ICDDTM'23

INTERNATIONAL CONFERENCE ON DRUG DISCOVERY AND TRANSLATIONAL MEDICINE 2023 (ICDDTM'23)

"Scientific Discoveries: Impacting Healthcare and Driving Economic Growth"

December 5-6 2023

Preconference Workshops | 4 December 2023
Postconference Symposiums | 8 December 2023

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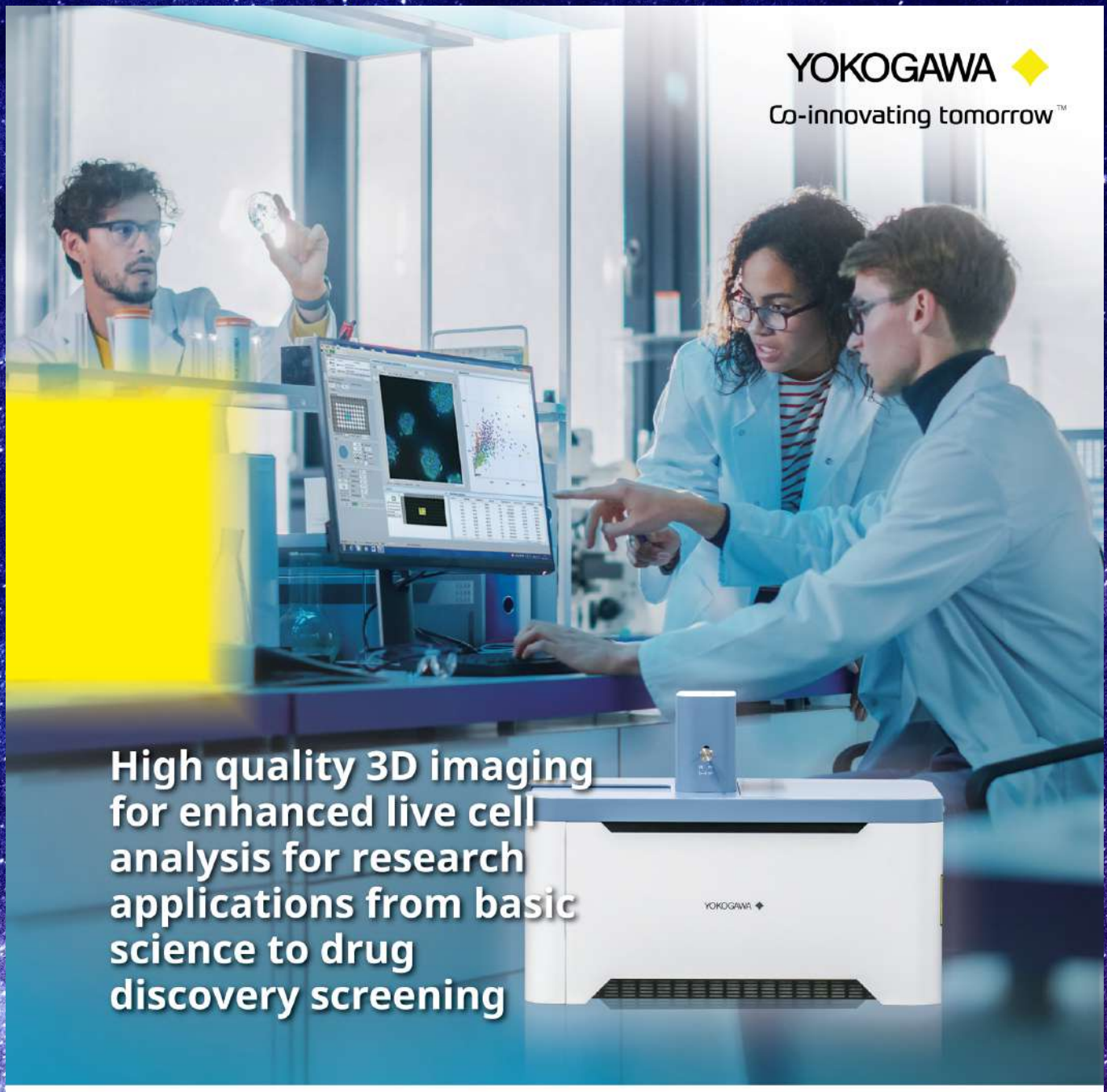

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Fax: (60)-3-8060-8078

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President | MACR
Universiti Putra Malaysia

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Co-chair | ICDDTM'23
Universiti Putra Malaysia

AP. Dr. Patrick Nwabueze Okechukwu
Co-chair | ICDDTM'23
UCSI University

The inaugural International Conference on Drug Discovery and Translational Medicine 2018 (ICDDTM'18) and its successor, International Conference on Drug Discovery, and Translational Medicine 2021 (ICDDTM'21), have served as global platforms for researchers and clinicians to network, exchange ideas, and discuss their latest discoveries pertinent to precision medicine and its associated disciplines. Both conferences were enormously successful, having attracted delegates from local and international institutions.

The MACR and its partners have once again formed alliances in organising the third meeting of the International Conference on Drug Discovery and Translational Medicine (ICDDTM'23) from 5th to 6th December 2023. On behalf of the ICDDTM '23 organising committee, we are truly honoured and delighted to invite delegates from all around the world to this conference. The conference theme, "Scientific Discoveries: Impacting Healthcare and Driving Economic Growth", spotlights the positive impact of scientific research on economic progress. Healthcare innovations derived from research benefit not only patients but also a nation's economy, the beneficiary that often goes unnoticed. It is time to rekindle public appreciation for science, especially among young digital natives who are generally more receptive to innovative ideas and concepts. ICDDTM'23 aims to bring together academicians, healthcare industry players, researchers, clinician scientists, medical doctors, nurses, pharmacists, nutritionists, other healthcare personnel, policymakers, undergraduates, postgraduates, and postdoctoral fellows from all parts of the world to discuss the current progress of drug discovery and translational medicine research.

The two-day conference programme focuses on five major areas, namely cancer, infectious diseases, inflammatory and metabolic diseases, mental health/neurodegeneration and miscellaneous (cardiovascular/ drug design/ delivery/ pharmacoeconomics) and will feature prominent plenary and invited talks. The Scientific Committee has also planned a comprehensive programme which includes preconference workshops, parallel oral and poster sessions covering the five major research areas, and postconference symposiums. To keep participants engaged, we have included some new activities, i.e., Two special forums to stimulate the much-needed debate on issues relating to stem cell therapy and medical uses of ketum. There will be the launch of The International Affordable Diagnostics and Therapeutics Alliance (IA-DATA). A collaborative platform for quadruple helix entities to work together towards a common objective of improving affordability and accessibility in health diagnostic and therapeutic particularly for neglected diseases.

The final highlight of the conference will be the award ceremony, where the Best Oral Presenters, Best Poster Presenters and Student awards, will be given as recognition of the outstanding work of the selected participants. It has been our greatest hope that this conference will function as an international platform to explore and promote potential collaborations in the future.

WELCOME NOTE FROM ICDDTM'23 SCIENTIFIC COMMITTEE CHAIR

Dr. Ooi Der Jiun
MAHSA University

Greetings and Welcome to Malaysia.

On behalf of the Scientific Committee, I am delighted to extend a warm and hearty welcome to all delegates and guests attending the International Conference on Drug Discovery and Translational Medicine (ICDDTM'23).

This year's conference, held under the theme of "Scientific Discoveries: Impacting Healthcare and Driving Economic Growth," unites us in our shared mission to leverage the power of science for the improvement of healthcare and the advancement of global economies. The past few years have underscored the essential role of scientific innovation in addressing global health challenges, and ICDDTM'23 stands as a testament to our commitment to driving progress in these vital areas.

Our heartfelt appreciation goes to the distinguished speakers and participants contributing to the international presence at the International Conference on Drug Discovery and Translational Medicine 2023 (ICDDTM'23). This global representation underscores the conference's dedication to fostering international collaboration and knowledge exchange in the realms of drug discovery and translational medicine. We are also glad to acknowledge abstract submissions from a diverse range of countries, including Malaysia, India, Indonesia, Singapore, Poland, Philippines, and Nigeria. These abstracts, soon to be published as conference proceedings in the esteemed Malaysian Journal of Medicine and Health Science (MJMHS), serve as tangible evidence of the active and invaluable participation of researchers and experts worldwide in ICDDTM'23.

In addition to recognizing outstanding oral and poster presentations, it brings us great pleasure to announce that this year, ICDDTM'23 is offering two Best Cancer Abstract winners sponsored by Oncologie and three travel award grants for young investigators. These awards and grants offer emerging talents a unique opportunity to share their insights and research journeys. Through these awards, we aim to inspire and empower young researchers, fostering an environment where the torch of scientific discovery is passed to the next generation.

To all participants, presenters, organizers, sponsors, and volunteers—your unwavering dedication has been instrumental in making ICDDTM'23 a reality. Let us collectively push the boundaries of knowledge, create innovative solutions, and make a lasting impact on healthcare and economic prosperity.

Wishing everyone a fruitful and inspiring experience at ICDDTM'23.

WELCOME NOTE FROM THE MINISTER OF SCIENCE, TECHNOLOGY AND INNOVATION MALAYSIA

Y.B. Chang Lih Kang
Minister of Science, Technology and Innovation, Malaysia

I am delighted to have been invited to officiate the International Conference on Drug Discovery and Translational Medicine 2023, or ICDDTM'23. This year, the Organising Committee set out to examine a key ingredient in the recipe for economic progress – scientific innovation. The conference theme, "Scientific Discoveries: Impacting Healthcare and Driving Economic Growth", sets the stage for an essential discourse on science and its inseparable relationship with the success or decline of a nation's economy.

Science has seamlessly integrated into our lives, using everyday conveniences, sophisticated gadgets, and technologies. In this modern era of science and technology, progress in producing original innovations and making groundbreaking discoveries has plateaued and stagnated. So, we have yet to unleash the full potential of what science can offer for the growth of our nation. However, this can change, provided we come together. In such challenging times where the COVID pandemic has derailed economic growth, we need good governance and science-backed solutions to steer the nation's economy back on the right track.

ICDDTM aligns with the government policies, which envision Malaysia's transformation into a knowledge-centric economy through several fundamental science, technology, and socio-economic drivers. A strong economy boosts the healthcare sector, which, in return, provides the country with a resilient and productive workforce. Healthcare-related innovations also benefit the economy in many other ways; for instance, stem cell-based therapy is one of the products of budding new industries that could create additional revenue streams for national income. Conferences like ICDDTM are perfect "incubators" for novel ideas and inventions. Browsing through the conference website, I learned that plants can be engineered to produce therapeutic proteins cost-efficiently! These innovations can benefit patients and the economy by their commercialisation potential.

Moreover, I am thrilled about the launch of The International Affordable Diagnostics and Therapeutics Alliance, IA-DATA, which aims to expand access to affordable disease diagnostics and treatments. The initiative is a collaborative endeavour between the Malaysian Association for Cancer Research, the Centre for Affordable Diagnostics and Therapeutics at St George's, University of London, Universiti Putra Malaysia, Universiti Malaya, MRANTI, and other local universities and industrial partners. I foresee that IA-DATA will serve as the "sledgehammer" we need to break down the cost barrier to healthcare.

Thank you for taking part in the conference. Let's embark on this remarkable journey of discovery, innovation, and progress together.

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TENTATIVE PROGRAM

DAY 1: 5th. December 2023

Venue: Hang Li Po Ballroom | Level 4

TIME	AGENDA
0800	Registration & Arrival of Distinguished Guests and Y.B. Chang Lih Kang, Minister of Science, Technology and Innovation Malaysia
0840	**Welcome Address** AP. Dr. Patrick Nwabueze Okechukwu *Co-Chair of ICDDTM'23*
0845	**Welcome Remarks** Prof. Dr. Johnson Stanslas *Advisor of ICDDTM'23* *President of the Malaysian Association for Cancer Research (MACR)*
0850	**Official Opening Address** Y.B. Chang Lih Kang *Minister of Science, Technology and Innovation, Malaysia*
0900	**Introduction and Launching of International Affordable Diagnostics and Therapeutics Alliance (IADATA)** Dr. Yolanda Augustin *Clinical Oncologist, St. George's University of London, United Kingdom*
	CANCER
	Moderator: **Prof. Dr. Johnson Stanslas** (UPM)
0915	**Plenary Session 1** Tumor Cell Metabolism as a Strategy to Bypass Drug Resistance ***Prof. Dr. Godefridus J. (Frits) Peters***	*Amsterdam University Medical Centers, Netherlands*
1000	**Coffee Break, Poster Viewing & Judging and Networking**
	Moderators: **Dr. Jonathan Lim Chee Woei** (UPM) **| AP. Dr. Lim Siong Meng** (UiTM)
1030	**Invited Talk 1** Repositioning Drug Repurposing for Cancer: Focusing on Pre-Cancerous Conditions, Combination Therapies and Antimetastatic Agent Development ***Dr. Yolanda Augustin***	*St. George's University of London, United Kingdom*
1050	**Invited Talk 2** Putting Malaysia on the Map of Early Phase Oncology Drug Development ***Dr. Voon Pei Jye***	*Sarawak General Hospital, Malaysia*
1110	**Invited Talk 3** A Phase I Study of Metronomic Oxaliplatin, Chronomodulated Capecitabine and UGT1A1-Genotype-Guided Irinotecan Regimen (OXIRI) for the Treatment of Pancreatic Ductal Adenocarcinoma ***Prof. Dr. Balram Chowbay***	*National Cancer Centre Singapore (NCCS), Singapore*
1130	**Q&A Session 1**

1145	**Forum | Stem Cell Industry** Moderators | **AP. Dr. Tan Jun Jie** (USM) | **AP. Dr Rajesh Ramasamy** (UPM) Panelists: **Dato' Dr. Rajbans Singh** Pantai Hospital Kuala Lumpur **Dato' Sri Dr. Tham Seng Kong** Alps Global Holding **Mr. James Then** Cryocord Sdn. Bhd. **Ms. Angelina Tiah** 23 Century International Life Science Centre
	Moderator: **Dr. Hadzliana Zainal** (USM)
1245	**Special Invited Talk 4 | Pharmacoeconomics** Challenges in Pharmacoeconomic Analysis of Oncology Treatment ***Prof. Dr. Asrul Akmal Shafie*** | *Universiti Sains Malaysia, Malaysia*
1310	**Technical Talk** Sponsored by Yokogawa
1330	**Lunch & Networking**
1430	**Concurrent Oral Presentations** *Hang Li Po Ballroom (Level 4)* | Infectious Diseases/ Cancer (Drug Delivery) *Cheng Ho (Level 3)* | Cancer (Drug Delivery/ Nanomedicine) *Hang Tuah (Level 3)* | Cancer (Drug Delivery/ Nanomedicine) *Hang Jebat (Level 3)* | Cancer (Therapeutic Biomarker/ Systematic Review) *Executive Lounge (Level 4)* | Miscellaneous (Extraction, Isolation and Drug Delivery)
	INFECTIOUS DISEASE
	Moderator | **Dr. Yolanda Augustin** | St. George's University of London
1530	**Plenary Session 2** Infectious Diseases and Cancers – Synergies that Suggest Causes and Cures? ***Prof. Dr. Sanjeev Krishna*** | *St. George's University of London, United Kingdom*
1615	**Coffee Break, Poster Viewing & Judging and Networking**
	Moderators: **Dr. Chua Eng Wee** (UKM) | **Dr. Thaigarajan Parumasivam** (USM)
1645	**Rocorded Invited Talk 5** Harnessing Tech and Nature: Malaysia's Approach to Dengue Drug Research ***Prof. Dr. Habibah A. Wahab*** | *Universiti Sains Malaysia, Malaysia*
1705	**Invited Talk 6** The Roadmap Towards Flavivirus Antiviral Drug Discovery ***Dr. Chan Wing Ki Kitti*** | *National University of Singapore/J&J*
1725	**Q&A Session 2**
1735	**Networking**
1830	**Gala Dinner**

TENTATIVE PROGRAM

DAY 2: 6th. December 2023

Venue: Hang Li Po Ballroom | Level 4

TIME	AGENDA
0800	**Registration**
	MENTAL HEALTH/NEURODEGENERATION
	Moderator: **Dr. Hadzliana Zainal** (USM)
0900	**Plenary Session 3** Kratom Consumed in Southeast Asia vs. Kratom Products Consumed in the West ***Prof. Dr. Marek C. Chawarski***	*Yale University, United States*
0945	**Forum | Use of Ketum (Kratom) for Medical Purposes** Moderator: **Dr. Siti Rafidah Yusof** (USM) Panelists: **Prof. Dr. B Vicknasingam Kasinather** Centre for Drug Research, Universiti Sains Malaysia **Prof. Dr. Marek Chawarski** Yale School of Medicine, Yale University USA **AP. Dr. Ekkasit Kumarnsit** Faculty of Science, Prince of Songkla University, Thailand **Mr. Asyraff Muntazar** Aqilmed Sdn. Bhd.
1045	**Coffee Break, Poster Viewing & Judging and Networking**
1115	**Concurrent Oral Presentations** *Hang Li Po Ballroom (Level 4)* | Inflammatory and Metabolic Diseases *Cheng Ho (Level 3)* | Cancer (Drug Discovery)/ Miscellaneous (Nanomedicine) *Hang Tuah (Level 3)* | Miscellaneous (Pharmacoeconomics/ Epidemiology/ Drug Design/Delivery) *Hang Jebat (Level 3)* | Miscellaneous (Nanomedicine/Drug Design/Delivery) *Executive Lounge (Level 4)* | Mental Health and Neurodegeneration/ Miscellaneous (Nanomedicine/Drug Design/Delivery)

	Moderator: **AP. Dr. Ekkasit Kumarnsit** (Prince of Songkla University)
1255	**Invited Talk 7** Use of Ketum for Medicinal Purposes **Prof. Dr. Vicknasingam Kasinather** | *Universiti Sains Malaysia, Malaysia*
1315	**Q&A Session 3**
1320	**Lunch & Networking**
	INFLAMMATORY & METABOLIC DISEASES
	Moderator : **AP. Dr. Patrick Nwabueze Okechuwu** (UCSI University)
1430	**Plenary Session 4** Modern Approaches to Modulate the Hsp90 Chaperone for the Treatment of Disease ***Prof. Dr. Brian Blagg*** | *University of Notre Dame, United States*
	Moderators: **Dr. Ooi Der Jiun** (MAHSA University) | **Dr. Nurhanan Murni Yunos** (FRIM)
1515	**Invited Talk 8 | Inflammatory & Metabolic Diseases** Novel Action for the Natural Compound Andrographolide As A MAPK-Activated Protein Kinase 2 (MK2) Degrader **Prof. Dr. Fred Wong Wai-Shiu** | *National University of Singapore, Singapore*
1535	**Q&A Session 4**
1540	**Travel Grant Awardee – Sharing Session**
1610	**Coffee Break, Poster Viewing and Networking**
1640	**Awards Presentation & Closing Remarks** Dr. Jonathan Lim Chee Woei *Co-Chairs of ICDDTM'23*

PLENARY SPEAKER BIOGRAPHY & ABSTRACT

Prof. Dr. Godefridus J. (Frits) Peters

Professor of Cancer Biology and Immunology
Amsterdam University Medical Centers
Netherlands

BIOGRAPHY

Professor Godefridus (Frits) J. Peters is based at the Laboratory Medical Oncology at the Amsterdam University Medical Center (location VU University Medical Center; VUmc) in Amsterdam, the Netherlands. The research of Prof. Peters is focused on the translation of the preclinical pharmacology of anticancer agents to the clinic. This includes all aspects of drug development of various classes, including anti-signalling protein kinase inhibitors, antifolates, antimetabolites, platinum analogues, topoisomerase inhibitors, taxanes, and drugs interfering with or using tumour metabolism. Prof Peters was involved in several Phase I and 2 studies of drugs now registered for the treatment of cancer, such as gemcitabine, pemetrexed, and erlotinib, while several "failed" clinical studies led to the development of related successful drugs in cancer and in other areas. Prof Peters supervised more than 35 Ph.D. students and over 100 master students and guest scientists from all continents. Teaching varied from bachelor students at the Amsterdam University College to master and Ph.D. students in pharmaceutical sciences, and post-graduate courses. He was one of the initiators of the Master in Oncology in 2002 and was chair of the examination committee from 2002-2013. Prof Peters has authored/co-authored 630 refereed research papers and reviews and 176 papers/chapters in books and congress proceedings.), he is/was a member of >50 editorial boards, and in 2018 initiated a journal devoted to drug resistance, Cancer Drug Resistance. He was one of the founders and president (2003-2005) of the Purine and Pyrimidine Society (PPS) and is currently secretary/treasurer of that group.

ABSTRACT

Tumor Cell Metabolism as a Strategy to Bypass Drug Resistance

Metabolism in cancer cells is different from normal cells. The Warburg effect postulates that in (hypoxic) tumor cells energy supply switches from the mitochondrion to the cytoplasmic glycolysis. Drugs targeting metabolism, such as antimetabolites are life-saving, but are also standard medication for various inflammatory diseases, while rational combinations are curative for various viral diseases (e.g. AIDS-HIV) and cancer. Targeting metabolism benefits from genomics, enabling to characterize potential targets in tumors, while metabolomics (using imaging-mass-spectrometry) identifies major metabolic changes in cancer cells. With molecular modeling effective drugs can be designed to target key enzymes in metabolism, such as lactate dehydrogenase A (LDH-A), pyruvate dehydrogenase kinase (PDK) and the transporter GLUT1, which are increased in tumors, including non-small-cell-lung-cancer (NSCLC), pancreatic-ductal-adenocarcinoma (PDAC) and malignant-pleural-mesothelioma (MPM). Specific inhibitors of LDH-A (NHI-1, NHI-2) were more effective against hypoxic tumor cells, and increased the efficacy of standard chemotherapeutics such as gemcitabine and pemetrexed in PDAC and MPM, respectively. A combination of LDH-A and GLUT1 inhibitors was synergistic in MPM cells, and associated with specific depletion of adenine nucleotides and a decreased NAD+/NADH ratio. A glycosylated derivative (NHI-GLC-2, to increase tumor uptake) showed a marked antitumor effect against MPM tumors. Targeting of PDK1 in NSCLC cells with Cpd-64 in combination with LDH-A inhibitors was highly synergistic with increased apoptosis and inhibition of the AKT-mTOR pathway, and normalized mitochondrial respiration, This combination was also very effective in an in vivo model of NSCLC. In conclusion, novel inhibitors of the glycolytic pathway have marked anticancer activity in notably resistant tumors, such as PDAC, MPM and NSCLC. Synergism (both in vitro and in vivo) was observed for combinations with standard anticancer drugs, as well as for combined inhibition of e.g. LDH-A and GLUT-1 or LDH-A and PDK1.

PLENARY SPEAKER BIOGRAPHY & ABSTRACT

Prof. Dr. Sanjeev Krishna

Professor of Molecular Parasitology and Medicine
St. George's University of London
United Kingdom

BIOGRAPHY

Dr. Sanjeev Krishna is a Professor of Molecular Parasitology and Medicine at St. George's, University of London. After completing a degree at Cambridge and a medical degree at Oxford, he studied malaria in Thailand before completing a DPhil at the Weatherall Institute of Molecular Medicine in Oxford. He joined St George's in 1993 and was an MRC Training Fellow and Wellcome Trust Senior Research Fellow in Clinical Science (1994 – 2001). He was elected a Fellow of the Academy of Medical Sciences in 2004 and awarded an ScD by the University of Cambridge in 2007. He is also an honorary consultant physician in infectious disease and medicine at St George's University Hospitals NHS Foundation Trust. He has been an advisor to multiple international bodies, including the World Health Organisation and sat on advisory committees for international funders, including the US National Institutes of Health, the UK's Wellcome Trust and others. He chairs the Infectious Disease Advisory Committee of QuantuMDx and is an advisor to the Foundation for Innovative New Diagnostics (FIND), a not-for-profit organisation promoting the development of new diagnostic tools for resource-poor countries. He also has strong industry contacts and has acted as a scientific advisor to several large pharmaceutical and biotech firms. Sanjeev Krishna is also a member of the Scientific Advisory Committee for the Foundation for Innovative New Diagnostics (FIND), a not-for-profit organisation that produces global guidance on affordable diagnostics.

ABSTRACT

Infectious Diseases and Cancers – Synergies that Suggest Causes and Cures?

Unrelated infectious agents including viruses, bacteria and parasites can cause many different types of cancers ranging from solid tumours to haematological malignancies. Chronic inflammation is a final common carcinogenic pathway resulting from a response to infection that cannot be eliminated soon after exposure. Sometimes, combinations of infections (as with EBV and malaria causing Burkitt's lymphoma) synergise to increase the risk of developing malignancy. Recognising an infectious cause of malignancy is critical to its management as these can be prevented by public health measures (for example, limiting the spread of HIV), vaccination (for example, for Hepatitis B, HPV) or treated (for example, Hepatitis C, schistosomiasis). Less well recognised is how treatments developed for one type of disease (for example, eflornithine for broad-spectrum cancer chemotherapy) have been repurposed for managing a lethal infection (West African human African trypanosomiasis). Artemisinins like artesunate are used widely in managing malaria. Their properties include anti-tumour efficacy in many laboratory models, anti-schistosomal effects and anti-viral properties (for example, in case studies against CMV infections). Some of the mechanisms of action of artesunate may be common to its anti-parasitic and anti-cancer effects. These will be discussed in greater detail to illustrate the basis for repurposing of artesunate as a potentially affordable and safe anti-cancer agent.

PLENARY SPEAKER BIOGRAPHY & ABSTRACT

Prof. Dr. Brian Blagg

Professor of Chemistry and Biochemistry
University of Notre Dame
United States

BIOGRAPHY

Brian Blagg is the Charles Huisking Professor of Chemistry and Biochemistry and Director of the Warren Family Research Center for Drug Discovery and Development at Notre Dame. After earning B.A.'s in Chemistry and Environmental Studies at Sonoma State University and his Ph.D. in Organic Chemistry from the University of Utah (Dale Poulter), he received an NIH Postdoctoral Fellowship and performed research at The Scripps Research Institute with Dale Boger. Blagg started his independent career in medicinal chemistry at the University of Kansas in 2002. In the fall of 2017, he moved to the University of Notre Dame wherein his lab continues to focus on chaperone proteins and protein folding in relation to cancer and neurodegeneration. Cancers are inherently more dependent on chaperone proteins because of their constant division and cellular stress. Consequently, Blagg's team works to selectively inhibit chaperone proteins to halt cancer growth. In contrast, his lab also studies the potential for utilizing chaperones to re-fold malfunctioning and/or aggregated proteins for the treatment of Alzheimer's disease and glaucoma. Brian Blagg is married to Leah Blagg and has three children, ranging in ages between 11 and 23. When not thinking about science, Blagg can be found with his family and friends.

ABSTRACT

Modern Approaches to Modulate the Hsp90 Chaperone for the Treatment of Disease

The Hsp90 molecular chaperone is composed of four family members that play a key role in the folding of nascent polypeptides as well as the rematuration of misfolded proteins. The cytostolic chaperones, Hsp90a and Hsp90b, contribute to tumorogenesis and represent attractive targets for the treatment of cancer. Grp94 is the ER-localized paralog that is responsible for the trafficking of proteins, such as myocillin, and consequently represents an ideal target for the treatment of primary open angle glaucoma. In contrast to the inhibition of Hsp90, the molecular chaperones can be overexpressed to exhibit neuroprotective activity in animal models of neuropathy. While the Hsp90 isoforms play key roles in various diseases, the N-terminal ATP-binding site is >85% identical, making the development of selective inhibitors challenging. In this presentation, methods used to develop isoform-selective inhibitors will be disclosed as well as early preclinical studies that are being pursued to assess therapeutic potential.

PLENARY SPEAKER BIOGRAPHY & ABSTRACT

Prof. Dr. Marek C. Chawarski

Professor of Psychiatry and Emergency Medicine
Yale University,
United States of America

BIOGRAPHY

Marek C. Chawarski, Ph.D. is a Professor in the Departments of Psychiatry and Emergency Medicine at Yale. His research focuses on developing and evaluating pharmacological and psychosocial/behavioral treatments for a range of substance use disorders. He has conducted randomized clinical trials, epidemiologic studies, and implementation science and mixed methods qualitative research in the US, Malaysia, and other countries in Asia. He collaborates on multiple research projects on kratom with a team of researchers from the University Sains Malaysia in Penang.

ABSTRACT

Kratom consumed in Southeast Asia vs. kratom products consumed in the West

In Southeast Asia, freshly-collected kratom leaves or their water-based preparations are consumed because they are believed to have a broad range of beneficial pharmacological properties. No serious adverse effects attributed to kratom consumption have been reported in Malaysia and other Southeast Asian countries. In the US and other Western countries, products manufactured from dried and oxidised kratom leaf material that are further processed to produce dry powders, capsules, or extracts are sold and consumed. Adverse effects reported and attributed to the consumption of these "kratom" products, range from mild to severe, and include fatalities. Most of published research on kratom to date, focused on chemical and pharmacological properties of mitragynine and 7-hydroxymitragynine while comprehensive phytochemical and pharmacological analyses of other compounds found in the kratom tree have rarely been published to date. Nonetheless, reviews of the accumulated body of literature and recent findings from studies conducted by the researchers at the Centre for Drug Research, University Sains Malaysia in Penang provide tentative mechanisms explaining the observed differences in the safety profiles of kratom fresh-leaf preparations consumed in Southeast Asia as compared to highly processed and oxidated products labelled as "kratom" that are primarily consumed in the US and other countries outside Southeast Asia. In this presentation, we will provide an overview of relevant previous findings, report on the latest studies conducted by our team, and discuss potential implications concerning kratom safety profile.

INVITED SPEAKER BIOGRAPHY & ABSTRACT

Dr. Yolanda Augustin

Clinical Oncologist
St. George's University of London
United Kingdom

BIOGRAPHY

Dr. Yolanda Augustin is a Malaysian oncologist with a special interest in affordable diagnostics and therapeutics for global oncology. Her current projects include drug repurposing for cancer, affordable point-of-care HPV diagnostics for cervical screening and advocacy work with community healthcare champions and local stakeholders in rural communities in Sarawak on removing barriers to equitable healthcare access and cancer service delivery. She has forged interdisciplinary collaborations with academia, government and industry, with research collaborations spanning Malaysia, Vietnam, India and Senegal.

ABSTRACT

Establishing an International Affordable Diagnostics and Therapeutics Alliance in Malaysia

The COVID-19 pandemic had a devastating impact on healthcare systems globally, with developing countries disproportionately affected. The need to develop self-reliance in affordable diagnostics and therapeutics has been brutally highlighted. The global pandemic response also made clear that in order to ensure equitable access to diagnostics and therapeutics across a range of diseases from infections to cancers, local solutions are needed. There is a need to strengthen development pipelines from pre-clinical to clinical translational research, regulatory pathways and local/regional manufacturing. The healthcare sector in many developing countries (including Malaysia) faces several challenges that limit access to affordable point-of-care diagnostics and therapeutics. A critical challenge is the high cost of these products, which can be a barrier for many patients, particularly those from low-income or rural communities. We propose the establishment of an 'International Affordable Diagnostics and Therapeutics Alliance' (IA-DATA) in Malaysia, bringing together the quadruple helix of government, academia, industry and civil society. IA-DATA will focus on the development of diagnostics and therapeutics for infectious diseases and cancers that are public health priorities in Southeast Asia, the Global South and Islamic Development Bank (IsDB) linked countries. The 3 main pillars of the alliance are affordable point-of-care diagnostics, drug repurposing and plant molecular pharming. The alliance will focus on solutions that ensure equitable access to diagnostics and therapeutics as well as future pandemic preparedness. Through ASEAN and the IsDB network, reverse linkage capacity strengthening and pull through mechanisms are proposed to enable effective deployment and clinical translational impact in partner countries.

INVITED SPEAKER BIOGRAPHY & ABSTRACT

Dr. Voon Pei Jye

Medical Oncologist
Sarawak General Hospital
Malaysia

BIOGRAPHY

Dr. Voon Pei Jye is a Consultant Medical Oncologist at Hospital Umum Sarawak. He obtained his MRCP (UK) and Master of Medicine (Internal Medicine), National University of Singapore in 2007. Subsequently, he received his advanced specialist training in Medical Oncology from National University Hospital Singapore. He has completed his Phase 1 Drug Development clinical research fellowship at Princess Margaret Cancer Centre, University of Toronto, Canada. He is an active investigator for numerous cancer trials encompassing early phase through to late phase studies. Dr Voon has published in various peer reviewed journals. He is a recipient for Hold'em for Life Oncology Fellowship Award, University of Toronto.

ABSTRACT

Putting Malaysia on the Map of Early-phase Oncology Drug Development

Historically, the majority of oncology clinical trials are conducted in Western Europe and North America. Globalization of drug development has resulted in sponsors shifting their focus to the Asia Pacific region. In Malaysia, the implementation of various government policies to promote clinical trials has been initiated since a decade ago. Although oncology clinical trials in Malaysia have seen promising growth in the past few years, there is still a limited number of early-phase oncology trials being conducted. Hence, the Phase 1 Realization Project (P1RP) was initiated to develop Malaysia's early-phase clinical trial capabilities and enhance the clinical research ecosystem in experimental therapeutics. In addition, the adaptation of good practises and measures from other countries contribute to the effective implementation of existing initiatives to drive progress in early-phase drug development. Furthermore, holistic approaches with emphasis in training and education, infrastructure capacities, strategic alliances, reinforcement of upstream activities in the value chain of drug development, coupled with continued commitment from stakeholders are imperative in nurturing a resilient clinical research ecosystem in the country.

INVITED SPEAKER BIOGRAPHY & ABSTRACT

Prof. Dr. Balram Chowbay

Professor of Clinical Pharmacology
National University of Singapore
Singapore

BIOGRAPHY

Prof Balram is the Senior Principal Investigator and Senior Clinical Pharmacologist at the National Cancer Center Singapore (NCCS). He is one of the leading researchers in pharmacogenomics in Singapore, and his research focuses on designing early-phase clinical trials based on applying pharmacokinetics (PK) and pharmacodynamics (PD) principles for dose optimization and pharmacogenomics to understand the inter-individual and inter-ethnic variability in patients, especially in Asian ethnic groups. He is also involved in drug development projects with pharma. He has co - co-authored over 100 publications and is an editorial board member for numerous drug metabolism and pharmacology-based journals. He is also a committee member of the International Union of Basic and Clinical Pharmacology representing the Pharmacogenetics, Drug Metabolism and Transport Committee and a visiting Professor at Universitas Sumatera Utara, Medan Indonesia. Prof. Balram holds multiple academic appointments at Duke - NUS Medical School, Singapore Immunology Network, Agency for Science, Technology and Research (A*STAR) Singapore, and Nanyang Technological University, Singapore (NTU). He currently serves on advisory committees, grant review boards and research councils both locally and internationally .

ABSTRACT

A Phase I Study of Metronomic Oxaliplatin, Chronomodulated Capecitabine and *UGT1A1*-genotype-guided Irinotecan Regimen (OXIRI) for the Treatment of Pancreatic Ductal Adenocarcinoma

A prospective phase I clinical study (NCT02368860) comprising of metronomic oxaliplatin, chronomodulated capecitabine and *UGT1A1* genotype-guided dosing of irinotecan [OXIRI] was mechanistically designed as a simplified version of FOLFIRINOX with the premise of reducing treatment-associated toxicities.The aim was to evaluate the safety and tolerability of this novel regimen, assess the pharmacokinetics (PK) of *UGT1A1*-genotype guided irinotecan and overall immune-mediated tumor response.Patients diagnosed with locally advanced and/or metastatic PDAC disease with prior chemotherapy were eligible. The regimen comprised of IV oxaliplatin at 50mg/m2, *UGT1A1*6* and *UGT1A1*28* genotype-directed dosing of IV irinotecan on days 1 and 8 and oral capecitabine at midnight on days 1 to 14 in a 21-day cycle. PK analyses of irinotecan were conducted by LC-MS/MS and non-compartmental methods. Pharmacodynamic measurements of cytokine levels was performed using Luminex platform.36 patients were recruited into either dose-escalation or expansion groups. MTD of capecitabine was determined as 2650mg/day. Grade 3 AEs included neutropenia (30.6%), diarrhea (13.9%), hypokalemia, peripheral sensory neuropathy, weight loss and fatigue (2.8% each). No grade 4 toxicity nor febrile neutropenia was observed. ORR was 22.2% (95% CI: 10.1-39.2%) with 1 CR, 7 PR, 15 SD and 6 PD. Median OS and PFS were 8.1 (95% CI: 5.1 – 12.0) and 5.2 (95% CI: 2.6- 6.5) months respectively. PK analyses revealed no significant differences in single-dose irinotecan profiles between *UGT1A1* wild-type and heterozygous patients. Cytokine analysis revealed significant decline in inflammatory cytokines: IL-10, CCL22, CXCL10 and TNFα at C1D1 (P≤0.001).The OXIRI regimen was found to be well-tolerated and exhibited good clinical activity in PDAC patients. PK profiles of SN-38 were similar across different *UGT1A1* genotype groups, suggesting usefulness of *UGT1A1* genotype guided therapy. Significant decreases in inflammatory markers indicated a potential immunomodulatory effect. Further mechanistic work is required to validate these findings.

INVITED SPEAKER BIOGRAPHIY & ABSTRACT

Prof. Dr. Habibah A. Wahab

Professor of Pharmaceutical Technology
Universiti Sains Malaysia
Malaysia

BIOGRAPHY

Professor Habibah A Wahab is the present Deputy Vice Chancellor of Research and Innovation at Universiti Sains Malaysia (USM). Prior to that, she served as the Dean of the School of Pharmaceutical Sciences, USM, where she elevated the school to rank top 100th globally in Pharmacy & Pharmacology (QS-Ranking 2017-2023). Additionally, as Chair of the Pharmacy Deans' Council, Ministry of Higher Education, Vice President 1 of the Malaysian Pharmacists Society cum Co-chair of the MPS-Education Chapter and Member of the Pharmacy Board of Malaysia, she has been instrumental in advancing pharmacy education in Malaysia. Habibah started her academic journey after obtaining her PhD in Pharmaceutical Technology from King's College London in 1999, where she founded the research group "Pharmaceutical Design and Simulation (PhD)" and later helped establish the Laboratory of Biocrystallography and Structural Bioinformatics, which evolved into the Centre for Chemical Biology, USM, by 2008. Promoted to full professor in 2010, she became USM's youngest female professor at the time. Her extensive service includes two tenures at the Ministry of Science, Technology and Innovation, as the Director and Director-General of the Malaysian Institute of Pharmaceuticals and Nutraceuticals, and an Associate Editor for the Journal of Chemical Information and Modeling, an American Chemical Society Publication for almost 10 years. Habibah has published over 100 articles in high-impact journals and has been recognized internationally as a visiting Professor/researcher at institutions like Universite Henri Poincare, France, Osaka University, Japan, Chulalongkorn University, Thailand as well as Padjajaran University in Indonesia.

ABSTRACT

Harnessing Tech and Nature: Malaysia's Approach to Dengue Drug Research

Dengue fever remains a pressing health concern, affecting millions globally each year. While development of effective dengue anti-viral are still elusive, regions heavily afflicted with the disease bear the brunt of the challenge. Malaysia, with its rich biodiversity, stands as a unique reservoir and templates for potential therapeutic agents against dengue. This presentation will delve into an innovative approach, which intertwines advanced technological methods with the exploration of its native flora and fauna. The heart of this initiative is the sophisticated use of digital tools to analyze Malaysia's biodiversity, facilitating the swift identification of compounds with potential anti-dengue properties. The elucidation of interactions contributing to binding affinity and the transition from virtual screening hits to experimental validation will be highlighted. Success stories, such as the identification of promising compounds including Americanin A from Morinda citrifolia fruit, bismahanine from Murayya koenigii, and quinoline derivatives inspired by theobromine of Theobroma cocoa, each showcasing distinct and encouraging characteristics, will be showcased. This collaborative synergy of technology and nature not only offers hope for more effective dengue treatments but also exemplifies how nations can leverage their unique strengths to address health challenges while driving economic growth. By harnessing both tech and nature, Malaysia presents a template that could inspire other nations to tackle neglected diseases with renewed vigor and innovation.

INVITED SPEAKER BIOGRAPHY & ABSTRACT

Dr. Chan Wing Ki Kitti

Senior Research Fellow
National University of Singapore/J&J
Singapore

BIOGRAPHY

Kitti W. K. Chan obtained her PhD degree from NUS Yong Loo Lin School of Medicine (Department of Microbiology and Immunology) in 2019, under the supervision of Prof. Subhash Vasudevan and A/Prof. Sylvie Alonso. She is a molecular virologist by training and her research interest is on understanding dengue/zika disease pathogenesis using different in vitro and in vivo model systems. She is currently a Senior Research Fellow in the Laboratory of Experimental Therapeutics (Prof. Subhash Vasudevan, Duke-NUS).

ABSTRACT

The roadmap towards flavivirus antiviral drug discovery

Flaviviruses which include dengue virus (DENV), zika virus (ZIKV), West Nile virus (WNV), Yellow fever virus (YFV) are vector-borne pathogens that present increasingly high epidemic potential and disease burden. Additionally the expanding geographical range of the mosquito vectors that transmit these viruses have been attributed to global warming. Although an integrated approach of vector management and/or vaccine prophylaxis have been implemented to control some of these flaviviral diseases, the re/emergence of these viruses in causing more severe disease has underscored the need for an effective antiviral therapeutic intervention. There are two strategies in antiviral drug discovery – host-directed or direct-acting antivirals targeting the virus, and the latter will be discussed from the perspective of antiviral research. The advances in the structural and mechanistic insights gained during virus replication has enabled target-specific design of compounds. A combination of biochemical and in vitro virological assays are employed as the first steps in assessing the efficacy of compounds against the virus, leading to the identification of a lead compound that can be evaluated in in vivo model systems. Furthermore in vitro resistance selection coupled with Next-Generation Sequencing complemented by in silico docking studies would facilitate in target deconvolution. Taken together these experimental data would provide valuable information to medicinal chemists to further improve the chemical moiety for cross-reactive potency and excellent pharmacological properties.

INVITED SPEAKER BIOGRAPHY & ABSTRACT

Prof. Dr. Asrul Akmal Shafie

Professor of Pharmacoeconomics
Universiti Sains Malaysia
Malaysia

BIOGRAPHY

Professor Asrul Akmal Shafie completed his PhD degree in 2008. His research interests are in pharmacoeconomic, and health service research with H-Index of 43. He led several prolific oncology research including economic evaluation, MCDA & WTP of cancer treatment, and the use of telemedicine in cancer screening. He is an appointed expert member for the UK National Institute for Health Research Committee, Malaysia Pharmacoeconomic Technical Committee and national advisory board for oncology treatment and financing. At present, Dr Asrul is the Professor of Pharmacoeconomic and Director for Institutional Planning & Strategic Centre in Universiti Sains Malaysia. He plays key role in strategically driving the university's excellence and competitiveness.

ABSTRACT

Challenges in Pharmacoeconomic Analysis of Oncology Treatment

Tremendous progress has been made in oncology treatments. They have changed from chemotherapies-based treatment to targeted therapies, and more recently immune-oncology. The change posed special challenges in the field of pharmacoeconomic. The current presentation will discuss these challenges including the issues in capturing quality of life (QOL) associated with toxicity due to chemotherapy, crossover upon progression in targeted therapy trials, and survival extrapolation for immuno-oncology drugs. Understanding these challenges will allow improvement in oncology research and its translation into practice.

INVITED SPEAKER BIOGRAPHIY & ABSTRACT

Prof. Dr. Vicknasingam Kasinather

Professor of Addiction
Universiti Sains Malaysia
Malaysia

BIOGRAPHY

Vicknasingam B. Kasinather is currently a Professor of Addiction. He is a member of the Scientific Advisory Committee of the World Drug Report, United Nations Office on Drugs and Crime (UNODC). Currently, he is the Malaysian principal investigator of a nationwide 5-year study entitled "Implementation of seek, test, treat and retain strategies among people who inject drugs in Malaysia" funded by the National Institute of Health US and Yale University.

ABSTRACT

Use of Ketum for Medicinal Purposes

Ketum is commonly found in Southeast Asia and has been consumed by traditional societies for centuries. Ketum has been used as traditional medicine and to improve productivity, specifically from laborious work. In recent years, ketum has become popular in urban areas probably due to the migration of society from rural to urban settings. It is uncertain when ketum was introduced in the west and the circumstances in how it was introduced. The lack of cultural and societal significance of its use in the traditional context makes it different compared to its use in Southeast Asia. Over the last 30 years or so, researchers in Asia and also in the West have started to conduct scientific research with the aim to develop ketum for medicinal purposes. The informal use and self-prescription of ketum for medicinal purpose has raised some controversies. While there have reported cases of ketum overdose in the West, there has been no reported cases to date in Asia. Opportunities and challenges in the developing ketum for medicinal purposes are discussed. These discussions will also include some of the current policy perspectives surrounding its use.

INVITED SPEAKER BIOGRAPHIY & ABSTRACT

Prof. Dr. Fred Wong Wai-Shiu

Professor of Pharmacology
National University of Singapore
Singapore

BIOGRAPHY

Dr. Wong received his PhD in Pharmacology from the Ohio State University in Columbus, Ohio. He did his postdoctoral in Lilly Research Laboratories in Indianapolis and in the Harvard Medical School in Boston. He is a Professor of Pharmacology in the Yong Loo Lin School of Medicine of the National University of Singapore. Dr. Wong is the Director of the Drug Discovery and Optimization Platform (DDOP) and the founding President of the Singapore Pharmacological Society. His research interest is to identify therapeutic targets and to discover novel molecules for the treatment of asthma, COPD and pulmonary fibrosis.

ABSTRACT

Novel Action for the Natural Compound Andrographolide as a MAPK-Activated Protein Kinase 2 (MK2) Degrader

The p38MAPK-MK2 signaling axis functions as an amplifier of inflammation. Targeting the p38MAPK-MK2 signaling axis represents a direct therapeutic intervention of inflammatory diseases. We describe here a novel mechanism of action of andrographolide (AG), a small molecule natural compound belonging to the ent-labdane diterpene family, as a MK2 degrader. AG was found to bind to the activation loop of MK2, located at the interface of the p38MAPK-MK2 bimolecular complex. This interaction disrupted the complex formation and caused irreversible loss of MK2 via a proteasome-mediated mechanism. We showed that AG induced MK2 degradation in a concentration- and time-dependent manner, and exerted its anti-inflammatory effects by destabilizing pro-inflammatory mediator mRNAs (e.g. TNF-α, MCP-1) via increasing the level of RNA-binding protein tristetraprolin (TTP). In a LPS-induced acute lung injury model, treatment with AG induced MK2 downregulation in alveolar macrophages and reduced bronchoalveolar lavage fluid total cell and neutrophil counts. Moreover, our results demonstrated that the anti-inflammatory effects achieved by AG as a MK2 degrader is more durable and sustained than that achieved by conventional MK2 kinase inhibitor (e.g. PF-3644022). Taken together, our findings not only illustrate a novel mode of action for AG in modulating the p38MAPK-MK2 signaling axis, but also present the first example of a small molecule MK2 degrader. Our discovery would pave the way for the development of a novel class of anti-inflammatory agents targeting MK2 for degradation by harnessing the privileged scaffold of AG. (This work was partially supported by a NRF grant A-0006243-00-00 and a NUHS grant E-559-00-0004-01 to W.S. Fred Wong)

LIST OF ORAL PRESENTATIONS | DAY 1

Details	Time	Presenter and Title of Presentation
DAY 1 **Hang Li Po Ballroom (Level 4)** **Infectious Diseases & Cancer (Drug Delivery)**	1400	**OA-1 | Priya Murugan** Structure-Based Drug Discovery of Curcuminoid Analogues as Potential Antimycobacterial Drug Candidates for Mycobacterium Tuberculosis CYP121 Drug Target
	1412	**OA-2 | Dhameliya Tejas Manjibhai** Indole-2-carboxamides as New Anti-Mycobacterial Agents: Design, Synthesis, Biological Evaluation and Molecular Modeling Against mmpL3
	1424	**OA-3 | Md. Sanower Hossain** Plant-Derived Extracellular Vesicles: Investigating Potential Inhibitor of Cyclin A of Colorectal Cancer Through In Silico Molecular Docking Approach
DAY 1 **Cheng Ho (Level 3)** **Cancer (Drug Delivery / Nanomedicine)**	1400	**OB-1 | Sitti Rahma Abdul Hafid** TRF Adjuvant Improves Dendritic Cell Vaccine Efficacy in Mouse Model of Breast Cancer
	1412	**OB-2 | Zhi Xuan Low** Cyclodextrin Inclusion Complex of Tetrahydrocurcumin (THC) Augments Solubility And In Vitro Anticancer Activity Against Colorectal Cancer
	1424	**OB-3 | Tejal A. Mehta** Erlotinib Loaded Lipidic Nanocarriers for Loco-Regional Therapy in Management of Oral Cancer: In-vitro and In-vivo Evaluation
	1436	**OB-4 | Alistia Fahira** The Effect of Polyethyleneimine (PEI) and Anti-cancer Drug Combination On Cytotoxicity, Colony Formation, And Apoptosis Mechanism of Triple-Negative Breast Cancer Cell Lines MDA-MB-231
DAY 1 **Hang Tuah (Level 3)** **Cancer (Drug Delivery/ Nanomedicine)**	1400	**OC-1 | Asha B Thomas** Alkylated Indole Hybrids: Synthesis and RTU Formulation Development for Treatment of Cancer
	1412	**OC-2 | Kawthar Alhussinei** In silico Discovery of RIOK3 Inhibitors Against Pancreatic Ductal Adenocarcinoma via Molecular Docking, Molecular Dynamics Simulations, and ADMET Prediction

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	1412	**OC-2 | Kawthar Alhussinei** In silico Discovery of RIOK3 Inhibitors Against Pancreatic Ductal Adenocarcinoma via Molecular Docking, Molecular Dynamics Simulations, and ADMET Prediction

	1424	**OC-3 | Yuni Elsa Hadisaputri** Anticancer Activity of Annona muricata Leaf Extract and Fractions Againts MCF-7 cells
	1436	**OC-4 | Beata Morak-Młodawska** New Dimers of Dipyridothiazines with Anticancer Activities
DAY 1 **Hang Jebat (Level 3)** **Cancer (Therapeutic Biomarker/ Systematic Review)**	1400	**OD-1 | Heena V Dave** Uncovering the Potential of Androgen Receptor as A Therapeutic Biomarker for Triple Negative Breast Cancers
	1412	**OD-2 | Zulfan Zazuli** Factors Related to Hematotoxicity, Hepatotoxicity, and Nephrotoxicity in Acute Lymphoblastic Leukemia during the Induction Phase at Dr. Hasan Sadikin General Hospital, Bandung, from 2020 to 2023
	1424	**OD-3 | Hanifa Dinda Hayati** Insufficient Induction of Cytotoxic Agents Affects the Expression of the TGF-β-related Gene in Breast Cancer Cell Lines
	1436	**OD-4 | Uruaka Christian Ifeanyi** Systematic Review of Annona Muricata Linn. Extract on Prostate Cancer
DAY 1 **Executive Lounge (Level 4)** **Miscellaneous (Extraction, Isolation and Drug Delivery)**	1400	**OE-1| Nada Basheir Ali** Exploring Nature's Toolbox: Isolation of Plant-Based Extracellular Vesicles
	1412	**OE-2 | Ahmad H Badawi** Design, Optimise, Standardise and Validate In Vitro Human Blood-Brain Barrier Models
	1424	**OE-3 | Kamran Ashraf** Identification and Comparison of Phytoconstituents of Oil, Leaf and Rhizomes of Elettariopsis Curtisii via GCMS and In Vitro Antioxidant Extracts Analysis
	1436	**OE-4 | Dipal Gandhi** Comparison of Green Technology Supercritical Fluid Extraction with Conventional Extraction Technique for Betulinic Acid, A Potential Anticancer Agent, from Dillenia indica Linn. Bark using Experimental Design

LIST OF ORAL PRESENTATIONS | DAY 2

Details	Time	Presenter and Title of Presentation
DAY 2 **Hang Li Po Ballroom (Level 4)** **Inflammatory and Metabolic Diseases**	1115	**OF-1 | Nur Izzati Izzati Razali** Effects of Nipa (Nypa fruticans Wurmb.) Vinegar on Biochemical Parameters of Type 2 Diabetes Rat Model
	1127	**OF-2 | Phyllis Gan Xiu Li** Dexamethasone Reverses Aspergillus fumigatus-Induced Severe Asthma by Reprogramming Pulmonary Metabolism
	1139	**OF-3 | Abbirami Balachandran** Nimbolide Alleviates Insulin Resistance through Increased Glucose Uptake and Activation of Glucose Transporter 4 (GLUT4) in L6 Myoblasts
	1151	**OF-4 | Raden Maya Febriyanti** In-vitro Alpha-Amylase Inhibitory Activity of Selected Medicinal Plants Used by the Sundanese Community for Managing Diabetes
	1203	**OF-5 | Nyi Mekar Saptarini** Investigation of Serum Cartilage Oligomeric Matrix Protein Levels and WOMAC Index in Patients with Knee Osteoarthritis in Bandung, Indonesia
	1215	**OF-6| Njundu Jatta** Simultaneous Quantification of Whole Blood Hydroxychloroquine and Desethylhydroxychloroquine for Lupus Erythematosus Patients
	1227	**OF-7| Shweta Mishra** Rational Based Investigation of Novel Derivatives as Anti-Diabetic Agents Using Multi-Target Drug Discovery Approach
DAY 2 **Cheng Ho (Level 3)** **Cancer (Drug Discovery)/ Miscellaneous (Nanomedicine)**	1115	**OG-1 | Doralyn Dalisay** Anticancer Potential of Angucyclone Polyketides from Streptomyces carlesensis Strain DSD011 against Human Lung, Colorectal, Breast, and Ovarian Cancer Cell Lines
	1127	**OG-2 | Nabiha Iran** Elucidating the Mechanisms of Combination Therapy Using Palm Vitamin E And Commercial Anti Leukemic Drug (Cytarabine) In Cell-Based Models of Acute Myeloid Leukaemia
	1139	**OG-3| Udit Jaiprakash Chaube** Design, Synthesis, and In-Vitro Biological Evaluation of Novel THQ Derivatives as Anticancer Agents
	1151	**OG-4 | Salsabiilaa Binti Mohd Razib** Synthesis of New Xanthone Derivatives with Potential Aromatase Inhibitory Activity as Anticancer Agents against Oestrogen-Receptor Positive (MCF-7) and Triple-Negative Breast Cancer (MDA-MB-231) Cell Lines

	1203	**OG-5 | Riezki Amalia** The Effect of Wnt Signaling Activation on AXIN2 level and Spheroid Formation in TMEPAI Knockdown Colon Cancer Cell lines
	1215	**OG-6 | Raajeswari Satiamurthy** The Antinociceptive Effects of 5-HT3 Receptor Antagonist in Chemotherapy-Induced Peripheral Neuropathy (CIPN) in a Rat Model
	1227	**OG-7 | Fatmawati Lambuk** Elucidating Interaction of Gold Nanoparticles on Expression of Tumor Necrosis Factor Receptor 2 (TNFR2) Positive Cells in Human Peripheral Blood Lymphocytes of Rheumatoid Arthritis Patients
DAY 2 **Hang Tuah (Level 3)** **Miscellaneous (Pharmacoeconomics/ Epidemiology/Drug Design/Delivery)**	1115	**OH-1 | Mustapha Mohammed** Prognostic Models Predicting Acute Ischemic Stroke Outcomes: A Population-Based Study
	1127	**OH-2 | Pricella Ginting** Predictive Factors for Length of Stay (LOS) Among COVID-19 Patient in Hospital Bandung City, Indonesia
	11:39	**OH-3 | Jiunn Jye Tan** Treatment with Red Yeast Rice Improves Endothelial Dysfunction in Spontaneously Hypertensive Rats
	1151	**OH-4 | Kirthani Anamalay** An In Vitro and In Silico Study of The Antihyperlipidemic Effect of (MY-A and MY-B)-4-Quinobenzothiazini Butane-Sulfonic Acids
	1203	**OH-5 | Elvira Yunita** Potential of Flavonoids from Kalamansi Orange (Citrofortunella microcarpa) against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS COV-2): An in-Silico Analysis
	1215	**OH-6 | Sok Kuan Wong** Effects of Palm Carotene Mixture on Static Bone Histomorphometry of Bovine Bone Scaffold Co-cultured with Osteoblasts and Osteoclasts
	1227	**OH-7| Evi Ekayanti Ginting** Risk Assessment Pb and Cd in Rice Consumption in Indonesia
DAY 2 **Hang Jebat (Level 3)** **Miscellaneous (Nanomedicine/Drug Design/Delivery)**	1115	**OI-1 | I Gusti Ngurah Jemmy Anton Prasetia** Assessing The Influence of DOTAP: Lipid Ratio on Lipid Nanoparticles Serving as Genetic Material Delivery System
	1127	**OI-2 | Okwuofu Emmanuel Oshiogwe** Nanoformulation of A Standardised Andrographis paniculata (Burm.) Nees Aqueous Extract Improves Pharmacokinetics Profile
	1139	**OI-3 | Parhan** Calcium Nanoliposomes: Potential Insulin Release Stimulator In Vivo

	1151	**OI-4 | Suhaili Shamsi** Synthesis, Characterization, Stability of NanoGraphene Oxide Functionalized with Pluronic (NanoGO-PF), and Its Biocompatibility Study in Zebrafish Embryos for Delivery of Hydrophobic Compound
	1203	**OI-5 | Nurul Jummah** Customizing Cationic Lipid Nanoparticles for Promising Gene Therapy Applications
	1215	**OI-6 | Nur Aliana Mohamed** Understanding the Effect of Introducing Biopolymer at Two Distinct Phases During Homogenization in a Double Solvent Evaporation Technique: A study Using Simvastatin as A Model Drug for Bone Tissue Regeneration.
	1227	**OI-7 | Nor Asyikin binti Nordin** Cellular Uptake of Liposome from Mycobacterium Smegmatis in Human Peripheral Blood Monocytes
DAY 2 **Executive Lounge (Level 4)** **Mental Health and Neurodegeneration/ Miscellaneous (Nanomedicine/Drug Design/Delivery)**	1115	**OJ-1 | Norsyifa Harun** Dependence Potential of Mitragynine (Kratom): Behavioural Pharmacology in Rodents
	1127	**OJ-2 | Rui Li** Application of Median Nerve Electrical Stimulation to Restore Neuronal Function and Promote Myelin Regeneration after Stroke in Rats
	1139	**OJ-3 | Lee Zheng Yang** Efficient Synthesis of (-)-Swainsonine Using Inexpensive and Readily Accessible Ascorbic Acid as a Starting Material
	1151	**OJ-4 | Amaal Mohammed Nasr** An Ensemble Docking Strategy for The Discovery of Novel Dengue Virus Inhibitors RNA-Dependent RNA Polymerase
	1203	**OJ-5 | Poh Kuan Wong** RNA Sequencing Reveals Transcriptomic Changes in HEK293 Cells Following Introduction of rs16851030 DNA Variant
	1215	**OJ-6 | Nasrul Wathoni** Characterization, Cytotoxicity Assessment, and In Vivo Evaluation of Chitosan/Alginate Polymeric Nanoparticle-Loaded with α-Mangostin Against Breast Cancer
	1227	**OJ-7 | Zuliar Permana** Assessment of Anti-Inflammatory Potential of Dayak Onion (Eleutherine bulbosa (Mill.) Urb.) Extract and Comparison with Celecoxib

LIST OF POSTER PRESENTATIONS

Poster Judging | Day 1 (5 December 2023) | 1000-1030

Presenter and Title of Presentation
PA-1 | Muhammad Aiman Irfan Ibrahim Active Targeting Docetaxel-loaded Nanocapsules Primarily Composed of Polycaprolactone, Chitosan-Folate, and TPGS for Lung Cancer Treatment
PA-2 | Ravindra Dattatray Wavhale Design and Development of Self-Propelling, Magnetic, Protein Conjugated Drug Delivery System
PA-3 | Ong Yong Sze Nanotheranostics Utilizing 5-Fluorouracil in Cancer Management: An In-Depth Analysis of Efficacy, Safety, and Diagnostic Applications
PA-4 | Anis Yohana Chaerunisaa Anticancer Potential of Andaliman (Zanthoxylum acanthopodium DC.) Fruit Ethanol Extract
PA-5 | Ziqing Xi The Role of Peroxisome Proliferator-Activated Receptor-β/δ Antagonist in Melanogenesis
PA-6 | Chin Piaw Gwee A broad-spectrum antiviral targeting RNA viruses
PA-7 | Jessa Marielle Paulines Exploring the Therapeutic Potential: In Vitro Assessment of the Dietary Supplement L-Citrulline's Antiglycation and Antioxidant Properties
PA-8 | Merell Billacura α-Amylase and α-Glucosidase Inhibitory Potential of the Different Solvent Extracts from the Air-Dried Leaves of Crescentia cujete Linn.
PA-9 | Abdulhakim Abubakar Chlorophytum alismifolium Baker Ameliorates Hyperglycaemia: Correlation Between Blood Glucose Levels and Some Biomarkers
PA-10 | Sarmad Abdulabbas Kashmar Assessment of a Self-Micro Emulsifying Drug Delivery System for Enhancing the Dissolution of Atorvastatin and Apigenin
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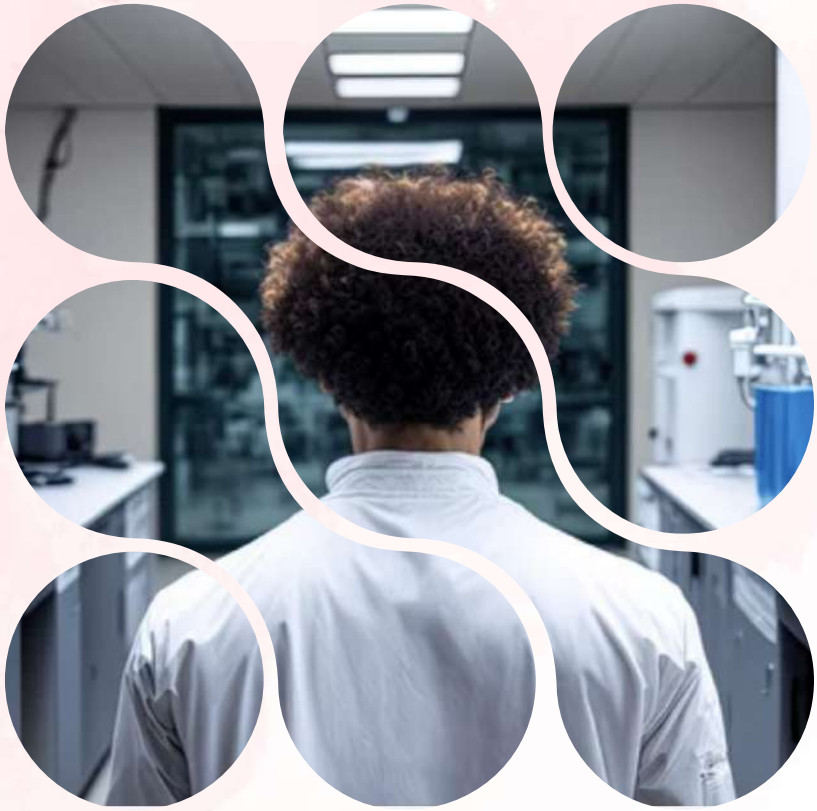

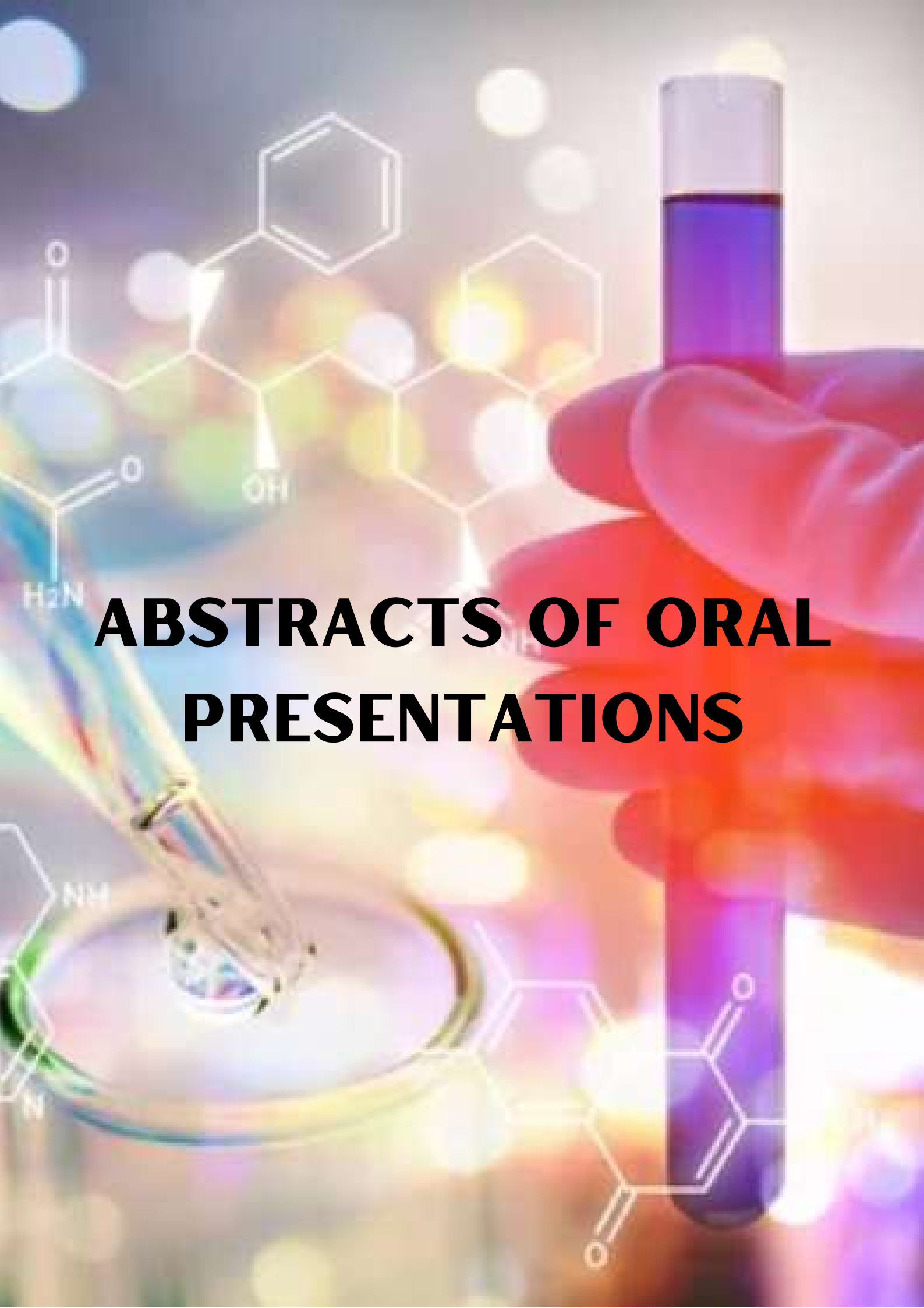

ABSTRACTS OF ORAL PRESENTATIONS

OA-1

Structure-Based Drug Discovery of Curcuminoid Analogues as Potential Antimycobacterial Drug Candidates for *Mycobacterium Tuberculosis* CYP121 Drug Target

Priya Murugan[1], Siti Munirah Mohd Faudzi[1], Fairolniza Mohd Shariff[2], Mohd Basyaruddin Abdul Rahman[1] and Bimo A. Tejo[1*]

[1] Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Selangor, Malaysia
[2] Department of Microbiology, Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

*Corresponding author's email: bimo.tejo@upm.edu.my

Introduction: Tuberculosis (TB) remains to be a serious global health issue due to the emergence of multidrug-resistant tuberculosis (MDR-TB) and total drug-resistant tuberculosis (TDR-TB). This raises the importance to develop novel drug candidates to combat the drug-resistant TB variants. CYP121 of *Mycobacterium tuberculosis (M. tb)* is considered a crucial target for the development of therapeutic agents to treat TB. This study focuses on uncovering new *M. tb* CYP121 inhibitors by performing ensemble docking using curcuminoid analogs based on the structure-based drug discovery principle. **Methods:** In this work, molecular dynamics simulation (MDS) was carried out on two different systems, i.e., CYP121 without ligand and CYP121 in complex with a potent azole inhibitor 69M using the AMBER16 suite of program. Then, all the generated trajectories were clustered into 70 ensemble conformations using an agglomerative hierarchical algorithm. Virtual screening of 328 curcuminoid compounds against 70 ensemble conformations of CYP121 was performed using EasyDock Vina software. **Results:** The best consensus of CYP121 inhibitors were selected based on the highest binding affinity value than its original ligand (-9.6 kcal/mol) and the interaction with CYP121 cofactor HEM which is substantial for catalytic activity of CYP121. We found out that the top ten curcuminoid consensus were mainly from sulfonamide and pyrazoline group of compounds which illustrated steady binding affinity values and great interactions with cofactor and surrounding residues at the CYP121 active site. The selected curcuminoid compounds were then screened for ADMET prediction. **Conclusion:** The best curcuminoid compounds are anticipated to introduce to MDS to study the behavior of CYP121 at both structural and residual levels and then synthesize to evaluate further potential biological activities. This study could serve as a preliminary study towards developing promising CYP121 inhibitors.

Keywords
Tuberculosis, CYP121, Drug Resistance, Ensemble Docking, Curcuminoid Compounds

OA-2

Indole-2-carboxamides as New Anti-Mycobacterial Agents: Design, Synthesis, Biological Evaluation and Molecular Modeling Against mmpL3

Tejas M. Dhameliya[1,2], Kaushikkumar A. Bhakhar[1], Punit V. Vaghela[1], Saiprasad D. Varakala[3], Shrdhhaba J. Chudasma[1], Normi D. Gajjar[1], Prinsa R. Nagar[1], and Dharmarajan Sriram[3]

[1] Department of Pharmaceutical Chemistry and Quality Assurance, L. M. College of Pharmacy, Navrangpura, Ahmedabad 380 009, Gujarat, India.
[2] Present Address: Department of Pharmaceutical Chemistry, Institute of Pharmacy, Nirma University, Ahmedabad 382 481, Gujarat, India.
[3] Department of Pharmacy, Birla Institute of Technology & Science - Pilani, Hyderabad Campus, Jawahar Nagar, Hyderabad 500 078, India.

*Corresponding author's email: tejasm.dhameliya@nirmauni.ac.in; tmdhameliya@gmail.com

Introduction: Tuberculosis (TB), an airborne disease caused by *Mycobacterium tuberculosis*, has infected millions of people and been responsible for their deaths. **Methods:** Toward the anti-TB endeavor, the synthesis of total twenty-four indole-2-carboxamide derivatives as potent anti-TB agents have been carried out using CDI-mediated amidation. **Results:** The biological evaluation against $H_{37}Rv$ revealed compounds 5d, 5e and 5u with MICs in the range of 3.125-12.5 µg/mL using MABA assay. Further, compound 5u was tested against RAW 264.7 cell by MTT assay and showed 32% growth inhibitions. The structure activity relationship of the indole-2-carboxamides has been established for antimycobacterial activity. The physicochemical properties and ADMET parameters of the 5d, 5e and 5u using pKCSM and SwissADME revealed their suitability as promising drug candidates. Molecular docking studies using AutoDock Vina revealed binding of 5u with the catalytic site of mmpL3 (PDB ID: 6AJG). The MD simulations of the most active compound 5u using GROMACS 2020.1 revealed its stability at the protein active site. **Conclusions:** Further optimization of indole-2-carboxamies may reveal the potentiation of identified anti-mycobacterial drug candidates.

Keywords
Indole-2-carboxamides, Anti-TB Agents, mmpL3, ADMET Assay, Molecular Modelling

OA-3

Plant-Derived Extracellular Vesicles: Investigating Potential Inhibitor of Cyclin A of Colorectal Cancer Through *In Silico* Molecular Docking Approach

Md. Sanower Hossain[1]*, Miah Roney[2], Jun Haslinda Shariffuddin[1,3] and Der Jiun Ooi[4]*

[1] Centre for Sustainability of Mineral and Resource Recovery Technology (Pusat SMaRRT), Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia.
[2] Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia.
[3] Faculty of Chemical and Process Engineering Tec.hnology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia
[4] Department of Preclinical Sciences, Faculty of Dentistry, MAHSA University, Jenjarom Selangor 42610, Malaysia.

*Corresponding authors' email: djooi@mahsa.edu.my; mshossainbge@gmail.com

Introduction: Colorectal cancer (CRC) ranks as the second deadliest cancer globally, with limitations in chemotherapy effectiveness due to complications and the emergence of resistance and recurrence. Plant-derived extracellular exosomes and vesicles (PDEV) serve as an innovative drug delivery system, offering targeted transport of bioactive compounds, immunomodulation, and potential resistance alleviation while containing secondary metabolites with unexplored anti-CRC potential. This study employs *in silico* docking, including protein/nucleotide exploration, molecular docking, and binding energy calculations, to screen PDEVs metabolites for an anti-CRC inhibitor targeting Cyclin A (PDBID:6GUE) through ligand- and structure-based approaches. **Methods:** A comprehensive literature search in Scopus, Web of Science, and PubMed used "Plant-derived Extracellular vesicles or nanovesicles or exosomes and secondary metabolites" to identify PDEV secondary metabolites. QSAR and ADMET analyses determined PIC_{50} values and compound behavior. Selected compounds underwent molecular docking using Cb-doc (http://clab.labshare.cn/cb-dock/php/blinddock.php) to assess binding interactions with the target protein. **Results:** This study screened 59 citations, yielding 26 research articles. Only three mentioned compounds are found in PDEV. Sixteen compounds with PIC_{50} values below 10 were identified, but ADMET analysis indicated potential toxicity for some, leading to the selection of 8 compounds for molecular docking. Among them, ferulic acid (-7.3) was chosen due to its non-toxic profile according to ADMET and a PIC_{50} of 4.13, lower than other compounds. The drug-likeness assessment also adhered to Lipinski's Rule of Five. Molecular docking demonstrated ferulic acid's interaction with specific amino acids in the target protein, mirroring co-crystal findings. Consequently, ferulic acid emerged as a lead compound, exhibiting strong binding, favorable pharmacokinetics, and drug-like characteristics against 6GUE. **Conclusion:** The compelling findings underscore ferulic acid's potential as a promising candidate for further development as an anti-CRC agent, warranting rigorous *in vitro* and *in vivo* investigations.

Keywords
Extracellular vesicles, Exosomes, Nanovesicles, Cancer

OB-1

TRF Adjuvant Improves Dendritic Cell Vaccine Efficacy in Mouse Model of Breast Cancer

Sitti Rahma Abd Hafid[1]*, Nabiha Iran[1], and Ammu Kutty Radhakrishnan[2]

[1] Malaysian Palm Oil Board, No.6 Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor D.E., Malaysia.
[2] Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Jalan Lagoon Selatan, 47500 Bandar Sunway, Selangor D.E., Malaysia.

*Correspondence author's email: ctrahma@mpob.gov.my

Introduction: Dendritic cells (DCs) are immune cells that can present antigens to T-cells and stimulate immune responses. Tocotrienol-rich fraction (TRF) from palm oil has been reported to have anti-cancer and immune-enhancing effects. **Methods:** In this study, TRF was used as an adjuvant to enhance the effectiveness of DC vaccines in treating mouse mammary cancer. **Results:** The results of the study revealed that early treatment significantly improved the prognosis of the mice with cancer. They also found that the tumours in the animals that were treated at the G1 stage had lower volume compared to those in the other groups. Interferon-gamma (IFN-γ) and interleukin-12 (IL-12) productions showed the highest level in the group exposed to the earliest vaccine therapy and combination with TRF. Similar pattern for tumour inhibition was observed in other groups. Furthermore, PD-1 and PD-L1 were found to be significantly down-regulated in the early treatment groups, compared to the delay treatment groups. The higher interactions of cell surface proteins (PD1 and PD-L1) elevate the progression of tumours in the tumour microenvironment. Therefore, early treatment inhibited the interaction of cell surface proteins in the tumour microenvironment. **Conclusion:** In conclusion, TRF can be used as an adjuvant to enhance tumour-specific immune response induced by DC-based vaccines in a syngeneic mouse model of breast cancer. Earlier treatment modality exposure to the mouse model warranted the best inhibition in tumour-bearing mice and increased higher anti-tumour immune response. Hence, DC-based vaccines together with TRF as an adjuvant may be clinically useful as a new immunotherapeutic approach towards cancers.

Keywords
TRF, Adjuvant**,** Dendritic Cell Vaccine, Breast Cancer, Immunotherapy

OB-2

Cyclodextrin Inclusion Complex of Tetrahydrocurcumin (THC) Augments Solubility And *In Vitro* Anticancer Activity Against Colorectal Cancer

Zhi Xuan Low[1], Michelle Yee Mun Teo[1], Asma Saleem Qazi[3], Fariza Juliana Nordin[4], Vijayaraj Kumar Palanirajan[2], and Lionel Lian Aun In[1*]

[1] Department of Biotechnology, Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia.
[2] Department of Pharmaceutical Technology, Faculty of Pharmaceutical Sciences, UCSI University, Kuala Lumpur, Malaysia.
[3] Department of Biological Sciences, National University of medical sciences, Islamabad, Pakistan.
[4] Department of Biological Sciences and Biotechnology, Faculty of Science and Technology, University Kebangsaan Malaysia, Selangor, Malaysia.

*Corresponding author's email: lionelin@ucsiuniversity.edu.my

Introduction: Tetrahydrocurcumin (THC), a hydrophobic polyphenolic bioactive substance extracted from turmeric, has been established as a natural anticancer agent. Unfortunately, its sparing solubility (approximately 1.3%) in water and its reduced systemic bioavailability has limited its efficacy. This study explores the use of an organic-based drug delivery approach via encapsulation to circumvent the pitfalls of THC's poor solubility and potentially improve its chemotherapeutic properties. **Methods:** An inclusion complex of THC with β-cyclodextrin (βCD) at a molar ratio of 2:1 was formed and characterized using UV-vis spectroscopy, differential scanning calorimetry (DSC), Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM). The inclusion complex's solubility assessment and drug release study were evaluated and compared with pure THC. The anticancer effects of the inclusion complex on colorectal cancer cells (SW480 and HCT116 cells) were investigated by MTT assays, migration assays, Transwell invasion assays, Annexin-V/PI staining assays, and poly adenosine diphosphate-ribose polymerase (PARP) cleavage assays. **Results:** The inclusion complex displayed higher aqueous dispersion (65-fold) and its physiochemical characterization confirmed the successful formation of a β-CD inclusion complex encompassing a hydrophobic cavity. Through the presence of an inclusion complex, cell viability was potentially reduced with an SI value >10 while the apoptosis rate was increased ($p < 0.05$) *in vitro*. Additionally, the complexation further enhanced both anti-migration and anti-invasion capabilities in comparison to pure THC. Both formulations were consistent in terms of caspase 3 activation. **Conclusion:** These findings provide evidence of the potential use of this formulation in rendering THC and conceptually other hydrophobic agents with an improved chemotherapeutic efficacy against various malignancies.

Keywords
Tetrahydrocurcumin, Cyclodextrin, Inclusion Complex, Solubility, Colorectal Cancer

OB-3

Erlotinib Loaded Lipidic Nanocarriers for Loco-Regional Therapy in Management of Oral Cancer: In-vitro and In-vivo Evaluation

Kartik Hariharan[1], and Tejal Mehta[1]*

[1] Department of Pharmaceutics, Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat-382481, India.

*Corresponding author's email: tejal.shah@nirmauni.ac.in, tjshah3@gmail.com

Introduction: As per the Globocan report of 2018, head and neck cancer ranks 2nd in terms of incidence in India. The carcinoma starts in squamous cells and leads to development of oral squamous cell carcinoma (OSCC) in more than 80% of oral cancers. Conventional treatment strategies have several side effects mandating the need for novel drug delivery. Recently, local site-specific delivery in oral cavity has been explored to treat cancerous lesions and those detected at early stages. This helps in reducing dose required and decreasing side effects without compromising therapeutic efficacy. The current research evaluates the feasibility of Erlotinib (ERB) loaded lipidic nanocarrier (ELNC) gel for treatment of chemically induced oral cancer in a rat model. **Method:** ELNC was prepared using hot homogenization technique with size reduction by high-pressure homogenization. The ELNC was characterized for PS, PDI, %EE, ZP and assessed for in-vitro cytotoxicity in KB-3-1 cell line. The nanocarriers were freeze-dried using mannitol as cryoprotectant and characterized further using DSC and XRD. Furthermore, the developed nanocarriers were loaded in carbopol gel and administered locally at the site of oral cancer in rat to evaluate in-vivo efficacy and cytokine levels. **Results:** ELNC sizes were in the range between 350nm to 380nm, PDI less than 0.35 and %EE up to 75%. The particles were stable with ZP up to -25mV. Freeze dried ELNC characterized by DSC and XRD revealed drug present in amorphous form inside LNC. Cytotoxicity studies showed potent anti-cancer effects with IC_{50} values of plain ERB (558.94 ±103.6nM) and ELNC (686.25 ± 44.8 nM). **Conclusion:** Pharmacological efficacy studies revealed, nanoformulation could decrease tumor size as compared to plain drug. Furthermore, decrease in cytokine levels, IL-6, IL-1β and TNF-α were observed with ELNC as compared to plain indicating decreased inflammatory conditions at the site of tumor with ERB loaded nanocarrier.

Keywords
Erlotinib, Oral Cancer, Lipidic Nanocarrier, Cytokine, High Pressure Homogenization

OB-4

The Effects of Polyethyleneimine (PEI) Combined with Cisplatin on Cytotoxicity, Colony Formation, and Apoptosis Mechanisms Against Triple-Negative Breast Cancer Cell Lines

Alistia Ilmiah Fahira[1,2,3], Riezki Amalia[1,2,3]*, and Melisa Intan Barliana[2,3,4]

[1] Cells and Molecular Biology Laboratory, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.
[2] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.
[3] Center of Excellence in Pharmaceutical Care Innovation, Universitas Padjadjaran, Bandung, Indonesia.
[4] Department of Biology Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.

*Corresponding author's email: riezki.amalia@unpad.ac.id

Introduction: Triple-negative breast cancer (TNBC) is a distinctive subtype characterized by a lack of three important receptors and molecular pathways. Conventional chemotherapy options like cisplatin is ineffective against TNBC. Recent studies have focused on the potential use of polyethyleneimine (PEI) as a co-delivery system for anticancer drugs to improve therapeutic efficacy. Acting as a transfection agent, PEI aids nuclear DNA binding and avoids endosomal barrier. PEI/cisplatin combination represents a promising strategy to improve cisplatin's efficacy in treating TNBC. **Methods:** 7 dfferent types of PEI were used in this research. Water Tetrazolium (WST)-1 assay, colony-forming assay, and Quantitative Reverse Transcription Polymerase Chain Reaction (RT-qPCR) were performed to determine cell viability and apoptosis mechanisms. **Results:** All PEI/cisplatin combinations increased cytotoxicity and reduced colony-forming ability. PEI with molecular weights of 600 and 750 kDa were excluded from colony-forming assay and RT-qPCR analysis as excessively high molecular weights caused irregular cell death. *CASP3* and *TP53* gene expressions were upregulated, meanwhile *BCL2* was downregulated following treatments. Low molecular weights PEI (0.8, 1.3, 2.5, and 5 kDa) at concentrations of 5 and 10 ppm showed potential when combined with cisplatin. However, the results were not significant, likely due to low concentrations used. PEI with higher molecular weights (25 kDa) showed lowest cell survival rate, a 15.7% decrease at 25:5 ppm PEI/cisplatin, and zero colony counts. Overexpresion of *BCL2* by 59.4-fold was observed at a concentration of 10:5 ppm PEI/cisplatin compared to cisplatin alone. **Conclusion:** The PEI/cisplatin combination improves *in vitro* efficacy against TNBC. PEI demonstrated unique properties in inducing cell death through variation in molecular weights, concentration, and structural characteristics. PEI with higher molecular weights exhibited cytotoxicity limitations that might lead to non-apoptotic cell death mechanisms. Further investigations including advanced nanoparticle formulation, assessing PEI toxicity and examining its effects on molecular regulation are necessitated.

Keywords
Triple Negative Breast Cancer, Cisplatin, Cationic Polymer, Polyethyleneimine, Drug Delivery

OC-1

Alkylated Indole Hybrids: Synthesis and RTU Formulation Development for Treatment of Cancer

Asha Thomas[1*], Ghansham More[1], Pranali Jadhav[1], and Sohan Chitlange[1]

[1] Department of Pharmaceutical Chemistry, Dr. D. Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Pune, Maharashtra, India (Affiliated to Savitribai Phule Pune University, Pune).

*Corresponding author's email: asha.thomas@dypvp.edu.in

Introduction: Indole heterocyclic compounds have shown diverse biological activities, making them privileged scaffold for drug development. In this study, we focused on design, synthesis and formulation of hybrid indole compounds containing 2-chloro-N-(2-chloroethyl)-N-methylethanamine as promising anti-cancer agents. **Methods:** In-silico study was conducted, wherein a library of 1500 indole compounds were designed, screened based on electrostatic properties and shape similarities using TorchLite 10.5.0. The eXtened Electron Distribution (XED) pattern was studied and compared with reference listed drugs (RLDs). The binding affinity of designed ligands to DNA target (PDB ID: 1AXL), was studied using Glide program. Multivariate analysis, ECFP-6 fingerprints and scatter plots were used which demonstrated closeness of designed compounds with RLDs. Alkylated indole derivatives were synthesized from substituted indoles with oxalyl chloride and replacement of chloride using diethanolamine, with further chlorination using thionyl chloride. The compounds were effectively characterized using physicochemical properties and spectral analysis. In vitro MTT assay was performed to evaluate anti-cancer potential of synthesized compounds. Stable and cost-effective Ready To Use (RTU) formulation of AGSPBM1006 indole alkylating agent was developed using 95% dehydrated alcohol as vehicle. The stability testing (accelerated condition: 40°C/75%RH) and assay of related substances present in formulation were studied using validated RP-HPLC method. **Results:** In the in-silico study, designed compound AGSPBM1006 showed lowest binding energy (-9.130) when compared to Bendamustine RLD (-6.232) and is capable of binding with minor grove in the active site. The compound demonstrated comparable IC_{50} values (2.20 and 3.97) to RLD bendamustine (2.31 and 4.35) against HEPG2 and MCF-7 cell lines respectively. Furthermore, stable RTU formulation of AGSPBM1006 was formulated using QbD approach with critical process parameters optimized through DoE. **Conclusion:** The alkylated Indole hybrid compound AGSPBM1006 identified through rigorous in-silico studies with promising anti-cancer potential can serve as a lead for further investigations for development of novel anti-cancer agents.

Keywords
Indole derivatives, Anticancer, In-silico studies, Alkylating agents, RTU injection

OC-2

In Silico Discovery of RIOK3 Inhibitors against Pancreatic Ductal Adenocarcinoma via Molecular Docking, Molecular Dynamics Simulations, and ADMET Prediction

Kawthar Alhussieni[1]*, Rozana Othman[1]*, Chuancheng Wei[1], Iskandar Abdullah[2], Vetriselvan Subramaniyan[3]*, T. Tamilanban[4], Tan Ke Han[1], and Muhanned Alhussieni[5]

[1] Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universiti Malaya, Kuala Lumpur 50603, Malaysia.
[2] Department of Chemistry, Faculty of Science, Universiti Malaya, Kuala Lumpur 50603, Malaysia.
[3] Pharmacology Unit, Jeffrey Cheah School of Medicine and Health Sciences, Monash University, Malaysia.
[4] Department of pharmacology, SRM College of Pharmacy, SRMIST, Kattankulathur - 603 203 Chengalpattu District, Tamil Nadu, India.
[5] Department of Internal Medicine, St.Irmgardis Hospital , Viersen 41749 , Germany.

*Corresponding authors' email: rozanaothman@um.edu.my, k.o.alhussine@gmail.com, subramaniyan.vetriselvan@monash.edu

Introduction: The highly metastatic pancreatic ductal adenocarcinoma (PDAC) is an exceptionally aggressive malignant disease. It has been demonstrated that PDAC invasion and metastasis are correlated well with RIO Kinase 3 enzyme (RIOK3). By stabilizing FAK protein expression and increasing its phosphorylation, RIOK3 promotes the invasion and metastasis of PDAC cells. This provides a novel target for treatment approaches that target RIOK3. In the field of protein prediction, ab initio techniques have started with potentials determined exclusively through physiochemical interactions. The revolutionary AlphaFold2, a neural network-based model created by Deep Mind, on the other hand, has ushered in a new age in protein structure prediction. In this study, drug repurposing approach will be used to find therapeutic inhibitor against RIOK3. **Methodology:** The structure of the RIOK3 was predicted viaI-TASSER server and Alphafold 2, which were evaluated using Saves Server and were docked with FDA-approved drugs using AutoDockVina. The pharmacokinetic and pharmacodynamic properties provided by the docking were examined using SwissADME. Molecular dynamics simulation and in vitro work were involved in the validation. An MTT assay was performed to assess the effect of the RIOK3 inhibitors on cell growth and survival. **Result**: Our study results identified the top five molecules as possible RIOK3 inhibitors with binding energies ranging from -11.3 to -10.8 kcal/mol. **Conclusion**: These proposed inhibitors' potential to be key anticancer candidates was demonstrated by the in vitro and in silico experiments that were carried out on the compounds. The present research provides structural insights that could be applied to further comprehend PDAC therapy goals by targeting RIOK3.

Keywords
Pancreatic ductal adenocarcinoma, AlphaFold2, Ab Initio, RIOK3, AutoDockvina

OC-3

Anticancer Activity of *Annona muricata* Leaf Extract and Fractions Againts MCF-7 cells

Yuni Elsa Hadisaputri[1,2]*, Ummi Habibah[1,2], Fajar Fauzi Abdullah[2,3], Eli Halimah[1], Mutakin Mutakin[1], Sandra Megantara[1], Rizky Abdulah[1], and Ajeng Diantini[1]

[1] Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, West Java, 45363, Indonesia
[2] Central Laboratory, Universitas Padjadjaran, Jatinangor, West Java, 45363, Indonesia.
[3] Department of Chemistry, Faculty of Mathematic and Sciences, Universitas Padjadjaran, Jatinangor, West Java, 45363, Indonesia.

*Corresponding author's email: yuni.elsa@unpad.ac.id

Introduction: Breast cancer is the most prevalent cancer among women globally, with a growing annual incidence rate. Soursop, scientifically known as *Annona muricata L* (*A. muricata*), is a traditional medicinal plant renowned for its potential as an anticancer remedy. This study aimed to clarify the cytotoxic effect and mechanism of *A. muricata* leaf extract and fractions. However, more studies are still warranted. **Methods:** In this research, we prepared ethanol extract and three solvents fractions (ethyl acetate, n-hexane, and water) from *A. muricata* leaves. The anti-proliferative and cytotoxic effects of these extract and fractions were evaluated on MCF7 breast cancer cells and CV1 normal kidney cells. Observation of cell morphology was performed by staining using mixture of propidium iodide and 4',6-diamidino-2-phenylindole, indicating an ongoing process of apoptotic cell death in MCF7 cells. To elucidate the apoptotic cell death mechanism, we assessed the *mRNA* expression of key components in the caspase cascade, including *caspase-9*, *caspase-3*, *PARP-1*, and the anti-apoptotic protein *Bcl-2*. **Results:** The ethanol extract, ethyl acetate, *n*-hexane, and water fractions derived from *A. muricata* leaves exhibited IC_{50} values of 5.3, 2.86, 3.08, and 48.31 µg/mL, respectively, against MCF7 cells, while showing no toxicity in CV1 cells. Exposure to *A. muricata* leaf ethanol extract and the ethyl acetate fraction induced distinct morphological changes in MCF7 cells within 6 hours. These changes included membrane and nuclear alterations indicative of apoptosis. The mechanism underlying this potent cytotoxic activity in MCF7 cells was linked to a decrease in the expression of *Bcl-2 mRNA,* alongside an increase in *caspase-9* and *caspase-3 mRNA* expressions. **Conclusion:** The leaves of the *A. muricata* medicinal plant contain compounds that, upon extraction, exerted highly effective anticancer activity against MCF7 breast cancer cells by inducing apoptotic cell death.

Keywords
Soursop, *Annona muricata* L., MCF7 Breast Cancer Cell, Cytotoxicity, Caspase-Cascade

OC-4

New Dimers of Dipyridothiazines with Anticancer Activities

Beata Morak-Młodawska[1]*, Emilia Martula[1, 2], Małgorzata Jeleń[1], Patrick N. Okechukwu[3], Huang Feng[4], and Malarvili Selvaraja[4]

[1] Department of Organic Chemistry, The Medical University of Silesia in Katowice, Jagiellońska 4, 41-200 Sosnowiec, Poland.
[2] Doctoral School of The Medical University of Silesia in Katowice, Poland.
[3] Department of Biotechnology, Faculty of Applied Sciences, UCSI Heights, (Taman Connaught) Cheras 56000 Kuala Lumpur, Malaysia.
[4] Department of Pharmaceutical Biology, Faculty of Pharmaceutical Sciences, UCSI University Kuala Lumpur (South Wing), UCSI Heights 56000 Cheras, Kuala Lumpur, Malaysia.

*Corresponding author's email: bmlodawska@sum.edu.pl

Introduction: Phenothiazines are classes of heterocyclic compounds with wide spectrum of biological properties especially in the mental disorders. Recent reports have shown promising anticancer, antiplasmid, antibacterial, anti-inflammatory and immunosuppressive activities of both classical and new derivatives of phenothiazines. Previously synthesized library of dipyridothiazines have demonstrated interesting antiproliferative, anticancer, antioxidant and immunosuppressive activities. The current project aims to obtain new derivatives of dipyridothiazines, which are expected to possess promising anticancer activity. **Methods:** New twelve dimer of dipyridothiazines were synthesized effective reactions of involving dipyridothiazines with selected linkers, in the presence of sodium hydride, and dimethylformamide (DMF). The structures of the new compounds were determine using NMR and 2D NMR spectroscopy (COSY, ROESY, HSQC, HMBC) as well as mass spectrometry (HR MS). All compounds were then subjected to biologically evaluation for their anticancer activity against colon (SW480) and breast cancer cell lines (MCF7). **Results:** Promising results were obtained, which encourage further research to explore the mechanism of anticancer activity and cytotoxicity. **Conclusion:** The research study underscores the potential importance of new dimers from dipirydothiazines in the search for targeted anti-cancer agents.

Keywords:
Dipyridothiazines, Structural Analysis, Anticancer Action

OD-1

Uncovering the Potential of Androgen Receptor as A Therapeutic Biomarker for Triple Negative Breast Cancers

Nirali Shukla[1], Deepshikha Rathore[1], Jigna Shah[2], Hemangini Vora[3], and Heena Dave[1]*

[1] Institute of Science, Nirma University, Ahmedabad, Gujarat, India – 382481
[2] Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat, India – 382481
[3] The Gujarat Cancer & Research Institute, Ahmedabad, Gujarat, India – 380016

*Corresponding author's email: heena.dave@nirmauni.ac.in

Introduction: Triple Negative Breast Cancer (TNBC) is a dreadful molecular subtype due to its aggressiveness and heterogeneity. The presence of Androgen Receptor (AR) signaling plays a pivotal role in tumor progression and metastasis. The anti-androgens are exhibiting better responses in treating prostate cancers. Luminal-Androgen Receptor (LAR$^+$TNBC) is one of the TNBC subtypes in which AR is present. In this study, it has been envisaged that targeting AR with AR antagonists for the treatment of TNBCs would be a better therapeutic regimen. We also identified the incidence of Androgen Receptor positivity in TNBC patients of Western India. **Methods:** The effectiveness of AR antagonists (Bicalutamide & Enzalutamide) were tested using *in-vitro* studies. Assessment of cell viability was determined by MTT assay in Human Breast cancer cell lines MDA-MB-453 (LAR$^+$TNBC), MDA-MB-231 (TNBC), and MCF-7 (ER$^+$PR$^+$). The genotypic and phenotypic expressions of AR were analyzed via qRT-PCR and western blotting, respectively. Fifty TNBC patients were enrolled at The Gujarat Cancer and Research Institute, Ahmedabad, and AR expression was determined by Immunohistochemistry. **Results:** Based on the cell IC-50 values, both AR antagonists showed significant response in both TNBC cell lines but not significant in MCF-7. Moreover, Enzalutamide showed a better response in both TNBC cell lines than Bicalutamide. In the case of the study in TNBC patients, AR positivity was 18%, and, the incidence was correlated with clinicopathological prognosticators and disease status. **Conclusion:** The incidence of AR positivity in TNBC patients is about 20% and the preliminary *in vitro* studies showed that both AR antagonists can be explored as a therapeutic regimen for TNBCs. However, further, the role of AR signaling and its underlying mechanisms will be explored for a better understanding of AR as an independent biomarker for TNBCs.

Keywords
Androgen Receptor, Triple-Negative Breast Cancer, Bicalutamide, Enzalutamide, AR Antagonists, Dihydrotestosterone

OD-2

Factors Related to Hematotoxicity, Hepatotoxicity, and Nephrotoxicity in Acute Lymphoblastic Leukemia during the Induction Phase at Dr. Hasan Sadikin General Hospital, Bandung, from 2020 to 2023

Zulfan Zazuli[1]*, Nur Melani Sari[2], and Fathi Khatami Maulana[1]

[1] Department of Pharmacology and Clinical Pharmacy, School of Pharmacy Institut Teknologi Bandung, Bandung, Indonesia
[2] Division of Hematology-Oncology, Department of Child Health, Faculty of Medicine, Universitas Padjadjaran/Dr. Hasan Sadikin General Hospital, Bandung, Indonesia

*Corresponding author's email: zulfan@itb.ac.id

Introduction: Acute lymphoblastic leukemia (ALL) in children makes up approximately 70% of all cancer cases in Indonesia. The primary treatment for childhood ALL involves chemotherapy with more complex regimens that significantly contribute to adverse drug effects (ADRs). This study aims to evaluate the severity of ADRs and determine the association between patient characteristics and drug toxicity during the induction phase. **Methods:** An observational cohort study was conducted using Indonesian Pediatric Cancer Registry (IP-CAR) by including children diagnosed with ALL. Data were collected retrospectively from 2020 to early 2023. Hematotoxicity, hepatotoxicity, and nephrotoxicity were defined based on Common Terminology Criteria for Adverse Events (CTCAE v.5). Uni and multivariate statistical analysis was conducted to estimate the association between factors and the outcomes. **Results:** A total of 85 subjects were included**.** The most frequently observed ADRs were decreased neutrophil counts (67.95%), decreased platelet counts (59.52%), and anemia (30.59%). Significant differences were found between sex and ADR anemia, age and decreased neutrophil count, risk stratification and decreased neutrophil count, as well as BMI and increased alanine transaminase (ALT) serum levels (p=0.049; p=0.004; p = 0.037; p = 0.022, respectively). The results of the multivariate analysis indicate that higher age is linked to a protective effect against reduced neutrophil count (OR = 0.85; 95% CI 0.75–0.96; p = 0.011) and decreased platelet count (OR = 0.89; 95% CI 0.81-0.99; p = 0.049). Moreover, an increase in BMI also demonstrates a protective association with elevated serum ALT levels (OR = 0.43; 95% CI 0.2-0.92; p = 0.029). **Conclusion:** The occurrence of drug toxicity during the initiation period is associated with younger age and lower Body mass index (BMI) in pediatric ALL patients.

Keywords
Acute lymphoblastic leukemia, Children, Adverse drug reaction, Chemotherapy, Toxicity

OD-3

Insufficient Induction of Cytotoxic Agents Affects the Expression of the TGF-β-related Gene in Breast Cancer Cell Lines

Hanifa Dinda Hayati[1,2], Hasnah Muzakiyyah[1], Alisha Zahra Salsabila[1,2], Bilqis Na'ilah Almattin[1,2], Paramitha Ayu Aidi[1,2], Shafira Nur Salsabila[1,2], and Riezki Amalia[1,2,3*]

[1] Cells and Molecular Biology Laboratory, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.
[2] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.
[3] Center of Excellence in Pharmaceutical Care Innovation, Universitas Padjadjaran, Bandung, Indonesia.

*Corresponding author's email: riezki.amalia@unpad.ac.id

Background: Insufficient intracellular concentration of cytotoxic agents alters drug sensitivity in breast cancer. Transforming growth factor-β signalling pathway affects transcriptional activations of target genes that regulate epithelial-mesenchymal transition (EMT) and drug sensitivity. This experiment investigates the effect of insufficient induction of cytotoxic agents on regulating TGF-β-related gene expressions in breast cancer cell lines. **Methods:** The cytotoxicity assay was performed before and after two cycles of induction with doxorubicin and cisplatin in MDA-MB-231 and MCF-7 cells. Expression levels of *TGIF1*, *SNA1*, and *PMEPA1* were quantified in both the parental cells and cells subjected to two cycles of induction. **Results:** A significant increase in the IC_{50} values for both doxorubicin- and cisplatin-inductions were observed in MDA-MB-231 cells, but not MCF-7 cells. In MDA-MB-231 cells, *TGIF1* and *SNA1* expression levels were upregulated following induction with both doxorubicin and cisplatin. In contrast, in MCF-7 cells, this upregulation was only evident after doxorubicin induction. Interestingly, *PMEPA1* expression level decreased after induction with both doxorubicin and cisplatin in MCF-7 cells. However, this effect was only observed with cisplatin induction in MDA-MB-231 cells. **Conclusions:** Insufficient concentration of cytotoxic agents was found to regulate the expression levels of genes related to TGF-β and EMT regulators, including *TGIF1*, *SNA1*, and *PMEPA1* in breast cancer cells. *PMEPA1* exhibited an opposite regulation manner compared to *TGIF1* and SNA1 in distinct cell types and in response to various cytotoxicity agents. This suggests the dynamic interplay between these genes in different cellular contexts and with different cytotoxicity agents.

Keywords
Insufficient Induction, Doxorubicin, Cisplatin, Breast Cancer, TGF-β Related Genes

OD-4

Systematic Review of *Annona Muricata* Linn. Extract on Prostate Cancer

Uruaka Christian Ifeanyi[1], Valentine Nnoka[1], Christian Ogbu[1], Michael Gboun[2], Ibinabo Oboro[1*], and Omotayo Ebong[1]

[1] Rivers State University, Port Harcourt, Nigeria.
[2] Centre for Research on Common Diseases in Africa and Asia, Canada.

*Corresponding author's email: ibinabo.oboro@gmail.com

Introduction: Cancer is the world's most prevalent cause of death, accounting for about 10 million fatalities in 2020; prostate cancer being the sixth leading cause of cancer death worldwide and the second most common malignancy occurring in men. Compounds *derived from Annona muricata (A. muricata)*, a member of the Annonaceae family have been documented to have positive effects against various cancers including prostate cancer. The study examined scientific reports on the effects of *A. muricata* on prostate cancer, to identify the phytochemically active components that exert beneficial and/or toxic effects. **Methods**: A systematic review conducted in July 2023. Scientific publications on PubMed, Google Scholar and ScienceDirect electronic databases were searched for cohort, quasi-experimental and randomized controlled trials. Keywords and MeSH terms for the search were developed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A total of eighty-eight (88) studies were identified from the databases, among which twelve (12) were selected that met the screening criteria in line with study objectives. **Results:** This review has shown that the pharmacodynamics, safety, tolerability, and efficacy of *A. muricata* and its phytochemical constituents (cyclic hexapeptides, flavonoids, isoquinoline alkaloids and importantly annonaceous acetogenins) on various cancers have been extensively reported. *A. muricata* extracts caused reduction in prostatic weight, prevented, and reversed prostatic hyperplasia and attenuated inflammatory and antioxidant indices. Mechanistically, they reduced prostatic hyperplasia by hormone modulation, down regulation and reduction of cellular proliferation and necrosis with good efficacy, safety profile and minimal toxicity were found. **Conclusion:** The active phytochemical constituents identified in *A. muricata* extract have the potential to be employed as promising agents for management of prostate cancer. Clinical studies are therefore strongly recommended to further establish their usefulness in this regard.

Keywords
Annona muricata, *Annonaceous acetogenins*, Prostate Cancer, Phytochemicals, Systematic Review

OE-1

Exploring Nature's Toolbox: Isolation of Plant-Based Extracellular Vesicles

Nada Basheir Ali[1], Norsharina Ismail[2], Kim Wei Chan[2], Jhi Biau Foo[3], Ahmad Faizal Abdull Razis[1,2], and Der Jiun Ooi[4]*

[1] Department of Food Science, Faculty of Food Science and Technology, Universiti Putra Malaysia (UPM), Serdang 43400, Selangor, Malaysia.
[2] Natural Medicines and Products Research Laboratory, Institute of Bioscience, Universiti Putra Malaysia (UPM), Serdang 43400, Selangor, Malaysia.
[3] School of Pharmacy, Faculty of Health and Medical Sciences, Taylor's University, Subang Jaya 47500, Selangor, Malaysia.
[4] Department of Preclinical Sciences, Faculty of Dentistry, MAHSA University, Bandar Saujana Putra, Jenjarom 42610, Selangor, Malaysia.

*Corresponding author's email: djooi@mahsa.edu.my

Introduction: Extracellular vesicles (EVs), a diverse group of membrane-enclosed nanoparticles, are important in cellular communication, shuttling proteins and RNA between prokaryotic and eukaryotic cells. These naturally derived vesicles offer distinct advantages as drug carriers over synthetic counterparts. While exploration of plant-derived EVs have only gained recent attention, their potential in biomedical applications is significant. The initial hurdle lies in successful isolation, a critical first step explored in the present study. **Methods:** The present study employed fruit juice for EV purification through an optimized hybrid method of modified centrifugation-ultracentrifugation and use of size exclusion column purification. The physical attributes of EV (size, shape, and purity) were further characterized using transmission electron microscopy (TEM), zetasizer, and nanoparticle tracking analysis (NTA) techniques. **Results:** The results demonstrated successful isolation of plant EVs by integrating differential centrifugation and size exclusion chromatography. TEM imagery revealed unique concave structure and bilayer composition, distinguishing exosomes (25-100 nm) from microvesicles (>300 nm). Zetasizer analysis confirmed the presence of particles beyond 300 nm, with zeta potentials measuring -17 mV. NTA quantified EV concentration at 4.04 x 10^9 particles/ml. **Conclusion:** The scarcity of comprehensive investigations centered around isolation of plant-derived EVs underscores the shortage of references and standardized protocols. The present study proposed an optimized isolation method combining optimised ultracentrifugation and additional purification step. The outcome was the attainment of pristine cup-shaped vesicles with higher concentration and smaller size, thus surmounting initial limitations. This study potentially contributes to the foundational understanding of plant-derived EVs and offers insight into their potential utility as effective drug carriers.

Keywords
Extracellular Vesicles, Plant-derived EV, Ultracentrifugation, Size exclusion chromatography, Exosomes

OE-2

Design, Optimise, Standardise and Validate *In Vitro* Human Blood-Brain Barrier Models

Ahmad Badawi[1], Johnson Stanslas[2], Brian Kirby[3], Nur Afiqah Mohamad[1,4], Vasantha Kumari Neela[5], Rajesh Ramasamy[6], and Hamidon Basri[1]*

[1] Department of Neurology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[2] Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[3] School of Pharmacy and Biomolecular Sciences, RCSI University of Medicine and Health Sciences, Dublin, Ireland.
[4] Centre for Foundation Studies, Lincoln University College, 47301, Petaling Jaya, Selangor, Malaysia.
[5] Department of Medical Microbiology and Parasitology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[6] Department of Pathology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

*Corresponding author's email: hamidon@upm.edu.my

Introduction: The brain endothelial cells, pericytes, and astrocytes communicate with each other to regulate the properties of blood-brain barrier (BBB). They share a common basement membrane to mimic the anatomical, functional, and microenvironmental situation *in vivo*. **Methods:** Construction of monoculture, coculture, and triculture models were performed using human microvascular endothelial cells (hCMEC/D3), human brain vascular pericytes (HBVP), and normal human astrocytes (NHA). Human extracellular matrix (ECM) proteins combinations were optimised using collagen-IV (10 µg/ml), fibronectin (5 µg/ml), laminin (5 µg/ml), agrin (1 µg/ml), and perlecan (10 µg/ml) at the ratios (100:100:100:100:100; 50:20:20:5:5; 56:18:18:4:4; 62:16:16:3:3, v/v, %). Transepithelial/ transendothelial electrical resistance (TEER), transmission electron microscopy (TEM) and scanning electron microscopy (SEM) were subsequently analysed. **Results:** Using 1 µm-translucent-PET in the thin-layer protocol, only at a ratio 56:18:18:4:4 is statistically significant ($P<0.0016$), TEER was 30±0.94 ohm*cm^2. The hCMEC/D3 seeding density at 6x10^4 cells/ml generated the highest TEER value at day 6. The hCMEC/D3 monoculture model showed a peak TEER of 36±0.50 ohm*cm^2 on day 6. TEM of endothelial cells showed close apposition to each other, with electron-dense areas at points of contact between adjacent cells, likely indicating the presence of adherent and tight junction complexes. SEM of hCMEC/D3 cells showed a confluent cell monolayer composed of closely apposed cells. HBVP seeding density at 4x10^4 cells/cm^2 in hCMEC/D3-HBVP coculture models produced the highest TEER (41±0.97 ohm*cm^2) at day 6 ($p<0.0001$). NHA seeding density at 4x10^4 cells/cm^2 in hCMEC/D3-HBVP-NHA triculture-models produced the highest TEER (103±0.97 ohm*cm^2) at day 6 ($p<0.0001$). The hCMEC/D3-HBVP-NHA triculture-model produced the highest statistically significant TEER ($p<0.0001$) 103±0.97 ohm*cm^2 compared to the hCMEC/D3-HBVP coculture-model 41±0.49 ohm*cm^2 and the hCMEC/D3 monoculture-model 35±0.97 ohm*cm^2. **Conclusion:** The designed, optimised, standardised, and validated *in vitro* human BBB models were successfully constructed to achieve intact, structural, and functional BBB barrier formation.

Keywords
In vitro Human BBB Model, Human ECM, Transwell Model, Optimisation, Validation

OE-3

Identification and Comparison of Phytoconstituents of Oil, Leaf and Rhizomes of *Elettariopsis Curtisii* via GCMS and *In Vitro* Antioxidant Extracts Analysis

Kamran Ashraf[1]*, and Engku Nurul Najlaa[1]

[1] Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Cawangan Selangor, Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor Darul Ehsan, Malaysia.

*Correspondence author's email: kamran1368@uitm.edu.my

Introduction: *Elettariopsis curtisii* is a medicinal plant that belongs to the family *Zingiberaceae* and is mostly found in Peninsular Malaysia, Thailand, and Borneo. *E. curtisii* grows from rhizomes on humid and wet ground in the shade. It is also called Pokok Kesing or Pokok Pepijat because it has a pungent smell that is like a stinking bug. It shows many pharmacological activities. Previous studies reported the phytoconstituents of rhizome oil only, with very little information available about the metabolites present in other plant parts of *E. curtisii*. Thus, the aim of the study was to analyse and identify the metabolites present in oil, leaf, and rhizomes, and consequently, *in vitro* antioxidant activity analysis via the DPPH method. **Methodology:** The extraction of volatile oils from rhizomes and leaves was carried out via hydro distillation using Clevenger apparatus and simple cold maceration using methanol as a solvent. All samples were analysed by GCMS, and phytoconstituents were identified based on the comparison in the NIST08 library. The antioxidant evaluation of rhizomes and leaf extracts was carried out via a DPPH assay. **Results:** There were 12 (rhizome oil), 4 (leaf oil), 46 (methanol rhizome extract), and 9 (methanol leaf extract) compounds detected via GCMS analysis. The most abundant phytoconstituents were aldehydes, with (E)-2-decenal (68.39%) in rhizome oil and (E)-2-octenal in leaf oil, and methanol rhizome extract and methanol leaf extract with values of 41.11%, 40.68%, and 54.14%, respectively. Antioxidant results show that the methanol leaf extract is found to be more potent than the methanol extract of the rhizome. **Conclusion:** We concluded that phytoconstituents identified in the methanolic leaf extract of *E. curtisii* could be a potential source for antioxidant activity. Further isolation and identification of potent, pure compounds can be made from the methanolic leaf extract of *E. curtisii.*

Keywords
Elettariopsis curtisii, GCMS Analysis, Antioxidant Activity

OE-4

Comparison of Green Technology Supercritical Fluid Extraction with Conventional Extraction Technique for Betulinic Acid, A Potential Anticancer Agent, from *Dillenia indica* Linn. Bark using Experimental Design

Dipal Gandhi[1]*, and Priti Mehta[2]

[1] Department of Pharmacognosy, Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat, India.
[2] Department of Pharmaceutical Analysis, Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat, India.

*Corresponding author's email: dipspharma@nirmauni.ac.in

Introduction: Betulinic acid has promising anticancer activity and present in appreciable quantity in *Dillenia indica Linn* bark commonly known as 'Karmal'. For the separation of betulinic acid from the bark of Dillenia indica Linn, supercritical fluid extraction was examined and compared to conventional extraction methods. The present investigation's goal was to isolate betulinic acid in pure form and compare ancient and novel extraction procedure. **Methods:** Soxhlet extraction followed by separation with column chromatography was applied and yield obtained was compared with super critical fluid extraction. The optimum extraction conditions for betulinic acid were also investigated by supercritical fluid extraction (SFE) using response surface methodology based on 3 factor 3 level Box-Behnken experimental design. Experiment design for SFE was performed to evaluate the combination effect of three independent variables like co-solvent concentration, temperature (35-60°C) and pressure (100-200 bar). Betulinic acid obtained was quantified using developed High Performance Thin Layer Chromatography method. **Results**: Analysis of variance showed that the "p-value" of SFE 0.0141 which indicate that models were statistically significant ($p<0.05$). and "coefficient of determination" (R^2 value) is 0.94 which indicate that the model showed the goodness of fit. The optimum conditions for the efficient super critical fluid extraction of betulinic acid were co-solvent concentration 10%, extraction temperature 50°C and extraction pressure 200bar. **Conclusion**: Soxhlet extraction technique followed by column chromatography is advantageous because SFE require specialized equipment while the conventional method required more amount of chemicals and reagents. Application of chemo metric tools in optimization of methods is that it reduces the number of experiments, reagent consumption and tedious laboratory work. According to the results of the SFE experimental design, the co-solvent concentration and extraction pressure have the largest influence and improve the percentage yield, while the extraction temperature has a negative impact and decreases the total yield.

Keywords
Betulinic Acid, *Dillenia indica* Bark, Green Technology, Experimental Design

OF-1

Effects of Nipa (*Nypa fruticans Wurmb.*) Vinegar on Biochemical Parameters of Type 2 Diabetes Rat Model

Nur Izzati Razali[1], Tri Widyawati[2], Lim Vuanghao[1], and Nor Adlin Yusoff[1]*

[1] Advanced Medical and Dental Institute, Universiti Sains Malaysia, 13200 Kepala Batas, Penang, Malaysia.
[2] Department of Pharmacology and Therapeutic, Faculty of Medicine, Universitas Sumatera Utara, 20155 Medan, Indonesia.

*Corresponding author's email: noradlinyusoff@usm.my

Introduction: Nipa palm vinegar had shown promising blood glucose lowering effects in type 1 diabetes rat model. Thus, this study is designed to further explore the possible antihyperglycemic effect of nipa palm vinegar in type 2 diabetes mellitus. **Methods:** Nipa palm vinegar's aqueous extract was prepared using liquid-liquid extraction. Type 2 diabetes model was induced in *Sprague Dawley* rats using a high-fat diet and low-dose streptozotocin (30 mg/kg body weight). The diabetic rats were treated with three doses of aqueous extract (250, 500, and 1000 mg/kg body weight) for 28 days. Analysis of glucose, insulin, incretin hormones (GLP-1 and GIP), liver enzymes (AST and ALT), DPP4, and lipid profiles (TC, HDL, TG, and LDL) were carried out. **Results**: Single administration of the extract significantly reduced blood glucose levels respectively at the dose of 250 mg/kg, 500 mg/kg, and 1000 mg/kg as compared to the negative control at $p<0.05$. After 28 days of treatment, there were significant differences between the 1000 mg/kg dose and the diabetic group at $p<0.05$ in decreasing the blood glucose and cholesterol levels. A significant ($p<0.05$) increase in the insulin level was observed in the groups treated with NPV at the doses of 1000 mg/kg and 250 mg/kg. In addition, the dose of 250 mg/kg lowered lipid content (TG and LDL) and the level of ALT enzyme in the liver. **Conclusion:** The overall study result has demonstrated the potential of nipa vinegar aqueous extract in normalizing biochemical parameters related to type 2 diabetes mellitus.

Keywords
Nipa Palm Vinegar, Type 2 Diabetes, Streptozotocin, Biochemical Parameters

OF-2

Dexamethasone Reverses *Aspergillus fumigatus*-Induced Severe Asthma by Reprogramming Pulmonary Metabolism

Phyllis X.L. Gan[1], Wupeng Liao[1,2], Hui Fang Lim[3,4], and W.S. Fred Wong[1,2,5]*

[1] Department of Pharmacology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore.
[2] Singapore-HUJ Alliance for Research and Enterprise, National University of Singapore, Singapore.
[3] Department of Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore.
[4] Division of Respiratory and Critical Care Medicine, Department of Medicine, National University Hospital, National University Health System, Singapore.
[5] Drug Discovery and Optimization Platform, Yong Loo Lin School of Medicine, National University Health System, Singapore.

*Corresponding author's email: phcwongf@nus.edu.sg

Introduction: In difficult-to-treat conditions such as cancer and autoimmune diseases, several drugs have demonstrated that reprogramming cellular metabolism translated to anti-inflammatory effects. Corticosteroids are mainstay therapeutic agents for patients with the predominant *Aspergillus fumigatus* (*Af*)-induced severe eosinophilic asthma subtype. Yet, its immunometabolic modulatory mechanism in severe asthma remains unknown. Unravelling this relationship would unearth novel targets that could support candidate drug development efforts aimed at advancing the management of severe asthma. **Methods:** Mice were exposed to repeated intratracheal administrations of *Af* aeroallergen before therapeutic intervention with dexamethasone (1 mg/kg). Extent of airway inflammation was determined through total airway cell counts, histological analysis, and levels of pro-inflammatory cytokines. Real-time shifts in metabolism were measured using Seahorse bioanalyzers in lung single cells and primary eosinophils. Expression of rate-limiting metabolic enzymes were studied via Western blotting and immunofluorescence. Statistical significance was determined by applying one-way ANOVA followed by a Dunnett's test. **Results:** Dexamethasone markedly reduced *Af*-induced airway inflammation as demonstrated by a significant reduction in airway eosinophils ($p<0.0001$), extent of peribronchial infiltration ($p=0.0013$), and levels of pro-inflammatory cytokines interleukin (IL)-4 ($p=0.0043$), IL-13 ($p=0.0473$), and eotaxin-1 ($p=0.0014$). This was accompanied by a suppression in glycolytic activity and key glycolytic enzymes, such as the terminal glycolytic enzyme lactate dehydrogenase, in both lung single cells and activated ($CD69^+CD80^+$) primary eosinophils. Dexamethasone's anti-inflammatory effects were further accompanied by an overall reduction in glutaminolysis, shown by a reduction in glutaminase ($p=0.001$) and arginase 2 ($p=0.0049$), and fatty acid synthesis, which was demonstrated by a reduction in the palmitate-producing fatty acid synthase enzyme ($p=0.023$). Notably, the reduction in airway eosinophils following dexamethasone treatment was accompanied by an upregulation in eosinophil mitochondrial proton leak ($p=0.0037$). **Conclusion:** Targeting dysregulations in lung glycolysis, glutaminolysis, and fatty acid synthesis, or inducing eosinophil mitochondrial proton leak could be emerging anti-inflammatory strategies against severe asthma.

Keywords
Eosinophil, Metabolic Reprogramming, Inflammation, Steroid, Lung

OF-3

Nimbolide Alleviates Insulin Resistance through Increased Glucose Uptake and Activation of Glucose Transporter 4 (GLUT4) in L6 Myoblasts

Abbirami Balachandran[1], Sameer Sapra[2], Gabriele R. A. Froemming[3], Morak-Młodawska Beata[4], Baskaran Gunasekaran[1], Salini D. Rajendran[5], and Patrick N. Okechukwu[1]*

[1] Department of Biotechnology, Faculty of Applied Sciences, UCSI University, 56000 Cheras, Kuala Lumpur, Malaysia.
[2] Physic Herbal Pvt. Ltd., No. 413, Sector 10 Panchkula, Haryana, India.
[3] Basic Medical Sciences, Faculty of Medicine & Health Sciences, University of Malaysia. Sarawak (UNIMAS), 94300, Kota Samarahan, Sarawak, Malaysia.
[4] Faculty of Pharmaceutical Sciences, Department of Organic Chemistry, Medical University of Sílesia, Jagiellonska Str. 4, 41-200 Sosnowiec, Poland.
[5] Faculty of Social Sciences and Leisure Management, School of Food Studies and Gastronomy, Taylor's University Lakeside Campus, 47500 Subang Jaya, Selangor, Malaysia.

*Corresponding author's email: patrickn@ucsiuniversity.edu.my

Introduction: *Azadirachta indica* (Neem) is a deciduous plant that is native to countries in South Asia including Malaysia. This plant has been widely reported for its pharmacological properties in treating diabetes, neurological disorders, and stomach ulcers. Our previous study showed that the crude extract of *A. indica* was able to prevent the formation of advanced glycation end products (AGEs) via the modulation of aldose reductase (ALR2) and glyoxalase 1 (GLO1) enzymes where nimbolide, a limonoid triterpene, was identified as a major compound through liquid chromatography-mass spectrometry (LC-MS). This study aimed to determine the antidiabetic potential of nimbolide through its glucose uptake ability in L6 myoblasts using glucose transporter 4 (GLUT4). **Methods:** Differentiated L6 myoblasts were treated for 24 hours with 1 mM metformin (positive control) and nimbolide (1, 5 and 10 µM) before performing the glucose uptake assay using the Promega Glucose Uptake-Glo™ Assay Kit and an ELISA test to determine the protein expression of GLUT4 in these cells. The rate of glucose uptake was calculated upon reading the luminescence signals from the glucose uptake assay whereas the GLUT4 concentration was extrapolated from the ELISA standard curve. **Results:** Nimbolide was able to promote glucose uptake in L6 myoblasts in a concentration-dependent manner. This was confirmed with the rate of glucose uptake where cells treated with 10 µM nimbolide was the highest. The ELISA analysis showed that nimbolide was able to stimulate GLUT4 in a concentration-dependent manner, suggesting that the increase in the rate of glucose uptake is associated to the increased protein expression of GLUT4 in the cells. **Conclusion:** Nimbolide showed promising results of promoting glucose uptake in L6 myoblasts through GLUT4, suggesting its potential as a therapeutic compound in treating insulin resistance and diabetes.

Keywords
Nimbolide, *Azadirachta indica,* Glucose Uptake, Glucose Transporter 4, Insulin Resistance

OF-4

In-vitro Alpha-Amylase Inhibitory Activity of Selected Medicinal Plants Used by the Sundanese Community for Managing Diabetes

Raden Maya Febriyanti[1]*, Intan Timur Maesyarah[1], Akhyatun Nisa[1], and Ajeng Diantini[2]

[1] Department of Pharmaceutical Biology, Faculty of Pharmacy Universitas Padjadjaran, Indonesia.
[2] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy Universitas Padjadjaran, Indonesia.

*Corresponding author's email: raden.maya@unpad.ac.id

Introduction: Diabetes mellitus (DM) is a complex, multifactorial disease which demands multiple therapeutic approaches. It is characterised by high blood glucose levels resulting from insufficient insulin production or impaired insulin functionality, hindering glucose uptake by cells. Ethnomedicine and ethnobotany research has indicated that, prior to the discovery of insulin and modern blood glucose lowering medications, traditional herbal remedies were used for diabetes management. The present study aims to evaluate the alpha-amylase inhibitory activity of selected medicinal plants traditionally used to manage diabetes within the Sundanese community in West Java, Indonesia. **Methods:** Dried leaves of *Moringa oleifera L., Physalis angulata L*., and *Annona muricata L.* were individually extracted using 70% ethanol. The α-amylase inhibition assay was performed using human α-amylase inhibitor screening kit. Total phenolic and flavonoid content analyses were determined spectrophotometrically using Folin-Ciocalteu's reagent and aluminium chloride ($AlCl_3$), respectively. **Results:** The study revealed that the highest inhibition of α-amylase activity (19.3%) was achieved by the *A. muricata* leaves extract at a dose of 500 μg/ml. The analysis of total phenolic and flavonoid contents in *A. muricata* leaves extract were 18.97±0.006 mg gallic acid equivalent (GAE)/g and 53.06±0.002 mg quercetin equivalent (QE)/g, respectively. **Conclusion:** These findings provide promising evidence for further investigations into the antidiabetic potential of *A. muricata* leaves.

Keywords
Diabetes Mellitus, Ethnomedicine, *Anona muricata*

OF-5

Investigation of Serum Cartilage Oligomeric Matrix Protein Levels and WOMAC Index in Patients with Knee Osteoarthritis in Bandung, Indonesia

Nyi Mekar Saptarini[1]*, and Resmi Mustarichie[1]

[1] Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, West Java, Indonesia.

*Corresponding author's email: nyi.mekar@unpad.ac.id

Introduction: Osteoarthritis (OA) is often associated with fractures, which can potentially be predicted through the evaluation of serum calcium levels or specific biomarkers like cartilage oligomeric matrix protein (COMP). The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) serves as a reliable tool for assessing the symptoms and physical disability experienced by patients with hip or knee OA. **Objective:** This study aims to investigate association of serum calcium levels, serum cartilage oligomeric matrix protein levels, and WOMAC scores in patients with knee OA. **Methods:** The study recruited patients from the orthopedic clinic of a private hospital in Bandung, Indonesia. There were 18 participants each among normal controls and patients with knee OA who met the inclusion criteria. Serum calcium levels were determined by colorimetry method, serum COMP levels were measured through enzyme-linked immunosorbent assay (ELISA), and WOMAC scores were assessed through a structured questionnaire. **Results:** The study found that the serum calcium level among the patients with knee OA was 113.36 ± 81.04 mg/mL, the serum COMP level was 773.02 ± 343.48 ng/mL, and the WOMAC score was 32.89 ± 0.34. Meanwhile, the serum calcium level and the serum COMP level for normal controls were 210.50 ± 49.26 mg/mL and 534.92 ± 315.55 ng/mL, respectively. **Conclusion:** In the patients with knee OA, the serum COMP level was higher compared to normal controls, indicating increased disease severity. Conversely, the serum calcium level in patients with knee OA was lower compared to normal controls.

Keywords
Health Monitoring, Osteoarthritis, Colorimetry Method, ELISA

OF-6

Simultaneous Quantification of Whole Blood Hydroxychloroquine and Desethylhydroxychloroquine for Lupus Erythematosus Patients

Njundu Jatta[1], Johnson Stanslas[1], Audrey Chee Hui Yong[2], Eng Wee Chua[3], Kang Nien How[1,4]*

[1] Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia.
[2] School of Pharmacy, MAHSA University, Bandar Saujana Putra, Jenjarom, Selangor, Malaysia.
[3] Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia.
[4] Dermatology Unit, Hospital Sultan Abdul Aziz Shah, Universiti Putra Malaysia, Serdang, Malaysia.

*Corresponding author's email: hkangnien@upm.edu.my

Introduction: Hydroxychloroquine is the first-line drug for lupus erythematosus. Quantifying whole blood hydroxychloroquine (WBHCQ) and its metabolite, desethylhydroxychloroquine (DHCQ), provides insight into its pharmacokinetic and pharmacodynamic, for treatment optimization. Methods to detect WBHCQ were previously described with variable detection and quantification limits. However, methods for DHCQ quantification were rarely described. We aimed to develop and validate a method for the detection and quantitation of HCQ and DHCQ for the monitoring of treatment response in lupus patients. **Methods**: A simple and sensitive, high-performance liquid chromatography (HPLC) with fluorescence detection method for the simultaneous detection and quantification of HCQ and DHCQ, in human blood was refined from previously published methods and validated. The blood sample was prepared by precipitating proteins with 2-fold methanol after the addition of internal standard chloroquine (CQ) and separated on an ACER Excel UHPLC C18 column (150 x 4.6 mm with 5 m particle size) as a stationary phase with a mobile phase consisting of 70% acetonitrile, 30% 20 mM sodium monophosphate buffer, and 0.25% v/v triethylamine (pH 8.0). Fluorescence detection was used to detect the analytes at excitation and emission wavelengths of 337 and 405 nm, respectively. **Results**: The method was linear for both analytes over the 3 - 3000 ng/mL range with r^2 >0.999, and the chromatographic run time was 10 minutes. The intra- and inter-day precision values with the %RSD ranged from 1.56% to 14.73%. The method showed a good sensitivity with a LOD and LOQ of 12.41 ng/mL and 37.5 ng/mL for HCQ, and 11.05 ng/mL and 33.5 ng/mL for DHCQ, respectively. Our method has shown similar sensitivity to other published methods. **Conclusion**: This improvised method has successfully detected and quantified both HCQ and DHCQ simultaneously with high sensitivity. This method can be adapted for therapeutic drug monitoring (TDM) for patients on HCQ.

Keywords
Cutaneous Lupus Erythematosus, Hydroxychloroquine, Whole Blood Hydroxychloroquine Concentration, Desethylhydroxychloroquine

OF-7

Rational Based Investigation of Novel Derivatives as Anti-Diabetic Agents Using Multi-Target Drug Discovery Approach

Shweta Mishra1*

[1]Dr. D.Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Pune

*Corresponding author's email: shweta.mishra@dypvp.edu.in

Introduction: Diabetes mellitus is increasing globally, affecting more than 180 million people worldwide. This is prevailing mostly in type 2 diabetes and according to WHO report, the incidence is likely to be more than doubled by 2030. Thiazolidinediones, Metformin, and Sulfonylureas are well known medications for diabetes management. However, cardiovascular risks, weight gain, and potential for hypoglycemia etc. are associated with it, which limits its use. PPAR-α, Irisin, PGRMC2 and AdipoR1 have been identified as attractive anti-diabetic targets as they play a crucial role in regulating glucose-stimulated insulin secretion in pancreatic β-cells without the allied risk of hypoglycemia. **Methods:** In this work, designing strategy relied on making a common pharmacophore having PPAR-α, Irisin, PGRMC2 and AdipoR1 modulating activity. According to the pharmacophore analysis, a series of diverse 254 derivatives were screened. The critical sites responsible for steric interactions, hydrogen acceptor, and donor interactions, and the electrostatic potential between receptor and ligand were pinpointed. For further investigation, individual compounds were docked with the active sites of the receptors, assessing the stability of their complexes with both proteins and determining the final binding orientations of these molecules. Subsequently, the derivatives exhibiting strong binding affinity for all the receptors underwent evaluation for their absorption, distribution, metabolism, and excretion properties. Following this, *in-silico* toxicity studies were also performed. **Result and Conclusion:** The positive results of these compounds suggest their suitability for further exploration in both *in-vitro* and *in-vivo* studies. These derivatives hold potential as promising lead compounds for the treatment of diabetes mellitus.

Keywords:
Molecular Modelling Studies, Irisin, PPAR-α, PGRMC2, AdipoR1

OG-1

Anticancer Potential of Angucyclone Polyketides from *Streptomyces carlesensis* Strain DSD011 against Human Lung, Colorectal, Breast, and Ovarian Cancer Cell Lines

Leah Katrine Bayog[1], May Octaviano[1], Diana Amago[1], Angelica Marie Aguadera[1], Jonel Saludes[2,3,4], and Doralyn Dalisay[1,3,5*]

[1] Center for Chemical Biology and Biotechnology, University of San Agustin, Iloilo City, Philippines.
[2] Center for Natural Drug Discovery and Development, University of San Agustin, Iloilo City, Philippines.
[3] Balik Scientist Program, Department of Science and Technology, Philippine Council for Health Research and Development, Bicutan, Taguig City, Philippines.
[4] Department of Chemistry, University of San Agustin, Iloilo City, Philippines.
[5] Department of Biology, University of San Agustin, Iloilo City, Philippines.

*Corresponding author's email: ddalisay@usa.edu.ph

Introduction: Cancer morbidity and mortality have been increasing at an alarming rate, urging drug discovery programs to discover potential anticancer compounds from natural products. The Philippine marine sediments harbors bacteria that produce metabolites with potent bioactivities, especially those that belong to the genus *Streptomyces*. This study aimed to determine the antiproliferative activity of *Streptomyces carlesensis* DSD011^T isolated from the marine sediments of Islas de Gigantes, Iloilo, Philippines against four cancer cell lines. **Method:** *Streptomyces carlesensis* DSD011^T extract was purified by HPLC to yield semi-pure and pure compounds, which were characterized by spectroscopic analysis (HRMS and NMR). These compounds were tested using MTT assay against cells of human colorectal cancer (HCT-116), human ovarian cancer (A2780), human breast cancer (MCF-7), and human lung cancer (A549) at final concentrations of 100 and 10 µg/mL. The positive controls used were 5-fluorouracil, cisplatin, tamoxifen, and doxorubicin hydrochloride for HCT-116, A2780, MCF-7, and A549, respectively. **Results:** Results showed that several fractions demonstrated cancer cell growth inhibitory activity. Specifically, fraction DSD011G6I2H41 exerted the most notable antiproliferative activity at both testing concentrations. At 100 µg/mL, the fraction showed 85%, 92%, 83%, and 78% growth inhibition against HCT-116, A2780, MCF-7, and A549, respectively. Conversely, the fraction demonstrated 84%, 97%, 92%, and 69% growth inhibitory activity at 10 µg/mL against HCT-116, A2780, MCF-7, and A549, respectively. The MS and NMR analysis indicate that these fractions contain angucycline polyketide compounds, known to have anticancer activities. Additionally, unpaired t-test with Welch correction showed that there is no significant difference ($p \geq 0.05$) between the bioactivities exhibited by fraction DSD011G6I2H41 at concentrations 100 and 10 µg/mL, indicating that the tested fraction has high antiproliferative activity even at a low testing concentration. **Conclusion:** *Streptomyces carlesensis* DSD011^T isolated from the marine sediments of Islas de Gigantes is a promising candidate for anticancer drug discovery.

Keywords
Anticancer, Drug Discovery, Marine Sediment, *Streptomyces carlesensis*

OG-2

Elucidating the Mechanisms of Combination Therapy Using Palm Vitamin E And Commercial Anti Leukemic Drug (Cytarabine) In Cell-Based Models of Acute Myeloid Leukaemia

Nabiha Iran[1,3]*, Sitti Rahma Abd Hafid[1], Ammu K. Radhakrishnan [2], and Abdul Aziz Baba[3]

[1] Nutrition Unit, Product Development and Advisory Services Division, Malaysian Palm Oil Board, No. 6 Persiaran Institusi, Bandar Baru Bangi, 43000, Kajang, Selangor D.E.
[2] Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia Jalan Lagoon Selatan, 47500 Bandar Sunway, Selangor D. E.
[3] International Medical University, Main Campus Bukit Jalil, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur.

*Corresponding author's email: nabiha@mpob.gov.my

Introduction: Acute myeloid leukaemia (AML) is a malignant disease of the bone marrow. The main treatment for most AML is chemotherapy, targeted therapy drug and stem cell transplant. Tocotrienol were proven to demonstrate high antioxidant performance in Chronic Myeloid Leukaemia. **Methods:** Water soluble tetrazolium (WST) assay, Caspase activities, Real Time Polymerase Chain Reaction (RT PCR), and Next Generation Sequencing (NGS) were assessed for three AML cell lines with single isomers of palm tocotrienol (δT3 and γT3) and the mix fraction called tocotrienol-rich fraction (TRF) and AML drug, cytarabine. **Results:** TRF is highly effective in inhibiting cell growth of THP 1, HL 60 and Kasumi 6 at different cell percentage ($p<0.05$). The best inhibition was found in Kasumi 6 with TRF treatment followed by HL 60 and THP 1. For combination study, the best inhibition was also found in Kasumi 6 with combination treatment ($p<0.05$). All caspases' activities in Kasumi 6, THP 1 dan HL 60 are significantly increased in 72 hours of incubation. The expression of MIG-6 gene, a tumour suppressor gene was upregulated while the expression of API-5, an apoptosis inhibitor gene was down-regulated in all three AML cell lines treated with the various forms of T3 with or without cytarabine. In NGS analysis, the highest fragments per kilobase of exon per million mapped fragments (FPKM) value was observed in the HL-60 cells treated with the combination of cytarabine and TRF, followed by HL-60 treated with cytarabine alone. Higher FPKM value observed in the combination group may indicate that there were more genes and interactions involved. NGS study also showed many key genes essential for cell viability were differentially regulated. **Conclusion:** All tocotrienol isoforms demonstrated potent anti-proliferative effects on the three AML human cell lines tested in this study, which was better or comparable to that observed with cytarabine.

Keywords:
Acute Myeloid Leukaemia, Palm Tocotrienol, Tocotrienol Rich Fraction, Next Generation Sequencing, Gene Ontology

OG-3

Design, Synthesis, and *In-Vitro* Biological Evaluation of Novel THQ Derivatives as Anticancer Agents

Rajdeep Dey[1], Suman Shaw[1], Bhumika Patel[1], Hardik Bhatt[1], Saumya Patel[2], Nandan Dixit[2], and Udit Chaube[1*]

[1] Department of Pharmaceutical Chemistry, Institute of Pharmacy, Nirma University, Ahmedabad, 382481, Gujarat, India.
[2] Department of Botany, Bioinformatics and Climate Change Impacts Management, Gujarat University, Ahmedabad 380009, India.

*Corresponding author's email: uditchoube@gmail.com

Introduction: The lack of effective treatments and drug resistance provides significant challenges in the treatment of cancer. PI3K/AKT/mTOR pathway was chosen in the current study as a key alternative target for the mitigation of cancer which can resolve the issue of futile treatment and drug resistance. **Methods**: The mTOR inhibitors were designed based on pharmacophore-based virtual screening findings and the contour map analysis of field-based and atom-based 3D-QSAR models. By combining the virtual hits with the compounds from the preclinical and clinical studies, the common active aspects for activity against mTOR (C1 and C2) were identified leading to a knowledge-based selection of tetrahydroquinoline (THQ) scaffold. Further, these novel tetrahydroquinoline (THQ) derivatives were designed and synthesized. Spectral characterization of these compounds was carried out with the aid of ^{1}H NMR, ^{13}C NMR, and D_2O exchange, confirming the formation of the desired compounds. Moreover, these optimized THQ derivatives were evaluated against the various panel of cell lines viz. colon cancer (HT-29), breast cancer (MCF-7), and lung cancer (A-549). **Results:** Among all the synthesized compounds, compound UC-BzCl-01 showed promising anticancer activity against the panel of these cancer cell lines. Further, FACS analysis of these THQ derivatives was carried out where UC-BzCl-01 demonstrated apoptotic characteristics. **Conclusion:** Based on the results of the study, UC-BzCl-01 may be explored further as a possible mTOR inhibitor and potential anticancer agent.

Keywords
Cancer, Atom Based-QSAR, mTOR, Tetrahydroquinoline, Apoptosis

OF-4

Synthesis of New Xanthone Derivatives with Potential Aromatase Inhibitory Activity as Anticancer Agents against Oestrogen-Receptor Positive (MCF-7) and Triple-Negative Breast Cancer (MDA-MB-231) Cell Lines

Salsabiilaa Mohd Razib[1]*, Nadiah Mad Nasir[1], Johnson Stanslas[2], Muhammad Alif M. Latif[3] and Pavithren Devakrishnan[1]

[1] Department of Chemistry, Faculty of Sciences, Universiti Putra Malaysia, Selangor, Malaysia.
[2] Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia.
[3] Centre of Foundation, University Putra Malaysia, Selangor, Malaysia.

*Corresponding author's email: salsabiilaarazib@gmail.com

Introduction: Breast cancer is characterized by the relentless division of cells, leading to the development of solid tumors and the potential for metastasis. World Health Organization in 2020 reported about 2.3 million women affected and 685000 deaths due to breast cancer. Available therapeutic agents for breast cancer are associated with severe toxicities. Therefore, there is a need to determine potential new aromatase with better selectivity. **Methods:** The Grover, Shah, and Shah (GSS) reaction method was employed to achieve the synthesis of xanthonoids in a one-pot procedure. To create the xanthonoid product, phenol-benzoic acid condensation and direct cyclisation of the benzophenone intermediate are required. The xanthonoid products were screened for cytotoxicity using the 3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide (MTT) assay at a concentration of 10 µM, against oestrogen-receptor positive (MCF-7) and triple-negative breast cancer cell line (MDA-MB-231). The determination of the selectivity index (SI) involved the utilisation of human epidermal keratinocyte (HaCaT) and macrophage (Raw 264.7) cell lines. **Results:** The synthesis of xanthone derivatives (compounds 1-21) was accomplished. Sequel to the screening test, compound 6 was chosen as an active compound due to its strong growth inhibitory activity (~80%) against MCF-7. However, there is a weak inhibitory activity against MDA-MB-231 (98.92 ± 2.76 %). The half-maximal inhibitory concentration (IC_{50}) value of compound 6 against MCF-7 (cancer cell), HaCaT, and Raw 264.7 (normal cell lines) were 7.00 ± 0.00 µM, 250.00 ± 70.71 µM and 800.00 ± 0.00 µM with SI 35.71 and 114.29 respectively. This indicates compound's selectivity against tumor cells. **Conclusion:** The findings of precent study revealed that compound 6 exhibits significant efficacy against MCF-7 indicating its promising potential in inhibiting human breast cancer.

Keywords
Breast Cancer, Selectivity Index, Therapeutic Agents, Toxicity, Xanthones

OG-5

The Effect of Wnt Signaling Activation on *AXIN2* level and Spheroid Formation in TMEPAI Knockdown Colon Cancer Cell lines

Riezki Amalia[1,2,3]*, Hasnah Muzakiyyah[1,3], and Ajeng Diantini [2,3]

[1] Cells and Molecular Biology Laboratory, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.
[2] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia.
[3] Center of Excellence in Pharmaceutical Care Innovation, Universitas Padjadjaran, Bandung, Indonesia.

*Corresponding author's email: riezki.amalia@unpad.ac.id

Background: TMEPAI is a novel oncogenic protein constitutively and highly expressed in cancers. TMEPAI is associated with poor prognosis, whereas the mechanism of how TMEPAI is involved in tumorigenesis is not entirely understood. TMEPAI is known as a TGF-β related molecule, and our previous finding showed that TMEPAI knockout in triple-negative breast cancer cell lines promoted β-catenin nuclear accumulation and upregulated *AXIN2* levels. Here, we investigate the effect of Wnt signaling activation on *AXIN2* level and spheroid formation in TMEPAI knockdown cells in colon cancer. **Methods:** Caco-2 and DLD-1 cells were used in this experiment as colon cancer models. Wnt3A conditioned medium activates Wnt signaling. The *AXIN2* level was quantified using qRT-PCR methods, and *in vitro* tumorigenesis was performed using spheroid formation assay. **Results:** In activated Wnt signaling, the *AXIN2* level was not significantly induced in Caco-2 cells and up-regulated in DLD-1 cells. TMEPAI knockdown in Caco-2 cells increased sphere sizes compared to the control, and Wnt3A treatment further increased the size and number of spheres. TMEPAI knockdown reduced the size and number of spheres compared to control in DLD-1 cells, and Wnt3A treatment further reduced sphere size and number. According to the Sanger database, Caco-2 and DLD-1 cells have constitutively activated Wnt signaling by APC mutation, while only Caco-2 cells have additional *SMAD4* and *CTNNB1* mutation. **Conclusion:** This result shows different effects of TMEPAI knockdown on *AXIN2* level and spheroid formation by different activated signaling and mutation in colon cancer cell lines.

Keywords
TMEPAI, Signaling Activation, Wnt Signaling, Tumorigenesis

OG-6

The Antinociceptive Effects of 5-HT_3 Receptor Antagonist in Chemotherapy-Induced Peripheral Neuropathy (CIPN) in a Rat Model

Raajeswari Satiamurthy[1], Norazrina Azmi[1], Che Aishah Nazariah Ismail[3], Noraida Mohamed Shah[2], and Nor Syafinaz Yaakob[1]*

[1] Centre for Drug and Herbal Development, Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Kuala Lumpur, 50300, Malaysia.
[2] Department of Physiology, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia.
[3] Centre of Quality Management of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, 50300, Malaysia.

*Corresponding author's email: nsy@ukm.edu.my

Background: Chemotherapy-Induced Peripheral Neuropathy (CIPN) is the second most common dose-limiting adverse effect that significantly impacts the quality of life of cancer patients and survivors. Effective treatments for CIPN have so far not been well-defined. Previous studies have shown that various neuropathic pain could be blocked by the 5-HT_3 receptor antagonist. Considering that 5-HT_3 receptor antagonists are already clinically used to treat chemotherapy-induced nausea and vomiting in cancer patients, it is worthwhile to explore 5-HT_3 receptor and its antagonist in CIPN. The present study aims to examine the role of 5-HT_3 receptor and its antagonists on CIPN in rats as animal model. **Methodology:** The effects of 5-HT_3 receptor (palonosetron and ondansetron) on CIPN were examined via mechanical allodynia test using the Von Frey filament method and cold allodynia test using acetone drop. The rats were induced with cisplatin (4mg/kg) weekly up to 3 cycles followed by palonosetron (3.1mg/kg) or ondansetron (148.48mg/kg) treatment orally for 1 week. The nociceptive behaviors were evaluated on the 7th day of the 1-week treatment. The involvement of 5-HT_{3R} was further validated by administrating mCPBG, a 5-HT_{3R} agonist prior to the administration of palonosetron. **Results:** In mechanical allodynia test, our results indicated that both palonosetron and ondansetron significantly reduced cisplatin-induced pain but not for cold allodynia. Palonosetron effectively counteracted mCPBG action which showed that the mechanical allodynia reduction was modulated via 5-HT_3 receptor. **Conclusion:** Blockade of 5-HT_3 receptor by its antagonist induces an antinociceptive effects on CIPN and suggests that the drugs especially palonosetron may have potential clinical utility for the management of CIPN.

Keywords:
Chemotherapy-Induced Peripheral Neuropathy (CIPN); 5-HT_3 Receptor; Palonosetron; Ondansetron

OG-7

Elucidating Interaction of Gold Nanoparticles on Expression of Tumor Necrosis Factor Receptor 2 (TNFR2) Positive Cells in Human Peripheral Blood Lymphocytes of Rheumatoid Arthritis Patients

Fatmawati Lambuk[1], Rohimah Mohamud[1], Asmahan Mohamed Ismail[2], Wan Syamimee Wan Ghazali[3], Ramlah Kadir[1], and Nurul Khaiza Yahya[1]*

[1] Department of Immunology, School of Medical Science, Universiti Sains Malaysia, Kelantan, Malaysia.
[2] Rheumatology Unit, General Medicine Department, Hospital Raja Perempuan Zainab II, Ministry of Health Malaysia, Kelantan, Malaysia.
[3] Department of Internal Medicine, School of Medical Science, Universiti Sains Malaysia, Kelantan, Malaysia.

*Corresponding author's email: nuruliza@usm.my

Introduction: Rheumatoid arthritis (RA) is an autoimmune disease that causes inflammation in the joints. Regulatory T (Treg) cells are very important in keeping the immune system in balance. Previous research revealed that TNFR2+ Treg cells are downregulated particularly during RA inflammation. To tackle this challenge, gold nanoparticles (GNPs) may influence immune responses to enhance the production of TNFR2+ Treg cells. The aim of this study is to elucidate the interaction between GNPs and TNFR2+ Treg cells. **Methods:** The PBMC from RA patients were cultured into different media supplied with lipopolysaccharide (LPS), GNPs, etanercept and tumor necrosis factor-alpha (TNF-α) for two days at 37°C in 5% CO_2. The lymphocytes were harvested and stained with Treg markers: CD4, CD25, CD127, Foxp3, TNFR1 and TNFR2. The phenotyping of the cells was evaluated using flow cytometer and analysis was performed by FlowJo software. **Results:** The proliferation of TNFR2+ Treg cells induced with GNPs is comparable to LPS, etanercept and in TNF-α. Our findings indicate that GNPs have the ability to enhance the proliferation of TNFR2+Treg cells. **Conclusion:** This study offers valuable insights to the understanding of the immunomodulatory impacts of GNPs on TNFR2+ Treg cells and emphasize the possibility of their applications in the field of immunotherapy and the management in RA disease.

Keywords
TNFR2, Rheumatoid Arthritis, Nanoparticles, Autoimmune

OH-1

Prognostic Models Predicting Acute Ischemic Stroke Outcomes: A Population-Based Study

Mustapha Mohammed[1,2], Hadzliana Zainal[1]*, Siew Chin Ong[1], Balamurugan Tangiisuran[1], Fatimatuzzahra' Abd Aziz[1], Norsima N Sidek[3], Irene Looi[4], and Zariah A Aziz[3]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Gelugor, Pulau Pinang, Malaysia.
[2] Department of Clinical Pharmacy and Pharmacy Practice, Ahmadu Bello University, 810107 Zaria, Kaduna, Nigeria.
[3] Clinical Research Centre, Hospital Sultanah Nur Zahirah, 20400 Kuala Terengganu, Terengganu, Malaysia.
[4] Clinical Research Centre, Hospital Seberang Jaya, 13700 Seberang Jaya, Pulau Pinang, Malaysia.

*Corresponding author's email: hadz@usm.my

Introduction: The outcomes after acute ischemic stroke (AIS) management remain variable. This study aimed to develop and validate a prognostic model that predicts 90-day outcomes following a first-ever acute ischemic stroke. **Methods**: We included 899 adult patients (aged 18 years and above) with first-ever acute ischemic stroke enrolled in the Malaysian National Stroke Registry (NSR) from 2010 to 2020. The outcomes measured were all-cause mortality and functional disability measured using the modified Rankin score (mRS) (≥3). A multivariable logistic regression was utilized for the prognostic modeling using 75:25 (development: validation). **Results:** The mean ± SD age of the patients was 60.1 ± 10.8 years, with the majority males (60.8%). The final model predicting mortality and disability included common predictors such as Glasgow coma scale (moderate-severe, GCS ≤8) [adjusted odds ratio, OR 2.66, 95% confidence interval, CI (1.31-5.40); 1.56 (1.00-2.45)], diabetes [2.42 (1.41-4.16); 1.60 (1.60-2.20)], and non-adherence to antiplatelet within 48 hrs. [2.30 (1.26-4.20); 1.99 (1.28-3.09)], to lipid-lowering therapy (2.09 (1.10-4.00); 1.77 (1.26-2.48)], to stroke education [39.61 (21.92-71.57); 11.46 (6.84-19.21)] and to rehabilitation [10.75 (6.00-19.25; 2.19 (1.59-3.09)], respectively. Other predictors of mortality were age ≥ 60 years, non-adherence to dysphagia screening, and antiplatelet upon discharge, while another predictor of disability was the female gender. The final models achieved acceptable validation performance using discrimination and calibration - mortality [AUROC=0.94; HL p=0.630] and disability [AUROC=0.78; HL p=0.967], respectively. **Conclusion:** A validated prognostic model that predicts 90-day mortality and functional disability following the management of the first-ever acute ischemic stroke in Malaysia was developed. The model demonstrated acceptable validation performance. In addition, the model scores could serve as a template for integration into an easy-to-use web-based risk calculator for clinicians, patients and other stakeholders.

Keywords
Acute ischemic stroke, Prognostic model, Mortality, Disability, Modified Rankin scale

OH-2

Predictive Factors for Length of Stay (LOS) Among COVID-19 Patient in Hospital Bandung City, Indonesia

Pricella Aqwilla Ginting[1]*, Lia Amalia[1]*, Arto Yuwono Soeroto[2], and Tjokorde Istri Armina Padmasawitri[1]

[1] Pharmacology-Clinical Pharmacy Department, School of Pharmacy, Bandung Institute of Technology, Bandung, 40161, Indonesia.
[2] Department of Internal Medicine, Hasan Sadikin Hospital, Bandung, 40161, Indonesia.

*Corresponding author's email: pricellaginting@yahoo.com, amalia@office.itb.ac.id

Introduction: As of September 3, 2023, the World Health Organization (WHO) has reported a staggering 770,563,467 confirmed cases of COVID-19, with 6,957,216 unfortunate fatalities, all attributed to the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). The management of COVID-19 frequently necessitates extended hospital stays, which not only strain healthcare resources but also impose a significant economic burden. Thus, it is important to comprehensively investigate the factors that predict the length of hospitalization in COVID-19 cases. **Methods**: This study employed a cross-sectional observational design, utilizing secondary data sourced from the medical records of a provincial hospital in Indonesia. Demographic characteristics, comorbidities, and hospital length of stay data were collected through purposive sampling techniques. The collected data were analyzed using chi-square statistical test. **Results**: Most COVID-19 patients were male, constituting 55.09% of the total cases. The highest proportion of cases fell within the age groups of 30-39 years and 60-69 years, accounting for 24.24% each. The majority of patients presented with comorbidities, with a prevalence of 72.27%. The prevalent comorbid conditions included hypertension, diabetes, asthma, and pneumonia. In 2020, the highest recorded total length of stay (LOS) exceeded 20 days, with an average LOS (AvLOS) of 28.818 days. Significant predictive factors associated with LOS were identified, including age (p-value: 0.001), gender (p-value: 0.0012), and comorbid status (p-value: 0.004). **Conclusion**: Several patient characteristics serve as valuable predictors for hospital LOS among COVID-19 patients. This information can prove instrumental in the development of triage systems and interventions aimed at reducing LOS in these cases.

Keywords
LOS, COVID-19, Predictive Factors.

OH-3

Treatment with Red Yeast Rice Improves Endothelial Dysfunction in Spontaneously Hypertensive Rats

Jiunn Jye Tan[1], Waye Hann Kang[1], Siew-Keah Lee[1], Dharmani Devi Murugan[2], and Wei Chih Ling[1]*

[1] M.Kandiah Faculty of Medicine and Health Science, Universiti Tunku Abdul Rahman, Selangor, Malaysia
[2] Department of Pharmacology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

*Corresponding author's email: lingwc@utar.edu.my

Introduction: Hypertension is closely associated with endothelial dysfunction, a condition caused by an imbalance between nitric oxide (NO) and reactive oxygen species (ROS), leading to impaired endothelium-dependent vasorelaxation due to reduced NO-cyclic GMP (cGMP) signaling. Red yeast rice (RYR) is a traditional folk medicine produced from the fermentation of rice with *Monascus purpereus* mould. RYR is reported to have anti-hypertensive properties but its effect in improving endothelial dysfunction is yet to be fully elucidated. Thus, the present study aimed to investigate if treatment with RYR improves endothelial dysfunction in Spontaneously Hypertensive Rats (SHR). **Methods**: Male SHR of age 10-12 weeks were administered with RYR (100 mg/kg/day). Male Wistar-Kyoto (WKY) rats of same age were used as normotensive controls. Drug administration was performed for 12 weeks through oral gavage. Systolic blood pressure was measured by tail-cuff method. Vascular reactivity was determined using isolated aortic rings in organ bath. The levels of vascular NO and ROS were measured using dihydroethidium (DHE) and difluorofluorescein acetate (DAF-FM) fluorescence assay respectively, while vascular tetrahydrobiopterin (BH_4) and cGMP levels were determined using commercial assay kits. **Results**: Treatment with RYR reduced elevated systolic blood pressure and enhanced endothelium-dependent vasorelaxation in isolated aortic rings of treated SHR. Furthermore, the level of vascular ROS was decreased and the levels of NO, BH_4 and cGMP in the aorta were significantly increased. **Conclusion:** The present study demonstrated that treatment with RYR for 12 weeks improved endothelial dysfunction partly via reduction of oxidative stress, leading to the decreased eNOS uncoupling and enhanced NO-cGMP signaling.

Keywords
Red Yeast Rice, Oxidative Stress, Nitric Oxide, Endothelial Dysfunction, Hypertension

OH-4

An *In Vitro* and *In Silico* Study of The Antihyperlipidemic Effect of (MY-A and MY-B)-4-Quinobenzothiazini Butane-Sulfonic Acids

Kirthani Anamalay[1], Małgorzata Jeleń[2], and Patrick N. Okechukwu[3]*

[1] Department of Food Science with Nutrition, Faculty of Applied Sciences, UCSI University, 56000 Cheras, Kuala Lumpur, Malaysia.
[2] Faculty of Pharmaceutical Sciences, Department of Organic Chemistry, Medical University of Sílesia, Jagiellonska Str. 4, 41-200 Sosnowiec, Poland.
[3] Department of Biotechnology, Faculty of Applied Sciences, UCSI University, 56000 Cheras, Kuala Lumpur, Malaysia.

*Corresponding author's email: patrickn@ucsiuniversity.edu.my

Introduction: Hyperlipidemia, a medical disorder characterized by elevated lipid levels in the blood, is often associated with an increased risk of heart diseases and other cardiovascular ailments. The current line of antihyperlipidemic drugs may have certain undesirable side effects and offer only partial success in treating hyperlipidemia. Hence, the current study aims to investigate the antihyperlipidemic activity of MY-A and MY-B compounds to act as a complement to the current gamut of antihyperlipidemic drugs. **Methods:** L6 myoblasts were used to determine the cytotoxicity of MY-A and MY-B where the cells were cultured and treated with these compounds at a concentration range of 0.01-2.58 µmol/mL for a period of 24 hours. The cell viability was then evaluated using the MTT cytotoxicity assay. Consequently, *in vitro* antihyperlipidemic studies were performed to assess the inhibitory effect of varying concentrations of MY-A and MY-B (0.01-2.58 µmol/mL) on pancreatic lipase, cholesterol esterase and HMG CoA reductase enzymes. Lastly, an *in silico* study was performed using AutoDock Vina 1.2.0 to determine the binding strength of MY-A and MY-B with these enzymes. **Results:** MY-B showed negligible signs of toxicity against L6 cells with an IC_{50} value of 43.27 ± 0.35 µmol/mL. The *in vitro* antihyperlipidemic studies showed that MY-A and MY-B effectively inhibited pancreatic lipase and cholesterol esterase in a concentration-dependent manner. The Lineweaver-Burk plot analysis showed the MY-B displayed the highest level of HMG CoA reductase inhibitory efficacy, at approximately 68%. The *in silico* study corroborated these findings by revealing a strong binding energy of MY-A and MY-B against the three enzymes among which, MY-B showed a significantly stronger affinity to these enzymes as compared to MY-A. **Conclusion:** MY-A and MY-B showed great potential as antihyperlipidemic agents which could provide greater therapeutic benefits in improving cholesterol metabolism and thus, relieving hyperlipidemia.

Keywords
4-Quinobenzothiazini Butane-Sulfonic Acids, Antihyperlipidemic, Pancreatic Lipase, Cholesterol Esterase, HMG Coa Reductase

OH-5

Potential of Flavonoids from Kalamansi Orange (*Citrofortunella microcarpa*) against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS COV-2): An *in-Silico* Analysis

Elvira Yunita[1]*, Umar Yahya[2], Muhammad Daffa Hanifan[2], Novriantika Lestari[3], Mardhatillah Sariyanti[4], Enny Nugraheni[4], Hernita Taurustya[3], and Diah Ayu Aguspa Dita[5]

[1] Department of Biochemistry and Molecular Biology, Faculty of Medicine and Health Sciences, Bengkulu University, Indonesia.
[2] Medical Study Program, Faculty of Medicine and Health Sciences, Bengkulu University, Indonesia.
[3] Department of Pharmacology, Faculty of Medicine and Health Sciences, Bengkulu University, Indonesia.
[4] Department of Microbiology, Faculty of Medicine and Health Sciences, Bengkulu University, Indonesia.
[5] Department of Physiology, Faculty of Medicine and Health Sciences, Bengkulu University, Indonesia.

*Corresponding author's email: elvirayunita@unib.ac.id

Background: Angiotensin converting enzyme-2 (ACE-2), main protease (Mpro), interleukin-6 (IL-6) and tumour necrosis factor alpha (TNF-α) are involved in the pathogenesis of SARS-COV-2. IL-6 and TNF-α influence the occurrence of a cytokine storm which often modulates the severity of COVID-19 in patients. This study aims to determine the ability of hesperidin, a compound from Kalamansi orange, to interact with the active site of ACE-2 and Mpro using the molecular docking method. In addition, the potentials of isosinensetin (ISO), bannamurpanisin (BAN), and 3,5,6,7,8,3',4'-Heptamethoxyflavone (HMF) from Kalamansi orange to interact with IL-6 and TNF-α in inhibiting the occurrence of cytokine storms were also analysed. **Methods:** An in silico study using the molecular docking method was processed by BIOVIA Discovery Studio and Autodock Vina programs. **Results:** Analysis of docking scores and ligand binding and active sites of ACE-2 and Mpro showed that both molecular targets had spontaneous binding (ΔG -12.1 kcal/mol on ACE-2 and -9.5 kcal/mol on Mpro) to hesperidin and could bind on the active site of the receptor. Hesperidin can form bonds spontaneously (ΔG < 0) on the active site of ACE-2 and Mpro proteins based on molecular docking results. The bond between hesperidin compounds was stronger with ACE-2 protein than with Mpro protein. Free Gibbs Energy showed that ISO, BAN and HMF could interact spontaneously to IL-6 and TNF-α. ISO could bond stronger to IL-6 and TNF-α than BAN and HMF based on their Gibbs free energy value. Hesperidin only meets one of the three criteria of Lipinski's Rule of five so that hesperidin can be developed as a non-oral drug whereas ISO, BAN and HMF meets Lipinski's rule of five. **Conclusions**: The present study suggest that flavonoids from kalamansi orange exhibit inhibitory activity against SARS-CoV-2 and may further be developed as effective antiviral drugs.

Keywords
Bannamurpanisin, Hesperidin, Heptamethoxyflavone, IL-6, SARS-CoV-2

OH-6

Effects of Palm Carotene Mixture on Static Bone Histomorphometry of Bovine Bone Scaffold Co-cultured with Osteoblasts and Osteoclasts

Sok Kuan Wong[1]*, Michelle Min Fang Yee[1], Kok-Yong Chin[1], Soelaiman Ima-Nirwana[1], Ekram Alias[2], and Kien Hui Chua[3]

[1] Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.
[2] Department of Biochemistry, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia
[3] Department of Physiology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia

*Corresponding author's email: sokkuan@ukm.edu.my

Introduction: Palm carotene exists naturally in complex mixture consisting of alpha-, beta-, and gamma-isomers. The effects of beta-carotene on bone have been previously reported, but the effects of other isomer either individually or in combination have not been investigated. This study aimed to investigate the effects of palm carotene mixture on static bone histomorphometry using bovine bone scaffold co-cultured with osteoblasts and osteoclasts, serving as an *in vitro* model that mimics endogenous bone microenvironment. **Methods:** The decellularised and demineralised bovine bone scaffold were randomised into five experimental groups: (a) native bone, (b) osteoporotic bone, (c) osteoporotic bone co-cultured with osteoblast-osteoclast, (d) osteoporotic bone co-cultured with osteoblast-osteoclast and treated with 12.5 µg/mL palm carotene mixture, and (e) osteoporotic bone co-cultured with osteoblast-osteoclast and treated with 10 nM alendronate. After 21 days of treatment, bone scaffolds were decalcified and stained with haematoxylin and eosin to assess the static bone parameters. **Results:** Bone scaffolds subjected with decellularisation and demineralisation had lower osteoblast number, osteoclast number, and osteoid surface as compared to native bone. The seeding of osteoblasts and osteoclasts increased osteoclast number in the bone scaffolds as compared to those without bone cells. Treatment of palm carotene mixture increased osteoblast number and osteoid volume as compared to the non-treated bone scaffolds. Bone scaffolds treated of alendronate showed raised osteoid volume as compared to the non-treated bone scaffolds. **Conclusion:** Palm carotene mixture increases osteoblast number and osteoid volume, suggesting its potential bone-protective effects.

Keywords
Bone scaffold, Carotene, Vitamin A, Osteoporosis

OH-7

Risk Analysis of Lead and Cadmium Contamination in Staple Foods in Jakarta and Bandung, Indonesia

Evi Ekayanti Ginting[1]*, Rahmana Emran Kartasasmitha[1], Muhayatun Santoso[2], and Ultriweni Mukhaiyar[3]

[1] School of Pharmacy, Bandung Institut of Technology, Jalan Ganesha10, Bandung 40132, Indonesia.
[2] National Nuclear Energy Agency (BATAN), Bandung, Indonesia.
[3] Statistics Research Division, Faculty of Mathematics and Natural Science, Institut Teknologi Bandung, Indonesia.

*Corresponding author's email: eviginting11@gmail.com

Introduction: Rice is a staple food in Indonesia. There is even a saying in Indonesian society, "you do not say you have eaten before taking rice". Official data from the Food and Drug Monitoring Agency of the Republic of Indonesia suggests an average daily rice consumption of 200 grams/ person, while the Food Security Agency reports a higher figure of 320 grams/ person/ day. Previous research highlighted high levels of heavy metals contamination, particularly lead (Pb) and cadmium (Cd) in rice. According to WHO in 2011, Pb lacks a defined safety threshold, with a Point of Departure (POD) set at 0.6 µg/kg bw/day, capable of causing a 1 IQ point reduction in children while 1.2 µg/kg bw/day linked to a 1 mmHg increase in blood pressure in adults. Contrarily, Cd is considered to have a safety threshold with Provisional Tolerable Monthly Intake (PTMI) set at 25 µg/kg bw/month. This study aims to provide essential risk analysis data related to Pb and Cd exposure through rice consumption. **Methods:** Rice samples sourced from various traditional markets in Jakarta and Bandung underwent analysis for Pb and Cd levels using the Atomic Absorption Spectrophotometry (Graphite Furnace) technique. This data obtained was subsequently used in the calculation of Excess Cancer Risk (ECR), which is linked to the daily rice intake of the Indonesian population. **Results:** The findings of this study reveal that the levels of Pb and Cd in the analyzed rice samples fall within safe thresholds, as determined by the Risk Analysis based on both the measured metal levels and the daily rice consumption per kilogram of body weight among the Indonesian populace. **Conclusion:** Risk analysis related to exposure of Indonesian communities to Pb and Cd through rice consumption is categorized as within safe limits.

Keywords
Risk Analysis, Pb, Cd, Staple Food

OI-1

Assessing The Influence of DOTAP: Lipid Ratio on Lipid Nanoparticles Serving as Genetic Material Delivery System

I Gusti Ngurah Jemmy Anton Prasetia[1,4]*, Diky Mudhakir[1], Catur Riani[2], and Neng Fisheri Kurniati[3]

[1] Department of Pharmaceutics, School of Pharmacy, Bandung Institute of Technology, Jalan Ganesha 10-Bandung, West Java, 40132, Indonesia.
[2] Biotechnology Laboratory, Department of Pharmaceutics, School of Pharmacy, Bandung Institute of Technology, Jalan Ganesha 10-Bandung, West Java, 40132, Indonesia.
[3] Department of Pharmacology, School of Pharmacy, Bandung Institute of Technology, Jalan Ganesha 10-Bandung, West Java, 40132, Indonesia.
[4] Pharmacy Study Program, Faculty of Math and Natural Sciences, Udayana University, Jalan Bukit Jimbaran-Badung, Bali, 80361, Indonesia.

*Corresponding author's email: jemmy_anton@unud.ac.id

Introduction: Lipid Nanoparticles (LNPs) represent a lipid-based delivery system, consisting of both solid and liquid lipids. This unique combination allows LNPs a greater drug loading capacity, making them an ideal carrier for both hydrophilic and hydrophobic drugs. Thus, LNPs are widely used as a delivery system to transport genetic material into the nucleus. Among the diverse array of lipids, cationic lipids play an important role in influencing drug biodistribution and efficacy. One such cationic lipid is DOTAP (1,2-Dioleoyl-3-trimethylammonium propane). This study aims to investigate the effect of varying DOTAP ratios in comparison to other lipid components within LNP formulations. **Method**: LNPs was prepared using emulsification-ultrasonication method. Four different formulations of LNPs were prepared, each featuring a unique DOTAP: Lipids ratio denoted as F1 (0.00), F2 (0.04), F3 (0.08) and F4 (0.15). The physicochemical characteristics of the LNPs, including particle size, polydispersity index and zeta potential measurements were assessed. Furthermore, cell viability test and cellular uptake assay were conducted using Hepa1-6 cells. **Results:** LNP particle size increased with increasing DOTAP concentration across the formulations. Specifically, the particle sizes measured were 73.2±2.1, 118.4±6.4, 131.1±9.7, and 158.3±2.2 nm, respectively. The polydispersity index value also exhibited a corresponding increase, measuring 0.294±0.043, 0.244±0.023, 0.237±0.017, and 0.299±0.019. Being a positively charged lipid, an increase in concentration of DOTAP causes the LNPs to become more positively charged, resulting in surface charges of -3.24±0.80, 5.24±1.20, 7.44±0.65, and 8.65±0.22 mV. Cell viability test and cellular uptake assay were performed using F2 formulation. The IC_{50} value for cell viability was determined to be 218.30 µg/mL. It was observed that cellular uptake of LNP F2 predominantly occurred through Clathrin-Mediated Endocytosis (CME). **Conclusion:** The present findings demonstrate the importance of carefully considering the concentration of cationic lipid bases in LNP formulations, as they would affect both particle size and LNP surface charge.

Keywords
Cationic Lipid, DOTAP, Genetic Material, Lipid Nanoparticle, Physicochemical Properties.

OI-2

Nanoformulation of A Standardised *Andrographis paniculata (Burm.)* Nees Aqueous Extract Improves Pharmacokinetics Profile

Emmanuel Oshiogwe Okwuofu[1], Audrey Yong Chee Hui[2], Jonathan Lim Chee Woei[1], and Johnson Stanslas[1]*

[1] Pharmacotherapeutic Unit, Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
[2] Department of Medicinal Chemistry, Faculty of Pharmacy, MAHSA University, 42610 Jenjarom, Selangor, Malaysia.

*Corresponding author's email: rcxjs@upm.edu.my, jstanslas@yahoo.co.uk

Introduction: The therapeutic efficacy of orally administered natural products is often limited by poor oral bioavailability, which may be due to poor water solubility, limited intestinal absorption, and being substrates of the efflux pump and cytochrome P450. *Andrographis paniculata* (AP) is widely used traditionally with proven prophylactic potential in mouse asthma models. However, the major active phytoconstituents exhibit poor oral bioavailability. This study aimed to formulate and determine the pharmacokinetic profile of a standardised lecithin phospholipid-based nanoformulation of AP aqueous extract (FAPAE) in mice. **Methods**: The optimisation of the nanoformulation was done at various ratios of compound:lecithin (1:1, 1:2, and 1:3) using a thin-film hydration technique. FAPAE was characterised using Zeta nanosizer, transmission electron microscopy (TEM), scanning electron microscopy (SEM), Fourier transmission infrared spectroscopy (FTIR), and encapsulation efficiency (EE) was determined. A single oral dose of 200 mg/kg was administered to female Balb/c mice (6 mice per group). At predetermined intervals of 5, 10, 15, 30, 60, 120, and 180 minutes, animals were anesthetised, and terminal blood samples were collected. The samples were processed using liquid-liquid extraction methods. PKsolver software was used to analyse the pharmacokinetic parameters. **Results**: The optimised FAPAE (1:3) exhibited a vesicular size of 108.60 ± 7.91, a polydispersible index of 0.25 ± 0.01, and a zeta potential of -48.90 ± 4.51 mV. TEM and SEM reveal a spherical-shaped particle, with an EE of 68.15%, 75.00%, and 71.96% for AGP, NAG, and DDAG, respectively. The *in vivo* pharmacokinetics study revealed an increase in the $AUC_{0\text{-}180}$ from 67.63 to 103.45, 297.44 to 365.02, and 125.54 to 163.88, while the absorption rate constant increased from 1.26 to 2.56, 4.03 to 5.09, and 1.44 to 2.19 µM/mL for AGP, NAG, and DDAG, respectively, in FAPAE compared to APAE. **Conclusion**: FAPAE shows promise as a nanoformulation for enhancing the absorption and oral bioavailability of the active compounds found in APAE.

Keywords
Andrographis paniculata, Nanoformulation, Pharmacokinetics, AUC, Andrographolide

OI-3

Calcium Nanoliposomes: Potential Insulin Release Stimulator *In Vivo*

Parhan[1]*, Kusnandar Anggadiredja[1], and Rachmad Mauludin[2]

[1] Pharmacology Laboratory, Department of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia.
[2] Formulation Technology, Department of Pharmacy, Bandung Institute of Technology, Bandung Indonesia.

*Corresponding author's email: parhanmahveen@gmail.com

Introduction: Glucose metabolism triggers ATP production, leading to closure of K-ATP channels, which in turn causes depolarization and the opening of calcium channels. The influx of intracellular calcium concentrations subsequently stimulates insulin secretion. Structural similarity of liposomes and cell membranes render them effective at facilitating the entry of concentrated calcium into pancreatic cells. This study aims to formulate calcium-loaded nanoliposomes for stimulating insulin release in pancreatic cells. **Method:** Calcium nanoliposomes were prepared using thin-layer hydration method. Characterization included observation of morphology, as well as assessment of particle diameter, polydispersity index, zeta potential, pH, and entrapment efficiency. In vivo experimentation was conducted using a glucose load model in a group of male white mice weighing between 30 to 40 grams and aged 40 to 50 days. Each group received a 50% glucose load. Blood glucose levels were measured at 30, 60, 90, 120, and 150-minute intervals using a glucometer. Blood samples (1-2 microliters) were collected from the tail vein. The experimental groups were: Group 1 received calcium nanoliposome, Group 2 received empty nanoliposomes, Group 3 received glibenclamide, and Group 4 received distilled water. **Results:** Glucose tolerance measurements showed significant differences among the groups. The group receiving calcium nanoliposomes showed significant reduction in blood glucose levels compared to the control group. Specifically, in Group 1, blood glucose levels were maintained at 186 mg/dL after 30 minutes of glucose loading, followed by significant reductions at 60, 90, 120, and 150 minutes, with values of 142, 128, 113, and 93 mg/dL, respectively. Group 2 displayed respective blood glucose levels of 277, 240, 205, 155, and 112 mg/dL at the same time points. Contrarily, Group 3 exhibited blood glucose levels of 135, 106, 87, 81, and 71 mg/dL, respectively. **Conclusion:** These results suggest the potential of calcium nanoliposomes as an insulin release stimulant.

Keywords
Calcium, Nanoliposome, Insulin

OI-4

Synthesis, Characterization, Stability of NanoGraphene Oxide Functionalized with Pluronic (NanoGO-PF), and Its Biocompatibility Study in Zebrafish Embryos for Delivery of Hydrophobic Compound

Suhaili Shamsi[1]*, Seri Narti Edayu Sarchio[2], and Faizah Md Yasin[3,4]

[1] Laboratory of Animal Biochemistry and Biotechnology, Department of Biochemistry, Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[2] Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, 43400, Malaysia.
[3] Department of Chemical and Environmental Engineering, Faculty of Engineering, Universiti Putra Malaysia, Serdang, Selangor, 43400, Malaysia.
[4] Institute of Nanoscience and Nanotechnology (ION2), Universiti Putra Malaysia, Serdang, Selangor, 43400, Malaysia.

*Corresponding author's email: sh_suhaili@upm.edu.my

Introduction: Graphene oxide (GO) has yielded new promising potentials as a nanoplatform for various applications, especially in pharmaceutical science. However, the major hurdles of GO in clinical settings are biocompatibility and stability as reported in the literature. The present study investigated the effects of GO functionalization with Pluronic (PF) on the biocompatibility and stability of GO, as well as its capability as a nanocarrier for hydrophobic compound. **Methods:** The GO, NanoGO and PF loaded graphene oxide (NanoGO-PF) were characterized by dynamic light scattering, UV-Vis spectroscopy, Raman spectroscopy, FT-IR, XRD, scanning electron microscopy coupled with EDX, and transmission electron microscopy (TEM). The storage stability of NanoGO-PF and in various media, were evaluated for size, size distribution and zeta potential. Toxicity profile of NanoGO-PF (0-100 µg/mL) on zebrafish embryonic model was recorded for 96 hours post-fertilization. Lastly, the ability of NanoGO-PF to load curcumin (CUR) was assessed. **Results:** NanoGO has a significant smaller hydrodynamic size, compared to GO (~119 nm), but increase in size to ~230 nm was observed following functionalization with PF. The attachment of PF onto NanoGO was found to be ≥50% and was further confirmed with UV-vis and FT-IR analyses. NanoGO-PF was found to be stable in storage and in several biological media. NanoGO-PF exhibited improved biocompatibility in zebrafish embryos with the ability to load CUR at different respective ratios. **Conclusion:** Findings from the present study provide pivotal data on the advancement of a compatible and stable GO nanocarriers.

Keywords
Graphene Oxide, Pluronic, Toxicity, Zebrafish, Stability

OI-5

Customizing Cationic Lipid Nanoparticles for Promising Gene Therapy Applications

Nurul Jummah[1,3]*, Satrialdi[1], Aluicia Anita Artarini[2], and Diky Mudhakir[1]

[1] Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung 40132, Indonesia.
[2] Biotechnology Laboratory, Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung 40132, Indonesia.
[3] Department of Pharmacy, Faculty of Mathematics and Natural Science, Universitas Islam Makassar, Makassar 90245, Indonesia.

*Corresponding author's email: nuruljummah.dty@uim-makassar.ac.id

Introduction: Gene therapy is a medical approach aimed at treating or preventing diseases by addressing fundamental genetic irregularities. Unlike conventional approaches reliant on drugs or surgical interventions, gene therapy employs innovative techniques to rectify genetic anomalies, including gene mutations. This therapeutic approach holds great promise, particularly in its capacity to precisely target the nucleus through the utilization of cationic lipid nanoparticle (cLNP) delivery systems. **Methods**: In this study, we formulated cLNPs using an emulsification methodology. The attributes of cLNPs, including size, polydispersity index, zeta potential, and morphological structure, were assessed using transmission electron microscopy. Entrapment efficiency was also being performed. For cLNP-mediated transfection, incorporation of cationic lipid 1,2-dioleoyl-3-trimethylammonium-propane (DOTAP) enabled electrostatic interactions with nucleic acids. To gauge the penetration ability of cLNPs into TM4 cells and their subsequent nucleus targeting, enhanced green fluorescent protein (EGFP) was used as a marker protein. EGFP served as confirmation for cLNP's efficacy in delivering the pEGFP gene into the nucleus, where the expression of EGFP protein is visually observed via confocal microscopy. **Results**: With a particle size of 146.17±33.47 nm and a positive particle charge of +0.43 mV, the cLNPs showed remarkable ability to penetrate TM4 cells. The polydispersity index showed exceptional size uniformity, with a value of 0.313±0.022 and entrapment efficiency of 90.03±0.055%. The TEM results showed the spherical morphology of these cLNPs, confirming their robust structural integrity. The interaction between materials forming the cLNPs was further evident through the difference in Tm, as observed in the DSC results. The cLNP were also able to internalise the nucleus, as indicated by the expression of EGFP resulting from the successful delivery of pEGFP by the cLNP into the cells. **Conclusion**: The characterization data of these cLNPs shows their potential as an efficacious gene therapy delivery system for addressing complex diseases within cellular contexts.

Keywords
Cationic Lipid Nanoparticle (cLNP), Enhanced Green Fluorescent Protein (EGFP), Gene Therapy, Nucleus, TM4 Cells

OI-6

Cellular Uptake of Liposome from *Mycobacterium smegmatis* in Human Peripheral Blood Monocytes

Nor Asyikin Nordin[1], Siti Suraiya Md Noor[2], Rohimah Mohamud[1], and Ramlah Kadir[1]*

[1] Department of Immunology, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia.
[2] Department of Microbiology and Parasitology, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia.

*Corresponding author's email: ramlahkadir@usm.my

Introduction: Liposomes are a type of lipid-based nanoparticle formed by the self-assembly of phospholipid molecules in an aqueous medium. Liposomes have unique properties such as biodegradable, biocompatible, reduced toxicity, strong immunogenicity, and good target availability. Nowadays there has been attention is focused on liposomes derived from bacterial lipids as potential carriers for targeted delivery in biomedical research for their adjuvant effects on moDCs. Thus, we aim to investigate the cellular uptake of liposomes derived from *Mycobacterium smegmatis* on moDCs. **Methods**: Liposomes were synthesized from total lipids of *M. smegmatis* and characterized by field emission scanning electron microscope (FESEM). MoDCs were sorted from human PBMC. The immature moDCs were treated with LPS, liposomes and inhibitor to form mature moDCs. The uptake of moDCs was observed and analyzed with FACS analysis, FESEM and confocal microscopy. **Results**: FESEM images of liposomes showing the spherical structures with average size between 20nm-80nm that can be classified as small unilamellar vesicles (SUV). For the cell surface marker, the MFI of CD80 and CD86 shows no significant difference compared to control group. FESEM and confocal microscopy images have shown the uptake of liposomes and it was internalized by moDCs. **Conclusion**: We successfully synthesized natural liposomes derived from total lipid of *M. smegmatis* before introducing with moDCs. Therefore, liposomes derived from total lipid of *M. smegmatis* were taken up and internalized by moDCs with the purpose of initiating and modulating immune responses.

Keywords
Liposomes, Inhibitors, moDCs, Cellular Uptake

OI-7

Understanding The Effect of Introducing Biopolymer at Two Distinct Phases During Homogenization in A Double Solvent Evaporation Technique: A Study Using Simvastatin as A Model Drug for Bone Tissue Regeneration

Nur Aliana Hidayah Mohamed[1]*, Ahmad Fareez Mohd Rawi[1], and Khairani Jaapar[1]

[1] Centre of Pre-Clinical Sciences, Faculty of Dentistry, Universiti Teknologi MARA, Jalan Hospital, 47000, Selangor.

*Corresponding author's email: alianahidayah@uitm.edu.my

Introduction: Simvastatin (SIM), a cholesterol-lowering medication, demonstrated potential osteogenic effects, rendering it an attractive choice for bone scaffolds. This research aims to study the encapsulation efficiency, yields, cumulative release, and mechanical properties of porous SIM microparticles (SIM/PMP). Three biopolymers were used in this study, namely chitosan, pectin, and pluronic F127. **Methods**: SIM-loaded-PLGA microparticles with 0.05% and 1% tripolyphosphate -chitosan (TPP-Chi), 0.4% and 1.0% pectin (Pec), and 0.13% and 0.5% of pluronic F127 (F127) were fabricated using double emulsion solvent evaporation. All the biopolymers were added at two distinct positions, either in the internal phase (MM1) or aqueous phase (MM2). All microparticles underwent a 48-hour lyophilization process. The percentage of yields, encapsulation efficiency and SIM cumulative release were further analysed. **Results**: A two-way ANOVA analysis indicated a significant different in the percentage of yield between different group of biopolymers in MM1 and MM2 with $F(6,28) = 4.712$, $p = 0.002$, and partial Eta Square (η^2) = 0.502. A post-hoc analysis was conducted to examine the multiple comparisons of encapsulation entrapment across all groups. Statistically significant difference in SIM release was observed between 0.5% TPP-Chi and 1.0% TPP-Chi at $F(4.263, 10.65) = [11.34]$, $p < 0.001$, and partial Eta Square $\eta^2 = 0.819$, over the 21 days of SIM cumulative release. **Conclusion:** The release profile of SIM/PMP, when compared to SIM/PMP with additional biopolymers using TPP-chi, Pec and F127, demonstrated increased encapsulation efficiency and prolonged release. Notably, formulations such as TPP-Chi 1.0% SIM/PMP (MM2), Pec 1.0% SIM/PMP (MM1), and F127 0.13% SIM/PMP (MM1) exhibited a slower and extended SIM release compared to other formulations. Among all these formulations, F127 0.13% SIM/PMP (MM1) displayed the most favorable mechanical properties.

Keywords
Simvastatin, Chitosan, Pectin, Pluronic Acid, Tissue Engineering

OJ-1

Dependence Potential of Mitragynine (Kratom): Behavioural Pharmacology in Rodents

Norsyifa Harun[1]*, and Illa Syafiqah Johari[1]

[1] Centre for Drug Research, Universiti Sains Malaysia, 11800 Gelugor, Pulau Pinang.

*Corresponding author's email: norsyifaharun@usm.my

Introduction: Kratom (*Mitragyna speciosa* Korth), has been widely explored for its potential therapeutic value as an opioid substitute. However, studies on the physiological and psychological dependence-producing properties of its main psychoactive compound, mitragynine (MG), remains limited. This study examined the dependence-producing effects of MG using operant-scheduled behaviour experiments in rats. The potential therapeutic effect of MG was investigated by comparison to buprenorphine in morphine-dependent rats. The pentylenetetrazol (PTZ) discrimination assay was used to investigate the generalisation effects of withdrawal from MG to anxiogenic PTZ stimulus. **Methods**: The rats received chronic administration of both MG and morphine to assess the development of physiological dependence. This involved monitoring the cessation of drug treatment and observing antagonist-precipitated withdrawal responses. Subsequently, the study examined the effects of MG substitution on naloxone-precipitated morphine withdrawal effects. Concurrently, another group of rats underwent chronic treatment with either MG or morphine, followed by naloxone-induced withdrawal. These rats underwent PTZ discrimination assays at 2-, 8- and 24-hour intervals post the last MG or morphine dose to assess PTZ generalization responses. **Results:** Unlike morphine, MG-treated rats showed no suppression of response rates following cessation of MG treatment. However, withdrawal effects were evident following naloxone precipitation. Higher MG doses (10 and 30 mg/kg) attenuated the naloxone-precipitated morphine withdrawal effects, while smaller doses of buprenorphine (0.3 and 1.0 mg/kg) achieved a similar outcome. In contrast to morphine which produced a time-dependent generalisation to the PTZ stimulus, naloxone did not induce withdrawal effects in MG-treated rats, as they consistently selected the vehicle lever across three withdrawal time points. **Conclusion**: This study suggests that MG induces less severe physiological and psychological dependence compared to morphine, while demonstrating potential in alleviating the physical symptoms associated with morphine withdrawal. These findings align with the desired characteristics of novel pharmacotherapeutic interventions for managing opioid use disorder (OUD).

Keywords
Mitragynine, Kratom, Opioid, Dependence, Rats

OJ-2

Application of Median Nerve Electrical Stimulation to Restore Neuronal Function and Promote Myelin Regeneration after Stroke in Rats

Rui Li[1,2], Jingyi Lu[1], Chengcai Zhang[3], Pengyue Zhang[3], and Kai Ling Chin[2]*

[1] Department of Rehabilitation Medicine, The Second People's Hospital of Kunming, Rehabilitation Hospital affiliated to Kunming University, Kunming, China.
[2] Department of Biomedical Sciences, Faculty of Medicine & Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia.
[3] Institute of Acupuncture, Tuina, and Rehabilitation, The Second Clinical Medical School, Yunnan University of Traditional Chinese Medicine, Kunming, China.

*Corresponding author's email: chinkl@ums.edu.my

Introduction: Upper limb motor dysfunction is one of the common complications of stroke patients. This symptom is associated with disruption of normal neuronal function. Restoration of the upper limb motor dysfunction following stroke remains a major challenge for rehabilitation medicine. Clinically, we had demonstrated that median nerve electrical stimulation (MNES) could significantly improve the upper limb motor function in stroke patients, but the underlying mechanism is still unclear. Myelin regeneration plays an important role in the restoration of nerve function in stroke. In this study, we aimed to investigate the effects of MNES on myelin regeneration in a rat stroke model. **Methods:** Adult male Sprague-Dawley rats (n=24) were divided into three groups, i.e., sham group, left middle cerebral artery occlusion stroke model (MCAO group), and stroke model receiving MNES treatment (MNES group). The MNES group received MNES intervention (once per day for 7 times) on the injured side forelimb at 3 days after MCAO. The neural functional recovery was evaluated by neurological severity score (NSS), Rotarod (RR), and foot fault test (FFT). The expression of myelin basic protein (MBP) was detected by Western blotting. The myelin thickness and number of medullated fibers in the penumbra area were observed by transmission electron microscopy (TEM). **Results:** The MNES group had significantly improved the performance of NSS, RR, and FFT scores compared to the MCAO group ($p<0.01$). Also, the expression level of MBP protein in the MNES group was increased ($p<0.05$). Under TEM, compared to the MCAO group, the MNES group had increased myelin thickness ($p<0.01$) and number of medullated fibers ($p<0.05$), the shape of nerve fibers was regular, and the lamellar structure was dense. **Conclusion:** The MNES treatment could help in restoring neuronal function by promoting the expression of MBP, myelin regeneration, and improving the microstructure of myelin after stroke.

Keywords
Stroke, Median nerve electrical stimulation, Neuronal function recovery, Myelin regeneration

OJ-3

Efficient Synthesis of (-)-Swainsonine Using Inexpensive and Readily Accessible Ascorbic Acid as a Starting Material

Zheng Yang Lee[1], Jhi Biau Foo[1,2]*, Agustono Wibowo[3], and Mohd Fazli Mohammat[4]

[1] School of Pharmacy, Taylor's University, Subang Jaya, Selangor, Malaysia.
[2] Centre for Drug Discovery and Molecular Pharmacology (CDDMP), Faculty of Health & Medical Sciences, Taylor's University, 1, Jalan Taylors, 47500, Subang Jaya, Selangor, Malaysia.
[3] Faculty of Applied Science, Universiti Teknologi MARA (UiTM) Pahang, Jengka Campus, 26400 Bandar Tun Abdul Razak Jengka, Pahang, Malaysia.
[4] Organic Synthesis Laboratory, Institute of Science, Universiti Teknologi MARA (UiTM), 40450 Shah Alam, Selangor, Malaysia.

*Corresponding author's email: jhibiau.foo@taylors.edu.my

Introduction: Swainsonine, an α-mannosidase II inhibitor, demonstrated capability to inhibit glycosylation pathways during pre-clinical investigations. However, this compound fails in clinical trial due to severe side effects including pulmonary oedema and neurological disorders, primarily arise from simultaneous inhibition of both lysosomal α-mannosidase II and Golgi α-mannosidase. To address these challenges, swainsonine analogues exhibiting greater selectivity towards Golgi α-mannosidase, as oppose to lysosomal α-mannosidase, are needed. To create highly selective analogs, it is imperative to begin with the parent compound swainsonine prior substitution. As it is costly to purchase swainsonine directly, we tested and developing a synthesis scheme for the preparation of swainsonine using *D*-isoascorbic acid as the chiral starting material. **Methods:** The medicinal chemistry synthesis pathway for swainsonine involves a series of protection and deprotection steps. Key transformations in the process include Wittig olefination, Huisgen 1,3-dipolar cycloaddition and hydroboration-oxidation. Purification of the products was carried out using the classical column chromatography Si-gel G60 (230-400 mesh, Merck). The 1H and 13C NMR spectra was registered in $CDCl_3$ with Joel Resonance ECZ400S 400 MHz (1H) and 100 MHz (13C), using TMS as the internal standard. High-resolution mass spectra (HRMS) were obtained on an Agilent 6520 Accurate-Mass Quadrupole Time-of-Flight Liquid Chromatography/ Mass Spectrometry (Q-TOF LC/MS) system. Specific optical rotation was determined using Anton Paar MCP 500 polarimeter. **Results:** The parental compound (-)-swainsonine was successfully synthesized from *D*-isoascorbic acid through a 13-step process. Following published protocols, lactol-aldehyde tautomerism issue was encountered, leading to failure in obtaining precursor **8**. We subsequently explored an alternative route and improved the access towards precursor **8** with few additional steps to prevent intramolecular cyclisation. **Conclusion:** In summary, we have succeeded in producing swainsonine skeleton from the inexpensive and readily available *D*-isoascorbic acid. While extending the number of steps involved, present modification led to improved accessibility to olefinic alcohol 8.

Keywords
Swainsonine, Glycosylation, Golgi α-mannosidase, Lactol-Aldehyde Tautomerism

OJ-4

An Ensemble Docking Strategy for The Discovery of Novel Dengue Virus Inhibitors RNA-Dependent RNA Polymerase

Amaal Mohammed Salih Nasr[1], Mohd Basyaruddin Abdul Rahman[1,2], Muhammad Alif Mohammad Latif[1,2], and Bimo A. Tejo[1,2]*

[1]Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400, UPM, Serdang, Malaysia.
[2]Integrated Chemical BioPhysics Research, Faculty of Science, Universiti Putra Malaysia UPM, 43400, Serdang, Selangor, Malaysia.

*Corresponding author's email: bimo.tejo@upm.edu.my

Introduction: Dengue fever is a significant health concern in tropical regions, transmitted by infected mosquitoes. Developing effective antiviral drugs is crucial to combat the disease. The NS5 RNA-dependent RNA polymerase (RdRp) is a potential therapeutic target due to its role in viral replication. This study aims to explore NS5 RdRp as a target for antiviral agents against dengue virus (using an ensemble docking strategy). **Methods:** Molecular dynamics (MD) simulations were conducted to study the behaviour and dynamics of NS5 RdRp apoprotein (PDB code: 2J7U) and the NS5 RdRp complex (PDB code: 2J7W) over 150 nanoseconds (ns). An ensemble docking strategy screened a compound library for potential RdRp inhibitors. **Results:** The root-mean-square deviation (RMSD) analysis revealed stable conformations for both the apoprotein and complex. Ligand binding reduced the complex's flexibility. The observed significant flexibility in the Met342-Arg352 region of the apoprotein, as revealed by RMSF analysis, implies its potential involvement in dynamic structural changes, possibly linked to specific functional activities. The relatively stable dynamics observed in all the modeled systems, with fluctuations ranging from 2.0 to 5.9 Å, suggest that these protein structures are well equilibrated and remain structurally robust without undergoing substantial conformational alterations throughout the simulation. Dynamic cross-correlation matrix (DCCM) analysis duemonstrated shifts in correlation, indicating changes in collective motions. MD trajectories clustered into 225 protein structures, screened with 328 curcuminoids. Ligands 90, 175, and 1CJS displayed high affinity compared to GTP, with ligand 90 showing stable binding interactions. Binding affinity evaluated using MM-PBSA indicated that ligand 90 had a high affinity of -127.6 kcal/mol, suggesting it as a potent RdRp inhibitor for DENV. **Conclusion:** Compound 90 is a potent RdRp inhibitor for DENV. Our analysis offers valuable insights into NS5 RdRp behavior and ligand interactions, aiding antiviral strategy development against dengue virus.

Keywords
Rdrp, Dengue Virus, Ensemble Docking, Molecular Dynamics Simulations, Virtual Screening

OJ-5

RNA Sequencing Reveals Transcriptomic Changes in HEK293 Cells Following Introduction of rs16851030 DNA Variant

Poh Kuan Wong[1], Norazrina Azmi[1], Saiful Effendi Syafruddin[2], Fook Choe Cheah[3], and Eng Wee Chua[1]*

[1] Drug and Herbal Research Centre, Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.
[2] UKM Medical Molecular Biology Institute, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.
[3] Department of Paediatrics, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur, Malaysia.

*Corresponding author's email: cew85911@ukm.edu.my

Introduction: Rs16851030, a single-nucleotide variant located in the 3'-untranslated region of the *ADORA1* gene, has been proposed as a potential marker of caffeine sensitivity in preterm apnoea, aspirin-induced asthma, and the development of acute chest syndrome. However, its functional significance is still unconfirmed. This study aimed to elucidate the functional impact of rs16851030 by using CRISPR/Cas9 to induce physiological changes associated with the DNA variant. **Methods:** The rs16851030 variant was introduced into HEK293 cells through homology-directed repair induced by a combination of a sgRNA, a plasmid-encoded CRISPR enzyme, and a single-stranded oligodeoxynucleotide donor template. Edited cells were then fluorescence-enriched, sorted, isolated, and grown into single-cell clones. The single-base edit was confirmed by Sanger sequencing. Finally, RNA sequencing was performed to elucidate the pathways affected by rs16851030. **Results:** rs16851030-mutant cells were found to be more susceptible to the adverse consequences of hypoxia. Following 24 h of exposure to hypoxia, both CRISPR-edited clones 1 and 2 exhibited lower levels of viability than the wild-type cells (75.45% and 74.47% vs 96.34%). **Conclusion:** Our study therefore provides valuable information about key pathways associated with rs16851030 DNA variant. The molecular mechanisms that underpinned the increased vulnerability to hypoxia should be explored in the future by investigating the transcriptomic changes caused by rs16851030 in hypoxic condition.

Keywords
rs16851030, CRISPR/Cas9, Hypoxia, Caffeine, Preterm Apnoea

OJ-6

Characterization, Cytotoxicity Assessment, and *In Vivo* Evaluation of Chitosan/Alginate Polymeric Nanoparticle-Loaded with α-Mangostin Against Breast Cancer

Nasrul Wathoni[1], Muchtaridi Muchtaridi[2,3,4]*, Ade Irma Suryani[1], Yedi Herdiana[1], Ahmed Fouad Abdelwahab Mohammed[5], Amirah Mohd Gazzali[6], Ronny Lesmana[7] and Made Joni[2,8]

[1] Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia.
[2] Functional Nano Powder University Center of Excellence (FiNder U CoE), Universitas Padjadjaran, Jalan Raya Bandung-Sumedang Km 21, Jatinangor 45363, Indonesia.
[3] Research Collaboration Centre for Radiopharmaceuticals Theranostic, National Research and Innovation Agency (BRIN), Jakarta 10340, Indonesia.
[4] Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia.
[5] Department of Pharmaceutics, Faculty of Pharmacy, Minia University, Minia 61519, Egypt.
[6] School of Pharmaceutical Sciences, Universiti Sains Malaysia, Gelugor 11800, Penang, Malaysia.
[7] Physiology Division, Department of Anatomy, Physiology and Biology Cell, Faculty of Medicine, Universitas Padjadjaran, Sumedang 45363, Indonesia.
[8] Departement of Physics, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Sumedang 45363, Indonesia.

*Corresponding author's email: muchtaridi@unpad.ac.id

Introduction: α-Mangostin (Amg), a compound isolated from the rind of the mangosteen (*Garcinia mangostana* L.), exhibits promising anticancer properties. However, its efficacy has been constrained by low solubility and selectivity towards cancer cells. To address this limitation, researchers have developed chitosan/alginate polymeric nanoparticles (NANO-AMCAL) to increase the efficiency of Amg. Initial *in vitro* research demonstrated the remarkable efficacy of NANO-AMCAL against breast cancer cells. The present study aims to assess NANO-AMCAL's potential for breast cancer treatment in Wistar rats (*Rattus norvegicus*) and determine the optimal dosage. **Methods:** Seven treatment groups, comprising normal (without DMBA induction), control, tamoxifen, Amg Pure (P.Amg), NANO-AMCAL 5 mg, NANO-AMCAL 10 mg, and NANO-AMCAL 20 mg, were established. The rats were subjected to subcutaneous administration of 7,12-dimethylbenz(a)anthracene (DMBA), a carcinogenic substance. Their body weight and tumor volume were measured every three days throughout the treatment period. On day 14, surgical procedures were conducted. Histopathological examinations were carried out on breast and lung tissues to assess the treatment's effectiveness. **Results:** The results showed that NANO-AMCAL significantly enhanced the anticancer activity of Amg in treating breast cancer in Wistar rats. NANO-AMCAL containing 0.33 mg of Amg had a healing effect three times better than 20 mg pure Amg and was comparable to tamoxifen. The effective dose of NANO-AMCAL for anti-breast cancer treatment in Wistar rats was found to be 20 mg, which exhibited a good healing response, and the tumor volume continued to decrease up to 17.43% on the 14th day. Furthermore, histopathological tests showed tissue repair and no metastases. **Conclusion:** These results imply that NANO-AMCAL could be a promising therapeutic choice for the treatment of breast cancer.

Keywords
α-Mangostin, Nanoparticles, DMBA, *In Vivo*, Breast Cancer

OJ-7

Assessment of Anti-Inflammatory Potential of Dayak Onion (*Eleutherine bulbosa* (Mill.) Urb.) Extract in Comparison to Celecoxib

Zuliar Permana[1]*, Normalita Faraz Zefrina[1], Neng Fisheri Kurniati[2], Muhamad Insanu[3], and Diky Mudhakir[1]

[1] Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung 40132, Indonesia.
[2] Department of Pharmacology, School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung 40132, Indonesia.
[3] Department of Pharmaceutical Biology, School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung 40132, Indonesia.

* Corresponding author's email: zuliarp@gmail.com

Introduction: *Eleutherine bulbosa* (Mill.) Urb., commonly known as Dayak onion, has a rich history in traditional medicine due to its diverse health benefits, including anti-inflammatory, anticancer, and immunostimulant activities. This study assessed the *in vitro* anti-inflammatory potential of the ethyl acetate fraction derived from Dayak onion bulb ethanol extract (DOF) in comparison to the nonsteroidal anti-inflammatory drug (NSAID) celecoxib (Cxb). **Methods:** DOF was procured via maceration extraction using ethanol as the primary solvent, followed by a subsequent liquid-liquid extraction using ethyl acetate. The anti-inflammatory activity of DOF was evaluated by measuring its ability to inhibit the production of the proinflammatory mediator nitric oxide (NO) in lipopolysaccharide-induced RAW 264.7 macrophages. **Results:** DOF, at concentrations up to 500 µg/mL, resulted a cell viability of 117.77% in RAW 264.7 macrophages when compared to the control. These data indicate its safety within this concentration range. In contrast, treatment of celecoxib at concentrations of 2 and 10 µg/mL resulted in cell viabilities of 128.99 and 134.04%, respectively when compared to the control. At a higher concentration of 50 µg/mL, however, it resulted in a reduced cell viability of 62.81%. These findings indicate that celecoxib at concentrations of 10 µg/mL or lower can be considered safe for use, whereas at higher concentrations, such as 50 µg/mL or above, it manifests cytotoxic effects on RAW 264.7 macrophages. DOF, at concentrations of 10, 20, 40, and 100 µg/mL provided successive inhibition of NO production in lipopolysaccharide-induced RAW 264.7 macrophage cells at 6.07, 9.52, 15.64, and 24.97%, respectively. Cxb at concentrations of 5, 10, and 20 µg/mL resulted in successive NO inhibitions at 8.89, 18.19, and 28.68%. **Conclusion**: DOF exhibits promising anti-inflammatory properties that warrant further investigation for potential therapeutic applications due to its non-toxic nature and ability to inhibit proinflammatory mediators.

Keywords
Dayak Onion (*Eleutherine bulbosa* (Mill.) Urb.) Extract, Anti-inflammatory Assessment, Celecoxib, Nitric Oxide Inhibition, RAW 264.7 Macrophages

ABSTRACTS OF POSTER PRESENTATIONS

PA-1

Active Targeting Docetaxel-loaded Nanocapsules Primarily Composed of Polycaprolactone, Chitosan-Folate, and TPGS for Lung Cancer Treatment

Muhammad Aiman Irfan Ibrahim[1]*, Rozana Othman[1,2], Chin Fei Chee[3] and Faisalina Ahmad Fisol[4]

[1] Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.
[2] Centre for Natural Products Research & Drug Discovery (CENAR), Universiti Malaya, 50603 Kuala Lumpur, Malaysia.
[3] Nanotechnology & Catalysis Research Centre (Nanocat), Universiti Malaya, 50603 Kuala Lumpur, Malaysia.
[4] Malaysian Institute of Pharmaceuticals and Nutraceuticals (IPHARM), National Institutes of Biotechnology Malaysia (NIBM), 11700 Gelugor, Pulau Pinang, Malaysia.

* Corresponding author's email: aimanedogawa4979@gmail.com

Introduction: Docetaxel, approved for the second-line treatment of advanced non-small cell lung cancer, is associated with several issues, including low tumor selectivity. Encapsulating Docetaxel into folate-functionalized nanocapsules helps to actively target folate receptors (FR) commonly overexpressed on lung tumor surfaces. **Methods:** Docetaxel and sorbitan monostearate are dissolved in ethanol followed by the addition of this ethanolic solution into polycaprolactone dissolved in acetone to form the organic phase. The organic phase is slowly added into the sonicated aqueous phase (TPGS dissolved in distilled water) to form nanoemulsion. The organic solvents are removed using a rotatory evaporator to induce nanoprecipitation. Finally, the chitosan-folate solution is slowly titrated into the sonicated concentrated emulsion followed by centrifugation to collect the nanocapsules. **Results:** Prior to the addition of chitosan-folate, the nanocapsules formed have a negative zeta potential (-18.7 ± 1.3 mV) contributed by the PEGylated surface. The positive-charged chitosan-folate interacts with the negative-charged surface to form the outer coating, a similar concept to ionotropic gelation. The nanocapsules have a median size of around 200 nm suitable for systemic circulation and negative zeta potential (-8.5 ± 0.5 mV), accorded by a novel combination of TPGS and chitosan-folate to mitigate renal elimination linked to positive-charged nanoparticles. The nanocapsule boasts a high encapsulation efficiency of close to 99%. Characterization using a transmission electron microscope reveals that the nanocapsules have a globular structure suitable for parenteral administration. **Conclusion:** The characteristic of nanocapsules produced seems promising to tackle drug delivery issues discussed in various literature. The targeting effectiveness will be determined through *in-vitro* cytotoxicity using lung tumor cells (FR-positive H1299 and FR-negative A549) and normal lung BEAS-2B. Depending on the *in-vitro* results, the effectiveness will be validated further through *in-vivo* pharmacokinetic, biodistribution, and toxicity studies.

Keywords
Non-Small Cell Lung Cancer, Drug Delivery, Docetaxel, Polymeric Nanoparticles, Folate Targeting

PA-2

Design and Development of Self-Propelling, Magnetic, Protein Conjugated Drug Delivery System

Ravindra Wavhale[1]*, Neha Naikwadi[1], Swati Biswas[2], and Sohan Chitlange[1]

[1] Department of Pharmaceutical Chemistry, Dr. D. Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Pune, India.
[2] Nanomedicine Research Laboratory, Department of Pharmacy, Birla Institute of Technology &Science-Pilani, Hyderabad Campus, Medchal, Hyderabad 500078, Telangana, India.

*Corresponding author's email: ravindra.wavhale@dypvp.edu.in

Introduction: Biocompatible, self-propelling and magnetic nanobots with high efficiency for drug loading and tumor targeting emerge as a promising strategy to address serious issues of currently used anticancer drugs. Here, we report plasma protein conjugated magnetic nanobots loaded with doxorubicin as a dynamic and targeting drug delivery platform. **Methods**: Novel magnetic nanobots have been fabricated by conjugating plasma proteins loaded by DOX with Fe_3O_4 nanoparticles. Propulsion and magnetic behaviour, Drug release kinetics and cytotoxicity analysis were studied. **Results**: Chemically conjugated plasma proteins create biocompatible surface which provides large chemical space for drug loading/conjugation and accessibility to multiple bio-macro molecules for tumor targeting e.g., albumin, transferrin etc. Moreover, self-propulsion and magnetic navigation born due to Fe_3O_4 nanoparticles enable this nano-system with dynamic functionality. Fe_3O_4 based nanobots were found to autonomously propel in biologically relevant media such as human blood serum and PBS. Propelling velocity, time and total distance travelled bynanobots were found to be increased with increasing H_2O_2 concentration. The designed nanobots showed pH responsive drug release, representing its selective activation and controlled drug release in tumor microenvironment. Cytotoxicity study confirmed the potential of nanobots to kill cancer cells more effectively than free DOX. **Conclusion:** This research work presenting a novel platform for nanobots that demonstrates multiple functions such as self-propulsion; tumor targeting and pH responsive drug release can be applied for delivery of highly toxic anticancer drugs and other cargo.

Keywords
Self-propelling, Drug Delivery System, Anticancer, Magnetic, Nanobots

PA-3

Nanotheranostics Utilizing 5-Fluorouracil in Cancer Management: An In-Depth Analysis of Efficacy, Safety, and Diagnostic Applications

Yong Sze Ong[1]*, Chee Wun How[1] and Siew Li Teoh[1]

[1] School of Pharmacy, Monash University Malaysia, 47500 Subang Jaya, Selangor, Malaysia.

*Corresponding author's email: Ong.YongSze@monash.edu

Introduction: The utilisation of nanocarriers for drug delivery in cancer treatment is further enhanced by incorporating diagnostic functionality. These dual-purpose nanotheranostic agents (NTAs), serve as a single platform capable of both treatment and real-time monitoring of cancer progression simultaneously. The wide range of materials utilised in constructing NTAs may lead to significant variations in their properties. Therefore, a systematic review was conducted to consolidate current NTAs incorporating 5-fluorouracil (5FU) and elucidate their differences in toxicity, efficacy, and imaging performance. **Methods:** Medline and Embase databases were searched up to 18th March 2022 to include articles with keywords of "cancer," "theranostics," "nanoparticle," "*in vivo*" and "fluorouracil" in combination. Publications were screened if they met the following criteria: original research involving 5FU, utilising an animal cancer model, and reported outcomes related to efficacy, toxicity, or diagnostics. **Results:** Nine studies were included in the analysis, with 44.4% developing NTAs using inorganic materials, mainly gold nanoparticles. Another 33.3% developed NTA using the hybrid of organic and inorganic materials while two studies used organic material only to achieve nanotheranostic properties. The 5FU-NTAs were categorised based on their functions: active targeting only (50.0%), thermal ablation only (33.3%) and a combination of both (16.67%). Irrespective of the materials used, all functionalised NTAs consistently outperformed the non-functionalised nanoparticles, evidenced by a tumour volume reduction exceeding 40% compared to the control. All NTAs did not result in significant toxicity based on the body weight change. For imaging, the NTAs tagged with targeting moiety achieved maximum tumour accumulation faster (within 6 hours). **Conclusion:** The functionalised NTAs hold promises for all-in-one management of advanced cancer. To further improve the quality of current preclinical practice, this review proposed a checklist of parameters (PICANT) to recommend researchers for nanoparticle testing in animal cancer studies.

Keywords
Nanoparticles, Cancer, Thermal Ablation, Tumour-Targeting, *In Vivo*

PA-4

Anticancer Potential of Andaliman (*Zanthoxylum acanthopodium* DC.) Fruit Ethanol Extract

Anis Yohana Chaerunisaa[1]*, Siti Fauziyah ZD Sutisna[1], Riezki Amalia[1], and Damaris Hutapea[1]

[1] Faculty of Pharmacy, Padjadjaran University, Jl. Raya Jatinangor Km 21,5, Sumedang Jawa Barat, Indonesia.

*Corresponding author's email: anis.yohana.chaerunisaa@unpad.ac.id

Introduction: Andaliman (*Zanthoxylum acanthopodium* DC.) is a shrub renowned for its fruit, a widely used spice in traditional cuisine. The 70% ethanol extract of Andaliman fruit is enriched with alkaloids, polyphenols, terpenoids and flavonoids which are recognized for potential anticancer activity. This research aims to study anticancer potential of Andaliman Fruit Ethanol Extract (EEBA) by evaluating its cytotoxic effects on MCF-7 breast cancer and HEK 293-A human embryonic kidney cell lines. **Methods:** EEBA was prepared from the fruits using 70% ethanol. Phytochemical screening on the extract was conducted by using Harborne method. Cytotoxicity assessments were conducted using the WST-1 method on both HEK 293-A and MCF-7 cell lines. Measurements were taken at 450 nm. Annexin V-PI staining was used to analyse cell death via apoptosis. Non-linear regression analysis was performed using GraphPad Prism and Microsoft Excel 2016. **Results:** Phytochemical screening of EEBA revealed the presence of alkaloids, polyphenols, flavonoids, monoterpenes, and steroids. The IC_{50} values for EEBA were determined to be 67.42 µg/mL for HEK 293-A cells and 100.2 µg/mL for MCF-7 cells. To assess selectivity, the toxicity of the extract on MCF-7 cells was compared to normal HEK 293-A cells, resulting in a selectivity value (IS) of 0.67. A high selectivity index is typically considered when IS > 3. Hence, the extract was considered to have low selectivity against MCF-7 cell line. Annexin V-P1 results revealed the early stage of apoptosis, as well as necrosis. **Conclusion:** EEBA showed potential cytotoxicity against both HEK 293-A and MCF-7 cell line, with IC_{50} values of 67.42 µg/mL and 100.2 µg/mL, respectively.

Keywords
Andaliman, *Zanthoxylum acanthopodium* DC., Cytotoxicity, MCF-7 Cell

PA-5

The Role of Peroxisome Proliferator-Activated Receptor-β/δ Antagonist in Melanogenesis

Ziqing Xi[1], Johnson Stanslas[1], Kang Nien How[2], Kok Wai Lam[3] and Jonathan Chee Woei Lim[1]

[1] Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia.
[2] Dermatology Unit, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia.
[3] Centre for Drug and Herbal Development, Faculty of Pharmacy, Universiti Kebangsaan Malaysia.

*Corresponding author's email: cheewoei85@upm.edu.my

Introduction: Peroxisome proliferator-activated receptor-β/δ (PPARβ/δ) is a ligand-activated transcription factor that belongs to the superfamily of nuclear hormone receptors. Antagonists targeting PPARβ/δ have been known to play an important role in various cellular responses including cell proliferation, differentiation, regulation of inflammation, and the maintenance of energy homeostasis. Notably, PPARβ/δ is expressed in both mouse and human melanocytes. The role of PPARβ/δ in melanogenesis remains unexplored. **Methods:** The B16F10 murine melanoma cell line derived from C57BL/6J mouse was exposed to a novel PPARβ/δ antagonist. The melanin secretion and the expression of Microphthalmia-associated transcription factor (Mitf) were subsequently assessed. **Results:** The exposure of B16F10 cells to the PPARβ/δ antagonist led to a significant reduction in melanin secretion by these cells when stimulated by alpha-melanocyte stimulating hormone. Importantly, this reduction in melanin secretion did not induce toxicity in the cells. A concomitant decrease in Mitf expression within mouse melanoma B16/F10 cells after the treatment was also noticed. **Conclusion:** Our results suggest that PPARβ/δ might play a role in regulating melanogenesis.

Keywords
Peroxisome Proliferator-Activated Receptor-β/δ, Antagonists, Melanogenesis

PA-6

A Broad-Spectrum Antiviral Targeting RNA Viruses

Chin Piaw Gwee[1], Tommaso Felicetti[2], Kitti Wing Ki Chan[3], Sylvie Alonso[4], Min Jie Alvin Tan[1], Wint Wint Phoo[3], Giuseppe Manfroni[2] and Subhash G. Vasudevan[1,3]*

[1] Program in Emerging Infectious Diseases, Duke-NUS Medical School, 8 College Road, Singapore 169857.
[2] Department of Pharmaceutical Sciences, University of Perugia, Via del Liceo, 1-06123-Perugia, Italy.
[3] Centers for Global Health Discovery, Duke-NUS Medical School, 8 College Road, Singapore 169857.
[4] Infectious Diseases Translational Research Program, Department of Microbiology & Immunology, Yong Loo Lin School of Medicine, Singapore.

*Corresponding author's email: subhash.vasudevan@duke-nus.edu.sg

Introduction: Dengue virus (DENV), a mosquito-borne flavivirus, continues to be a major public health threat in many countries and there are no antiviral therapeutics available. Limited protective efficacy across four dengue serotypes of the current available DENGVAXIA and QDENGA vaccine prompt the need to search for alternative. **Methods:** In this work, we discovered a sulfonyl anthranilic acid (SAA) derivative of the 2,1-benzothiazine 2,2-dioxide core that was previously used to develop DENV NS5 polymerase inhibitors. Dose-response inhibition experiment of SAA against DENV was performed to determine the EC_{50} and CC_{50} values. Time-of-drug-addition assay (TODA) was carried out to investigate the mechanism of action of the most potent compound - FlaR18, followed by quantification of viral RNA level and viral protein production. The efficacy of FlaR18 is also evaluated in different cell lines. Thermal proteome profiling (TPP) was performed to investigate the binding target of FlaR18. **Results:** Of the 38 SAA derivatives, several exhibited potent anti-DENV-2 activity in the cell-based inhibition assay, but surprisingly did not inhibit DENV NS5 polymerase activity. Notably, compound FlaR18 showed EC_{50} values in the range of 0.3 to 0.6 μM against the four dengue serotypes (DENV-1-4) and different RNA viruses. Time of addition assay revealed that analogue FlaR18 is a post-entry replication inhibitor that appears to be specific for cells of primate origin, implicating a host target. We have taken a high throughput proteomic approach, Cellular Thermal Shift Assay coupled to Mass Spec (MS-CETSA), to identify potential host targets that are currently being validated in gene knock out assays to elucidate the mechanism of action for compound FlaR18**.** **Conclusion:** Compound FlaR18 could serve as a lead for more potent inhibitors against the target since it also shows similar antiviral efficacy against other RNA viruses that have been tested.

Keywords
Dengue Virus, Host-Directed Antiviral, Cell-Based Infection Assay, Mass-Spectrometry

PA-7

Exploring the Therapeutic Potential: *In Vitro* Assessment of the Dietary Supplement L-Citrulline's Antiglycation and Antioxidant Properties

Jessa Marielle U. Paulines[1]*, Nwabueze Okechukwu[2], and Charlie A. Lavilla Jr.[3]

[1] Department of Chemistry, Mindanao State University-Iligan Institute of Technology, Tibanga, Iligan City, Lanao del Norte, Philippines.
[2] Department of Biotechnology, University College Sedaya International, Cheras 56000, Kuala Lumpur, Malaysia.
[3] Department of Chemistry, Mindanao State University-Iligan Institute of Technology, Tibanga, Iligan City, Lanao del Norte, Philippines.

*Corresponding author's email: jessamarielle.paulines@g.msuiit.edu.ph

Introduction: Diabetes mellitus (DM) is a worldwide health issue characterized by hyperglycemia due to insulin resistance, which causes protein glycation and oxidative stress. Protein glycation and oxidative stress play critical roles in the pathogenesis of DM by contributing to impaired insulin sensitivity and pancreatic beta-cell dysfunction. The rising prevalence of diabetes mellitus has spurred a search for a new, affordable, and effective medication. The primary goal of this study is to investigate the anti-glycation and antioxidant properties of the dietary supplement L-Citrulline. **Methods:** The researcher employed a two-reaction model system to study the dietary supplement L-Citrulline's impact on advanced glycation end product (AGE) formation. This involved in vitro assays, including the BSA-Glucose and BSA-MGO assays. Additionally, the supplement's antioxidant abilities were assessed by measuring its metal ion binding capacity through absorbance reading and its reactive oxygen species scavenging potential using differentiated C2C12 myoblasts in a fluorescence measurement. **Results:** In antiglycation assays, at 100 ppm, dietary supplement L-Citrulline inhibited AGEs by 52.19 ± 0.39% (BSA-Glucose) and 49.64 ± 0.27% (BSA-MGO) when compared to the control. It also chelated Fe^{2+} ions, reducing activity by 68.58 ± 0.45% at 100 ppm when compared to the control. In the reactive oxygen species assay with Glucolipotoxicity (GLT) media, reactive species levels increased significantly by 173.48 ± 9.37% compared to the control, but adding 10 mM, dietary supplement L-Citrulline reduced this increase significantly to 98.42 ± 5.04%. These findings suggest that dietary L-Citrulline has therapeutic potential in eliminating reactive oxygen species (ROS) in skeletal muscle cells as a dietary supplement. **Conclusion:** The study findings indicate that L-Citrulline, a dietary supplement, effectively inhibits glycation at various concentrations and demonstrates significant antioxidant efficacy. These results suggest its potential as a treatment for diabetes mellitus.

Keywords
Type 2 Diabetes Mellitus, Hyperglycemia, *In vitro*, Dietary Supplement L-Citrulline

PA-8

α-Amylase and α-Glucosidase Inhibitory Potential of the Different Solvent Extracts from the Air-Dried Leaves of *Crescentia cujete* Linn.

Jizel Mae G. Nuñeza[1], Charlie A. Lavilla, Jr.[2], Maria Distressa G. Billacura[2], and Merell P. Billacura[1]*

[1] Department of Chemistry, College of Natural Sciences and Mathematics, Mindanao State University-Main Campus, Marawi City, Lanao del Sur 9700, Philippines.
[2] Department of Chemistry, College of Science and Mathematics, Mindanao State University-Iligan Institute of Technology, Lanao del Norte 9200, Philippines.

*Corresponding author's email: merell.billacura@msumain.edu.ph

Introduction: Diabetes mellitus is characterized by high blood sugar levels resulting from defects in insulin secretion, insulin action, or both, in the absence of treatment. Approximately 90% of people with diabetes are classified as having type 2 diabetes mellitus (T2DM), 8% have type 1 diabetes mellitus (T1DM), and 2% have a rare type of diabetes. *Crescentia cujete* Linn., commonly known as Calabash Tree, had previously been reported to possess antimicrobial, anti-inflammatory, analgesic, antioxidant, and antidiabetic properties. It had been widely used as an herbal medicine in rural areas of the Davao region in the Philippines. The present study aims to investigate the *in vitro* antidiabetic potential of the different solvent extracts from the air-dried leaves of Calabash Tree. **Methods:** Secondary metabolites of the crude ethanol, partitioned ethanol/ hexane, and ethyl acetate extracts of the air-dried leaves of *Crescentia cujete* Linn. were assessed qualitatively. *In vitro* α-amylase and α-glucosidase inhibition assays were conducted. **Results:** Qualitative screening of the secondary metabolites showed the presence of flavonoids, saponins, alkaloids, saponins, reducing sugars, and condensed tannins in all the solvent extracts. Notably, the ethyl acetate solvent extract exhibited significant inhibition of 75.43% against α-amylase and ethanol solvent extract demonstrated significant inhibition of 57.12% against α-glucosidase. **Conclusion:** This study demonstrates that air-dried leaves of *Crescentia cujete* Linn. could serve as a valuable source of secondary metabolites capable of combating α-amylase and α-glucosidase activities.

Keywords
Phytochemical Screening, Calabash Tree, Diabetes Mellitus

PA-9

Chlorophytum alismifolium Baker Ameliorates Hyperglycaemia: Correlation Between Blood Glucose Levels and Some Biomarkers

Abubakar A.[1]*, Jimoh A.[2], Nazifi, A.B.[3], Hassan, F.I.[1], Usman M.A.[4], Galadanchi F.A.[5], Danraka, R.N.[1], Yunusa, I.[1], Tiiba, J.I.[1], Abubakar, A.Z.[5], and Abdurahman, E.M.[5]

[1]Department of Pharmacology and Therapeutics, Ahmadu Bello University, Zaria, Nigeria.
[2]Department of Human Physiology, Ahmadu Bello University, Zaria, Nigeria.
[3]Department of Pharmacology and Therapeutics, Bayero University, Kano, Nigeria.
[4]Department of Biochemistry, Ahmadu Bello University, Zaria, Nigeria.
[5]Department of Pharmacognosy and Drug Development, Ahmadu Bello University, Zaria, Nigeria.

*Corresponding author's email: abdulhakimevuti@ gmail.com, aabdulhakim@abu.edu.ng

Introduction: Medicinal plants are widely utilized in the management of many ailments. *Chlorophytum alismifolium* Baker ameliorates diabetes mellitus and its complications. This study focused on the antihyperglycaemic effect of *C. alismifolium* and the correlation of blood glucose level with some biomarkers using the Enzyme-linked Immunosorbent Assay (ELISA) technique. **Method**: Diabetes was induced in rats using streptozotocin. The rats were administered graded doses (150, 300 and 600 mg/kg) of the various extracts and fraction of *C. alismifolium* daily for 28 days. Blood glucose was measured weekly and serum dipeptidyl peptidase 4, (DPP-4) and peroxisome proliferator activated receptor gamma (PPAR-ɤ) levels were evaluated at the end of the study using ELISA technique. SPSS Version 20 was used for the analyses. Data were expressed as Mean ± Standard Error of the Mean (S.E.M.) and the differences between means were analyzed using One way and Repeated Measure ANOVA followed by Bonferoni's post hoc. Pearson's correlation analysis was performed to measure the association of blood glucose levels on day 28 with serum PPAR-ɤ, AR and DPP-4. Values of P≤ 0.05 were considered statistically significant. **Results**: Induction of diabetes significantly (p<0.001) raised the blood glucose level in hyperglycaemic rats compared to the normal control. Administration of the various extracts and fraction of *C. alismifolium* significantly (p<0.05) lowered the blood glucose levels compared to the hyperglycaemic control and over time. Ethyl acetate extract of *C. alismifolium* (EACA) produced the best glycaemic control and significantly (p<0.05) increased PPAR-ɤ expression and markedly (p<0.05) decreased serum levels of DPP-4. Pearson's correlation analysis revealed a significant negative correlation (p<0.001) between the blood glucose levels and PPAR-γ. However, a significant positive correlation was observed between the blood glucose levels and DPP-4 (p<0.001). **Conclusion**: EACA elicits antihyperglycaemic activity which is possibly mediated through increased PPAR-ɤ expression and decreased serum level of DPP-4.

Keywords:
Chlorophytum alismifolium, Dipeptidyl peptidase 4, ELISA, Hyperglycaemia, Peroxisome proliferator activated receptor gamma

PA10

Assessment of a Self-Micro Emulsifying Drug Delivery System for Enhancing the Dissolution of Atorvastatin and Apigenin

Sarmad Abdulabbas Kashmar[1,2], Siok Yee Chan[1]* and Muqdad Alhijjaj[3]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM Penang, Malaysia.
[2] Al-Fayhaa Teaching Hospital, Basrah Health Directorate, 61001 Basrah, Iraq.
[3] College of Pharmacy; University of Basrah, 61001 Basrah, Iraq.

*Corresponding author's email: sychan@usm.my

Introduction: Poorly water-soluble orally administered drugs often encounter dissolution challenges due to limited aqueous solubility. This study focuses on enhancing dissolution through self-micro emulsifying drug delivery systems (SMEDDS). It aims to improve the dissolution of atorvastatin and apigenin in fixed dose combination, both Biopharmaceutical Classification System Type 2 drugs, using well-optimized SMEDDS formulations in various vehicles. **Methods:** Lipid-based systems were meticulously developed for atorvastatin-apigenin, capable of forming Self-Micro Emulsifying Drug Delivery Systems (SMEDDS). These systems incorporated key components, including an oil phase (Capmul MCM and black seed oil) and a surfactant/co-surfactant or co-solvent phase (Cremophor RH40, Transcutol HP, PEG400). Evaluation of the SMEDDS encompassed critical quality attributes like size distribution and drug dissolution profiles, alongside assessments of dilution effects, transmittance, zeta potential, polydispersity index (PDI), and solubility profiles. **Results:** SMEDDS formulations yielded negatively charged dispersions, typically sized between 20-80 nanometers at varying dilutions. All SMEDDS showed rapid drug release, with about 90% released within 10-20 minutes, indicating improved release compared to unprocessed drug powder. Formulations remained stable upon dilution. Visual inspection, size distribution, and zeta potential of SMEDDS stored at 25°C and 40°C remained unchanged. Enhanced drug release in SMEDDS was attributed to stable nano-sized dispersions and high drug solubility within the formulation. **Conclusion:** The lipid-based systems incorporating Capmul MCM or black seed oil, along with Cremophor RH40, Transcutol HP, or PEG400, successfully generated Self-Micro Emulsifying Drug Delivery Systems (SMEDDS). These SMEDDS formulations resulted in a substantial improvement in the dissolution of both atorvastatin and apigenin, accompanied by optimized particle size, distribution, and long-term stability.

Keywords
Self-Micro Emulsifying Drug Delivery Systems (SMEDDS), Poor Water-Soluble Drug, Dissolution, Atorvastatin, Apigenin

PA-11

In Vitro Antimicrobial and Anticancer Activities, and Identification of Rare Actinomycete Strains Isolated from Soil

Hema Thopla Govender[1]*, Getha Krishnasamy[1], Nurhanan Murni Yunos[1], Muhammmad Syamil Azahar[1], Nor Jannah Sallehudin[1], and Lili Sahira Husin[1]

[1] Biological Resources Programme, Natural Products Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor.

*Corresponding author's email: hema@frim.gov.my

Introduction: Actinomycetes are among the most attractive microbial sources of new bioactive metabolites, and many genera within this group are being harnessed for their potential by the pharmaceutical industry. Unfortunately, the rate of discovering new compounds has decreased as ubiquitous species have already undergone extensive study. Currently, the discovery of new natural metabolites is focused on rare actinomycetes. **Methods**: Culture broth crude extracts of Strain TY052-011 and Strain TY028-004 were tested for antimicrobial activity using a preliminary method. Anticancer activity was tested using the Sulforhodamine B (SRB) assay. The strains were identified based on their 16S rRNA gene sequences. **Results:** Both strains exhibited antimicrobial activity against Gram-positive bacteria (*Staphylococcus aureus* and *Micrococcus luteus*), but the extracts were inactive against Gram-negative bacteria (*Escherichia coli*) and yeast (*Candida albicans*). Only Strain TY028-004 exhibited moderate anticancer activity against breast (*MCF-7*), ovarian (*SKOV-3*), and colorectal (*HT-29*) cancer cell lines, with IC_{50} values of 54.81, 66.03, and 74.36 ug/ml, respectively. Phylogenetic analysis indicated that Strain TY052-011 was most closely related to *Nonomuraea cypriaca* (98.37% homology), and Strain TY028-004 is closely related to *Microbispora bryophytorum* (98.56% homology). **Conclusion**: *Nonomuraea* sp. TY052-011 and *Microbispora* sp. TY028-004 are rare actinomycetes belonging to the family Streptosporangiaceae in the class Actinomycetia. Recent reports have indicated that new species of rare actinomycetes hold promise as sources of bioactive natural products with potential applications. Further investigation into the bioactive compounds produced by *Microbispora* sp. TY028-004 is promising, as it exhibits antimicrobial and anticancer activities.

Keywords
Rare Actinomycetes, *Nonomuraea*, *Microbispora*, Antimicrobial, Anticancer

PA-12

Intracellular Trafficking of *Phyllanthus niruri* Extract-Loaded Chitosan Nanoparticles in Sertoli Cells

Diky Mudhakir[1]*, Catherine Vania Zerlina[1], and Satrialdi[1]

[1] Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Indonesia.

*Corresponding author's email: mudhakir@itb.ac.id

Introduction: Ethanol extract of *Phyllanthus niruri (P. niruri)* leaves was previously loaded into chitosan nanoparticles, serving as a co-adjuvant therapy of hepatitis. However, these nanoparticles system showed reproductive toxicity towards Sertoli cells and spermatogenesis in mice. Understanding the mechanisms of cellular entry and the intracellular localization of nanoparticles is important for assessing their toxicity profiles. The present study aims to provide a comprehensive understanding of the reproductive toxicity associated with these nanoparticles. **Methods:** Chitosan nanoparticles encapsulating *P. niruri* extract were prepared by ionic gelation method. The cellular uptake mechanism and endosomal escape of cargo-loaded chitosan nanoparticles were examined through Confocal Laser Scanning Microscopy analysis. To investigate particle, rhodamine-labeled chitosan nanoparticles were employed. Sertoli cells were subjected to treatments involving sucrose, amiloride, or filipin III, while nucleus labeling was performed using Hoechst 33343. To assess the nanoparticles' ability to escape from endosomes, rhodamine-labeled chitosan nanoparticles were utilized, and endosomes were visualized by staining with Lysosensor. **Results:** The *P. niruri*-loaded chitosan nanoparticles exhibited a size of 185.70 ± 4.10 nm and a positive charge of +34.49 ± 2.10 mV. Interestingly, when *P. niruri* extract was replaced with rhodamine as the cargo, the size and charge of the particles remained consistent. The present results showed that these chitosan nanoparticles gain entry into the mouse Sertoli cells through mechanisms involving macropinocytosis and clathrin-dependent endocytosis. A significant increase in lysosomal colocalization of chitosan nanoparticles was observed after three hours, while significant cytosolic release from endosomes was noticed after five hours of incubation. **Conclusion**: The observed toxicity of *P. niruri* extract-loaded chitosan nanoparticles appear to be closely linked to the cellular uptake mechanism involving endocytosis, followed by subsequently release of their cargo within Sertoli cells.

Keywords
Phyllanthus niruri, Chitosan Nanoparticles, Uptake Mechanism, Endosomal Escape, Sertoli Cells

PA-13

Fragment-Based *in Silico* Design of SARS CoV-2 Main Protease Inhibitors

Sarfraz Ahmad[1]*, Muhammad Usman Mirza[2], Lee Yean Kee[1], Mamoona Nazir[3], Noorsaadah Abd Rahman[1], John F. Trant[2], Iskandar Abdullah[1]*

[1] Drug Design Development Research Group, Department of Chemistry, Faculty of Science, Universiti Malaya, Kuala Lumpur 50603, Malaysia.
[2] Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON N9B 3P4, Canada.
[3] Department of Pharmacy, The University of Lahore, Lahore, Pakistan.

*Corresponding author email: iskandar.a@um.edu.my, sarfraz.ahmad@um.edu.my

Introduction: 3CLpro is essential for SARS-CoV-2 replication and infection. Inhibition of 3CLpro using small molecules is, hence, a potential therapeutic strategy. In this study, a comprehensive crystallography-guided fragment-based drug discovery approach was employed to design new inhibitors for SARS-CoV-2 3CLpro. **Methods:** All small molecules co-crystallised with SARS-CoV-2 3CLpro and structures deposited in the Protein Data Bank were used as inputs. Fragments located within the binding pocket (87) were grouped into eight geographical types. These fragments were then interactively coupled using various synthetically reasonable linkers to generate larger molecules with divalent binding modes, taking advantage on interactions between two different fragments. **Results:** In total, 1,251 compounds were proposed, and 7,158 stereoisomers were screened using Glide (standard precision and extra precision), AutoDock Vina, and Prime MMGBSA. The top 22 hits having conformations approaching the linear combination of their constituent fragments were selected for MD simulation on Desmond. MD simulation suggested 15 of these compounds indeed adopted conformations very close to their constituent pieces, with far higher binding affinity than either constituent domain in isolation. **Conclusion:** These structures could provide a starting point for the subsequent development of SARS-CoV-2 3CLpro inhibitors with the potential of improved binding. Detailed structural information is provided for reference and further exploration.

Keywords
Coronavirus COVID-19, Fragment-Based Drug Discovery, Main Protease Mpro 3CLpro, Multivalency, SARS-CoV-2

PA-14

Exploring Immunomodulation Effects of *Moringa oleifera* (Lam.) Leaves Extract on Normal and Immunocompromised Animal Model

Ramesh Ranggasamy[1,2], Vahid Hosseinpour Sarmadi[1], Johnson Stanslas[3], and Rajesh Ramasamy[1]*

[1] Department of Pathology, Faculty of Medicine and Health Sciences, University Putra Malaysia, Malaysia, 43400 Serdang, Selangor, Malaysia.
[2] Herbal Medicine Research Centre, Institute for Medical Research (IMR), National Institute of Health Complex, Setia Alam, Selangor, Malaysia.
[3] Pharmacotherapeutics Unit, Department of Medicine, Faculty of Medicine and Health Sciences, University Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

*Corresponding author's email: rajesh@upm.edu.my

Introduction: Insufficient immunity can lead to poor immune system performance against antigens leading to chronic diseases via down-regulation in lymphocytes or stem cell proliferation. There is a surge in illnesses, particularly infectious diseases, that need effective body defence systems to regulate through the process of immunomodulation. As a result, the development of natural immunomodulators with desirable safety and efficacy profiles is crucial. This study aimed to investigate the immunoregulatory and regenerative capabilities of a standardized 70% ethanol extract of *Moringa oleifera* leaves (MoETE) on animal models. **Methods**: 5 groups (n=6) of SD of immuno-competent and induced immuno-suppressed rats were administrated with 150, 300 and 600 mg/kg of MoETE through oral gavage for 28 days whereas administration of water and levamisole served as negative and positive controls. Tail blood was withdrawn periodically and organs were analysed at the end of the study. **Results**: MoETE did not significantly affect the level of red and white blood cells in the healthy rats, immunosuppression group showed the supplementation of MoETE normalized the red and immune cell levels. Statistical analysis revealed a significant difference between the groups and days on the dependent variance WBC in both normal and immunosuppressed groups ($p < 0.05$ for α level). It was evident that the number of CD8+ T cells and regulatory T cells increased by MoETE. **Conclusion**: Supplementation of *Moringa Oleifera* (Lam.) improves the immune system function in immunocompromised animal models.

Keywords
Moringa oleifera, Immunomodulatory, Immune Cells

PA-15

Development of Nanostructured Lipid Carrier as a Nanocarrier for Clove (*Syzygium aromaticum*) Essential Oil

Satrialdi[1]*, Nada Nurul Husna[1], Risya Qonitah Rihad[1], and Ratna Annisa Utami[1]

[1]Pharmaceutics Department, School of Pharmacy, Institut Teknologi Bandung, Bandung City, Indonesia.

*Corresponding author's email: satrialdi@itb.ac.id

Introduction: The essential oil derived from clove (*Syzygium aromaticum*) has been reported to possess diverse pharmacological activities, including antioxidant, anticancer, and antimicrobial activities. However, the specific physicochemical properties of clove essential oil (CO), including high volatility, oxidation susceptibility, and potential irritation effects, limit the practical application of CO as a therapeutic agent. To overcome these challenges, the present research aimed to develop a nanostructured lipid carrier (NLC) to optimize the delivery of CO for enhanced health benefits. **Methods:** CO was incorporated into the NLC system using the emulsification-sonication method. Several formulation factors, including the selection of liquid lipid component, determination of surfactant concentration, and the selection of co-surfactant, were optimized. The optimized CO-NLC formulation underwent comprehensive characterization, including assessment of particle size and distribution, measurement of zeta potential, visualization of particle morphology, and computation of encapsulation efficiency. The stability of CO-NLC was rigorously assessed during the storage at 4 °C to ensure its reliability over time. **Results:** The optimized CO-NLC formulation displayed a spherical shape, homogenous particle distribution, and a hydrodynamic diameter of approximately 125 nm. These nanoparticles exhibited a negatively charged properties with an encapsulation efficiency of 97%. During the 14-day storage period, no significant change in the particle size of CO-NLC was observed. **Conclusion:** We succeeded in developing CO-NLC with both high encapsulation efficiency and stability, warranting further exploration and development in the pharmaceutical and cosmetic industries.

Keywords
Clove Essential Oil, Nanostructured Lipid Carrier, Antioxidant

PB-1

In Vitro Anticancer Activities of *Derris microphylla* Extracts on Selected Cancer Cell Lines

Nor Jannah Sallehudin[1], Nurhanan Murni Yunos[1]*, Fadzureena Jamaludin[2], Ariff Fahmi Abu Bakar[3], Nik Musaadah Mustapha[1], and Fauziah Abdullah[4]

[1] Bioprospect Programme, Natural Products Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor, Malaysia
[2] Biological Resources Programme, Natural Products Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor.
[3] Economic & Strategic Analysis Programme, Research Planning Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor.
[4] Phytochemistry Programme, Natural Product Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor.

*Corresponding author's email: hanan@frim.gov.my

Introduction: Natural products, particularly those derived from plants, have been the mainstay of cancer chemotherapy for the past 40 years. Despite the advancement of current chemotherapy drugs, cancer cases continue to rise and the search for new chemotherapy drugs is still ongoing to combat drug resistance and minimise adverse effects in cancer patients. One such potential candidate is *Derris microphylla*, a plant species from the Fabaceae family, traditionally used by the Semai sub-ethnic for treating scabies. However, its potential in treating cancer has not been extensively studied or documented in scientific literature. The aim of this study is to evaluate the potential anticancer activity in vitro in *D. microphylla* aged 48 and 54 months. **Methods:** Plantlets were gathered from Ulu Geroh, Gopeng, Perak and cultivated at FRIM Research Station (SPF) in Selandar, Malacca. The leaves, stems and bark from 48- and 54-month-old trees were collected and subjected for ethanol extraction for 72 hours at room temperature. The resulting ethanolic extracts were then filtered, concentrated using a rotary evaporator and stored in 4˚C. These ethanolic extracts were screened for in vitro anticancer activity against a panel of six human cancer cell lines (A2780, SKOV-3 – ovarian cancers, A375 – melanoma, HeLa – cervical cancer, HT-29 – colorectal cancer, MCF-7 – breast cancer) using Sulforhodamine B (SRB) assay. **Results:** The ethanolic extracts obtained from the stems of 48- and 54-month-old *D. microphylla* trees exhibited remarkably potent anticancer activity with IC_{50} values less than 10 µg/mL in all cancer cells tested. **Conclusion:** These findings offer valuable insights into the anticancer potential of *D. microphylla* extracts, thereby broadening treatment possibilities for numerous cancer cell lines that warrant further investigation.

Keywords
Derris microphylla, Traditional Medicine, *In Vitro* Anticancer, Cultivated, Semai

PB-2

Design, Synthesis and Evaluation of Novel Enzalutamide Analogues as Potential Anticancer Agents

Ritesh Bhole[1]*, and Sohan Chitlange[1]

[1]Dr. D. Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Pune, Maharastra, India- 411018.

*Corresponding author's email: ritesh.bhole@dypvp.edu.in

Introduction: The androgen receptor inhibitor, Enzalutamide, has demonstrated effectiveness against castration-resistant prostate cancer, leading to clinical benefits and increased survival rates in men. However, the emergence of AR mutation (F876L) converts Enzalutamide from an antagonist to an agonist, indicating the rapid evolution of resistance. To overcome this resistance mechanism, our goal is to design and develop novel Enzalutamide analogues. **Methods:** We designed a dataset of Enzalutamide derivatives using the shape and electrostatic features of Enzalutamide to match the pharmacophoric features necessary for tight binding with the androgen receptor. Based on this design strategy, ten novel derivatives, including 5,5-dimethyl-3-(6-substituted benzo[d]thia/oxazol-2-yl)-2-thioxo-1-(4-(trifluoromethyl) pyridin-2-yl) imidazolidin-4-one (6a-j), were selected for synthesis. *In-vitro* evaluations of all compounds were performed on prostate cancer cell lines DU-145, LNCaP, and PC3. **Results**: Two compounds, 3-(6-hydroxybenzo[d]thiazol-2-yl)-5,5-dimethyl-2-thioxo-1-(4-(trifluoromethyl)pyridin-2-yl)imidazolidin-4-one (6c) and 3-(6-hydroxybenzo[d]oxazol-2-yl)-5,5-dimethyl-2-thioxo-1-(4-(trifluoromethyl)pyridin-2-yl)imidazolidin-4-one (6h), showed promising *in-vitro* antiproliferative activity against prostate cancer cell lines, with IC_{50} values ranging from 18.26 to 20.31µM. The binding mechanism of these potential androgen receptor inhibitors was further studied through molecular docking, molecular dynamics simulations, and MM-GBSA binding free energy calculations. The results of these analyses were found to be in agreement with the *in-vitro* studies, providing strong theoretical support for our hypothesis. **Conclusion**: Our study aimed to overcome resistance caused by the AR mutation in Enzalutamide treatment by designing novel analogues. Two compounds (6c and 6h) showed promising *in-vitro* antiproliferative activity against prostate cancer. Molecular docking and simulations supported our hypothesis, providing insights into the binding mechanism. Further research is needed to explore the therapeutic potential of these analogues in overcoming castration resistance.

Keywords
Hybrid Molecules, Imidazolidinone Derivatives, Molecular Docking

PB-3

Protein Profiling of AIC250 Treated on Endothelial Cell Line EA.hy926 for Anti-angiogenesis Assessment

Nor Datiakma Mat Amin[1,2]*, Nurhanan Murni Yunos[1]*, Norjannah Sallehuddin[1], Mohd Afiq Hazlami Habib[2], and Mohd Nazri Ismail[2]

[1] Natural Products Division, Forest Research Institute Malaysia, 52109 Kepong, Selangor.
[2] Analytical Biochemistry Research Centre, Universiti Sains Malaysia, 11900, Bayan Lepas, Pulau Pinang, Malaysia.

*Corresponding author's email: nordatiakma@frim.gov.my, hanan@frim.gov.my

Introduction: Early intervention of angiogenesis is crucial in halting tumour progression. Although VEGF-targeted anti-angiogenesis drugs exist, effectiveness and specificity challenges persist. Amid the quest for enhanced therapies, innovative strategies seek novel agents disrupting cancer angiogenesis via diverse mechanisms. Current inhibitors' limited efficacy and target reach underscore the need for new drug candidates affecting cancer angiogenesis proteins. Our previous finding discovered that active ingredient AIC250, a plant alkaloid from Simaroubaceae exhibited potent anti-angiogenic effects. Therefore, this study was undertaken to assess protein expression in non-treated and AIC250-treated endothelial cell line EA.hy926 to determine the compound's mechanisms of action in exhibiting anti-angiogenesis effect. **Methods:** Both non-treated and AIC250-treated-EA.hy926 cells were harvested, followed by protein extraction and trypsin digestion to produce peptides. The resultant peptide masses were subsequently acquired through Orbitrap-Easy nLCMS/MS analysis (Thermo Scientific, USA). The peptide masses were uploaded into PEAKS 7.5 software (Bioinformatics Solution Inc, Canada) for de novo sequencing. The results were subsequently compared against human protein database (SwissProt) for protein identification. **Results:** A total of 1057 proteins were identified. Among these, 66 proteins were differentially expressed with 0.5-fold changes where 48 proteins upregulated and 18 proteins downregulated. Preliminary protein analysis identified a diverse array of 8 distinct protein functional groups critical to cellular processes. These encompassed enzymes catalyzing diverse metabolic reactions, G-protein coupled receptors that influence signaling pathways, kinases central to cell communication, peptidases vital for protein degradation, transcription regulators shaping gene expression, translation regulators modulating protein synthesis, transporters managing molecule movement and a group of other proteins with unique functionalities. **Conclusion:** The protein analysis of non-treated and treated-AIC250 highlighted the potential mechanisms underlying AIC250's inhibition of angiogenesis. Further research is necessary to comprehensively elucidate AIC250's role as an anti-angiogenic agent and its specific impact on relevant protein networks.

Keywords
Anti-angiogenesis, Endothelial Cell Line EA.hy926, Proteome Profiling, Protein Family, Alkaloid

PB-4

FDFT1 Mediates Cisplatin Resistance of Bladder Cancer and Is Targeted by miR-146b-5p

Nurul Amniyyah Azhar[1], Yogaambikai Paramanantham[1], and Nur Akmarina B.M. Said[1]*

[1] Department of Pharmaceutical Life Sciences, Faculty of Pharmacy, Universiti Malaya, 50603, Kuala Lumpur, Malaysia

*Corresponding author's email: nur_akmarina@um.edu.my

Introduction: Chemotherapy against muscle-invasive bladder cancer is challenged by the increasing prevalence of chemoresistance. Farnesyl-diphosphate farnesyltransferase 1 (FDFT1), the first specific gene in the cholesterol biosynthesis pathway, has been identified as a tumour suppressor and chemoresistance modulator through a multiparametric screening on bladder cancer metastasis. In parallel to that, FDFT1 expression was reduced in our cisplatin-resistant bladder cancer cell line (T24R) compared to the parental, cisplatin-sensitive bladder cancer cell line (T24). Thus, this study aims to explore the role of FDFT1 in mediating the cisplatin resistance of bladder cancer cell lines. **Method:** Using both functional knockdown and ectopic overexpression, FDFT1 gene modifications were carried out in T24 and T24R cell lines and its regulation upon the cisplatin-induced cell apoptosis was assessed. **Results:** The siRNA knockdown of FDFT1 suppresses cisplatin-induced apoptosis in T24 cells and conversely, the overexpression of FDFT1 increases the cisplatin-induced apoptosis in T24R cells. Through bioinformatic analysis, an inverse correlation was found between miR-146b-5p and FDFT1 expression. This study has demonstrated for the first time that miR-146b-5p directly targets and downregulates the expression of FDFT1 along with decreasing the cisplatin sensitivity of T24 cells, of which could be restored by the forced expression of FDFT1. **Conclusion:** Taken together, these results indicate that FDFT1 is required at least in part in the regulation of cisplatin sensitivity of bladder cancer cells and might be modulated via miR-146b-5p activity, suggesting the FDFT1/miR-146b-5p axis as a promising potential target in tackling chemoresistance of bladder cancer.

Keywords
Bladder Cancer, Cisplatin Resistance, Cholesterol Biosynthesis Pathway, FDFT1, Mir-146b-5p

PB-5

Anti-Angiogenic Properties of Postbiotics Derived from Lactic Acid Bacteria Against Colorectal Cancer *In Vitro*

Umi Khalsom Mohd Bajuri[1], Kalavathy Ramasamy[1], and Siong Meng Lim[1]*

[1] Collaborative Drug Discovery Research (CDDR) Group, Faculty of Pharmacy, Universiti Teknologi MARA (UiTM) Cawangan Selangor, Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor Darul Ehsan, Malaysia.

*Corresponding author's email: lim219@uitm.edu.my

Introduction: The emergence of side effects and cancer resistance, which compromises the efficacy of current chemotherapy and targeted therapy against colorectal cancer (CRC), raises the need for alternative approaches to prevent and/ or manage CRC. Given that CRC is angiogenesis-dependent, the present study examined the anti-angiogenic potential of postbiotics derived from four unique strains of lactic acid bacteria (LAB; i.e., *Lactiplantibacillus plantarum* LAB1, *Pediococcus pentosaceus* LAB3, *P. acidilactici* LAB4 and *L. plantarum* LAB12) isolated from fermented food *in vitro*. **Methods**: The postbiotics derived from LAB were assessed for their anti-angiogenicity against human umbilical vein endothelial cells (HUVEC) using both scratch and tube formation assays. The effects of LAB-derived postbiotics against regulation of the expressions of RhoA, vascular endothelial growth factor (VEGF) and thrombospondin (TSP-1) in the HCT116 colorectal cancer cell line were then examined using immunocytochemistry. **Results:** Out of the four LAB postbiotics, LAB12-derived postbiotics possessed the best anti-angiogenic properties against migration and differentiation of HUVEC. Immunocytostaining of HCT116 cells treated with LAB12-derived postbiotics showed reduced formation of stress fibers, indicating inactivation of active RhoA. The immunocytochemistry findings also showed downregulation of VEGF but upregulation of TSP-1, indicating inhibition of the angiogenic switch in HCT116 cells. **Conclusion**: The present findings strongly implied the anti-angiogenic potential of LAB12-derived postbiotics and warrants further validation using *in vivo* models.

Keywords
Tumour Angiogenesis, Postbiotics, RhoA, Vascular Endothelial Growth Factor, Thrombospondin

PB-6

Anti-Diabetic and Nephroprotective Activities of *Colocasia esculenta* (L.) Schott Leaf Decoction in Alloxan-Induced Albino Mice

Richemae Grace R. Lebosada[1]*, Lydia M. Bajo[1], and Roger S. Tan[3]

[1] Department of Chemistry, College of Science and Mathematics, Mindanao State University- Iligan Institute of Technology, A. Bonifacio Avenue, Iligan City, Philippines, 9200.
[2] Department of Chemistry, College of Science, De La Salle University, Taft Avenue, Manila, Philippines, 1004.

*Corresponding author's email: richemaegrace.lebosada@g.msuiit.edu.ph

Introduction: Type 2 diabetes mellitus (T2DM) is a metabolic disease characterized by hyperglycemia which may be aggravated by poor lifestyle. Variations in lifestyle with the application of therapeutic interventions may delay diabetes and its complications. For decades, plant-derived products have been used as an alternative source of medicine. This study was conducted to assess the anti-diabetic and nephroprotective activities of *Colocasia esculenta* (L.) Schott leaf decoction in alloxan-induced albino mice. **Methods:** The experimental subjects were made diabetic by injecting a single dose of 190 mg/kg alloxan monohydrate intraperitoneally in PBS (pH 7.4). Varying concentrations (400, 200, 100 mg/kg) of *C. esculenta* leaf decoction were prepared and administered to diabetic albino mice for 14 days. The nephroprotective activities were assessed by kidney coefficient (Kc), blood urea nitrogen (BUN), serum creatinine (SCr) levels, and histopathological analysis. **Results:** The anti-diabetic evaluations revealed that the interventions were correlated to the observation period ($p < 0.001$). The fasting blood glucose levels decrease with time. The reduced body weights were countered by the continuous uptake of *C. esculenta,* although no significant difference among the doses. This suggests that *C. esculenta* leaf improves blood glucose levels at all concentrations. The Kc values revealed insignificant differences among the test subjects with kidney enlargement in diabetic mice. Moreover, the BUN and SCr levels showed lower values compared to metformin-treated mice. This is accompanied by improved renal morphology and restoration of the glomerulus structure. **Conclusion:** The results of the study validate the effectiveness of the plant as a remedy for diabetes, however, further evaluation must still be carried out.

Keywords
Colocasia esculenta (L.) Schott, alloxan-induced albino mice, anti-diabetic, nephroprotective

PB-7

7-Benzoylnimbocinol Isolated from *Azadirachta indica* Ameliorates Endoplasmic Reticulum (ER) Stress through the PERK Pathway

Mohamed Shabbir Mohamed[1], and Patrick N. Okechukwu[1]*

[1] Department of Biotechnology, Faculty of Applied Sciences, UCSI University, 56000 Cheras, Kuala Lumpur, Malaysia

*Corresponding author's email: patrickn@ucsiuniversity.edu.my

Introduction: The endoplasmic reticulum (ER) is a large dynamic organelle present in eukaryotic cells, playing a vital role in processes such as protein synthesis, lipid metabolism and calcium storage. When the accumulation of misfolded proteins saturates the ER's natural capacity, it triggers ER stress, subsequently activating the unfolded protein response (UPR). This UPR mechanism is mediated through transmembrane signalling protein kinase R-like ER kinase (PERK). When the cell's coping mechanisms fall short, it can lead to apoptosis. *Azadirachta indica*, commonly known as Neem, is a fast-growing tree native to the Indian subcontinent and widely found throughout South Asia. A previous study from our research showed that Neem's crude extract could ameliorate ER stress by inhibiting the PERK pathway, with 7-benzoylnimbocinol identified as the major compound involved. The present study aims to evaluate the signalling pathway mediated by 7-benzoylnimbocinol in reducing ER stress in 3T3-L1 adipocyte. **Method:** ER stress in 3T3-L1 adipocytes was induced using 5 µg/mL of tunicamycin for 5 hours, prior to treating the cells with 10, 50 and 100 µM of 7-benzoylnimbocinol for 24 hours. Following treatment, protein extraction was performed using an appropriate lysis buffer. ELISA tests were conducted to determine the protein expression levels of PERK, ATF4, and GADD34. **Results:** The ELISA findings revealed that 7-benzoylnimbocinol effectively inhibited the expression of PERK and ATF4 proteins, while leading to an increase in GADD34 protein expression. **Conclusion:** The present results suggest that 7-benzoylnimbocinol has the potential to ameliorate ER stress by activating GADD34, while inhibiting PERK and ATF4, thus presenting a promising approach for further research in alleviating ER stress-related conditions.

Keywords
7-benzoylnimbocinol, ER Stress, PERK Pathway, Neem, Diabetes

PB-8

Anti-Inflammatory Potential of Rutin Isolated from *Physalis angulata*: A Promising Source for Therapeutic Intervention

Nur Syafika Aina M Bakri[1]*, Fauziah Abdullah[1], Mazura Md Pisar[1], Nurhanan Murni Yunos[1], Khadijah Nabilah Mohd Nazri[1], Siti Nur Aisyah Mohd Hashim[1], and Siti Nasuha Zainodin[1]

[1] Natural Product Division, Forest Research Institute Malaysia, 52109 Kepong, Selangor Darul Ehsan, Malaysia

*Corresponding author's email: nursyafika@frim.gov.my

Introduction: *Physalis angulata,* an indigenous herb belonging to the Solanaceae family, has been recognised for its medicinal significance and is commonly found in tropical and subtropical regions. This study aimed to evaluate the anti-inflammatory activity of rutin, a flavonoid found in *P. angulata*. **Method**: A phytochemical analysis of the water fraction of the entire plant was conducted using chromatographic techniques, leading to the isolation and identification of rutin. The compound's structure was established through the interpretation of NMR spectroscopic data. The anti-inflammatory potential of the isolated rutin was assessed through various enzymatic inhibitory assays, including lipoxygenase, hyaluronidase, protein denaturation, xanthine oxidase and elastase. These enzymes are known to play essential roles in the inflammatory processes associated with various diseases. **Result**: The assayed compound exhibited promising anti-inflammatory properties with moderate inhibitory activity against lipoxygenase, xanthine oxidase and elastase but weakest in hyaluronidase. **Conclusion**: We concluded that the tested flavonoid rutin has the potential to be a candidate for anti-inflammatory agents for the prevention and treatment of numerous diseases that are caused by complex inflammatory processes.

Keywords
Physalis angulata, Rutin, Anti-inflammatory, Phytochemical

PB-9

Stability Study of A Nanoformulation of Standardised *Andrographis paniculata (Burm.)* Nees Aqueous Extract

Emmanuel Oshiogwe Okwuofu[1], Audrey Yong Chee Hui[2], Jonathan Lim Chee Woei[1], and Johnson Stanslas[1]*

[1] Pharmacotherapeutic Unit, Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
[2] Department of Medicinal Chemistry, Faculty of Pharmacy, MAHSA University, 42610 Jenjarom, Selangor, Malaysia.

*Corresponding author's email: rcxjs@upm.edu.my, jstanslas@yahoo.co.uk

Introduction: Stability studies during product development are critical aspects that ensure the maintenance of product quality, safety, and efficacy throughout the shelf-life of a pharmaceutical product. Therefore, this study was designed to evaluate the impact of a lecithin phospholipid nanoformulation of standardised *Andrographis paniculata* aqueous extract (FAPAE) and *Andrographis paniculata* aqueous extract (APAE) during six months of accelerated stability testing. **Methods**: Lyophilized APAE was standardised for three main phytocompounds: andrographolide (AGP), neoandrographolide (NAG), and 14-deoxy-11,12-didehydroandrographolide (DDAG). Accelerated stability testing was conducted in three batches of the formulation and APAE. Samples were stored in a screw-capped transparent glass bottle. The study was conducted at 4°C, 30°C/75%RH, and 40°C/75%RH. Samples were randomly collected and analysed using FTIR and high-performance liquid chromatography (HPLC). **Results**: Quantification using HPLC revealed a significantly ($P < 0.05$) lower degradation of AGP and NAG in the formulation compared to APAE. FTIR spectra show decreased peak intensity with increasing time but no demonstrable additional peak was observed in both APAE and FAPAE. The formulation improved the shelf-life from 6.7 to 13.49 months for AGP and 7.72 to 9.74 months for NAG at 40°C/75%RH. Meanwhile, at 30°C/75%RH, the shelf-life was increased from 13.436 to 20.749 months for AGP and from 13.052 to 21.736 months for NAG. The shelf-life of DDAG was not determined since the compound increased with time. However, at 4°C, there was no significant change in the shelf-life of both preparations. **Conclusion**: FAPAE may be a useful nanoformulation for improving the shelf-life of the active compounds present in APAE.

Keywords
Andrographis paniculata, Andrographolide, Nanoformulation, Stability, Shelf-life

PB-10

A Study on the Effect of Administration of 500mg/kg Tocotrienol-Rich Fraction (TRF) on Liver Membrane Protein Expression in Mice Using Label-Free Quantitative Proteomics

Mohd Kamil Md Yusof[1], Muhammad Fadzli Rusli[1], Benjamin Yii Chung Lau[2], Nur Azlina Mohd Fahami[1], Qodriyah Haji Mohd Saad[1], and Azman Abdullah[1]*

[1] Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia (UKM), Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.
[2] Malaysian Palm Oil Board, No. 6, Persiaran Institusi, Bandar Baru Bangi, 43000, Kajang, Selangor, Malaysia.

*Corresponding author's email: azman.abdullah@ukm.edu.my

Introduction: Tocotrienol-rich fraction (TRF) derived from palm oil is the most common preparation of tocotrienols that has superior antioxidant and biological effects. The objective of this study is to determine the effect of administration of 500mg/kg TRF on the liver membrane protein expression in mice. **Methods:** Adult male ICR white mice were divided into two groups: vehicle control (n = 6) and 500 mg/kg TRF-treated (n = 6). Mice in the vehicle control group were only administered the vehicle (corn oil) by oral gavage. The TRF-treated mice were administered 500 mg/kg of TRF dissolved in corn oil by oral gavage. The mice were treated once a day in the morning for 14 days. At day 15, the mice were sacrificed and their livers isolated. The livers were then homogenised, and the membrane fractions were analysed using the label-free quantitative proteomics method. **Results:** TRF significantly increased the expression of proteins involved in the upregulation of the fatty acid metabolism, amino acids metabolism, drug metabolism, metabolism of xenobiotics by cytochrome P450, glutathione metabolism, glycolysis/gluconeogenesis and biological oxidations pathways. TRF significantly decreased the expression of proteins involved in the downregulation of the steroid hormone biosynthesis, chemical carcinogenesis, retinol metabolism, starch and sucrose metabolism and cholesterol metabolism pathways. **Conclusion:** Treatment of mice with 500 mg/kg TRF for 14 days could improve the liver health, the liver antioxidant potential and the liver cytoprotective status compared to mice in the control group.

Keywords
Label-Free Proteomics, Vitamin E, Tocotrienol-Rich Fraction, Mice, Liver

PB-11

Computational Platform for Natural Product Screening and Dereplication

Hubbi Nashrullah Muhammad[1]*

[1] Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Institut Teknologi Bandung, Indonesia

*Corresponding author's email: hubbi@itb.ac.id

Introduction: The conventional process of natural drug development involves the purification and isolation of bioactive compounds from natural extracts, followed by manual structure elucidation using spectral data (e.g., NMR, MS). Two major challenges in this process are: (1) isolating and identifying new bioactive compounds in a reasonable time and cost, and (2) producing compounds with desired activity and toxicity profiles. Dereplication, which utilizes existing data on previously isolated bioactive compounds to identify the presence/absence of new compounds with minimal human intervention, offers a solution. With advancements in computer technology and machine learning, there is an opportunity to develop a computational platform integrating spectral data and experimental data of natural substances. **Methods:** A new database was curated consisting of various existing databases with the option of integrating future in-house isolated compound data, specifically for dereplication. Chemical compounds in the database were represented as tokens/vectors generated by calculating various chemical descriptors. Machine learning models, including naive Bayes classifier, support vector machines, random forest, and convolutional neural networks, were developed for structure elucidation in the dereplication process. The performance of these models was evaluated using precision, recall, F1-score, and AUC of the ROC curve. **Results:** The developed machine learning models were able to predict compound structures from preliminary spectral measurements with a precision of 78%, recall of 67%, an F1-score of 0.72, and an AUC of 0.79. These results are promising and the machine learning models can still be optimized further with additional data. **Conclusion:** The integration of machine learning algorithms with a curated database offers a promising approach for automating the dereplication process and discovery of active compounds from natural materials, potentially accelerating natural drug development. Future potential directions include external validation of the developed machine learning models using manual structure elucidation of natural product isolates.

Keywords
Machine Learning, Dereplication, Natural Products

PB-12

Trans-Resveratrol Attenuates Fibronectin Deposition via Downregulation of TGFβ1-SMAD Pathway in Dexamethasone-treated Human Trabecular Meshwork Cells

Amy Suzana Abu Bakar[1,2], Renu Agarwal[3], Igor Iezhitsa[3], and Norhafiza Razali[1,2]*

[1] Department of Pharmacology, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.
[2] Institute of Medical Molecular Biotechnology (IMMB), Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.
[3] School of Medicine, International Medical University (IMU), Bukit Jalil, 57000 Kuala Lumpur, Malaysia.

*Corresponding author's email: norhafiza8409@uitm.edu.my

Introduction: TGF-β-SMAD pathway has been associated with increased extracellular matrix (ECM) in the trabecular meshwork (TM) leading to aqueous humour outflow resistance and elevation of intraocular pressure (IOP) in primary open-angle glaucoma (POAG). Elevated IOP remains the only modifiable risk factor and treatment target for POAG. *Trans*-resveratrol (TR), a polyphenolic compound has been shown to counteract steroid-induced increase in IOP. Its effect on ECM deposition mediated by TGF-β-SMAD pathway however, is unknown. This study explored the involvement of TGF-β-SMAD pathway in the reduction of fibronectin (FN) by TR in dexamethasone-treated human TM cells (HTMCs). **Methods:** Primary HTMCs were incubated with 12.5 µM TR, with or without 100 nM dexamethasone. Analysis of FN, TGF-β1, SMAD4 and SMAD7 were determined using cell lysate and culture media, collected after 3 and 7 days of incubation for gene and protein expressions using real-time polymerase chain reaction (RT-qPCR) and ELISA, respectively. **Results:** TR treatment downregulated both gene and protein expressions of FN by 1.3- and 76.72-fold, respectively; TGF-β1 by 0.89- and 75.61-fold, respectively and SMAD4 by 1.37- and 67.5-fold, respectively and upregulated the SMAD7 by 0.28- and 1.32-fold, respectively in comparison with dexamethasone-only treated group ($p<0.05$). **Conclusion:** Reduction of fibronectin by TR induced by dexamethasone in HTMCs involved the repression of TGF-β1 and SMAD4 and augmentation of the inhibitory SMAD7 signalling. These effects maybe the key to TR's ability in lowering IOP leading to ECM reduction and enhancing aqueous humour outflow in the TM. TR therefore has a significant potential as a future antiglaucoma agent. This study is supported by grant no. 600-RMC/GIP 5/3 (068/2022).

Keywords
Dexamethasone, Extracellular Matrix, Glaucoma, TGF-B, *Trans*-Resveratrol

PB-13

Liposomes and Extracellular Vesicles: A Synergy for Wound Healing

Fong Fong Liew[1]*, Jzit Weii Chen[2], Hsiao Wei Tan[3], and Ivy Chung[2]

[1] Department of Oral Biology and Biomedical Science, Faculty of Dentistry, MAHSA University, 42610 Selangor, Malaysia.
[2] Department of Pharmacology, Faculty of Medicine, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.
[3] Institute of Research Management and Services, Research and Innovation Management Complex, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

*Corresponding author's email: ffliew@mahsa.edu.my

Introduction: Designing biomacromolecules and their assemblies is essential for advancing regenerative medicine, shedding light on molecular healing mechanisms, and facilitating innovative therapies for tissue regeneration and repair. Extracellular vesicles, nanoscale vesicles secreted by cells, are key players in cell-to-cell communication, tissue repair, and regeneration. Yet, their natural secretion is limited, impeding their therapeutic potential. **Methods:** Liposomal stimulation is explored to improve extracellular vesicles production. Dynamic light scattering and transmission electron microscopy were conducted to monitor the successful preparation of the different types of liposomes and collection of extracellular vesicles. Extracellular vesicles uptake and application of extracellular vesicles on scratch assay was performed. **Result:** Cholesterol-linoleic acid-liposomes significantly improved the secretion of extracellular vesicles from immortalized adipose-derived mesenchymal stem cells. Extracellular vesicle uptake was observed, and the cholesterol-linoleic acid-induced extracellular vesicles significantly enhanced the migration of human keratinocytes. **Conclusion:** Developing liposomes to enhance extracellular vesicle secretion could lead to new therapeutic approaches for wound healing, and understanding their secretion mechanisms could facilitate gene editing targeting their biogenesis pathway.

Keywords
Extracellular Vesicles, Immortalized AD-MSCs, Liposomes, Regenerative Medicine

PB-14

Antioxidant Potency of *Moringa oleifera* Lam. Extract- and Fraction-Loaded Nanostructured Lipid Carriers

Rika Hartati[1]*, Nidenia Permata Putri[1], and Satrialdi[1]

[1] School of Pharmacy, Bandung Institute of Technology, Jl. Ganesha, 10, Bandung, 40132, West Java, Indonesia.

*Corresponding author's email: rika@itb.ac.id

Introduction: The generation of reactive oxygen species (ROS) on the skin can lead to oxidative stress and is believed to contribute to skin aging due to UV radiation. *Moringa oleifera* Lam. is one of the plants that contains various types of antioxidant compounds. This research aims to determine the antioxidant activity of ethanol extract and fractions from moringa leaves, as well as to formulate and characterize nanostructured lipid carriers (NLC) from the selected part of moringa leaves with the best antioxidant activity. **Methods:** Extraction was carried out using the maceration method with 96% ethanol as the solvent. Fractionation was done using liquid-liquid extraction with n-hexane, ethyl acetate, and water as solvents. Antioxidant activity tests on the extract and fractions were conducted using TLC-Bioautography and determination of IC_{50} values using the DPPH method. **Results:** The IC_{50} values for the extract, n-hexane fraction, ethyl acetate fraction, and aqueous-ethanol fraction were 199.79 ± 1.89, 194.96 ± 0.52, 85.77 ± 1.04, and 155.93 ± 2.51 µg/mL, respectively. The ethyl acetate fraction was chosen as the active ingredient for further preparation of NLC due to its best antioxidant activity. The obtained optimal formula consisted of 0.5% ethyl acetate fraction of moringa leaves, 1.8% glyceryl monostearate, 4.2% oleic acid, 4% Tween 80, and 1% TEGO® Care 165. The resulting NLC had a particle size of 253.63 ± 4.97 nm, polydispersity index of 0.34 ± 0.06, zeta potential of -35.59 mV, and encapsulation efficiency of 38.08 ± 15.94%. The antioxidant activity of NLC-Ethyl acetate fraction of moringa leaves increased compared to the IC_{50} of the ethyl acetate fraction, becoming 71.76 ± 0.81 µg/mL. The NLC-Ethyl acetate fraction formulation showed stability at temperatures of 2-8°C for 14 days. **Conclusion:** Ethyl acetate fraction of *Moringa oleifera* Lam. loaded NLC formula can be improved as a potential antioxidant.

Keywords
Moringa oleifera Lam., Antioxidant, DPPH, Nanostructured Lipid Carrier

PB-15

Formulation of Biocompatible and Biodegradable Polymers as Andrographolide Carrier for Antidiabetic Therapy

Bambang Hernawan Nugroho[1,2], Satrialdi[1] and Lucy D. N. Sasongko[1]*

[1] School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia.
[2] Department of Pharmacy, Faculty Mathematics and Natural Sciences, Universitas Islam, Yogyakarta, Indonesia.

*Corresponding author's email: lucys@itb.ac.id

Introduction: The most convenient way to administer andrographolide for type II diabetes is through oral consumption. However, andrographolide has limited oral bioavailability due to its poor water solubility. Some strategies have been proposed to improve the solubility of andrographolide, one of which is by utilizing the polymeric nanocarrier. However, the use of non-biocompatible and non-biodegradable polymers has raised safety concerns. Therefore, we aim to develop a novel nanocarrier for andrographolide by utilizing biocompatible and biodegradable polymers, including polylactic-co-glycolic acid (PLGA), chitosan, and polyethylene glycol (PEG). **Methods:** The andrographolide-loaded polymeric nanocarrier was constructed using the solvent evaporation method. Several formulation factors were optimized. The resulting particles were characterized by measuring their size and distribution, zeta potential, morphology, and encapsulation efficiency. **Result:** The spherical and homogenous nanoparticles were obtained with a hydrodynamic diameter ranging from 200-300 nm. The encapsulation efficiency of andrographolide varied between 80% and 94%, depending on the initial concentration of andrographolide. Furthermore, it was found that the addition of PEG influences zeta potential and particle size. **Conclusion:** We successfully developed andrographolide-loaded polymeric nanocapsules using a combination of biocompatible and biodegradable polymers - PLGA, chitosan, and PEG. The nanoparticles represent a promising characteristic for improving the oral delivery of andrographolide.

Keywords
Andrographolide, Polymeric Nanoparticle, Poly Lactic-co-Glycolic Acid (PLGA), Polyethylene Glycol (PEG), Chitosan.

PC-1

Emergence of Bone Metastasis in Triple Negative Breast Cancers: Exploring the Role of MicroRNAs

Deepshikha Rathore[1], Nirali Shukla[1], and Heena V. Dave[1]*

[1] Institute of Science, Nirma University, Ahmedabad, Gujarat, India.

*Corresponding author's email: heena.dave@nirmauni.ac.in

Introduction: Triple-negative Breast Cancer (TNBC) is highly combative among subtypes of breast cancer. Metastasis is the adverse complication of TNBC as it can be observed in ~45% of the TNBC cases, ultimately reducing the patient's survival. TNBC cells primarily target the bone for colonization and cause bone metastasis (BM). However, the underlying molecular mechanism remains underexplored to date. MicroRNAs and their roles are actively being studied in cancer progression and metastasis. In this study, we are aiming to study the MicroRNAs responsible for bone metastasis that may serve as potential biomarkers for TNBCs. **Methods:** The exploration of unique microRNAs was done using bioinformatic platforms in which both Gene Expression Omnibus (GEO) and The Cancer Genome Atlas (TCGA) databases were accessed. Selection of the unique microRNAs was done by comparing the read counts (RCs) and significance. Target prediction was also accomplished for selected microRNAs using the TargetScan. The validation of microRNAs was done using cell line studies. **Results:** Three unique miRNAs (miR-214, miR-149, and miR-363) were identified based on fold change from the TCGA database. Literature searches also suggested the role of these miRNAs, in bone-associated diseases, cancer, and metastasis. Hence, we further decided to determine their role in breast cancer cell lines. In MDA-MB-231, miR-214 was 3-fold downregulated and miR-363 was 2-fold upregulated as compared to the MCF-7 cell line ($p< 0.05$). No change in miR-149 was observed. **Conclusion:** These novel miRNAs (miR-214, miR-149, and miR-363) can be further explored in the bone metastasis- and bone cancer-specific cell line. Based on the bioinformatics and in vitro studies, miR-214 is found to be a promising candidate for further exploration. Subsequently, target prediction can be further explored to confirm the miRNA/mRNA axis's role in the development of bone metastasis in TNBCs.

Keywords
Triple-Negative Breast Cancer, Bone Metastasis, MicroRNAs

PC-2

Evaluation of the Anti-Prostate Cancer Activity of Brazilin in C57BL/6 Mice

Sriwidodo Sriwidodo[1]*, Syafika Alaydrus[2], Ajeng Diantini[3], Anis Yohana Chaerunisa[1], Nia Kurnia sari[1,4], Deby Tristiyanti[1,4], and Pupung Ismayadi[1,4]

[1] Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, West Java 45363, Indonesia.
[2] Department of Pharmacy, STIFA Pelita Mas Palu, Central Sulawesi, Palu, Indonesia.
[3] Department of Pharmacology, Faculty of Pharmacy, Padjadjaran University.
[4] Sekolah Tinggi Farmasi Indonesia.

*Corresponding author's email: sriwidodo@unpad.ac.id

Introduction: Prostate cancer, primarily originating from the prostate gland, manifests as prostate adenocarcinoma. Characterized by symptoms related to urination difficulties, this form of cancer is commonly diagnosed in individuals aged 65 and above. Prostate cancer also tends to progress slowly. Current research highlights the anticancer potential of natural compounds and their secondary metabolites in inhibiting the proliferation of various cancer cell types. One such compound that merits further exploration for its anticancer potential is brazilin. Brazilin is an isoflavonoid obtained from the *Caesalpinia sappan* heartwood. **Methods:** Acute toxicity of brazilin was assessed using the fix dose procedure method. *In vitro* cytotoxicity was performed on prostate cancer cell line using the WST-8 method. Syngeneic cancer animal model was used to study *in vivo* anticancer activity. Histopathological analyses of liver and kidneys were performed through the hematoxylin-eosin staining method. **Results:** The results confirmed the absence of heavy metal contamination (Cd, Cu, Pb, As, and Hg) in brazilin. The total plate count and mold/yeast count on brazilin adhered to established requirements, with values ≤ 10 and ≤ 10^3, respectively. Brazilin exhibited a favourable lethal dose 50 (LD_{50}) above 5,000 mg/kg bodyweight, categorizing it as practically non-toxic. The IC_{50} value of brazilin against DU prostate cancer cell line was determined to be 145 ± 17.25 mg/L. Histopathological examinations revealed no observable changes in the kidneys and liver. No metastatic developments were observed. *In vivo* studies demonstrated brazilin's prostate tumour inhibitory activity in C57BL/6 mice. **Conclusion:** Based on present data, brazilin demonstrated potential as a promising candidate for an anticancer drug. However, further research is required to unveil a comprehensive profile of its anticancer activity and underlying mechanisms.

Keywords
Brazilin, Prostate Cancer, Activity

PC-3

Could Multiple Gene Mutations Among Asian Lung Cancer Patients Affect Response to EGFR-TKIs?

Rui Jing[1], Yandong Miao[2], Soon Hin How[3], Fang Zhang[2], and Johnson Stanslas[1]*

[1] Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia.
[2] Department of Oncology, Yantai affiliated hospital of Binzhou Medical University, 264100, Yantai, Shandong Province, China.
[3] Kulliyyah of Medicine, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.

*Corresponding author's email: rcxjs@upm.edu.my; jstanslas@yahoo.co.uk

Introduction: Non-small cell lung cancer (NSCLC) is a complex disease characterized by genetic alterations. EGFR mutations are the most common gene mutation in Asian population which ranged from 32.3% to 50.2% and this was followed by KRAS (8%), ALK (7.8%), RET (<5%), PIK3CA (2.9%), HER2 (2.1%), BRAF (1.6%), MET (1.3%), ROS1 (0.6%) and RET (0.6%). It has been reported EGFR mutations can co-occur with other gene mutations. The treatment landscape for EGFR mutation-positive NSCLC has evolved significantly with the introduction of tyrosine kinase inhibitors (TKIs) targeting the epidermal growth factor receptor (EGFR) pathway. These TKIs, spanning three generations, have become crucial advancements in managing the condition. However, it is important to note that not all EGFR mutation-positive patients exhibit a therapeutic response to these drugs. **Method:** This review is based on literature search performed using Google Scholar and PubMed between 2020 up to 2023. **Results:** There have been relevant reports on multiple-gene mutations affecting the response to EGFR-TKI drugs: EGFR with KRAS co-alteration showed no significant differences in the PFS; EGFR with ALK co-alterations showed poor responses to EGFR-TKIs; EGFR with PIK3CA co-alterations had significantly shorter progression-free survival (PFS); EGFR with HER2 co-alterations may contribute to resistance mechanisms against EGFR-TKIs. The above situations have been sporadically reported among the Asian population. **Conclusion:** It is believed that the presence of other gene mutations could have contributed to this clinical observation. Therefore, different subtypes of EGFR and co-gene mutations could impact the EGFR-TKI efficacy. One of the hypotheses being multiple gene mutations among Asian lung cancer patients affecting response to EGFR-TKIs. To date, a limited number of reports have provided indications supporting this perspective. Yet, a definitive conclusion has not been reached.

Keywords
NSCLC, Gene Mutation, Co-Gene Mutation, EGFR-TKI, Asian People

PC-4

Design, Synthesis and Biological Evaluation of PROTAC for Its Anticancer Activity

Sohan Chitlange[1]*, and Ritesh Bhole[1]

[1]Dr. D. Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Pune, Maharstra, India- 411018.

*Corresponding author's email: principal.pharmacy@dypvp.edu.in

Introduction: Prostate cancer is a prevalent disease, affecting one in six men. The androgen receptor (AR) plays a vital role in prostate cancer progression. However, currently available AR inhibitors, such as Enzalutamide and Bicalutamide, face limitations in targeting undruggable proteins and developing resistance. To address these challenges, PROTACs (PROteolysis TArgeting Chimera) have emerged as a promising approach. In this study, we designed a novel PROTAC using Enzalutamide and Thalidomide as ligands, along with N-Boc-1,6-hexandiamine as the linker. Our innovative PROTAC has the potential to enhance anticancer activity by degrading the target protein and overcoming resistance caused by mutations. **Methods:** To design the PROTAC molecule, molecular docking (AutoDock 12.3) and molecular dynamics simulations (DESMOND module, Schrodinger) were performed using PDB IDs 7KHL and 7KHH. The synthesis involved four steps, including amidation reaction followed by acidification, which was monitored using techniques such as melting point determination, thin-layer chromatography (TLC), and infrared (IR) interpretation. The structure was confirmed using nuclear magnetic resonance (NMR) and mass spectrometry. **Results:** Molecular docking studies revealed promising dock scores of -10.65 kcal/mol (7KHL) and -12.511 kcal/mol (7KHH) for the designed PROTAC molecule. Characterization data confirmed the structure, with IR spectra displaying N-H stretching bands indicating the amide linkage. NMR spectra showed specific signals validating the presence of 2,6-dioxopiperidine and dimethyl-4-oxo-2-thioxoimidazolidin (Enzalutamide), and mass spectrometry confirmed the molecular weight. *In vitro* studies demonstrated significant anticancer activity of the PROTAC against MCF-7 cell lines, with a GI50 value below 10. **Conclusion:** The synthesis of enzalutamide-based PROTACs represents a novel and promising approach for targeted protein degradation. Enzalutamide, a well-known androgen receptor inhibitor primarily used in the treatment of prostate cancer, can be effectively utilized as a component in PROTACs to overcome drug resistance and enhance therapeutic efficacy. This study provides valuable insights into the potential of PROTACs in advancing the field of cancer treatment, specifically in targeting undruggable proteins and combating drug resistance in prostate cancer.

Keywords
PROTAC, Prostate cancer, Enzalutamide

PC-5

Computer-Aided Discovery of Potential EGFR Inhibitors by Virtual Screening of Drug Bank, ADMET, Docking, DFT And MD Simulation Studies

Miah Roney[1,2], Amit Dubey[3], Muhammad Hassan Nasir[4], Aisha Tufail[3], Saiful Nizam Tajuddin[2], Mohd Fadhlizil Fasihi Mohd Aluwi[1,2] and AKM Moyeenul Huq[2,5]*

[1] Faculty of Industrial Sciences and Technology, Universiti Malafysia Pahang Al-Sultan Abdullah, Lebuhraya Tun Razak, Pahang, Darul Makmur, Malaysia.
[2] Centre for Bio-Aromatic Research, Universiti Malaysia Pahang Al-Sultan Abdullah, Lebuhraya Tun Razak, Pahang, Darul Makmur, Malaysia.
[3] Department of Pharmacology, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India.
[4] Faculty of Medicine, University Sultan Zainal Abidin (UniSZA), Terengganu, Darul Iman, Malaysia.
[5] Department of Pharmacy, School of Medicine, University of Asia Pacific, 74/A, Dhaka, Bangladesh.

*Corresponding author's email: moyeenul@umpsa.edu.my

Introduction: Numerous malignancies, ranging from breast cancer, non-small cell lung cancer and chronic myeloid leukemia, are driven by aberrant tyrosine kinase signaling. Given the well-documented toxicity of current chemotherapeutic medicines, there is a great need and demand for the discovery of novel drugs that are either toxic-free or having low toxicity, while effectively targeting and inhibiting the growth of tumor cells. . This work describes the *in-silico* examination of substances from the drug bank as potential EGFR inhibitors. **Methods:** Firstly, the drug bank was screened using the pharmacophore technique to select ligands. Erlotinib (DB00530) was used as a reference compound. The selected ligands were screened using ADMET analysis and the hit compounds were subsequently subjected to docking studies. The lead compound from docking studies was subjected to Density Functional Theory (DFT) and Molecular Dynamics (MD) simulation studies. **Results:** Using the pharmacophore technique, 23 compounds were identified through virtual drug bank screening. One hit molecule from ADMET prediction was the subject for docking study. According to the findings, DB03365 molecule fits to the EGFR active site by forming several hydrogen bond interactions with amino acids. DFT analysis revealed high reactivity of DB03365 compound within the binding pocket of the target protein, as indicated by ELUMO, EHOMO and band energy gap values. Furthermore, MD simulations for 100 ns revealed that the ligand interactions with the residues of EGFR protein were part of the essential residues for structural stability and functionality. **Conclusion:** DB03365 was found to be highly selective for EGFR, suggesting its potential as a therapeutic agent. However, further studies are warranted to thoroughly explore the therapeutic potentials of DB03365.

Keywords
EGFR inhibitor, Virtual Screening, Docking, Molecular Dynamic Simulation

PC-6

In Silico Investigation of Quinozoline Derivatives as Potential EGFR L858R/T790M/C797S Mutant Inhibitor

Md Swapan Hossain[1], Johnson Stanslas[2], AKM Moyeenul Huq[3] and Audrey Yong Chee Hui[1]*

[1] Faculty of pharmacy, MAHSA University, Jln SP 2, Bandar Saujana Putra, 42610 Jenjarom, Selangor, Malaysia.
[2] Faculty of Medicine and Health Sciences, Universiti Putra Malaysia 43400 UPM Serdang, Selangor, Malaysia.
[3] Bio Aromatic Research Centre, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan, 26300, Pahang, Malaysia.

*Corresponding author's email: audrey@mahsa.edu.my

Introduction: EGFR is a transmembrane protein tyrosine kinase that is crucial for cellular signalling for cell growth, invasion, metastasis, apoptosis, and angiogenesis. Increased EGFR activity, such as EGFR overexpression and mutations, results in EGFR deregulation. Numerous malignant tumours, notably non-small cell lung cancer (NSCLC), are linked to elevated EGFR activity. A major obstacle in the development of EGFR tyrosine kinase inhibitors to combat treatment resistance in non-small cell lung cancer (NSCLC) is the targeting of L858R/T790M and L858R/T790M/C797S mutant EGFR. Therefore, it is essential to find new generation of EGFR tyrosine kinase inhibitors (TKIs). The objective of the study was to discover a novel quinazoline-3(4H)-one based potent EGFR-TK inhibitors to overcome the resistance of L858R/T790M/C797S mutant EGFR. **Methods:** Molecular docking of five quinazoline derivatives was performed followed by *in silico* ADMET and drug likeness study. **Results:** All the five derivatives showed higher interaction towards the wild type EGFR having CDOCKER interaction energy ranging from (-51.97 to -53.76 kcal/mol) than the L858R/T790M/C797S mutant type (-33.88 to -39.41 kcal/mol). The derivatives OD-5 and OD-4 showed the maximum interaction with the wild type and the mutant type respectively. *In silico* prediction depicted class 4 toxicity for all compounds (LD50 > 1500 mg/kg). Moreover, the physicochemical properties were suitable as drug candidate and passed the Lipinski's, Egan's, Veber's, Muegge's, and Ghose's rules for oral intake. **Conclusion:** The quinazoline derivatives demonstrated specific binding towards the wild type EGFR. Structural modification is required to increase selectivity towards the L858R/T790M/C797S mutant EGFR with further validation by *in vitro* experiments.

Keywords
Quinazoline derivatives, EGFR inhibitor, Docking, ADMET

PC-7

Comparative Evaluation of the Antiglycation, Anti-diabetic, and Antioxidant Potential of Panyawan and Serpentina Capsules

Michael Angelo R. Circulado[1,3]*, Charlie A. Lavilla Jr.[1], and Patrick Nwabueze Okechukwu[2]

[1]Department of Chemistry, College of Science and Mathematics, Mindanao State University–Iligan Institute of Technology, Iligan City 9200 Philippines.
[2]Department of Biotechnology, Faculty of Applied Sciences, UCSI University, Kuala Lumpur 56000 Malaysia.
[3]Department of Chemistry, College of Arts and Sciences, Negros Oriental State University, Dumaguete City 6200 Philippines.

*Corresponding author's email: michaelangelo.circulado@g.msuiit.edu.ph

Introduction: The COVID-19 pandemic has prompted a surge in health-consciousness among the public, leading to increased consumption of dietary supplements. However, there is a common misconception that these supplements can cure diseases, often due to misleading labels like "No approved therapeutic claims" and "FDA-approved". Hence, there is a need to validate the efficacy of food supplements. In this study, we scrutinized two commercial food supplements for their potential antiglycation, anti-diabetic, and antioxidant properties. **Methods:** Various assays were conducted to assess the anti-glycation, anti-diabetic, and antioxidant effects of these food supplements. Additionally, treatments were performed on cultured and differentiated L6 skeletal muscle cells following standard protocols. Subsequently, these cells were lysed to extract proteins for the analysis of PI3K protein expression using ELISA. **Results:** Both capsules demonstrated the ability to preserve the secondary structure of bovine serum albumin (BSA). However, serpentina capsule may render better anti-diabetic activity as it exhibited moderately high anti-glycation activity compared to the positive control. Treatments using both dietary supplements also led to the downregulation of PI3K expression. Additionally, both supplements also exhibited moderate scavenging of DPPH radicals compared to the control. **Conclusions:** These results suggest that both panyawan and serpentina capsules possess promising anti-diabetic properties.

Keywords
Food Supplements, Anti-glycation, PI3K Protein Expression

PC-8

Selected Mindanaoan Medicinal Plants as Potential Agents to Improve Insulin Resistance in Skeletal Muscle Cells Under Metabolic Stress

Charlie A. Lavilla, Jr[1,2]*, Charles Klein M. Gorit[2], Francis N. Limbag[2], Heisen Jane S. Esdicul[1], and Mylene M. Uy[1,2]

[1] Chemistry Department, College of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines.
[2] Natural Products and Drug Discovery Research Group, Premier Research Institute of Science and Mathematics, MSU-Iligan Institute of Technology, Philippines.

*Corresponding author's email: charliejr.lavilla@g.msuiit.edu.ph

Introduction: Type 2 diabetes is characterized by failure to control glucose homeostasis. Diabetes is predicted to more than double, affecting 7.8 million individuals in the Philippines by 2030. This represents a significant major threat to the nation's health and economy. This study offers strategies to help prevent the onset of the disease or to significantly slow its development and the onset of debilitating (and expensive to treat) complications. **Methods**: C2C12 mouse myotubes were incubated in standard tissue culture media, or media supplemented with 28 mM glucose, 200 µM palmitic acid, and 200 µM oleic acid as a glucolipotoxic cellular model of insulin resistance. Intracellular reactive species content was assayed using 2',7'-dichlorofluorescein diacetate dye, and glucose uptake was determined through 2-deoxy glucose-6-phosphate luminescence. Based on previous data (total phenolics and flavonoid content), ethanolic or decoction extracts of 6 out of 20 local tribe plants were further evaluated for antidiabetic screening. **Results:** Our data indicated that ethanol or decoction extracts of these six (6) plants, coded as (SMYLD, SKLD, MHLE, SELD, SGLD, and SMLE), significantly protect the cells from these deleterious reactive species. Importantly, two of these plants (SGLD and SMLE) were further evaluated and observed to elicit insulin-sensitizing effects or enhance insulin-dependent glucose uptake. **Conclusion**: These Mindanaoan plants could potentially be utilized as food supplements to deliver improved health to low-income families across the country with immediate effect. The use of locally available natural sources as potential anti-diabetic agents will make them more accessible and affordable to the communities and thus could offer a low-cost solution to a major healthcare problem.

Keywords
Glucolipotixicity, Oxidative Stress, Mindanao Medicinal Plants, Natural Products, Carnosine

PC-9

Exploring the Potential Anti-Psoriatic Properties of A Semi-Synthetic 14-Deoxy-11,12-didehydroandrographolide Derivative

Dineshwar Sugumaran[1], Johnson Stanslas[1]*, Jonathan Lim Chee Woei[1], How Kang Nien[1], and Audrey Yong Chee Hui[2]*

[1] Pharmacotherapeutic Unit, Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
[2] Faculty of Pharmacy, Mahsa University, Bandar Saujana Putra, Jenjarom, Selangor, Malaysia.

*Corresponding authors' email: audrey@mahsa.edu.my; rcxjs@upm.edu.my

Introduction: Psoriasis is a chronic skin disease characterized by inflammation and hyperproliferation that affects around 2% to 3% of the global population. Currently, no control is available for psoriasis and existing treatments have limitations due to side effects, necessitating the development of safer and more effective anti-psoriatic agents. This study was carried out to determine the anti-psoriatic activity of the 14-deoxy-11,12-didehydroandrographolide (DDAG) derivative via the inhibition of inflammatory pathways, such as nuclear factor kappa light chain enhancer of activated B cells (NF-κB) and mitogen-activated protein kinase (MAPK). **Methods:** Spontaneously immortalized human keratinocyte (HaCaT) and immortalized mouse macrophage (RAW264.7) cells, respectively were treated with andrographolide (AGP), DDAG, SRS49 (semi-synthesized DDAG), and gemcitabine (positive control). The cytotoxicity was evaluated via MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. **Results and Discussion:** AGP (IC_{50}: 3.03 µM) and gemcitabine (IC_{50}: 0.075 µM) exhibited high cytotoxicity against HaCaT cells, while DDAG did not exhibit any toxicity even at high concentration (100 µM). AGP and gemcitabine also displayed high cytotoxicity against RAW264.7 cells, with DDAG showing moderate cytotoxicity. SRS49 exhibit higher cytotoxicity against HaCaT cells (IC_{50}: 48.67 µM) compared to RAW264.7. SRS49 demonstrated anti-proliferative activity against HaCaT cells, indicating potential anti-psoriatic properties. Further studies will be conducted to investigate the effect of SRS49 against proteins involved in NF-κB and MAPK pathways through western blot analysis. **Conclusion:** SRS49 exhibited promising anti-psoriatic properties by selectively inhibiting HaCaT cell proliferation, making it a potential candidate for psoriasis treatment. However, additional studies are needed to determine whether SRS49 has anti-inflammatory activity in HaCaT cells induced with proinflammatory agents, such as tumour necrosis factor-alpha (TNF-α) and interleukin 17 (IL-17) to further support its efficacy against psoriasis.

Keywords
Psoriasis, 14-Deoxy-11,12-didehydroandrographolide, Anti-proliferative, Anti-inflammatory

PC-10

In Vitro Neuroprotective Effects of *Centella asiatica*

Norhayati Ismail[1]*, Asiah Osman[1], Nurhanan Murni Yunos[1], Mastura Montar[1], and Muhammad Haffiz Jauri[1]

[1] Bioprospecting Programme, Natural Products Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor.

*Corresponding author's email: norhayati@frim.gov.my

Introduction: The generation of free radicals and oxidative stress has been linked to several neurodegenerative diseases including Parkinson's disease and Alzheimer's disease. The determination of free radical scavenging agents for the reduction of intracellular reactive oxygen species is one of the approaches used in the clinical management of neurodegeneration. *Centella asiatica* is an important medicinal plant with an extensive range of ethnomedicinal uses that have been reported to exhibit ranges of bioactivity. **Methods**: Bioassay-guided fractionation was performed in this study to determine the active fraction of *C. asiatica* which responds to neuroprotective effects on H_2O_2-induced neurotoxic neuroblastoma SH-SY5Y cell lines. The results were expressed as a percentage of cell viability which was determined using an MTT assay after each of the experiments. **Results:** In comparison to ethanolic extract, post-treatment with methanolic extracts at 0.49–125 g/ml demonstrated the best protection against H_2O_2-induced cells by enhancing cell viability. Six fractions were produced by further bioassay-guided separation of the methanolic extract. All fractions exhibit neuroprotective effects at concentrations ranging from 0.49 to 1 25 g/ml, which enhanced the vitality of H_2O_2-induced SH-SY5Y cells. **Conclusion**: The treatment of *C. asiatica* on H_2O_2-induced neurotoxicity showed promise, according to the findings. Taken together, this study may suggest *C. asiatica* as a potential therapeutic treatment for H_2O_2-induced neurotoxicity and further study should be done to investigate the active compound attributed to these neuroprotective effects.

Keywords
Medicinal plants, *Centella asiatica*, Neuroprotection, Hydrogen peroxide (H_2O_2)

PC-11

Barriers To Psychiatric Illness Treatment in Saudi Arabia: A Population-Based Cross-Sectional Study

Ahmed Adel Mohammed[1,2*], Sufyan Mohammed Alomair[1], Abdulrahman A. Alnijadi[1], Abdulazia S Almulhim[1], Fatimatuzzahra' Abd Aziz[2], Mohamed Anwar Hammad[3], Promise Madu Emeka[4]

[1] Department of Pharmacy Practice, College of Clinical Pharmacy, King Faisal University, Al Ahsa, Saudi Arabia.
[2] School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia.
[3] Department of Clinical Pharmacy, Faculty of Clinical Pharmacy, Albaha University, Albaha, Saudi Arabia.
[4] Department of Pharmaceutical Sciences, College of Clinical Pharmacy, King Faisal University, Al Ahsa, Saudi Arabia.

* Corresponding author's email: ahmedadelm@student.usm.my

Introduction: Mental illness is a disorder that can cause impairment and disability affecting mood, thinking, and behavior. Early intervention on mental illness could reduce morbidity. This study aims to evaluate the barriers associated with the family and society that prevent mental health patients from seeking consultation and treatment. **Methods**: A cross-sectional study was conducted upon 440 males and females between the ages of 26-40 years, between January and March 2020, in Saudi Arabia. Data were collected by an interview questionnaire which consisted of two parts. The first part included data about socio-demography, while the second part contains subsections of society/family, personal and medical barriers. **Results**: The results showed that 81.1% of the respondents indicated that society and family barriers impacted them. 70.3% of the respondents also believed that it was their own personal barriers that hindered them from seeking help. Medical barriers were opted by 63.5% of the respondents as a form of hindrance as well. Specifically, the respondents indicated that it is difficult to talk freely about the disease (39.5%) due to shame and stigma (25.9%), which is thus challenging for anyone to share about their feelings and emotions (34.3%). Our findings indicated a low level of trust in-hospital treatment, hence losing confidence in using medications. **Conclusion**: The findings of this study indicated that stigmatization from society and family could be the significant barriers that prevent most people from seeking mental health consultation.

Keywords
Mental Illness, Barriers, Stigma, Consultation

PC-12

Association Between Frequency of Vegetable Intake and The Incidence of Depression in Indonesian General Population: Findings from The Indonesian Family Life Survey (IFLS-5)

Irma Melyani Puspitasari[1,2]*, Petrus Putra Bagaskhara[1], and Sofa Dewi Alfian[1,2]

[1] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia.
[2] Center of Excellence for Pharmaceutical Care Innovation, Universitas Padjadjaran, Sumedang, Indonesia.

*Corresponding author's email: irma.melyani@unpad.ac.id

Introduction: A higher intake of fruits and vegetables has been linked to a reduced risk of certain chronic diseases, such as obesity, coronary heart disease, and several types of cancer. Consumption of fruits and vegetables has recently been connected to mental health, particularly depression. Depression is a mental disorder that involves a depressed mood or loss of pleasure or interest in activities for long periods. Depression prevalence in Indonesia has reached 3.7% of the population, or about 9 million people. Previous studies found that a higher frequency of vegetable intake could lower the risk of depression. This study investigates the association between the frequency of vegetable intake and the incidence of depression in the Indonesian general population. **Methods:** Retrospective data were obtained from the Indonesian Family Life Survey (IFLS-5) 2014, a national cross-sectional population-based survey in Indonesia. The respondents with CESD-10 depression scoring values and frequency of vegetable intake were included in this study. Age, gender, body mass index, marital status, employment status, type of employment, education level, location of residence, and province of the subject were considered sociodemographic factors. Binary logistic regression analysis was performed to find the association between the frequency of vegetable intake and the incidence of depression adjusted with sociodemographic factors. **Results:** A total of 18,412 respondent data were obtained. The findings showed that the frequency of vegetable intake once a week compared to seven times a week is associated with depression among respondents (aOR:1.658, 95%CI:1.023-2,687; p=0.040), adjusted by marital status, education level, and location of residence. **Conclusion:** Individuals who consume vegetables once a week compared to seven times a week have a higher risk of experiencing depression. Health promotion regarding increasing vegetable intake in the Indonesian general population should be performed to prevent depression.

Keywords
IFLS-5, Vegetable, Depression, CESD-10, Mental Health

PC13

Neuroprotective Potential of Astaxanthin Nanoemulsions in a Rat Model of Permanent Middle Cerebral Artery Occlusion (pMCAO): A Preliminary Study

Anis Syahirah Mohd Shafie[1], Siti Norsyafika Kamarudin[1*], Meor Mohd Affandi Meor Mohd Redzuan[2], and Rosfaiizah Siran[3]

[1] Faculty of Medicine, Universiti Teknologi MARA, 47000 Sungai Buloh, Selangor, Malaysia.
[2] Faculty of Pharmacy, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia.
[3] Neuroscience Research Group, Faculty of Medicine, Universiti Teknologi MARA, 47000 Sungai Buloh, Selangor, Malaysia.

*Corresponding author's email: norsyafika7020@uitm.edu.my

Introduction: Astaxanthin (ATX), a natural occurring carotenoid derived from the algae (*Haematococcus pluvialis*), exhibits abundant antioxidant and anti-inflammatory properties. Utilizing nanoemulsion technology potentially enhances its bioavailability by facilitating passage through the blood-brain barrier. This preliminary study investigated the impact of different concentration of ATX nanoemulsion in reducing the infarct volume and improving neurological function in a rat model of permanent middle cerebral artery occlusion (pMCAO). **Methods**: Twelve (12) Sprague Dawley rats were divided into four groups, each receiving different dosages of ATX nanoemulsion: Group A (160 mg/kg of body weight), Group B (320 mg/kg of BW), Group C (640 mg/kg of BW), and Group D (1280 mg/kg of BW). The administration of ATX nanoemulsion was carried out orally for 7 days before and 3 hours after pMCAO induction. Neurological function assessments and brain infarcted volume measurements were conducted 24 hours post-pMCAO. The rat was euthanized by cardiac puncture and the brain was collected for infarct volume analysis. The data were analysed by one-way ANOVA and post-hoc Tukey test, with a significance level set at $p < 0.05$. **Results**: The neurological scores and grid walking test showed significant differences ($p<0.05$) between group D with groups A and B. The rotarod test for group D was significantly higher ($p<0.001$) compared to groups A, B and C. Meanwhile, the infarct volume of group D was significantly lower ($p<0.001$) compared to groups A, B and C. **Conclusion**: This preliminary study showed that administration of ATX nanoemulsion at a concentration of 1280 mg/kg bodyweight to be optimal, as it significantly improved neurological function and reduced the infarct volume in the pMCAO rat model.

Keywords
Astaxanthin, Nanoemulsion, Stroke, Neuroprotection

PC14

The Effect of Temperature and Extraction Time on Antioxidant Activity in The Preparation of *Salvia officinalis* L. Extract

Mohd Kamal Nik Hasan[1], Zaridah Mohd Zaki[1], Azman Mohamed[1], and Nurul Umira Binti Hasnan[2]

[1] Natural Product Division, Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor Darul Ehsan, Malaysia.
[2] Faculty of Pharmacy, Universiti Teknologi MARA (UiTM) Selangor Branch, 42300, Bandar Puncak Alam, Selangor, Malaysia.

*Corresponding author's email: mohdkamal@from.gov.my

Introduction: *Salvia officinalis L.*, also known as sage. It belongs to the Lamiaceae family and is used for its pleasant fragrance and flavor. The aim of this study is to determine the optimum temperature and time for the preparation of sage water extract. **Methods:** Sage was mixed with water and exposed to different temperatures: 40°C, 60°C and 80°C. At each temperature, the extraction process took different lengths of time: 30 minutes, 1 hour, 2 hours, and 3 hours. After filtration, the antioxidant properties of the extract were evaluated using antioxidant assays. **Results:** Sage extract heated at a temperature of 40°C/ 3 hours can scavenge 66% of DPPH free radicals. In addition, heating at 40°C/ 30 minutes has a high FRAP value compared to the other parameters. In the TPC test, the highest TPC value was obtained at 40°C/ 1 hour. The MDA test showed that a temperature of 40°C/ 3 hours resulted in a lower MDA value. At 60°C, the percentage of DPPH inhibition is in the range of 15% - 63%. In addition, the 60°C/ 3 hours has a high FRAP value compared to the others. The highest TPC value was obtained at 60°C/ 2 hours. In addition, lower MDA values were obtained at 60°C/ 30 minutes. In contrast, the percentage of DPPH inhibition at a temperature of 80°C is in the range of 80% - 89%. The use of 80°C/ 2 hours parameter has a high FRAP value compared to others. The highest TPC value was measured at 80°C/ 30 minutes. However, a temperature of 80°C/ 1 hour resulted in lower MDA values than the other parameters. **Conclusion**: In conclusion, the optimal condition for the preparation of a sage extract with effective antioxidants is 60°C/ 30 minutes.

Keywords
Salvia officinalis, Antioxidant, DPPH, FRAP, MDA

PC-15

Effects of Tocotrienol-doped Calcium Phosphate Cement on Bone Mineral Density, Bone Mineral Content and Biomechanical Strength in Tibia of Ovariectomised Rats with Bone Defect

Siti Sarah Md Dali[1], Sok Kuan Wong[1]*, Kok-Yong Chin[1], and Fairus Ahmad[2]

[1] Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.
[2] Department of Anatomy, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.

* Corresponding author's email: sokkuan@ukm.edu.my

Introduction: Calcium phosphate cement (CPC) is used to fill in bone defects, but its practical application is restricted due to low mechanical properties and osteogenic potential. This study aimed to investigate the effects of CPC incorporated with palm tocotrienol (CPC/T3) on bone regeneration in ovariectomised rats with tibial bone defect. **Methods:** Female Sprague-Dawley rats were divided into four experimental arms: (a) sham-operated rats, (b) ovariectomised rats, (c) ovariectomised rats subjected to bone defect and implanted with CPC, as well as (d) ovariectomised rats subjected to bone defect and implanted with CPC/T3. The implantation was performed after 12 weeks of ovariectomy for a duration of 8 weeks. Rats were scanned with dual-energy X-ray absorptiometer for BMD and BMC at whole body and left tibia throughout the study. At the end of 20-week study, left tibias were harvested for biomechanical strength analysis. **Results:** Whole body BMD of the CPC/T3-filled group increased significantly after implantation (week 16 & 20) as compared to before implantation (week 0 & 12), which was not seen in other experimental groups. Higher left tibia BMC was also observed in the CPC- and CPC/T3-filled groups after implantation as compared to before implantation. The CPC/T3-filled group exhibited significantly higher bone stiffness as compared to the sham-operated and ovariectomised groups. **Conclusion:** The presence of tocotrienol in CPC potentially enhances BMD, BMC and bone stiffness suggesting that tocotrienol can be incorporated into CPC improve its properties.

Keywords
Calcium Phosphate Cement, Bone Defect, Ovariectomy, Tocotrienol, Vitamin E

PC-16

In Vitro Cytotoxicity of Ruthenium (II) Polypyridyl Complex in Combination with PARP Inhibitor in A549 Lung Cancer Spheroids Model

Haslina Ahmad[1,4]*, Nur Aininie Yusoh[1], Norazalina Saad[1], Chia Suet Lin[1,2], and Martin R. Gill[3]

[1] UPM-MAKNA Cancer Research Laboratory, Institute of Bioscience, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
[2] Department of Microbiology, Faculty of Biotechnology and Biomolecular Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
[3] Department of Chemistry, Faculty of Science and Engineering, Swansea University, Swansea, SA2 8PP, UK.
[4] Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

*Corresponding author's email: haslina_ahmad@upm.edu.my

Introduction: The evaluation of drug effects in a 3D spheroids model can provide insight on the cytotoxicity and drug penetration. In addition, 3D spheroids often better recapitulate the tissue microenvironment in vivo as they mimic the complexity and heterogeneity of cellular organization in clinical tumors. Ruthenium (II) polypyridyl complexes (RPCs) have emerged as promising anticancer candidates due to their attractive DNA binding property. Inhibitors of poly(ADP-ribose) polymerase (PARP) are new small molecule drugs that show promising therapeutic effects. Previously, we have evaluated the rationale combination of the RPC $[Ru(dppz)_2(PIP)]^{2+}$ (dppz = dipyrido[3,2-a:2',3'-c]phenazine, PIP = 2-(phenyl)-imidazo[4,5-f][1,10]phenanthroline), "Ru-PIP" with PARP inhibitor Olaparib in 2D monolayer cell culture in which Ru-PIP/Olaparib synergy was shown. In the present study, we examine the identified synergistic Ru-PIP/Olaparib combination in 3D lung cancer spheroids to further elucidate synergy. **Methods**: A549 lung cancer spheroids were developed using hanging drop technique. Spheroids growth inhibition study and spheroids live/dead staining experiments were conducted to examine the cellular viability of the spheroids upon treated with Ru-PIP/Olaparib combination. **Results**: A549 cells formed spheroids that managed to grow in diameter in size and volume over 15 days, thereby qualifying them as a suitable 3D cell culture model. Our results show that the structural integrity of the A549 spheroids was lost after 12 days of treatment with the combination, meanwhile single agents-treated spheroids remained structurally intact, although Ru-PIP single agent inhibited spheroids growth. Compared to single agents alone, the combination induced more cell death in A549 spheroids, as indicated by Calcein AM/PI staining. **Conclusion**: We demonstrate that the synergistic Ru-PIP/Olaparib combination is able to inhibit the growth of the more resistant lung cancer spheroids model, showing promising therapeutic effects and merit further clinical assessment in vivo.

Keywords
Lung Cancer, Combination Therapy, Ruthenium, PARP inhibitor

PC-17

In Vitro Cytotoxicity and Zebrafish Embryos Acute Toxicity Assessment of Ruthenium (II) Metal-based Complexes in Combination with PARP Inhibitor

Nur Aininie Yusoh[1], Norazalina Saad[1], Chia Suet Lin[1,2], Martin R. Gill[3], and Haslina Ahmad[1,4]*

[1] UPM-MAKNA Cancer Research Laboratory, Institute of Bioscience, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
[2] Department of Microbiology, Faculty of Biotechnology and Biomolecular Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
[3] Department of Chemistry, Faculty of Science and Engineering, Swansea University, Swansea, SA2 8PP, UK.
[4] Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

*Corresponding author's email: haslina_ahmad@upm.edu.my

Introduction: Poly(ADP-ribose) polymerase (PARP) inhibitors (PARPi) target the key DNA repair enzymes of PARP and have emerged as small molecule drugs. Recently, ruthenium(II) polypyridyl complexes (RPCs) have shown promise as anticancer candidates due to their ability to form non-covalent (reversible) interactions with DNA. Previously, we have reported the RPC $[Ru(dppz)_2(PIP)]^{2+}$ (dppz = dipyrido[3,2-a:2',3'-c]phenazine, PIP = 2-(phenyl)-imidazo[4,5-f][1,10]phenanthroline), "Ru-PIP" induce replication stress in cancer cells by stalling the DNA replication fork progression. Therefore, the rational combination of Ru-PIP with PARPi may show synergistic activities in cancer cells. In the present study, we examine the combination of Ru-PIP with the most successful PARPi to date, Olaparib for synergy in lung cancer cells. We additionally assess toxicity of the identified combination in a zebrafish embryo model. **Methods**: A549 cells were treated with Ru-PIP or Olaparib single agents alone or in combination and MTT assay was carried out. Synergy was determined using Chou and Talalay combination index (CI) method in which C1 < 1 represents synergy and synergy was further confirmed using clonogenic survival assay. Further acute toxicity test of the identified synergy combination on zebrafish embryos was then carried out. **Results**: Ru-PIP and Olaparib synergy was observed in A549 lung cancer cell line. Synergy was confirmed by loss in clonogenic potential. Moreover, acute zebrafish embryos toxicity studies revealed that this combination showed reduced toxicity compared to single-agent Ru-PIP. **Conclusion**: We demonstrate that the identified synergistic Ru-PIP/Olaparib combination may potentially reduce side effects observed in single-agent therapy and thus, demonstrate new promising therapeutic strategy to combat cancer.

Keywords
Lung Cancer, Combination Therapy, Ruthenium, PARP inhibitor

PC-18

Alternative To Animal Testing in Drug Regulatory Process: 3R As an Indispensable Approach

Wen Tsin Poh[1] and Johnson Stanslas[1]*

[1] Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

*Corresponding author's email: rcxjs@upm.edu.my; jstanslas@yahoo.co.uk

Introduction: Regulatory studies have revolutionised over time. Today, the focus has shifted from animal to non-animal toxicity and efficacy testing. This move aligns with the international 3Rs (Replacement, Refinement and Reduction) principle and has also changed the regulator's perspective. The 3Rs principle has stimulated changes in policy, regulations, and new approaches to safety assessment in drug development in many countries. The 3Rs approach has resulted in the discovery and implementation of new technologies and human-relevant *in vitro* methods that reduce the reliance on animal testing. These include organoids, organ-on-a-chip and alternative assays such as the chick chorioallantoic membrane (CAM) assay. These advancements are not only valuable for research but also contribute to improved animal welfare by minimising the use of animals including non-human primates. Various international guidelines on the principles of regulatory acceptance of 3Rs testing approaches and regulatory testing approaches have been published to promote their application in pharmaceutical safety assessment. Additionally, in early 2023, US FDA passed a new legislation that does not require all new human drugs to be tested on animals, changing the current testing paradigm. The 3Rs alternative method is indispensable and has been widely adopted in various fields of biomedical research, applied in screening research for therapeutic targets, as well as preclinical toxicity testing. These 3Rs approaches are promising and might have drug development and discovery implication for future practice. **Methodology:** This presentation provides a current overview and future perspectives on 3Rs alternatives. **Results:** It was observed that there were no significant differences observed when comparing the legal framework, guidelines and standards across countries. **Conclusion:** Considering the persistent dedication to fostering global animal research and the international initiatives aimed at enhancing animal welfare, it is foreseeable that the landscape of laws, regulations and guidelines will continue to evolve.

Keywords
3Rs Principles, Preclinical Studies, Organoids, Organ-On-A-Chip, Chick Chorioallantoic Membrane (CAM) Assay

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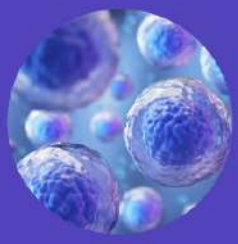
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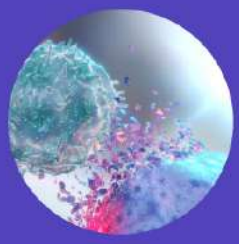
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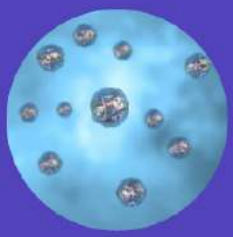
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