assessment of behavioral alterations using a battery of validated neurobehavioral tests.

Locomotor activity was evaluated to determine changes in swimming behavior and movement patterns, while the Novel Tank Diving Test was employed to assess exploratory behavior and anxiety-like responses. The Light-Dark Preference Test was conducted to evaluate anxiety-related behavior and alterations in environmental preference. Parkinsonian zebrafish exhibited reduced locomotor activity, decreased exploratory behavior, increased bottom-dwelling tendency, and altered light-dark preference, indicating significant neurobehavioral impairments associated with dopaminergic dysfunction.

The observed behavioral deficits closely resemble key manifestations of Parkinson's disease in humans, highlighting the translational relevance of the zebrafish model. Owing to its genetic similarity to humans, ease of maintenance, and suitability for high-throughput screening, zebrafish represents a valuable platform for studying disease mechanisms and identifying novel neuroprotective therapies. These findings support the application of zebrafish neurobehavioral assays in advancing Parkinson's disease research and drug discovery.

Index Terms:

Parkinson's disease, Zebrafish, Neurobehavioral Assessment, Novel Tank Diving Test, Light-Dark Preference Test, Locomotor Activity

Development of Nanosponge-Based Drug Delivery System for Solubility Enhancement

Sameer Kumar Dubey*

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Subhankar Bej

Sardar Bhagwan Singh University, Dehradun, Uttarakhand, India

Dr. Alka Singh

Sardar Bhagwan Singh University, Dehradun, Uttarakhand, India

Abstract:

Tenoxicam is a non-steroidal anti-inflammatory drug effective in treating rheumatoid arthritis but suffers from low water solubility, which limits its oral bioavailability. This study aimed to enhance Tenoxicam's solubility and in-vitro release by formulating nanosponges using Hydroxypropyl- β -cyclodextrin (HP β CD) and Diphenyl Carbonate (DPC) through the hyper-crosslinked method. Various formulations were created, with preformulation analyses including melting point determination, FTIR spectroscopy, and solubility testing. The synthesised nanosponges were evaluated for yield percentage, particle size, polydispersity index, zeta potential, entrapment efficiency, drug loading capacity, solubility improvement, and in vitro drug release using a dialysis membrane technique. Among all formulations, F3 exhibited superior characteristics: a particle size of 457.2 nm, zeta potential of 27.00 mV, entrapment efficiency of 89%, drug loading of 47.09%, and a yield of 80.5%. Notably, F3 significantly improved the solubility of Tenoxicam compared to the pure drug, and in vitro release tests showed a cumulative release of 97.78% after 9 hours, compared to only 34.1% for the pure drug. The study demonstrates that HP β CD-based nanosponges significantly enhance Tenoxicam's solubility and release profile, indicating potential for effective oral delivery.

Index Terms:

Nanosponges, Hydroxypropyl- β -cyclodextrin, Tenoxicam, Rheumatoid Arthritis

Supersaturable Self-Emulsifying Drug Delivery Systems (S-SEDDS): A Promising Strategy for Enhancing Oral Delivery of BCS Class III Drugs

Saurav Kumar

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Manik Sharma

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Sandeep Bohra

Sardar Bhagwan Singh University, Dehradun, Uttarakhand, India

Mohit Kumar

Sardar Bhagwan Singh University, Dehradun, Uttarakhand, India

Abstract:

Despite their high aqueous solubility, Biopharmaceutics Classification System Class III drugs often exhibit poor intestinal permeability, limiting oral bioavailability and therapeutic efficacy. Super saturable Self-Emulsifying Drug Delivery Systems (S-SEDDS) have emerged as a promising lipid-based strategy to overcome these challenges while reducing the high surfactant levels associated with conventional Self-Emulsifying Drug Delivery Systems. Upon dilution in gastrointestinal fluids, S-SEDDS generate a transient supersaturated state that maintains elevated drug concentrations at the absorption site, thereby enhancing the driving force for intestinal permeation. Polymeric precipitation inhibitors play a crucial role in stabilizing this supersaturated state by preventing drug precipitation and prolonging drug availability for absorption. In addition, S-SEDDS may improve drug transport through interactions with intestinal membranes, mucus layers, and tight junctions. Successful formulation requires careful selection of oils, surfactants, co-surfactants, and precipitation inhibitors to ensure stability and performance. Comprehensive in vitro and in vivo evaluations are essential to assess emulsification behavior, supersaturation maintenance, permeability enhancement, pharmacokinetics, and safety. By improving bioavailability, reducing surfactant-related toxicity, and enhancing patient acceptability, S-SEDDS represent a promising platform for the oral delivery of permeability-limited drugs. Their growing translational and regulatory potential supports further research and clinical development.

Index Terms:

BCS Class III Drugs, Oral Bioavailability, Intestinal Permeability, Supersaturation, Polymeric Precipitation Inhibitors, Lipid-Based Drug Delivery, Drug Absorption, Permeability Enhancement, Oral Drug Delivery

Preparation and Evaluation of Bucco-adhesive Tablets Containing Simvastatin

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Rishab Singh Rawat

Sardar Bhagwan Singh University, Dehradun, Uttarakhand, India

Kanupriya

Sardar Bhagwan Singh University, Dehradun, Uttarakhand, India

Ms. Sandhya Sharma

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Abstract:

The present study aimed to enhance the aqueous solubility of Simvastatin, a poorly watersoluble drug, using hydrotropic solubilization and to develop Bucco-adhesive tablets for improving its bioavailability through buccal delivery. Solubility studies were carried out in distilled water, phosphate buffer (pH 6.8), and various hydrotropic agents, namely sodium benzoate, sodium acetate, citric acid, urea, mannitol, and niacinamide, at concentrations ranging from 10% to 40%. Among these, 40% niacinamide exhibited the highest solubility of Simvastatin in water (1.032 ± 0.020 mg/ml) and was selected for formulation development. Bucco-adhesive tablets were prepared using Carbopol, chitosan, and their combinations. The niacinamide–Carbopol formulation exhibited the highest drug release, 91.52%, within 2 hours and 12 minutes. Physicochemical evaluation demonstrated acceptable weight variation, hardness, and friability values, indicating adequate mechanical strength. Swelling studies revealed progressive hydration of the tablets over time. Drug content was found to be 124.2% for nicotinamide and 94.2% for sodium benzoate formulations. In vitro permeation studies showed greater permeation from niacinamide containing tablets than from sodium benzoate formulations and pure Simvastatin. Overall, hydrotropic solubilization with niacinamide and sodium benzoate effectively enhanced Simvastatin solubility, while the developed Buccoadhesive tablets demonstrated promising potential to improve buccal bioavailability.

Index Terms:

Simvastatin, Solubility, Bucco-adhesive, Hydrotropes

Development and Characterization of 3D Bioprinted Scaffold for Wound Healing

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Abstract:

The use of three-dimensional (3D) printed construct has recently gained popularity as an alternative approach for tissue engineering. The current study aimed at the development and characterization of a 3D printed scaffold to be used as a skin substitute. In this study, we used a composite biomaterial of natural polymer, sodium alginate and gelatin (5%+6%) for printing utilizing the extrusion-based method. Rheological characterization was done to ensure the good printability and structural stability. Swelling and degradation studies were carried out with lyophilised construct to confirm good biodegradability. Fourier Transform Infrared spectroscopy (FTIR) revealed the chemical bonds formed in the composite biomaterial, while Scanning Electron Microscopy (SEM) was performed for architectural characterization and to ensure the porosity required for nutrient transport and cellular infiltration. To check the in vitro cell viability, MTT assay was performed with L929 fibroblasts cells with 24 hr treatment using lyophilised printed construct at two concentrations, 0.5 mg/ml and 1 mg/ml. The results of MTT ensured the suitability of the biomaterial for cell-laden printing, which can be employed for the treatment of cutaneous wound or to be used for skin transplant in 2nd or 3rd degree burn cases.

Index Terms:

Simvastatin, Solubility, Bucco-adhesive, Hydrotropes

Thymol Nanoparticles in Colon Cancer

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Abstract:

Thymol is the most common dietary constituent and is mainly found in thyme species. It contains 2-isopropyl-5-methylphenol with colorless crystalline in nature. Nowadays it is used in traditional medicine. It has been observed that thymol has several pharmacological properties as well as multiple therapeutic activities that include antibacterial, anti-inflammatory, anticancer, antispasmodic, and others. The object of this review article is to summarize the effect of anticancer of thymol and thymol nanoparticles in different types of cancer as well as different molecular level mechanism pathways for inhibition of cancer. Different types of nanoparticle formulations loaded with thymol have developed in recent research due to their potential therapeutic activity, pharmacological action as well and significant mechanism action as nature-originated potential candidates. Here We developed thymol loaded nanoparticles and revealed its effect in colon cancer.

In Silico and Organ-on-a-Chip Toxicology for Predictive Safety Assessment

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Abstract:

Toxicological examination is essential for determining whether medications, chemicals, cosmetics, and environmental pollutants are safe. Conventional cell culture models and animal studies are the mainstays of traditional toxicity assessment, however these methods are constrained by ethical issues, high expenses, long testing times, and inadequate human response prediction. New developments in micro-physiological systems and computational toxicology have offered creative substitutes for safety assessment. To anticipate the toxicological behavior of chemical compounds, in silico toxicology uses computational methods such as molecular docking, machine learning, quantitative structure–activity relationship modeling, and physiologically based pharmacokinetic modeling. By facilitating quick screening and early detection of possible harmful effects, these techniques lessen the workload associated with experiments and speed up risk assessment. Organ-on-a-chip technology replicates the form and function of human organs under physiologically appropriate conditions by using microfluidic devices containing living human cells. These systems make it easier to evaluate organ-level toxicity and medication efficacy and offer better prediction of human-specific responses. By fusing computational prediction with human-relevant experimental validation, the integration of in silico techniques with organ-on-a-chip systems presents a viable method for next-generation toxicology. The precision, effectiveness, and sustainability of toxicity testing and regulatory decision-making could all be improved by this integrated approach.

Index Terms:

Simvastatin, Solubility, Bucco-adhesive, Hydrotropes

Habitual Black Coffee Consumption Is Associated with Elevated TC/HDL-C Ratio Among Carriers of the *MTHFR* 677T Allele

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Abstract:

Black coffee consumption has been extensively studied for its effects on cardiometabolic health; however, the interaction between genetic factors and black coffee consumption in influencing cardiometabolic risk remains poorly understood. Limited information is available regarding the role of the methylenetetrahydrofolate reductase (*MTHFR*) C677T polymorphism (rs1801133) in cardiovascular responses and lipid metabolism among black coffee consumers. This study aimed to investigate the association between black coffee consumption, *MTHFR* C677T polymorphism, blood pressure, pulse rate, and lipid profile among young adults. A convenience sampling approach was employed. A total of 298 participants (110 males and 188 females) were recruited for a cross-sectional study, while 106 participants (37 males and 69 females) participated in an experimental study evaluating the acute effects of black coffee consumption. Participants completed questionnaires on black coffee consumption habits and lifestyle factors. Genotyping was performed using buccal cell DNA, and measurements of blood pressure, pulse rate, and lipid profile were obtained. Statistical analyses were conducted using SPSS version 27.0. The genotype frequencies of CC, CT, and TT were 49.1%, 50.0%, and 0.94%, respectively. A significant association was observed between the *MTHFR* C677T polymorphism and habitual black coffee consumption ($\chi^2 = 8.038$, $p < 0.05$). Among T-allele carriers, habitual black coffee drinkers exhibited a significantly higher total cholesterol-to-HDL cholesterol (TC/HDL-C) ratio than non-habitual black coffee drinkers ($p < 0.05$). Acute black coffee consumption significantly increased systolic and diastolic blood pressure while decreasing pulse rate among habitual black coffee drinkers ($p < 0.05$). These findings suggest that habitual black coffee consumption may increase cardiovascular risk among T-allele carriers through an elevated TC/HDL-C ratio. Furthermore, acute black coffee intake influences cardiovascular responses by increasing blood pressure and reducing pulse rate. This study highlights the importance of gene-diet interactions in cardiometabolic health and supports the application of nutrigenetic approaches in personalized nutrition.

Electron Microscopic Investigation of Structural Alterations in Liver Components induced by the Toxic Impact of Copper Ions

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Abstract:

Copper is an essential trace element involved in numerous enzymatic processes; however, excessive accumulation of copper ions can induce severe hepatotoxicity through oxidative stress and disruption of cellular homeostasis. This study aimed to investigate the ultrastructural alterations in liver tissue following exposure to toxic levels of copper ions using transmission electron microscopy (TEM). Experimental models were subjected to controlled copper ion administration, and liver samples were processed for ultrastructural examination.

Among the toxic compounds of copper a special role is played by complications caused by the action of copper (II) sulfate. The purpose of this work is a study the structural changes in the liver of white rats under the action of CuSO₄, introduced by the alimentary method using a light and electron microscope.

Electron microscopic analysis revealed pronounced structural changes in hepatocytes, including mitochondrial swelling, cristae disorganization, and increased electron density of the mitochondrial matrix. The rough endoplasmic reticulum exhibited dilation and fragmentation, while ribosomal detachment was frequently observed. Nuclear alterations included chromatin condensation and irregularities in the nuclear envelope.

During action of CuSO₄, almost all of the liver's structural elements are exposed to destructive changes of different degrees. With the influence of CuSO₄ an aggregation of blood elements and loss of the liquid part of the plasma as a result of violation of the integrity of the endothelial layer of blood vessels, leads to the Sladj phenomenon. And in the cytoplasm of the hepatocyte of the central zone, there are non-recoverable – in the place of granular endoplasmic nets and mitochondria as a result of destructive changes

These findings indicate that copper ion toxicity induces significant ultrastructural damage to hepatocellular organelles, primarily mediated by oxidative injury and impaired intracellular trafficking. The observed morphological alterations provide insight into the cellular mechanisms underlying copper-induced liver injury and may contribute to the development of targeted therapeutic strategies for copper-related hepatopathies.

Formulation and Evaluation of Ocular SNEEDS of Ketoconazole

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Abstract:

Ocular drug delivery remains a significant challenge due to the complex barriers presented by the anatomy and physiology of the eye. In recent years, self-nanoemulsifying drug delivery systems (SNEDDS) have emerged as a promising approach to enhance the bioavailability and therapeutic efficacy of ophthalmic drugs. SNEDDS are lipid-based formulations that form spontaneously nano-sized emulsions when in contact with aqueous media, offering several advantages such as improved drug solubility, enhanced stability, and prolonged drug release. Ketoconazole is BCS II drug having poor solubility. The purpose of this study was to investigate self nano-emulsifying drug delivery system (SNEDDS) for ophthalmic delivery of KTZ to treat fungal keratitis. Oleic acid used as oil, Tween 80 used as surfactant and Transcutol HP used as co-surfactant to prepare SNEDDS with a low energy method and ternary phase diagram was constructed in order to determine the nano-emulsion region. Physicochemical parameters (droplet size, PDI, zeta potential, pH and viscosity) and in vitro release of SNEDDS were studied. On the basis of greater transmittance, droplet size and PDI, it was found that F4 was the best formulation with the droplet size of 129.8 nm, PDI of 0.277 and zeta potential 19.7 and showed no phase separation. F4 formulation showed a pH of 6.2 ± 0.05 and viscosity of 120 ± 2.31 cP. F4 formulation showed greater drug release of 89% in 8 hours where pure drug suspension showed incomplete release of 32% in 8 hours. These results suggest that KTZ SNEDDS can be used as a promising nanocarrier for ocular drug delivery.

Evaluation of the Effect of Chronic Administration of Ayurvedic formulation 4 (AF4) in Spontaneously Hypertensive Rats

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Abstract:

Hypertension is a major contributor to cardiovascular disease worldwide, and Hypertension affects an estimated 1.28 billion adults worldwide and is a major contributor to cardiovascular disease, leading to organ damage. When blood pressure remains high for an extended period, it triggers several detrimental changes in the body, including activation of the renin–angiotensin–aldosterone system, increased activity of the sympathetic nervous system, damage to the blood vessel lining, heightened oxidative stress, and inflammation, which causes cardiac hypertrophy and leads to heart failure. Various antihypertensive drugs are used to mitigate hypertension, but their prolonged use has adverse effects, including dizziness, fatigue, electrolyte disturbances, and renal complications. Therefore, Ayurveda based Ayurvedic Formulation 4 (AF4) compound developed at CSIR-CDRI has been studied for its antihypertensive activity in spontaneously hypertensive (SHR) rats. AF4 was administered orally at 4 doses (45 mg/kg, 90 mg/kg, 180 mg/kg and 360 mg/kg) for 30 days and hemodynamic parameters like systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), and heart rate (HR), were assessed using invasive blood pressure techniques with the PowerLab AD system (AD Instruments, Australia). The AF4 compound demonstrated a significant reduction in SBP, DBP, and MAP in this study while maintaining HR within the normal range. Besides lowering blood pressure, this formulation also decreased inflammation by reducing TNF- α levels. The study highlights that combining traditional medicine with modern scientific methods could be a useful way to manage hypertension.

