Design of Mometasone Furoate Loaded Niosomal System as Drug Delivery Carrier: optimization formula

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Introduction: Some topical applications of compounds combined with glucocorticoids and vitamin D can treat mild to moderate psoriasis, while systemic treatment is needed for severe psoriasis. Mometasone furoate (MF) is a steroidal anti-inflammatory compound that is reported to have clinical indications for treating psoriasis. Transdermal psoriasis therapy can be done by forming MF in the niosomal system, namely a nanovesicles so that the penetration power through the skin layers is higher and will increase the bioavailability of the drug.

Methodology: Optimization was designed using the Box Behnken experimental approach, and niosomes were made using the thin-layer hydration method. Evaluation of particle size, polydispersion index, zeta potential, and entrapment efficiency were used as the research's response variables.

Results: The niosomes produced have the appearance of a cloudy liquid (dispersion), milky white in color, and odorless. The size of niosomal vesicles varies around 336.1 nm. In general, a zeta potential greater than ±30 mV is a good indicator of stability. All formulations have good stability so the tendency for aggregate formation or flocculation is lower. Measurement of entrapment efficiency was carried out spectrophotometrically by measuring free drug and drug entrapped in vesicles and obtained EE results ± 87%. The results show that MF can be formed using the niosomes system at MF concentration 1.396 mg/mL, cholesterol 0.5 M, and surfactant (combination) HLB value 4.7.

Tabel 1. Evaluation of Mometasone Furoate Loaded Niosomal System

Run	Factor A: HLB Value	Factor B: Ratio Molar Cholesterol	Factor C: Mometasone Furoate (mg/mL)	Response Y_1: Particle Size (nm)	Response Y_2: Zeta Potential (mV)	Response Y_3: Polidispersion Index	Response Y_4: Entrapment Efficiency (%)
1	4.70	1.0	1.0	477.3	-38.30	0.000	80.989
2	6.35	1.5	1.0	413.1	-27.90	0.000	74.599
3	8.00	0.5	1.5	145.4	-29.62	0.562	61.159
4	4.70	1.5	1.5	451.2	-40.24	0.381	80.197
5	6.35	1.0	1.5	282.4	-28.61	0.571	70.026
6	6.35	1.0	1.5	279.1	-23.85	0.571	68.374
7	6.35	0.5	2.0	250.9	-31.51	0.571	78.432
8	8.00	1.0	1.0	233.0	-26.67	0.571	40.695
9	4.70	1.0	2.0	376.4	-41.91	0.571	90.103
10	6.35	0.5	1.0	298.4	-29.51	0.571	48.258
11	6.35	1.5	2.0	480.2	-29.10	0.571	73.542
12	8.00	1.0	2.0	306.5	-21.75	0.571	68.913
13	6.35	1.0	1.5	395.6	-30.13	0.000	76.198
14	6.35	1.0	1.5	428.2	-33.66	0.000	77.676
15	6.35	1.0	1.5	360.6	-33.44	0.571	62.550
16	4.70	0.5	1.5	485.0	-58.96	0.000	88.630
17	8.00	1.5	1.5	276.9	-32.79	0.571	75.242

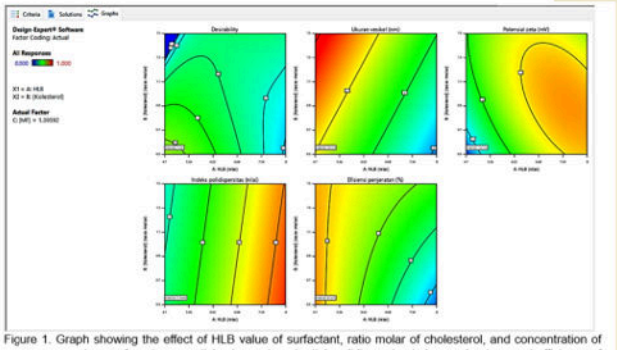

Figure 1. Graph showing the effect of HLB value of surfactant, ratio molar of cholesterol, and concentration of mometasone furoate on particle size, zeta potential, polidispersion index, and entrapment efficiency of noisome mometasone furoate.

Table 2. Optimal Formula of Niosome Mometason Furoate

Number	HLB	Cholesterol	[Mometasone]	Particle Size	Zeta Potential	Polidispersion Index	Entrapment Efficiency	Desirability	
Goal	is in range	is in range	is in range	minimize	minimize	is target = 0.15	maximize	-	
1.	4.700	0.500	1.396	397.926	-56.171	0.219	83.125	0.642	**Selected**
2.	4.700	0.500	1.392	397.933	-56.139	0.218	83.044	0.642	
3.	4.700	0.500	1.401	397.917	-56.211	0.220	83.229	0.642	
4.	4.700	0.500	1.413	397.894	-56.312	0.224	82.724	0.642	
5.	4.700	0.500	1.378	397.961	-56.011	0.214	82.636	0.642	
6.	4.700	0.500	1.374	397.968	-56.974	0.213	82.531	0.642	
7.	4.700	0.500	1.370	397.977	-55.929	0.211	82.531	0.642	
8.	4.700	0.500	1.363	397.989	-55.866	0.210	82.383	0.642	
9.	4.700	0.500	1.433	397.854	-56.469	0.229	83.959	0.642	

Conclusion: This result indicated the formula can be developed for a transdermal drug delivery system.

Acknowledgement
The Universitas Muhammadiyah Prof. DR. HAMKA Research and Development Institute has provided funding and assistance for this study.

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This research presented at MONASH INITIATE 2023 on October 25–26, 2023

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WELCOME MESSAGE

PRESIDENT AND PRO VICE-CHANCELLOR

With great pleasure and profound anticipation, I extend my warmest welcome to all esteemed participants, distinguished guests, and scholars of the field to the Monash International Health Science and Technology Conference 2023 (MONASH INITIATE 2023).

Under the overarching theme, "Translating Research into Practice: Revolutionizing Healthcare Delivery and Outcomes," MONASH INITIATE 2023 stands as a beacon of enlightenment, guiding us toward the future of healthcare. As President and Pro-Vice Chancellor of Monash University Malaysia, I am deeply proud of our university's role in fostering scientific progress and promoting interdisciplinary collaboration to achieve better health outcomes for all.

MONASH INITIATE 2023 provides a unique platform for researchers, practitioners, and innovators from around the globe to forge meaningful connections, explore new frontiers, and catalyse change. The insights gained during these deliberations will contribute to the academic discourse and translate into tangible improvements in patient care, public health, and healthcare systems worldwide.

As we embark on this academic odyssey, I encourage all participants to seize the opportunity to learn, network, and contribute to the greater good of our shared mission. We will inspire, challenge, and innovate, charting a course toward a brighter and healthier future.

Thank you for your unwavering dedication to advancing science and healthcare.

Professor Dato' Dr Adeeba Kamarulzaman
President and Pro Vice-Chancellor
Monash University Malaysia

WELCOME MESSAGE

HEAD OF SCHOOL

I am delighted to extend my warmest greetings as we gather for the third annual Monash International Health Science and Technology Conference (MONASH INITIATE 2023), themed "Translating Research into Practice: Revolutionizing Healthcare Delivery and Outcomes."

It fills me with a sense of joy and accomplishment that we can convene in person this year after successfully hosting this conference virtually for two years while navigating the challenges presented by the COVID-19 pandemic. This year, we have the privilege of hosting a distinguished line-up of speakers, experts from prestigious institutions such as the National Institutes of Biotechnology, the National Pharmaceutical Regulatory Agency, Universiti Sains Malaysia (USM), Universiti Teknologi MARA (UiTM), Monash University Australia, the University of Technology Sydney, and the University of Oxford, who promise to share enlightening insights and discoveries.

Moreover, MONASH INITIATE 2023 serves as a global platform that unites researchers, scientists, and students from diverse countries, including the Philippines, Australia, and Indonesia, all driven by a shared commitment to advancing healthcare through scientific and technological innovation. I hope that you will derive fruitful outcomes from this three-day event by actively engaging in meaningful discussions, forging new connections, and contributing to shaping the future of healthcare.

Lastly, I would also like to extend my sincere gratitude to our dedicated organizing committee for their hard work and to our sponsors for their invaluable support in making this conference a reality. The success of this conference relies on the unwavering support of the parties mentioned above.

Thank you for being a part of MONASH INITIATE 2023. Welcome, and I wish you an enjoyable and enriching experience!

Professor Gan Siew Hua
Head, School of Pharmacy
Monash University Malaysia

WELCOME MESSAGE

ORGANISING CHAIRPERSON

As Chairperson and on behalf of the organizing committee, I am delighted to welcome delegates from all over the world to the Monash International Health Science and Technology Conference 2023 (MONASH INITIATE 2023). We are indeed privileged to bring together distinguished academicians, researchers and practitioners in key disciplines to discuss along the central theme of this exciting forum which is "Translating Research into Practice: Revolutionizing Healthcare Delivery and Outcomes."

This year, MONASH INITIATE 2023 attracted around 150 participants from 09 countries. Translating research into clinical practice is a global priority because of its potential impact on health services delivery and outcomes. Despite the ever-increasing depth and breadth of health research, most areas across the globe seem to be slow to translate relevant research evidence into clinical practice. Recent years have seen a revolution in the domain of medical science, with ground-breaking discoveries changing health care as we once knew it. These advances have considerably improved disease diagnosis, treatment, and management, improving patient outcomes and quality of life. These innovations range from the creation of novel medications and treatments to the utilization of cutting-edge technologies. This is in line with the theme of MONASH INITIATE 2023.

Selected abstracts and posters on the most recent scientific findings and experiences will be presented on a broad range of topics. The scientific sessions offer an opportunity for a prestigious group of opinion leaders to contribute to a common vision of advances in Pharmaceutical Sciences and the emerging challenges in practice.

This conference will allow delegates to understand the different approaches, perspectives and sensitivities among the different players in Pharmaceutical Sciences, offering the opportunity to initiate fruitful discussions and collaborations.

I am confident that MONASH INITIATE 2023 to be an interesting and memorable scientific conference. To our foreign delegates, I hope you can take time to explore our beautiful country and enjoy your stay in Malaysia.

Associate Professor Dr. Mahendran Sekar.
School of Pharmacy
Monash University Malaysia

WELCOME MESSAGE

HEAD OF SCIENTIFIC COMMITTEE

It is with great pleasure and excitement that I welcome you to the pages of the Monash INITIATE 2023 e-book which serves as a testament to the dedication and passion that each of you brings to the healthcare fraternity. We are truly humbled by the overwhelming response from all of you in submitting a multitude of abstracts for Monash INITIATE 2023. Your enthusiastic contributions have enriched this conference in countless ways.

As we flip through these pages, you'll discover a rich collection of research and findings. You'll find the heartbeats of countless hours of work, the unwavering commitment to patient care, and the relentless pursuit of knowledge. Over here, we see the combined efforts of many great, young minds, whose collective contributions to science and humanity makes our tomorrows better than what we have today.

Our gratitude goes out to every contributor, every researcher, every healthcare provider, and every pharmacist who has poured their expertise and passion into these pages. Your work is the foundation upon which we build a stronger, healthier world. So, as you delve into this conference proceeding, may you find inspiration, insights, and a renewed sense of purpose. May it remind you of the incredible impact pharmacy has on society, and the difference each one of you makes.

Thank you for being a part of this community, and thank you for your invaluable contributions to the world of research and discovery. Your presence in these pages makes a difference, and for that, we are deeply grateful.

Dr Wong Yen Jun
Assistant Lecturer, School of Pharmacy
Monash University Malaysia

WELCOME MESSAGE

STUDENT REPRESENTATIVE COMMITTEE

First and foremost, it is my privilege to extend a heartfelt welcome to all attendees of our Monash International Health Science and Technology Conference (Monash INITIATE 2023) under the theme of “Translating Research into Practice: Revolutionizing Healthcare Delivery and Outcomes”.

“Science knows no country because knowledge belongs to humanity, and it’s the torch which illuminates the world.” – Louis Pasteur.

This gathering represents a platform for students, professionals, and academics to unite and share in the pursuit of knowledge and innovation. We aim to inspire, educate, and collaborate. Together, we will explore the frontiers, delving into breakthrough research, novel discoveries, and the limitless potential of our field.

The pharmaceutical landscape is evolving, and as the next generation of healthcare leaders, our role in shaping its future is pivotal. I encourage my fellow peers to embrace every moment of this conference, to participate actively, and to engage with esteemed mentors and peers. This is a unique chance to learn, grow, and connect with the vibrant community that defines our discipline.

Thank you for being a part of this event. Your presence enriches this conference and contributes to our shared vision of advancing healthcare through pharmacy and pharmaceutical sciences excellence. I would like to extend my appreciation to the committee members for making this possible. Let us embark on this journey together, sharing insights, sparking innovation, and creating a brighter future for healthcare.

Tow Wai Kit
PhD Candidate, School of Pharmacy
Monash University Malaysia

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8.00am	**Registration**
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9.20am	**Keynote Address by Professor Emeritus Dr Yuen Kah Hay** **Universiti Sains Malaysia (USM), Penang, Malaysia** Topic: Advances in Personalized/Precision Medicine through Science and Technology
10.10am	**Tea Break and Poster Viewing [Exhibition foyer]**
10.30am	**Keynote Speaker:** **Prof. Datin. Paduka Dr Khatijah Mohamad Yusoff** **Universiti Putra Malaysia (UPM), Malaysia** Topic: Harnessing the Potential of Newcastle Disease Virus: An Encouraging Strategy for Cancer Treatment
11.20am	**Plenary Speaker:** **Dr Kamal Dua** **University of Technology Sydney, Australia** Topic: Integration of Biological and Technological Advances in Developing Novel Therapeutic Interventions for Lung Diseases
12.10pm	**Plenary Speaker:** **Mdm Rosliza Lajis, Head of New Drug Product Section** **National Pharmaceutical Regulatory Agency (NPRA)** **Ministry of Health, Malaysia** Topic: The Evolution of Pharmaceutical Product Registration in Malaysia

Agenda: Day 1

Time (MYT)	DAY 1 – 25 OCTOBER 2023, WEDNESDAY Auditorium 5114
1.00pm	Sponsor talk
1.15pm	Lunch break and poster viewing [Exhibition foyer]
2.00pm	Oral Presentation [Kindly refer to the Oral Presentation Schedule]
3.40pm	Tea break and poster viewing [Exhibition foyer]
4:00pm	Poster evaluation [Exhibition foyer] *ALL presenters please standby at your poster
	End of Day 1

Agenda: Day 2

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10.10am	**Tea Break and Poster Viewing [Exhibition foyer]**
10.30am	**Plenary Speaker:** **Associate Professor Dr Daniel Malone,** **Monash Institute of Pharmaceutical Sciences** **Monash University Australia** Topic: Exploring Ways to Better Prepare Pharmacy Students for Practice
11.20am	**Plenary Speaker:** **Dr Janattul Ain Jamal, Faculty of Pharmacy,** **Universiti Teknologi MARA (UiTM), Malaysia** Topic: Optimizing Antimicrobial Therapy: Dosing, Therapeutic Drug Monitoring, Challenges, and Opportunities
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Agenda: Day 2

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1.00pm	**Lunch break and poster viewing [Exhibition foyer]**
2.00pm	**Oral Presentation [Kindly refer to the Oral Presentation Schedule]**
3.40pm	**Tea break and poster viewing [Exhibition foyer]**
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4.50pm	**AWARD PRESENTATION AND CLOSING CEREMONY**
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Oral Presentation Schedule Day 1 – 25 Oct 2023 (Wed)

Time Start (pm)	Time End (pm)	Drug delivery (DD)	Drug discovery and synthesis (DS)	Life Sciences (LS)	Clinical Pharmacy (CP) + Digital Health (DH)
Venue		**Lecture theatre 6006**	**Auditorium 5114**	**Lecture theatre 6007**	**Lecture theatre 6008**
2.00	2.15	OP-DD-05	OP-DS-01	OP-LS-01	OP-CP-01
2.15	2.30	OP-DD-06	OP-DS-03	OP-LS-02	OP-CP-03
2.30	2.45	OP-DD-08	OP-DS-04	OP-LS-03	OP-CP-04
2.45	3.00	OP-DD-09	OP-DS-05	OP-LS-04	OP-CP-05
3.00	3.15	OP-DD-10	OP-DS-06	OP-LS-05	OP-CP-06
3.15	3.30	OP-DD-12	OP-DS-09	OP-LS-06	OP-CP-07
3.30	3.45	OP-DD-13	OP-DS-12	OP-LS-08	OP-DH-03
3.45	4.00	OP-DD-11	Tea break and poster viewing		
4.00	4.15	-	OP-DS-15	OP-LS-09	OP-DH-04
4.15	4.30	-	OP-DS-19	OP-LS-21	OP-DH-05
4.30	4.45	-	OP-DS-20	OP-LS-07	
4.45	5.00	-		OP-LS-14	

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Time Start (pm)	Time End (pm)	Drug delivery (DD)	Drug discovery and synthesis (DS)	Life Sciences (LS)	Public Health (PH)
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2.00	2.15	OP-DD-15	OP-DS-13	OP-LS-10	OP-PH-01
2.15	2.30	OP-DD-19	OP-DS-21	OP-LS-11	OP-PH-02
2.30	2.45	OP-DD-16	OP-DS-22	OP-LS-16	OP-PH-04
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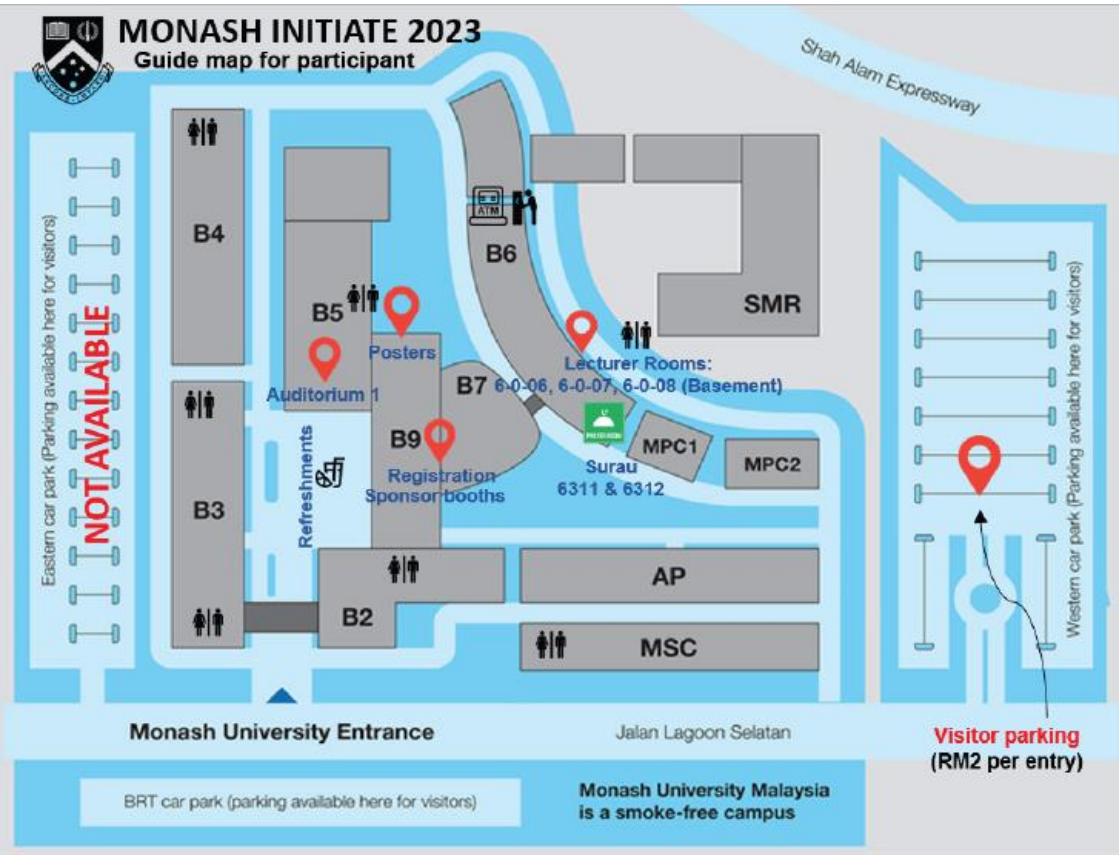
3.00	3.15	-	OP-DS-24	OP-LS-18	OP-PH-06
3.15	3.30	-	OP-DS-25	OP-LS-19	OP-PH-07
3.30	3.45	-	-	OP-LS-20	OP-PH-03

All abstracts will be published in the Monash INITIATE 2023 e-book which will be available for view and download on 25 October 2023.

VENUE MAP



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Learning Skills
Library and Learning Commons
Monash University English Language Centre

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MPC 1 & MPC 2
(Multi-purpose Court)

MSC
(Monash Sports Centre)
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AP
(Emergency Assembly Point)

SMR
(Sunway Monash Residence)

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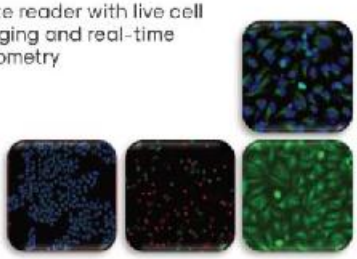

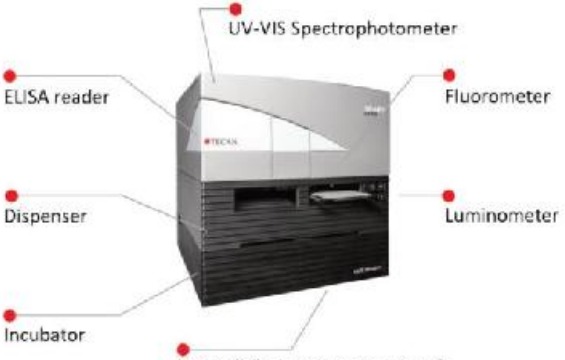

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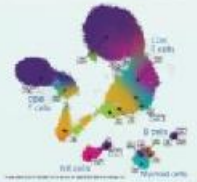
CD19	CD57	CXCR5
CD20	CD66b	HLA-DR
CD25	CD123	IgD
CD27	CD127	TCRγδ



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Surface Plasmon Resonance (SPR)

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Characterization of molecular interactions | Structural/functional studies | Screening | Characterization | Lead optimization

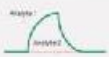
Pure or complex.
Small or large.

Affinity
Reflects the binding strength.

Kinetics
How fast/slow a complex forms and dissociates.

Concentration
Determine concentration of active analyte.

Specificity
Is the molecule specific for its target?



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SPEAKERS PROFILE

KEYNOTE SPEAKER

Professor Emeritus Dr Yuen Kah Hay
School of Pharmaceutical Sciences
Universiti Sains Malaysia (USM)
Penang, Malaysia

Emeritus Professor Yuen Kah Hay obtained his B.Pharm.(1st class Hons) and M.Sc. from Universiti Sains Malaysia and Ph.D. from University of London. He has been lecturing at the School of Pharmaceutical Sciences, Universiti Sains Malaysia for over 40 years. To date he has successfully supervised over 60 postgraduate students at the master's and Ph.D levels and published over 170 research papers. Whilst lecturing in the university, he was also a consultant to a local pharmaceutical company, Hovid Bhd since 1992, where he led a team in drug formulation and product development as well as heading a BE center in conducting bioequivalence studies for the pharmaceutical industry. He began investigating palm tocotrienols in the late 90s and helped to launch the first tocotrienol product in Malaysia, including the development of a patented system used in Tocovid Suprabio. He was also the lead investigator of several clinical studies investigating the neuroprotective effects of tocotrienols and also their therapeutic benefits in Non Alcoholic Fatty Liver. He has retired from the university on December 2016 and from Hovid on December 2020. In recognition of his contributions in research and to the local Pharmaceutical Industry, he was conferred the title Emeritus Professor by Universiti Sains Malaysia in 2019 and was listed as the "World's top 2% Scientists" in 2020 and "top 2% most cited scientist in the world" in 2021 by Stanford University. He has since joined a subsidiary company of Sarawak Oil Palms Bhd on 1st July 2021 and the research labs are still based in USM.

SPEAKER ABSTRACT

Advances in Personalized/Precision Medicine through Science and Technology

More than 2 thousand years ago, Hippocrates disclosed in his teachings that “People have differences in illness, symptoms and response to treatment”. He further emphasized that “treatment should be tailored to each patient’s unique idiosyncrasia”. It is clear from these statements, that the concept of “Personalized Medicine” which has become a buzz word in recent years, was first founded by Hippocrates. He further asserted that “It is far more important to know what person the disease has, than what disease the person has” which is in accord to modern medical practice of refining treatment according to patients’ characteristics including age, body weight, genetic makeup and other environmental factors. Over the years, the practice of medicine has not wavered from this concept since its founding, but has evolved and grown in sophistication in tandem with advances in science and technology. This presentation will provide an overview of the progress made in the last few decades replete with examples. More recently a new term “Precision Medicine” was coined. It is not just an issue of semantics but also of conceptual shift, with emphasis that development in health management or treatment modalities should be more population based rather than focusing on an individual. Regardless of the terms however, the ultimate goal is to use all scientific knowledge and tools at our disposal for better health management, patient care and treatment of diseases.

“*Wherever the art of Medicine is love, there is also a love of Humanity” (Hippocrates, 460-377BC)*

Professor Emeritus Dr Yuen Kah Hay
Universiti Sains Malaysia, Penang, Malaysia

KEYNOTE SPEAKER

Professor Datin Paduka Dr Khatijah Mohamad Yusoff
PhD, DSc (honoris causa) (La Trobe)
FASc, FTWAS, FIAS, FMSA
National Institutes of Biotechnology Malaysia

Khatijah has extensive engagement and network with industry, professional bodies and academies; she is currently the Vice-President of Islamic World Academy of Sciences (IAS), member of the Council of Scientific Advisors of International Centre for Genetic engineering and Biotechnology (ICGEB), a Senior Fellow of the Academy of Sciences Malaysia (ASM), Fellow of the Malaysian Scientific Association (MSA) and Fellow and former Vice-President of The World Academy of Sciences for the advancement of science in developing countries (TWAS). Her 5-year stint as the Deputy Secretary-General of Ministry of Science, Technology and Innovation Malaysia (2008-2013) gave her an opportunity to promote science through national policies and development of a strong framework in managing Science in the country. She believes strongly on the need for translating science into tangible benefits to people around the world; she previously sat on the Board of Trustees of the International Livestock Research Institute, SEAMEO-BIOTROP Governing Board, Advisory Board for La Trobe Asia, and the Technical Advisory Panel for COMSATS as well as several agencies in Malaysia. She is involved in promoting science to the communities; she was formerly a member of the National Science Research Council and the National Bioethics Council. She is currently the Chairman of the National Committee on Research Integrity and the Advisor of the Talent Development Committee under ASM. Her research focuses on the molecular biology of Newcastle disease virus, a poultry virus which kills cancer cells without affecting the normal cells. Through reverse genetics, she is currently developing an NDV-based cancer vaccine for the treatment of colorectal and bladder cancers. Her work has received many awards, the most recent being the Anugerah Tokoh Akademik Negara 2022. She was also featured in a 2021 special edition of DC Comics "Wonder Women: Wonderful Women of The World. Her special message to young Malaysian scientists looking to impact their field is to "never give up and value the importance of teamwork".

SPEAKER ABSTRACT

Harnessing the Potential of Newcastle Disease Virus: An Encouraging Strategy for Cancer Treatment

Newcastle disease virus (NDV) is significant avian paramyxovirus known to infect a diverse range of bird species, including domestic poultry. Remarkably, the virus exhibits a unique capability: it can specifically target and eliminate human cancer cells while sparing normal cells from harm. Furthermore, its impact on humans is limited to mild flu-like symptoms and conjunctivitis, posing no serious health risks. This unique characteristic of lysing cancer cells with precision and sensitivity provides a promising foundation for its potential role in cancer treatment. By utilising reverse genetics, NDV can be strategically engineered to carry various genes, including immunomodulatory genes. These additional genes attract immune cells, enhancing the virus's ability to combat cancer cells effectively. This approach, known as oncolysis, involves the use of viruses to destroy cancer cells. Encouragingly, several ongoing clinical trials are yielding promising outcomes. The manipulation of the NDV genome to develop therapeutic vaccines represents a captivating and challenging avenue for cancer therapy, or better known as oncovirotherapy. It opens up novel prospects for harnessing the virus's potential to revolutionise the field of cancer treatment. The enhanced therapeutic outcomes associated with this approach inspire hope for individuals seeking transformative breakthroughs in their battle against cancer.

Professor Datin Paduka Dr Khatijah Mohamad Yusoff
National Institutes of Biotechnology Malaysia

PLENARY SPEAKER

Dr Kamal Dua
Senior Lecturer, Graduate School of Health, University of Technology Sydney (UTS)
Senior Research Fellow and Translation Lead, Australian Research Centre in Complementary and Integrative Medicine (ARCCIM)
Node Leader of Drug Delivery Research in the Centre for Inflammation at Centenary Institute/UTS

Dr Kamal Dua is a Senior Lecturer in the Discipline of Pharmacy at the Graduate School of Health, University of Technology Sydney (UTS). He has research experience of over 14 years working in the field of drug delivery targeting inflammatory diseases. Dr. Dua is also a Senior Research Fellow and Translation Lead, Australian Research Centre in Complementary and Integrative Medicine (ARCCIM) and Node Leader of Drug Delivery Research in the Centre for Inflammation at Centenary Institute/UTS where the targets identified from the research projects are pursued to develop novel formulations as the first step towards translation into clinics. Dr. Dua researches two complementary areas; drug delivery and immunology, specifically addressing how these disciplines can advance one another, helping the community live longer and healthier. His extensive publication record evidences this in reputed journals. Dr. Dua's research interests focus on harnessing the pharmaceutical potential of modulating critical regulators such as Interleukins and microRNAs and developing new and effective drug delivery formulations to manage inflammation in chronic airway diseases and cancer. Since 2019, Dr Dua's research has resulted into >300 publications with >11, 600 citation and h index of 47. He has also published 7 books with Elsevier and Springer and >80 book chapters.

SPEAKER ABSTRACT

Integration of Biological and Technological Advances in Developing Novel Therapeutic Interventions for Lung Diseases

Chronic respiratory diseases, including asthma, chronic obstructive pulmonary disease (COPD), and cystic fibrosis (CF), are the leading cause of morbidity and mortality worldwide. This is primarily because of the aging population and increasing prevalence of cigarette smoking globally. Thus, it is very crucial to have an effective therapeutic moiety delivered to the target site at the right time and in an appropriate amount, especially with various chronic respiratory diseases, such as asthma where immediate therapeutic action is needed. Globally, viral respiratory infections are also one of the major health problems. The investigations in this area are becoming more challenging because of the complexity of the relationship between the host's defences and microbial virulence. Though there are a number of translational and clinical studies performed worldwide to investigate molecular mechanisms interlinking various infections and allergic airway diseases along with the ongoing search for potential therapeutic interventions, there are still many questions that remain unaddressed. Some of these impediments include patterns of inflammation involved due to various respiratory viruses and multiple genes and their products, which underpin the regulatory mechanisms driving the disease pathology. In my talk, I will be covering some of the novel therapeutic interventions discovered through biological advances and phytoceuticals leading into a suitable advanced delivery system like nanoparticles in our team. In order to have clinically relevant and meaningful data, it is essential to validate and standardize the various biological techniques to warrant greater reproducibility and minimum variability for future applications in respiratory research. Such approaches will be of interest for both biological and formulation scientists to understand and explore the new vistas in the area of pulmonary inflammatory diseases.

Dr Kamal Dua
University of Technology Sydney, Australia

PLENARY SPEAKER

Rosliza Lajis
Head of New Drug Product Section
Centre of Product and Cosmetic Evaluation
National Pharmaceutical Regulatory Agency
Malaysia

Rosliza Lajis completed her Master of International Health Economics and Pharmacoeconomics from the Cardiff University, United Kingdom and her pharmacy undergraduate studies at Bandung Institute of Technology, Indonesia, in 2011 and 2001, respectively. The latter was funded by Public Service Department Scholarship.

In 2002, she joined the Ministry of Health (MoH) Malaysia and since March 2020 she has lead the New Drug Product Section, Centre of Product & Cosmetic Evaluation, National Pharmaceutical Regulatory Agency (NPRA) to date.

Her expertise covers all matters on Access to Medicine and she is highly involved in international and local discussions pertaining to Drug Accessibility, Formulary Management, Pharmacoeconomics & Health Economics and Managed Entry Agreements (MEAs) from 2011 till 2019. Her current interest is now focusing on the regulatory work on areas pertaining to good reliance practice and collaborative assessment initiatives as part of a strategy towards facilitating an earlier access to a quality-assured, safe and effective medicines.

SPEAKER ABSTRACT

The Evolution of Pharmaceutical Product Registration in Malaysia

Regulators worldwide are continuously challenged to ensure timely access to quality, safe and efficacious medicines. Over the years, registration process of pharmaceuticals in Malaysia has continued to evolve to cater for the changing needs.

NPRA has started a regulatory-strengthening initiatives which involved a comprehensive regulatory review in 2018. Consequently, new registration pathways were established since 2019 to provide expedited access to essential products and to satisfy unmet medical needs of the population. Priority reviews are given to pharmaceutical products that met the set criteria. In 2020, a pathway that allow conditional registration of novel products during pandemics or emergencies was also introduced to provide early access to vaccines and treatments of Covid-19.

In this session, the various regulatory pathways available to register pharmaceutical products in Malaysia will be featured and discussed. Criteria & requirements for pharmaceutical products eligible for the different pathways will also be outlined.

Rosliza binti Lajis
National Pharmaceutical Regulatory Agency, Malaysia

KEYNOTE SPEAKER

Professor Chris Bain
Digital Health Theme
Department of Human Centred Computing
Faculty of Information Technology
Monash University
Melbourne, Victoria, Australia

Chris Bain is the inaugural Professor of Practice in Digital Health in the Faculty of Information Technology, Monash University, Australia. He has more than 30 years' experience in the health industry, including 12 in clinical medicine. He's led numerous software development and implementation projects in the health industry and works with many faculties and Institutes across the University, as well as with a range of health industry partners, in leading the Monash efforts in Digital Health

SPEAKER ABSTRACT

Digital Health and its Relationship to Precision Health and Wellness

There are many drivers of digital health in healthcare systems all around the world, be they highly developed and well-funded healthcare systems, or still relatively under-developed ones. In this talk Prof Bain will outline for the audience what the essence of digital health actually is and what its hallmarks are. He will specifically examine sub areas of digital health such as digital therapeutics, where digitally enabled interventions can and do provide positive outcomes for patients, carers and the healthcare system. Most audiences are quite surprised at just what digital health is already able to do, and how it can offer a refreshing picture of the future of healthcare across the world.

Professor Chris Bain
Monash University, Australia

PLENARY SPEAKER

Associate Professor Dr. Daniel Malone
Faculty of Pharmacy and Pharmaceutical Sciences
Monash University
Melbourne, Victoria, Australia

Dr Daniel Malone is the Director of the Pharmacy degree at Monash University, Melbourne, Australia, and as such is responsible for the education of over 1000 undergraduate pharmacy students. He is a registered pharmacist and completed his PhD in neuropharmacology in 2000. In addition to numerous university and faculty teaching awards, he has won an Australian Government Office of Learning and Teaching Citation for Outstanding Contributions to Student Learning, and in 2022 led a team that won the American Associated Colleges of Pharmacy Innovation in Teaching Award, the first time this has been awarded to a team outside of the USA. His research focuses on exploring ways to improve the education of pharmacy students, in particularly regarding authentic assessment methods, improving cultural capability and professionalism in pharmacy students. He has published over 50 papers in well-respected peer reviewed journals.

SPEAKER ABSTRACT

Exploring Ways to Better Prepare Pharmacy Students for Practice

As pharmacy practice continues to evolve and expand, pharmacy education must adapt to meet the demands of a dynamic healthcare landscape. This presentation will explore the critical role of authentic assessments and simulations in enhancing the preparedness of pharmacy students for real-world practice. Authentic assessments go beyond traditional testing methods to evaluate a student's ability to apply knowledge and skills in realistic, complex scenarios. Simulations, on the other hand, provide students with immersive, hands-on experiences that mirror the challenges they will encounter in their professional careers.

This presentation will discuss the benefits of incorporating authentic assessments and simulations into pharmacy education, offering insights into how these pedagogical approaches can bridge the gap between classroom learning and clinical practice. We will discuss the design and implementation of authentic assessments and simulations, highlighting their ability to foster critical thinking, decision-making, and communication skills among pharmacy students.

Furthermore, the talk will showcase the development and use of simulations such as MyDispense, a dispensing simulation developed by Monash University, including potential future uses of MyDispense simulations to create authentic assessments. Attendees will gain a deeper understanding of the practical applications of simulations and authentic assessments in terms of enhancing the educational experience of pharmacy students so that they are have enhanced skills needed to excel in their future roles as healthcare professionals.

Associate Professor Dr Daniel Malone
Monash University, Australia

PLENARY SPEAKER

Dr. Janattul Ain Jamal
Principal Lecturer
Department of Clinical Pharmacy
Faculty of Pharmacy
Universiti Teknologi MARA
Malaysia

Dr. Ain had a 19-year career as a hospital pharmacist, particularly practiced in the area of clinical pharmacy before recently moved to academia. She has been practicing in intensive care unit for almost 15 years as critical care pharmacist and actively involved in the development and implementation of antimicrobial stewardship programme during her clinical practice. Since 2009 she has involved in various industrial-sponsored and investigator-initiated research. Her area of interest is the drug dosing optimization in critically ill patients, particularly those who are receiving renal replacement therapy (RRT). She has authored publications in leading journals such as Critical Care Medicine, International Journal of Antimicrobial Agents, Nephrology, on her area of specialty. She is currently the member of European Society of Clinical Microbiology and Infectious Disease (ESCMID) and has been appointed as a panel member of ESCMID guideline project on 'Dosing of Antimicrobials in Patients with Renal Impairment with or without RRT'.

SPEAKER ABSTRACT

Optimising Antimicrobial Therapy: Dosing, Therapeutic Drug Monitoring, Challenges, Opportunities

The continued rise of antimicrobial resistance prompts the need to optimize antimicrobial dosing. Timely and appropriate initiation of antimicrobial therapy is crucial, particularly for patients with severe and/or difficult to treat infection, as it may significantly improve clinical outcomes. Certain hospitalised patients, including the critically ill, obese, and elderly patients may exhibit several pathophysiological and/or iatrogenic factors due to the illnesses that can alter the drug pharmacokinetic parameters leading to suboptimal drug exposure, particularly in the early phase of antimicrobial therapy. Coupled with the of emergence of antimicrobial resistance (AMR) and limited availability of newly agent to be used, delivering antimicrobial therapy can be challenging. Antimicrobial dosing strategies incorporating the principle of pharmacokinetic and pharmacodynamic has been highly recommended as one of the key approaches to ensure appropriate drug concentration at the infection site. In recent years, therapeutic drug monitoring (TDM) has emerged as a valuable tool widely employed to assist in delivering the most effective antimicrobial dosing regimen in complex infection situations. Individualised antimicrobial dosing represents a potential approach to optimise care in patients with severe infection especially in the presence of difficult to treat infection. However, extending the use of TDM beyond its traditional utilization such as for the beta lactams, antifungals and antivirals can be challenging and limited in local practice. Nonetheless, through collaborative efforts across various disciplines, implementing the TDM beyond its conventional use can be successful and integration with technology such as AI could aid in the delivery of optimal pharmacotherapy for patients with infection in Malaysia.

Dr Janattul Ain Jamal
Universiti Teknologi MARA, Malaysia

INVITED SPEAKER

Dr. Daniel Wright
The Oxford Vaccine Group
University of Oxford
United Kingdom

My research interests involve the immunology of infectious disease with a focus on vaccine development. I studied Biology at Exeter University before completing an MSc in Medical Parasitology at the London School of Hygiene and Tropical Medicine. After gaining laboratory experience in an immunology-based biotech company for two years, I moved to the Jenner Institute working on clinical vaccine trials. In 2018, I began my DPhil in Clinical Medicine at Oxford University, splitting my time working between Oxford and Kilifi, Kenya, where my research focused on the immunology of Rift Valley fever virus in multiple species. Much of this work has focused on characterising the immune response to infection or vaccination with a novel Rift Valley fever vaccine designed for both animals and humans. Since 2020, I have been heavily involved with the testing of the Oxford/AstraZeneca COVID-19 vaccine along with establishing additional pre-clinical vaccine programmes on New World arenaviruses and Rift Valley fever using viral-vector and mRNA platforms.

SPEAKER ABSTRACT

Developing Vaccines against Emerging Pathogens

There is a pressing need to develop vaccines against pathogens with significant potential to cause epidemics and pandemics. International organisations such as the W.H.O. have drawn up lists of the pathogens considered a priority for this. Rift Valley fever virus (RVFV) is one such pathogen, with livestock and human disease threatening public and animal health. Understanding protective immunity is crucial, particularly when the sporadic nature of outbreaks for emerging pathogens can make efficacy testing extremely challenging. A One-Health approach to vaccinology, where animal and human vaccines are co-developed in parallel, has significant advantages for diseases like RVF. In addition to the numerous pathogens with significant, if periodic, burdens of disease, we must also be prepared to rapidly design and test vaccines against novel pathogens, using platform technologies. This talk will share the group's development of various vaccines for emerging pathogens, from pre-clinical to efficacy testing and licensure, including the Oxford/AZ COVID-19 that has now been used in more than 170 countries.

Dr Daniel Wright
University of Oxford, United Kingdom

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FAQs

✓ What is CLOX?
CLOX is water based but highly efficient and non-residue disinfectant.

✓ How highly efficient is it?
Our test result shows that even at extremely low concentration (0.1ppm), ClO_2 can kills most disease causing bacteria.

✓ What is the core ingredient?
Chlorine dioxide in the form of gas

Application


Food Sanitation


Public Places


Personal Hygiene


Air Deodorisation


Pet Disinfectant


Healthcare Hygiene


Children Disinfectant

Disinfectant Contact Time

TEST ORGANISM	CHLORINE DIOXIDE	ALCOHOL 70%	QUATERNARY	AMPHOTERIC SURFACTANT	HYPOCHLORITE
STAPHYLOCOCCUS AUREUS	5 mins	5 mins	5 mins	5 mins	5 mins
CANDIDA ALBICANS	5 mins	5 mins	15 mins	15 mins	5 mins
ENTEROCOCCUS HIRAE	5 mins	5 mins	5 mins	5 mins	5 mins
PSEUDOMONAS AERUGINOSA	5 mins	5 mins	5 mins	5 mins	5 mins
ESCHERICHIA COLI	5 mins	5 mins	5 mins	5 mins	5 mins
BACILLUS CEREUS	5 mins				5 mins
ASPERGILLUS BRASILIENSIS	5 mins				15 mins

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CLEANING TOOLS	BIOSAFETY CABINET/ISOLATOR CLEANING TOOLS • STERILE WIPE • WIPE • CLEANROOM MOP • STICKY ROLLER HANDLE • PE STICKY ROLLER REFILL • CUSTOMADE MOP HEAD • CUSTOMADE MOP COVER • POLYSTER SWAB
PPE	STERILE COVERALL • STERILE BOOT COVER • STERILE GOWN • COVERALL • BOOT COVER • GOWN • NON WOVEN CAP • FACE MASK • RESPIRATOR MASK • SAFETY GOGGLE • FACE SHIELD • NITRILE GLOVE • LATEX GLOVE • SHOE COVER
DISPOSABLE	STERILE PREPARATION MAT • STERILE EYE DROP BOTTLE • STERILE AMBER VIAL • AMBER GLASS BOTTLE • PARAFILM • PLASTIC BOTTLE • ZIP LOCK BAG • STICKY MAT • ALUMINIUM FOIL • CHEMO SPILL KIT • BLOOD SPILL KIT • CHEMICAL SPILL KIT • BIOHAZARD SPILL KIT
PREPARED MEDIA	STERIPACK TRIPLE WRAPPED MEDIA • PREPARED PLATED MEDIA • PREPARED TUBED MEDIA • TRANSCULTSWAB • CHROMOGENIC AGAR
LABORATORY	BEAKER • JUG • CYLINDER • FUNNEL • GLASS STIRRING ROD • FORCEP • SPATULA • STIRRER BAR • WASH BOTTLE • STAINLESS STEEL SCISSORS • DECON 90
TRAINING	DEMONSTRATION ASEPTIC GOWNING • DEMONSTRATION GLOVING TECHNIQUE • CLEANROOM INTRODUCTION AND CONTAMINATION IN CLEANROOM • DEISINFECTANT SELECTION • CLEANING PROGRAMME

PRESENTERS DRUG DISCOVERY & SYNTHESIS

Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-DS-01	**Associate Professor Dr B. R. Prashantha Kumar** Novel Derivatives of Eugenol as Potent Anti-Inflammatory Agents via PPARγ Agonism: Rational Design, Synthesis, Analysis, PPARγ Protein Binding Assay and Computational Studies	2:00 PM
OP-DS-03	**Indhumathi Thirugnanasambandham** Innovative Approaches to Unveil Potential PAD4 Inhibitors for Rheumatoid Arthritis Treatment	2:15 PM
OP-DS-04	**Dr Prabitha P** Novel Glitazones Derivatives with Neuroprotective and Anti-Inflammatory Potential for PGC-1α Activation via PPAR-γ Binding in LPS-Induced SHSY5Y Cells	2:30 PM
OP-DS-05	**Associate Professor Dr T. Tamilanban** Attenuation of *N*-Nitrosodiethylamine and Phenobarbitone Induced Hepatocellular Carcinoma by Posterior Salivary Gland Toxin from Cuttlefish *Sepia pharaonis* in Male Rats	2:45 PM
OP-DS-06	**Dr Honnavalli Yogish Kumar** Design and Synthesis of Novel *N*-[3-(benzimidazol-2-ylamino)phenyl]amine and *N*-[3-(benzoxazol-2-ylamino)phenyl]amine Derivatives as Potential Anticancer Agents	3:00 PM

Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-DS-09	**Ms Deepthy Varghese** Development and Evaluation of Novel β-Diketonates as Potential Antiangiogenic Agents by Inhibition of MMP9: A Computational and Experimental Approach	3:15 PM
OP-DS-12	**Ms Mustika Furi** Principal Component Analysis, Total Phenolic Content, In Vitro Antioxidant, Tyrosinase Inhibitory and Antimalarial Activities of Terap (*Artocarpus odoratissimus* Blanco) Leaves	3:30 PM
OP-DS-15	**Ms Rahayu Utami** Phytochemical Profile and Antioxidant Capacity of Leaves Extract of *Sauropus androgynus* Originated from Riau Province, Indonesia	4:00 PM
OP-DS-19	**Ms Jing Yi Wong** Protective Effect of Atorvastatin Against NMDA-Induced Excitotoxic Retinal Injury in Rats: A Dose-Response Study	4:15 PM
OP-DS-20	**Ms Jannelle Manarang** Determination of Sedative and Anxiolytic Effect of *Clitoria ternatea* Flower Extract on Male Albino Mice	4:30 PM

Oral Presenters		
Date: 26 October 2023 (Thursday)		
ID	**Presenters**	**Time**
OP-DS-13	**Dr Srikanth Jeyabalan** *In silico* and *In vivo* Evaluation of 4-Hydroxy Benzoic Acid against Mercury Chloride Induced Alzheimer Disease in Zebrafish (Danio rerio)	2:00 PM
OP-DS-21	**Ms Nina Angela B. Lazaro** Antibacterial Activity of Oral Spray containing *Graptophyllum pictum* (L.) Griff Leaf Extract against *Streptococcus mutans*	2:15 PM
OP-DS-22	**Ms Yoghinni A/P Manogaran** Synthesis and Evaluation of Anticancer Potential of Novel Imino Analogues	2:30 PM
OP-DS-23	**Ms Dharshini Jagadeesan** Discovery of New Quinoline Analogues for Oral Squamous Cell Carcinoma Treatment	2:45 PM
OP-DS-24	**Ms Darssheela A/P Ramasamy** In vitro Antiviral Activity of *Coriander sativum L.* Crude Extract against Respiratory Syncytial Virus	3:00 PM
OP-DS-25	**Dr Sivananthan Manoharan** Tripeptide GVR Blocked Catalytic Site of C-domain of Somatic ACE and Chymase Enzymes Simultaneously Then Reduced High Blood Pressure in Strictly Fasted Spontaneously Hypertensive Rats	3:15 PM

Novel Derivatives of Eugenol as Potent Anti-Inflammatory Agents via PPARγ Agonism: Rational Design, Synthesis, Analysis, PPARγ Protein Binding Assay and Computational Studies

Noor Fathima Anjum, Madhusudan N. Purohit, B.R. Prashantha Kumar
Department of Pharmaceutical Chemistry, JSS College of Pharmacy, Mysuru 570 015, India. JSS Academy of Higher Education & Research, Mysuru 570 015, India.
Correspondence: Dr. B.R. Prashantha Kumar
(email: brprashanthkumar@jssuni.edu.in)

Introduction: Eugenol, a natural product abundantly found in clove buds, is known for its pharmacological properties such as anti-inflammatory, antidiabetic, antioxidant, and anticancer activities. It is well known from the literature that peroxisome proliferator-activated receptors (PPARγ) have been reported to regulate inflammatory responses. **Objective:** This work aimed to search for new potent semi-synthetic anti-inflammatory PPARγ agonists. **Methodology:** We applied a computational approach to design semi-synthetic derivatives of eugenol, synthesize, purify, and analyze them as potential anti-inflammatory agents and PPARγ agonists. Compounds were screened for PPARγ protein binding by time-resolved fluorescence (TR-FRET) assay. **Results:** The biochemical assay identified one potent compound (1C), which exhibited significant binding affinity with an IC_{50} value of 10.65 µM as compared to the standard pioglitazone. In addition to the protein binding studies, the synthesized eugenol derivatives were screened for in vitro anti-inflammatory activity at concentrations ranging from 6.25 µM to 400 µM. Among four compounds tested, 1C shows reasonably good anti-inflammatory activity with an IC_{50} value of 133.8 µM compared to a standard Diclofenac sodium IC_{50} value of 54.32 µM. Structure-activity relationships are derived based on computational studies. Additionally, molecular dynamics simulations were performed to examine the stability of the protein-ligand complex, the dynamic behavior, and the binding affinity of newly synthesized molecules. **Conclusion:** We identified novel eugenol derivatives as PPARγ agonists with anti-inflammatory properties.

Keywords: Eugenol derivatives; peroxisome proliferator-activated receptor gamma (PPARγ); molecular dynamics; anti-inflammatory activity.

Innovative Approaches to Unveil Potential PAD4 Inhibitors for Rheumatoid Arthritis Treatment

Indhumathi Thirugnanasambandham[1], Gowthamarajan Kuppusamy[1], Srikanth Jupudi[2]

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Introduction: Rheumatoid arthritis (RA) is an autoimmune disease characterized by persistent impairment, functional limitations, and mobility restrictions. Dysregulation of peptidylarginine deiminase 4 (PAD4) affects impaired citrullination and excessive NETosis, contributing to RA development. Targeting PAD4 with specific inhibitors is of great interest due to the unique expression profile and diverse functions of this enzyme. **Objective:** Our objective was to identify potential PAD4 inhibitors with innovative approaches and techniques. **Methodology:** Virtual screening of 30 FDA-approved drug molecules was performed using molecular docking. The top-ranked compounds were subjected to an enzymatic bio-assay. Stability analysis of the inhibitors within the catalytic pocket was conducted through molecular dynamics simulations. Structural changes of PAD4 were examined using nuclear magnetic resonance (NMR) spectroscopy and electrospray ionization mass-spectrometry (ESI/MS-TOF). The binding affinity between PAD4 and the selected inhibitor was determined using an in vitro binding assay. **Results:** Saquinavir (SQV) emerged as a potential PAD4 inhibitor based on the enzymatic bio-assay. Molecular dynamics simulations revealed a stable binding conformation of SQV within the catalytic pocket of PAD4. Analysis of PAD4 structural changes using NMR and ESI/MS-TOF provided insights into the protein-inhibitor interaction. The in vitro binding assay confirmed significant binding affinity between PAD4 and SQV. **Conclusion:** SQV shows promise as a potential drug candidate for RA treatment. Its inhibitory properties, stable binding conformation, and significant binding affinity with PAD4 highlight its potential as a targeted therapeutic option. This study contributes to drug discovery and synthesis efforts, emphasizing the importance of developing PAD4-specific inhibitors for RA treatment.

Keywords: Rheumatoid arthritis; peptidyl arginine deiminase 4; drug repositioning; biophysical characterization.

Novel Glitazones Derivatives with Neuroprotective and Anti-Inflammatory Potential for PGC-1α Activation via PPAR-γ Binding in LPS-Induced SHSY5Y Cells

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Introduction: Glitazones, also known as thiazolidinediones (TZD) have received a lot of attention due to their biological activities. In the present study, fifteen novel glitazones were designed and synthesized for their neuroprotective and anti-inflammatory potential. **Methodology:** We designed compounds using *in silico c*omputational approaches and analyzed their binding affinity to activate PGC-1α via PPAR-γ binding. The molecular dynamic simulation was done to study the conformational changes in molecular interactions with the active site of the protein. The proposed fifteen novel glitazones were synthesized by Knoevenagel condensation and screened for TR-FRET PPAR-γ competitive binding assay to arrive at a selective PPAR-γ ligand. The PPAR-γ transcriptional activity in SHSY5Y cells was measured with an ELISA-based PPARγ transcription factor assay kit. To evaluate the effect of these compounds on the mitochondrial membrane potential of cells, JC-1 staining studies were performed. The neuroprotective effects of synthesized glitazones were tested in Lipopolysaccharide (LPS) intoxicated SHSY5Y neuroblastoma cell lines. To explore the anti-inflammatory potential of synthesized glitazones, the level of cytokines (TNF-α, NF-kB, and IL-6) was estimated using flow cytometry. **Results:** Three compounds with the best binding affinity were selected based on the lowest CDOCKER interaction energy. Interestingly, three compounds PP001, PP002, and PP010 from the synthesized series were found to have more significant neuroprotective and anti-inflammatory activity than the standard drug pioglitazone based on the reduced levels of IL-6, TNF-α, and NF-kB expression in SHSY5Y cell lines. **Conclusion:** This study showed the potential neuroprotective effect of novel glitazones PP001, PP002, and PP010 under neuroinflammatory conditions; The effect could involve activation of central PGC-1α signaling via the PPAR- γ receptor.

Keywords: Glitazones; PPAR-γ; PGC-1α; TZDs; Neuroprotective; Anti-inflammatory; Docking; Molecular Dynamic Simulation.

Attenuation of *N*-Nitrosodiethylamine and Phenobarbitone Induced Hepatocellular Carcinoma by Posterior Salivary Gland Toxin from Cuttlefish *Sepia pharaonis* in Male Rats

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Introduction: Hepatocellular Carcinoma (HCC) is a life-threatening disease and is the third leading cause of death around the globe. *Sepia pharaonis* is a type of marine cuttlefish species that belongs to the squid family, and recent research has shown that the active ingredients in sepia ink (SIP) may have several potential medical uses. **Objectives:** The goal of the current study was to assess the zoochemical status, antioxidant potential, and anticancer activity of SIP and its polysaccharides in *N*-nitrosodiethylamine (DEN) induced HCC. **Methodology:** HCC was induced by single i.p injection of DEN at a dose of 200 mg/kg used as an initiator and phenobarbitone (PB) 0.05% in drinking water p.o. used as a promoter. The SIP treatment was received for 90 days after 14 days of development of HCC and continued for the entire study period, whereas the other three groups were given normal saline, 5-FU (20mg/kg) i.p. **Results:** The results showed that the injection of DEN+PB led to the development of liver tumors in rats. Significant escalation of the serum biochemical parameters like SGOT, SGPT, ALP, urea, creatinine, and tumor markers was observed with depletion of endogenous antioxidants SOD, CAT, GPX, GSH, and LPO thereby leading to higher lipid peroxidation. Intraperitoneal administration of SIP at a high dose of 400 mg/kg/bw to DEN- and PB-treated rats compared to control, returned the aforementioned variables to around normal levels. The biochemical results supported histological findings that SIP has a significant dose-dependent hepatoprotective effect. **Conclusion:** Our findings demonstrated that SIP therapy reduced liver damage in DEN-induced hepatocellular carcinoma, preserved the antioxidant defense system, and had anti-carcinogenic activity.

Keywords: Hepatocellular Carcinoma; N-Nitrosodiethylamine; Fucoidan; Sepia ink Polysaccharides; Sepia pharaonis.

Design and Synthesis of Novel *N*-[3-(benzimidazol-2-ylamino)phenyl]amine and *N*-[3-(benzoxazol-2-ylamino)phenyl]amine Derivatives as Potential Anticancer Agents

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Introduction: Chronic myeloid leukemia (CML) is a clonal cancer in which cells of the myeloid family undergo aggressive cellular multiplication. Imatinib mesylate is a blockbuster drug approved by the US FDA for targeting the BCR-ABL, the integral protein responsible for the development of CML. This drug paved the way to explore interests in the area of molecular targeted therapies. **Objectives:** Various substituted benzimidazolyl derivatives were designed utilizing knowledge-based drug design approach. The structure of the well-known marketed drug imatinib was used as the prototype. The pyridopyrimidine system of imatinib was isosterically replaced with benzimidazolyl and benzoxazolyl moieties and the modelled compounds were synthesized and screened using an *in vitro* cell-based assay. **Methodology:** The thiourea intermediates were synthesized by reacting various *o*-phenylenediamine or *o*-aminophenol with *m*-nitrophenyl isothiocyanates. The subsequent cyclisation of the thiourea intermediates was performed using dicyclohexylcarbodiimide as the cyclodesulfurising agent. The thiourea derivatives were synthesized from different isothiocyanates. **Results:** *In vitro* cytotoxicity assay of twenty-six selected compounds was carried out at National Cancer Institute (NCI), USA and **NSC D-762842/1** and **NSC D-764942/1** have shown remarkable cytotoxicity with GI_{50} values ranging between 0.589-14.3 µM and 0.276-12.3 µM respectively, in the representative nine subpanels of human tumour cell lines. Further, flow cytometry analysis demonstrated that **NSC D-762842/1** exerted cell cycle arrest at G2/M phase and showed dose-dependent enhancement in apoptosis in K-562 leukaemic cells. **Conclusion:** Overall, amide derivatives of *N*-(benzimidazol-2-yl)phenyl-1,3-diamine were found to possess moderate to good anticancer activity. Considering their *in vitro* cytotoxicity profiles, these compounds are likely to act as new lead chemotherapeutics and therefore, this piece of work needs to be further taken up for *in vivo* and mechanistic investigations.

Keywords: Imatinib; Cell lines; Leukemia; Cytotoxicity.

Development and Evaluation of Novel β-Diketonates as Potential Antiangiogenic Agents by Inhibition of MMP9: A Computational and Experimental Approach

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Introduction: Gelatinase A (MMP2) and B (MMP9) have been proven to be involved in cancer angiogenesis, metastasis and are therefore good targets in drug discovery. It is also reported that MMP9 cleaves the effector T cell chemoattractants such as CXCL-9, -10, -11 thereby making it a good target to promote antitumor immunity in lymphoma models. **Objective:** This study aims to design, synthesize, and characterize a series of novel Knovenagel condensates of β-diketonates and tested for their antiangiogenic potentials by the inhibition of MMP9. **Methodology:** Several molecules were designed and screened for their binding affinity towards MMP9 by molecular docking studies. Out of these ligands, molecules that showed higher binding affinity were complexed with receptors and subjected to MD simulation studies. using GROMACS 5.7.4 package. The ADME properties of ligands that were stable in the MD simulation studies were predicted using SwissADME. The compounds were then synthesized using Knovenagel condensation and subjected to CAM assay to evaluate their antiangiogenic potential. **Results:** Eighteen compounds were designed for molecular docking studies and seven of these showed strong affinity to MMP9 and were used for MD simulation and ADMET computational studies. None of the compounds elicited significant toxicity in the ADMET studies, and one (viz. BH2), when complexed with MMP9, showed remarkable stability of the complex with the receptor in the MD simulation studies. The radius of gyration, RMSD, and RMSF of this protein-ligand complex in the 10ns MD simulation analysis further validated the stability of their interaction in the solvated, charge-neutralized system. BH2 was therefore synthesized by a modified Knovenagel condensation and its structure was confirmed by IR, ^{1}HNMR,^{13}C NMR, MS spectroscopy and elemental analysis. BH2 was used in the CAM assay to prove its antiangiogenic potential by the inhibition of MMP9. **Conclusion:** The Knovenagel condensates of β-diketonates can therefore be considered as a novel class of MMP9 inhibitors. Further preclinical studies are required to promote them as clinical drugs.

Keywords: Angiogenesis; beta-diketonates; MMP9.

Principal Component Analysis, Total Phenolic Content, In Vitro Antioxidant, Tyrosinase Inhibitory and Antimalarial Activities of Terap (*Artocarpus odoratissimus* Blanco) Leaves

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Introduction: Terap is a species belonging to the *Artocarpus* genus which is rich in phenolic compounds including flavonoids. In Riau, Terap leaves are widely used as traditional medicine. Flavonoids are important for human health because of their pharmacological activity such as antioxidant, tyrosinase inhibitory and antimalarial activities. **Objectives:** The present study explored antioxidant, tyrosinase inhibitory and antimalarial activities of the leaves of *Artocarpus odoratissimus* Blanco. **Methodology:** The leaves of *A. odoratissimus* were extracted using the maceration technique using ethanol and subsequently fractionated using hexane, ethyl acetate, and butanol. The capability of the extract to scavenge radicals was evaluated using the DPPH (2,2-diphenyl-1-picryl-hydrazyl) assay. The phenolic content (TPC) was assessed using the Folin-Ciocalteau method. The antimalarial activity was assessed using the hematin polymerization inhibition method. The tyrosinase inhibitor assay was conducted using tyrosinase from mushroom. The chemical composition analysis of the extract and fractions was performed using the Fourier transform infrared (FTIR) method, chemometrics analysis using Principal Component Analysis (PCA). **Results:** Results showed that the ethanol extract and the fractions prepared with n-hexane, ethyl acetate, and n-butanol contain phenolic compounds and flavonoids. The ethyl acetate fraction showed the highest radical scavenging activity with IC_{50} 42.9 µg/mL in the DPPH assay. Meanwhile, for tyrosinase inhibitory activity, the ethyl acetate fraction showed the highest activity with IC_{50} 18.85 µg/mL. These results were in accordance with the total phenolic content (TPC) of the extract, in which the highest TPC was obtained from the ethanol extract [154 mg gallic acid equivalent (GAE/g)] and the ethyl acetate fraction [106 mg gallic acid equivalent (GAE/g)]. The ethanol extract at 1000 µg/mL showed highest antimalaria activity with 89.9% inhibition. IR spectrum profiles combined with chemometrics PCA suggested that phenolic compounds were present in the extract and fractions of Terap leaves. **Conclusion:** This study revealed that the ethanol extract and the ethyl acetate fraction of the leaves of *A. odoratissimus* could be used as natural antimalarial, sunscreen, and antioxidant agents.

Keywords: *Artocarpus odoratissimus* Blanco; Terap; antimalarial activity; antioxidant activity; PCA; tyrosinase inhibitory activity.

In silico and *In vivo* Evaluation of 4-Hydroxy Benzoic Acid against Mercury Chloride Induced Alzheimer Disease in Zebrafish (Danio rerio)

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Introduction: Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by memory loss and cognitive decline. The neurotoxic effects of mercury chloride ($HgCl_2$) have been linked to AD-like symptoms in various organisms, including zebrafish, making it an essential model for evaluating potential therapeutics. **Objectives:** In this study, we investigated the neuroprotective effects of 4-hydroxy benzoic acid (4-HBA) using molecular docking and simulation techniques and *in vivo* evaluation against $HgCl_2$-induced Alzheimer's-like pathology in zebrafish model. **Methodology:** *In silico* analysis was done using AutoDock and molecular simulations in GROMACS software. ADME and toxicity profiling were predicted using SwissADME and Pro-Tox databases. Molecular docking simulations involved assessment of the binding affinity of 4-HBA with acetylcholinesterase (AChE), a key enzyme associated with AD pathogenesis. For the *in vivo* evaluation, adult zebrafish were exposed to $HgCl_2$ to induce AD-like symptoms. Subsequently, the treatment group received 4-HBA regimen, while a control group remained untreated. Behavioural assessments were conducted to measure memory and cognitive function, while histological analyses were performed to assess neurodegeneration formation in zebrafish brains. **Results:** The molecular docking and dynamic simulation results revealed favorable interactions between 4-HBA and AChE, suggesting a potential inhibitory effect on AChE activity. Treatment with 4-HBA significantly ameliorated the memory deficits and cognitive impairments induced by $HgCl_2$ exposure. Histological analysis revealed a reduction in neurodegeneration in 4-HBA-treated zebrafish compared to the untreated group. Furthermore, spectrophotometer analysis showed a decrease in AChE activity in the brains of 4-HBA-treated zebrafish, confirming the potential mechanism of action. **Conclusion:** Our findings demonstrate the neuroprotective effects of 4-HBA against $HgCl_2$-induced Alzheimer's-like pathology in zebrafish. 4-HBA holds promise as a therapeutic candidate for Alzheimer's disease and warrants further investigation for its potential use in human AD management. The zebrafish model is a valuable platform for preclinical drug screening and underscores the translational potential of this research.

Keywords: Alzheimer's disease; Mercury chloride; Molecular simulations; Acetylcholinesterase; Zebrafish.

Phytochemical Profile and Antioxidant Capacity of Leaves Extract of *Sauropus androgynus* Originated from Riau Province, Indonesia

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Introduction: *Sauropus androgynus* is a plant from Euphorbiaceae family which contains high levels of phenolic, flavonoid as well as antioxidant properties. **Objectives:** This present study aims to determine phenolic and flavonoid content, antioxidant activity and FTIR spectrum profile of leaves extract of *Sauropus androgynus* originated from Riau Province, Indonesia. **Methodology:** The plant samples were collected from five different regency in Riau Province, Indonesia namely Pekanbaru (PKU), Pelalawan (PLN), Kampar (KMP), Rokan Hulu (RHU) and Kepulauan Meranti (KMI) regency. The dried-bulk leaves were extracted by maceration method using ethanol as solvent. The determination of total phenolic and flavonoid content was conducted by colorimetry method using Folin Ciocalteu and $AlCl_3$ as reagents, respectively. As for antioxidant capacity was evaluated using the DPPH free radical scavenging method. The chemometric analysis on the FTIR spectrum dataset of the ethanol extracts using principal component analysis (PCA). **Results:** The result showed that ethanol extract KMI afforded the highest total phenolic and flavonoid content among others with values of 79.536 ± 0.349 mgGAE/g extract and 67.780 ± 2.295 mgQE/g extract, respectively. The ethanol extract KMI also gave the most potential antioxidant capacity and significantly different from three other extracts (PKU, PLN and KMP) with an IC_{50} value of 32.7 ± 6.43 µg/mL. The three extracts (KMI, RHU and PLN) can be grouped based on FTIR spectrum data using PCA with a total variance of 99.1% at wavelength range of 2800-3300 cm^{-1}. **Conclusion:** These obtained results revealed that geographic origin provides different antioxidant capacity as well as the phytochemical profiles.

Keywords: Antioxidant; leaves; PCA; Riau; *Sauropus androgynus*.

Protective Effect of Atorvastatin Against NMDA-Induced Excitotoxic Retinal Injury in Rats: A Dose-Response Study

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Introduction: Excitotoxicity is caused by glutamate-mediated NMDA receptor stimulation resulting in Ca^{2+} overload and neuronal apoptosis, such as in diseases like glaucoma, a leading cause of irreversible blindness. None of the existing treatments directly target mechanisms underlying neuronal apoptosis in glaucoma. Atorvastatin (ATV), primarily known as a cholesterol-lowering agent, exhibits potential benefits for neurodegenerative disorders due to its pleiotropic effects including modulation of synaptic transmission. However, it remains uncertain whether ATV can provide protection against excitotoxic neuronal apoptosis. **Objectives:** To determine whether ATV prevents NMDA-induced neuronal apoptosis and to identify the optimal dose of its anti-apoptotic effect in rat retinas. **Methodology:** Seven groups of rats (n=9 per group, total=63), aged 6-8 weeks, were treated intravitreally. Group 1 received no treatment, while group 2 was administered DMSO 24 hours before NMDA (160 mM) exposure. Groups 3 to 7 received atorvastatin dissolved in DMSO at five doses (0.1, 0.5, 1.0, 20, 100 µM) 24 hours before NMDA exposure. Seven days post-injection, rats were sacrificed, and their retinas were isolated. Retinal cell apoptosis was assessed using Bax and Bcl-2 ELISA kits with Bcl-2/Bax ratio being analysed. **Results:** In NMDA-treated group, the Bax protein expression was higher by 2.00-fold compared to the untreated group ($P \leq 0.0001$). In ATV-treated groups 3-7, the same was lower by 1.73, 2.10, 1.80, 2.93, and 1.91-folds, respectively, compared to the NMDA-treated group ($P \leq 0.0001$). Conversely, in NMDA-treated rats, the mean Bcl-2 protein level remained comparable to untreated rats. However, in ATV-treated groups 3-7, the same was significantly higher by 2.35, 1.87, 2.01, 3.86, and 2.27-folds, respectively, compared to the NMDA-treated group. Notably, among the ATV-treated groups, the group receiving 20 µM showed a significantly higher Bcl-2/Bax ratio than other ATV-treated groups. **Conclusions:** ATV protects against NMDA-induced retinal cell apoptosis in rats with 20 µM emerging as the optimal dose. Dose optimisation can be useful for future studies to determine protective mechanisms involved in ATV on retinal cell apoptosis by using other markers.

Keywords: Atorvastatin; dose optimization; retina; excitotoxic retinal injury; neuroprotection.

Determination of Sedative and Anxiolytic Effect of *Clitoria ternatea* Flower Extract on Male Albino Mice

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Introduction: The *Clitoria ternatea* flower has gained a great deal of interest recently due to its medical benefits in treating issues like stress, anxiety, depression, and many more. **Objectives:** To look for potential sedative and anxiolytic effects of *C. ternatea* flower extract in different concentrations (20, 200, and 2000 mg/kg) in male albino mice and to compare the effects of *C. ternatea* to diazepam. **Methodology:** The flower of *C. ternatea* was macerated with distilled water, infused for 2 hours, lyophilized and reconstituted. Administered to the mice through oral gavage then mice initially underwent a right reflex test for 0, 15, 30, and 60 minutes after administration and then placed in a hole board test for 5 minutes. **Results:** The result showed anthocyanins and alkaloids in the *C. ternatea* flower. In the right reflex test, one-way ANOVA indicated statistically significant differences between groups at intervals of 0, 30, and 60 minutes (p 0.05) and no statistically significant differences in the 15-minute interval. In the hole board test, one-way ANOVA showed statistically significant differences among the tested groups, in which number of head dipping ($F = 3.193$, $p < 0.030$), time of dipping ($F = 4.392$, $p < 0.008$), and rearing ($F = 4.123$, $p < 0.011$) were significantly ($p < 0.05$) found in mice treated with 2000, 200, and 20 mg/kg, which is similar to the group treated with diazepam (1 mg/kg, p.o). **Conclusion:** This study has proven that the flower extract of *C. ternatea* has sedative properties at 2000 mg/kg from 0 to 60 minutes and at 200 mg/kg from a 30- to 60-minute observation time. Thus, the flower extracts of *C. ternatea* (2000 and 200 mg/kg) and diazepam (1 mg/kg) have the same action when taken orally, which has a similar effect to diazepam.

Keywords: *Clitoria ternatea*; sedative; anxiolytic.

Antibacterial Activity of Oral Spray containing *Graptophyllum pictum* (L.) Griff Leaf Extract against *Streptococcus mutans*

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Introduction: The need for more alternatives to current oral health care products arises as strains of *Streptococcus mutans* start to become resistant to fluoride-containing products. To combat these, the study aims to evaluate the antibacterial activity of an oral spray containing extracts from the leaves of *Graptophyllum pictum* (L.) Griff. **Objectives:** The study aims to evaluate the antibacterial activity of herbal oral spray formulation containing *Graptophyllum pictum* (L.) Griff (Purple Caricature Plant) leaf extract against *Streptococcus mutans*. **Methods:** A disk diffusion test was performed to determine the optimal concentration of *G. pictum* (L.) Griff leaf extract to be used in the formulation of the oral spray. Linear regression method was used to identify what concentration has the highest antibacterial property. A final disk diffusion test was performed to determine the significant difference between the oral spray containing *G. pictum* (L.) Griff leaf extract and the commercially available product (cetylpyridinium chloride + sodium fluoride) against *Streptococcus mutans*. **Results:** In determining the optimal concentration, only the 0.50% concentration among eight concentrations obtained a p-value of 0.033, showing its significant effect against the bacterial sample. In the antibacterial activity test using the oral spray solution, it obtained a t stat value of 5.291502 (>t-Crit two-tail value of 4.302653). This may suggest that the solution is as effective compared to the cetylpyridinium chloride + sodium fluoride oral spray. **Conclusion:** Based on the results, this study showed that the formulated oral spray from *G. pictum* (L.) Griff leaf extract has significant antibacterial activity against *S. mutans* and it may be a useful adjunct in the prevention of dental caries. This indicates the potential of *G. pictum* (L.) Griff leaf extract formulations to combat fluoride-resistant cariogens.

Keywords: *Graptophyllum pictum*, purple caricature plant, oral spray, Streptococcus mutans, antimicrobial susceptibility test

Synthesis and Evaluation of Anticancer Potential of Novel Imino Analogues

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Introduction: Breast cancer is the major of cause of deaths in female cancer patients. The safety of commercially available chemotherapeutic drugs is always major concern for the investigators. Benzopyrans and imines are known to offer high anticancer potential. **Objective**: Present study was intended to carry out the synthesis, characterization and anticancer activity of some new imino analogues (NIA). **Methodology:** Study involved synthesis of new imino analogues (NIAs), by hydrazination of benzotetronic acid ester (1), followed by Schiff reaction with different aldehydes to offer NIA (4a-d). Synthesized NIA were characterized based on the 1H-NMR, 13C-NMR, FTIR, and mass spectrometric data. Synthesized compounds were investigated for their cell viability against HEK-293 (normal cells) and anticancer potential against MCF-7 cancer cell lines using MTT assay and invitro scratch assay. **Results:** The study revealed that structures of NIA were in full agreement with their spectral data. Appearance of the new IR signal at 2926 and 1698 cm^{-1} indicated the C-H and C=O stretching confirmed the presence of ester group in the structure of NIA (2). Absence of IR signal at 2926 cm^{-1} related to C-H stretching and appearance of new IR doublet signal at 3267 cm^{-1} related N-H stretching, confirmed the presence of hydrazide group in NIA (3). Absence of IR doublet signal at 3267 and appearance of new IR signals between 1594-1582 confirmed the presence of C=N group in the NIA (4a-d). Appearance of new 1H-NMR signal between 9.33-9.35 confirmed the presence of N=CH protons in the NIA 4a-d. Appearance of new ^{13}C-NMR signal at 151.37-152.09 confirmed the presence of N=C group in the NIA (4a-d). The parent ion peaks of all NIAs were in full agreement with respective molecular ion peak in their respective mass spectra. The cell viability study, MTT and invitro scratch assay of NIAs, revealed compound 4d to possess highest activity and safety when compared with standard (irinotecan). **Conclusion:** Present study concludes that among all synthesized compounds, the compound 4d possess highest anticancer potential and more safety when compared with irinotecan. It was observed that incorporation of electron donating group (*p*-methoxy) in the NIA offered maximum safety and anticancer activity. However, further clinical studies are required to further establish its clinical significance.

Keywords: Benzopyran; Imino analogues; Anticancer; Cytotoxicity; Synthesis.

Discovery of New Quinoline Analogues for Oral Squamous Cell Carcinoma Treatment

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Introduction: Among oral cancer, the oral squamous cell carcinoma (OSCC) is considered as the 6th most common cancer worldwide. Although there are several chemotherapeutics available, but the associated side effects with the current anticancer drugs offers a major challenge. **Objective:** Hence based on the severity of OSCC and side-effects of existing chemotherapeutic, an effort was made to develop new anticancer for OSCC treatment. In this study, new quinoline analogues (NQA) were synthesized, characterized, and evaluated for the anticancer properties in OSCC. **Methodology:** The synthesis experiment involved treatment of substituted quinoline (1) with ethyl chloroacetate to offer ester derivative (2), that on reaction with hydrazine hydrate yielded hydrazide analogue (3), which was finally cyclized into oxadiazole analogues (4) using aromatic acid. The chemical structures of synthesized NQA were characterized based on the FTIR, NMR and mass spectral data. The synthesized NQA were further evaluated for their antiproliferative potential (IC50) using CAL27, OSCC cell line followed by cell cycle analysis. **Result:** The antiproliferative study of NQA revealed NQA3 to exhibit the lowest IC50 value (3.26µg/mL). Whereas cell cycle analysis revealed that all NQA1-4 causes cell arrest in cell synthesis 'S-phase'. **Discussion:** A lower IC50 value gives the confidence of less toxicity in the OSCC cell line. The active metabolite in NQA gives the ability to arrest the cells in the S-phase, preventing the cells from going through the mitotic phase and halting the progression of cancer. **Conclusion:** The ability of NQA to arrest the cells in the S-phase, sheds light on hope for the application of NQA in OSCC treatment, however further investigation to study the molecular activity of NQAs is currently under active study.

Keywords: Quinoline analogues; Irinotecan; Synthesis; Oxadiazole; Hydrazide; Ester; Anticancer activity.

In vitro Antiviral Activity of *Coriander sativum L.* Crude Extract against Respiratory Syncytial Virus

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Introduction: Human respiratory syncytial virus (RSV) is a leading cause of childhood acute lower respiratory infection worldwide. Recently, vaccines for RSV have been approved, however their usage is restricted to elderly individuals. To date, only one antiviral drug is used to treat RSV, namely ribavirin. Ribavirin is a broad spectrum nucleoside analogue which has been shown to cause side effects and is costly. Hence, there is a need to develop a safe yet cheap antivirals against RSV. *Coriander sativum L.* is a culinary and medicinal herb that has been shown to exert antiviral activities against dengue, hepatitis A, Newcastle disease and Human immunodeficiency virus infections. **Objectives:** This study aims to determine whether seed extract from *Coriander sativum L.* have antiviral properties against RSV in vitro. **Methodology:** Methanolic crude extract from dried coriander seeds was prepared using maceration method. Maximum non-toxic concentration (MNTC) of seed extract was determined using MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) tetrazolium reduction assay, which was 125 µg/mL. The antiviral activity of the methanolic seed extract was examined using normal human bronchial epithelial cell line BEAS-2B cells as RSV-infection model. Ribavirin was used as a positive control. Viral load post treatment was quantified using Median Tissue Culture Infectious Dose (TCID-50)-MTT assay and end point PCR analysis. Finally, a gas chromatography-mass spectrometry (GC-MS) analysis was performed to identify the bioactive compounds present in the extract. **Results:** Treatment of RSV-infected BEAS2B cells with *Coriander sativum L.* seed crude extract at 125 µg/mL significantly reduced RSV-induced cell death or cytopathic effect and viral replication. The GC-MS analysis revealed that methanolic seed extract contains high amounts of bioactive compounds including n-Hexadecanoic acid, 5-Hydroxymethylfurfural, and linalool. **Conclusion:** Collectively, the results suggest that methanolic extract of *Coriander sativum L.* seed could be a natural source of an antiviral drug candidate against RSV infection.

Keywords: Respiratory syncytial virus; *Coriander sativum* L.; antiviral; plant extracts; active compounds.

Tripeptide GVR Blocked Catalytic Site of C-domain of Somatic ACE and Chymase Enzymes Simultaneously Then Reduced High Blood Pressure in Strictly Fasted Spontaneously Hypertensive Rats

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Introduction: Hypertension is one of the most common chronic diseases affecting millions of people worldwide. Angiotensin-I-converting enzyme (ACE) is one of the enzymes responsible for causing high blood pressure. When ACE is inhibited (e.g. by ACE inhibitors), chymase enzymes will be activated to carry out ACE's task which is to convert angiotensin-I to angiotensin-II and cause an increase in blood pressure. ACE is composed of 2 domains i.e. the C-domain and N-domain. Selective inhibition of the C-domain of ACE and chymase enzyme simultaneously is an important therapeutic goal to reduce systolic blood pressure in hypertensive patients and reduce chronic dry cough, which is the main side effect of ACE inhibitors. The dry cough is due to accumulation of bradykinins (another substrate of ACE) which forces doctors to change ACE inhibitors to other antihypertensive medications. **Methods:** We first carried out *in silico* studies, followed by *in vitro* and *in vivo* experiments. For the *in silico* methodology, the crystal structure of the enzymes were downloaded from the protein data bank and then docked with ligand; tripeptide glycine-valine-arginine (GVR) through molecular docking analysis. Later, the peptide was synthesised and tested *in vitro* through enzyme kinetic studies. Subsequently, *in vivo* toxicity and efficacy of the peptide was tested in spontaneously hypertensive rats (SHRs). **Results:** Based on the molecular docking studies, GVR competitively inhibited C-domain but not N-domain of somatic ACE and chymase. The molecular docking studies were validated using enzyme-kinetic analysis where tripeptide GVR was found to be a competitive inhibitor and was able to bound at the catalytic and active sites of both enzymes. In long-term toxicity studies, the lethal dose (LD_{50}) of GVR was >2000 mg/kg b.w. Based on *in vivo* experiments which lasted for 3 weeks, at the dosage of 100 mg/kg b.w, tripeptide GVR significantly reduced the systolic blood pressure in strictly fasted spontaneously hypertensive rats (SHRs). Interestingly, based on lipid profile studies, triglyceride was significantly reduced ($p<0.05$) in tripeptide GVR treated SHRs when compared to negative and positive control (captopril), respectively. Based on the histopathologist's review, tripeptide GVR did not produce any toxic effect in the liver and kidney tissues and these findings are in line with the *in vivo* toxicity study. Through metabolomic studies, GVR affected ACE pathways. **Conclusion:** Based on our results, the tripeptide GVR could be developed as an antihypertensive agent which could target both ACE and chymase enzymes with reduced side effects. GVR may reduce coughing frequency in patients and improve patients' quality of life.

Keywords: *In silico*; *In vitro*; *In vivo*; Peptide; Renin angiotensin system.

Poster Presenters	
ID	**Presenters**
PP-DS-01	**Mr Arunkumar Subramanian**
	Computational Investigation and Neuroprotective Potential of Pterostilbene against Sleep Deprivation Induced Alzheimer's Disease Using Zebrafish Model
PP-DS-04	**Ms Aathira Sujathan Nair**
	Unraveling Nature's Secrets: Virtual Screening and Molecular Docking of Coumarin Derivatives to Unlock ER-alpha Receptor Potential
PP-DS-05	**Mr Shadisvaaran Saminathan**
	The Protective Effect of Annatto Tocotrienol on Hypertension and Periodontitis in Animal Model
PP-DS-06	**Ms Kavesha Parameswaran**
	In-vitro Antiviral Activity of Linalool against Respiratory Syncytial Virus

Poster Presenters	
ID	**Presenters**
PP-DS-07	**Dr Sri Devi Sukumaran** 2′-Hydroxychalcone Analogues With Modified C4-Substituents for the Treatment of Alzheimer's Disease: Biological Evaluation and Molecular Modelling Studies
PP-DS-08	**Dr. apt. Hariyanti** Characterization and Antioxidant Activity of Gelatin, and the Derived Peptides from Barramundi (*Lates calcarifer*) Scales
PP-DS-09	**How Wan Leong** *In silico* Pharmacokinetic and Molecular Docking Studies of Labdane Diterpenes of *Alpinia* Genus against Butyrylcholinesterase, A Therapeutic Target for Alzheimer’s Disease

Computational Investigation and Neuroprotective Potential of Pterostilbene against Sleep Deprivation Induced Alzheimer's Disease Using Zebrafish Model

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Introduction: The depletion of oxidizing enzymes and the formation of β-amyloid plaques that cause neurodegeneration in Alzheimer's disease have frequently been linked to sleep cycle disruptions. A growing body of scientific evidence suggests that healthy sleep patterns can facilitate the synthesis and activity of anti-oxidant enzymes and can promote the clearance of β-amyloid plaques out of the brain. **Methods:** Using *in-silico* tools like Molinspiration, SwissADME, and PreADMET, the bioactivity score, molecular properties, and pharmacokinetic parameters of pterostilbene were assessed. The binding affinity and interactions of pterostilbene with the selected six receptors were predicted using Autodock 4.2 software. To further confirm its neuroprotective potential, *in vitro* assays on acetylcholinesterase enzyme level, lipid peroxidation activity, and catalase activity were performed. *In vivo* neurobehavioral analysis of zebrafish treated with pterostilbene was carried out using T-maze, Y-maze, and inhibitory avoidance apparatus. **Results:** Pterostilbene complies with Lipinski's rule and has significant blood-brain barrier penetration and bioavailability. *In silico* studies reveal that pterostilbene has good binding affinity and interactions with different receptors which supports pterostilbene's multi-target potential. *In vitro* assays show that pterostilbene exhibits cholinesterase inhibition and potent antioxidant properties. *In vivo* neurobehavioral analysis reveals that pterostilbene supports greater memory retention in zebrafish, and histopathological studies reveal significant amelioration and reduction of amyloid deposits on zebrafish brains against sleep deprivation-induced AD. **Conclusion:** Further exploration with respect to preclinical and clinical aspects of pterostilbene is required to confirm the therapeutic potential of pterostilbene for the treatment of Alzheimer's disease.

Keywords: Pterostilbene; Alzheimer's Disease; Anti-oxidant; Sleep deprivation.

Unraveling Nature's Secrets: Virtual Screening and Molecular Docking of Coumarin Derivatives to Unlock Estrogen Receptor Alpha Potential

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Introduction: Breast cancer is the second leading cause of cancer mortality worldwide. In Malaysia, the prevalence of developing breast cancer is 1 in 20. It is the most prevalent cancer seen in women. The estrogen receptor alpha (ER-alpha) is the focus of our work to battle breast cancer. A ligand with high ER-alpha affinity is still sought after despite extensive studies. The pharmacological effects of coumarins have been the subject of substantial research. The pharmacological value of coumarins in treating different cancers has received a lot of attention and thus, we focus on coumarins as a potential target against ER-alpha. **Objectives:** To virtually screen libraries of coumarin compounds based on their physicochemical properties; evaluate their binding affinity towards the ER-alpha using different softwares; and evaluate the molecular dynamics of the top 10 best compounds. **Methodology:** Virtual screening of coumarin compounds obtained from databases like ChemBL, BindingDB based on physicochemical properties of compounds using Datawarrior; evaluation of binding affinity of the virtually screened compounds and filtering out the top ten against ER-alpha (PDB ID: 1R5K) using AutoDock, YASARA, and Discovery Studio; and evaluation of the best hit compound using Molecular Dynamics. **Results:** The top 10 hits were chosen using the Autodock Vina and YASARA tools from 509 compounds. These hits were chosen for Molecular Dynamics modelling after being further examined and shown to have the highest binding affinity. Compound **3** has the greatest binding affinity of -11.47 kcal/mol. Compound **3** attained equilibrium during molecular dynamics simulations at 55 ns and remained stable, demonstrating RMSD variations between 4.0 and 5.5 from 55 to 100 ns. **Conclusion:** Notably, compounds **1, 2,** and **3** stood out due to their strong binding affinities. MD simulations of the **1R5K-compound 3 complex** revealed equilibrium at 55 ns, with stability maintained up to 100 ns. RMSD variations between 4.0 and 5.5 from 55 to 100 ns were observed. These findings enhance our grasp of drug-receptor interactions, suggesting potential advancements in ER-alpha-targeted breast cancer therapies.

Keywords: Virtual screening; molecular dynamics; binding affinity; estrogen receptor-alpha; coumarins.

The Protective Effect of Annatto Tocotrienol on Hypertension and Periodontitis in Animal Model

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Introduction: Periodontitis is a common chronic inflammatory disease which damages the tooth supporting structure in the oral cavity. Recent findings show periodontitis is linked to blood pressure elevation. Adults in Malaysia are greatly affected by hypertension (HT) and periodontitis (PD), but combating these conditions is cost prohibitive. Annatto tocotrienol (AT) from *Bixa orellana* was shown to have protective effects on diseases mediated by inflammation based on recent studies. **Objectives**: To explore the protective effects of annatto tocotrienol on periodontitis and hypertension in rats. **Methodology**: 12-week-old male Wistar rats were divided into 7 groups. Hypertension was induced in the rats using NG-nitro-l-arginine methyl ester (L-NAME) (40 mg/kg) intraperitoneally for 2 weeks. After 14 days, on the rats' left maxillary second molar, an orthodontic wire was ligated for 4 weeks to induce periodontitis. The rats were then treated with AT (60 mg/kg/day, oral) for 4 weeks. After 4 weeks the plasma and the maxilla were collected for further analysis. Plasma pro-inflammatory cytokines were analyzed using ELISA whereas micro-computed tomography was used to determine alveolar bone loss and percentage of bone remaining. **Results**: Bone loss was established in the rats with ligation as significant difference was observed comparing sham group to PD group ($p<0.05$). Alveolar bone loss was severe in rats with both PD + HT group compared to PD group ($p<0.001$). Percentage of bone remaining was significantly higher in the PD group compared to PD + HT ($p<0.001$). AT treatment significantly reduced periodontitis-induced alveolar bone loss and improved percentage of bone remaining in rats with hypertension ($p<0.05$). However, circulating IL-6, IL-1β and TNF-α showed no significant difference among groups. **Conclusion**: This study shows the association of hypertension in exacerbating periodontitis in rats. Furthermore, treatment of AT showed protective effects against periodontitis and hypertension concurrently.

Keywords: Annatto tocotrienol; hypertension; periodontitis; computed tomography.

In-vitro Antiviral Activity of Linalool against Respiratory Syncytial Virus

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Introduction: Human respiratory syncytial virus (RSV) was found to be one of the most prevalent respiratory pathogen which caused acute respiratory tract illnesses among children between the years 2015 to 2019 in Malaysia. The absence of RSV-specific antiviral drug and vaccine, especially for children, coupled with the risk of re-infections has raised the need for the development of antiviral targeting RSV. Essential oils are secondary metabolites of aromatic plants and are composed of various compounds. They are being used extensively in numerous industries for their biological properties. Linalool; one of the compounds found in essential oils, has been shown to exert antiviral activity against influenza virus, adenovirus and herpes simplex virus. **Objectives:** In this study, we sought to explore the potential inhibitory effects of linalool against RSV infection in human lung epithelial cells. **Methodology:** The antiviral property of linalool was assessed in vitro using normal human bronchial epithelial cell line BEAS-2B cells as RSV-infection model. BEAS-2B cells were infected with RSV at multiplicity of infection (MOI) 0.1 for 2 hours before being treated with linalool at various non-toxic concentrations which was determined prior to the antiviral assay. Ribavirin; non-RSV specific antiviral drug, was used as positive control. The inhibitory effect of linalool was assessed by end-point PCR. **Results:** The maximum non-toxic concentration of linalool on BEAS-2B cells was determined to be 100 µg/mL. Linalool at 20 µg/mL showed slight antiviral activity against RSV compared to treatment at 40 µg/mL and 100 µg/mL. The control drug ribavirin showed the most significant antiviral activity against RSV. **Conclusion:** To conclude, linalool exhibited mild antiviral activity against RSV. Despite the differences between in antiviral potency between linalool and ribavirin, linalool remains to be a viable candidate for potential therapeutic application against RSV infection considering the high costs, side effects and challenging administration method associated with ribavirin.

Keywords: Antiviral effect; respiratory syncytial virus; natural compound; linalool.

2′-Hydroxychalcone Analogues With Modified C4-Substituents for the Treatment of Alzheimer's Disease: Biological Evaluation and Molecular Modelling Studies

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Introduction: Alzheimer's disease (AD) is characterised as a progressive neurodegenerative disorder and is typically managed with cholinesterase inhibitors as the first line of treatment. **Objectives:** This study aims to determine the efficacy of C4-substituted tertiary nitrogen-bearing 2′-hydroxychalcones as a therapeutic candidate for the treatment of AD. **Methodology:** The target compounds were designed and synthesised on the basis of a previously developed mixed type acetylcholinesterase (AChE) inhibitor. Subsequently, the anticholinesterase activity of these compounds was examined and molecular docking experiments were carried out. **Results:** The study found that the majority of the 2′-hydroxychalcone analogues inhibited AChE more effectively than butyrylcholinesterase (BuChE). Among them, compound 4c was identified to be the one with the highest AChE inhibitor potency (IC_{50}: 3.3 µM) and best AChE selectivity over BuChE (ratio >30:1). According to molecular docking analyses, compound 4c interacts with both the peripheral anionic site (PAS) and catalytic anionic site (CAS) regions of AChE. Additionally, ADMET analysis supported the therapeutic value of compound 4c based on its blood–brain barrier penetration properties. **Conclusion:** Overall, the findings reveal that this 2′-hydroxychalcone merits further investigation as a potential AD treatment approach.

Keywords: Alzheimer's disease; acetylcholinesterase; butyrylcholinesterase; chalcones; molecular modelling.

Characterization and Antioxidant Activity of Gelatin, and the Derived Peptides from Barramundi (*Lates calcarifer*) Scales

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Introduction: Fish gelatin hydrolysate includes a wide extent of benefits in pharmaceutical and food applications include Barramundi scales. The gelatin extraction method using autoclave was selected with the best product yield. **Objectives:** The purpose of this study to determine the antioxidant activity of gelatin hydrolysate of Barramundi scales and its characteristics. **Methodology:** Gelatin was extracted using acetic acid 5% with autoclave method. Hydrolysis was carried out with 1% Protease, followed by fractionation with a molecular weight cut off sieve. The antioxidant activity of Barramundi scale gelatin hydrolysate was determined using the 2,2-diphenyl-1-picrylhydrazil (DPPH) and Ferric Reducing Antioxidant Power (FRAP) methods. **Results:** Gelatin hydrolysis results obtained a yield of 94.4% with pH value 5,21. The obtained gelatin hydrolysate was then fractionated using the Molecular Weight Cut-Off ultrafiltration technique of 50 KDa, producing the highest yield of 60.04% of <50 KDa fraction. The highest protein content was found in the gelatin sample, namely 40.59 %. The best antioxidant activity from the DPPH method was found in gelatin hydrolysate. Meanwhile, the best antioxidant activity from the DPPH method was found in fraction < 50 KDa of gelatin hydrolysate. **Conclusion:** Antioxidant activities of these peptide were higher than those before hydrolysis.

Keywords: *Lates calcarifer*; Barramundi scales; autoclave; gelatine hydrolysate; Antioxidant activity.

In silico Pharmacokinetic and Molecular Docking Studies of Labdane Diterpenes of *Alpinia* Genus against Butyrylcholinesterase, A Therapeutic Target for Alzheimer's Disease

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Introduction: Labdane diterpenes are phytochemicals which have been reported effective against acetylcholinesterase inhibition. Butyrylcholinesterase (BChE) is another enzyme involved in hydrolysis of acetylcholine in the brain. Both enzymes are regarded as important therapeutic targets for Alzheimer's disease. Nonetheless, study on the effect of labdane diterpenes towards BChE inhibition is scarce. In view of their versatility in displaying various biological activities found in previous studies, the present project has been designed to explore the potential of such scaffold against the BChE through computational methods. **Objectives**: This project aimed to study the pharmacokinetic profiles of labdane diterpenes of *Alpinia* genus via *in silico* methods and to evaluate their binding interactions in the active site of butyrylcholinesterase through molecular docking. **Methodology**: A series of 30 labdane diterpenes (Refer to Appendix 1) from *Alpinia* genus were investigated for physicochemical properties using Molinspiration server and pharmacokinetic profiles using pkCSM. Docking systems consisting of butyrylcholinesterase protein (PDB ID: 4DBS) and labdane diterpenes were subjected to docking studies using AutoDockTools (ADT4.2). Protein-Ligand Interaction Profiler (PLIP) was used to analyze the docking outputs; LigPlot+ program was used to illustrate the binding interaction between butyrylcholinesterase protein and labdane diterpenes. **Results**: A total of 20 labdane diterpenes met the requirement of Lipinski's rule and complied to Veber rule. Some of these compounds have shown high volume of distribution (steady state) and can readily cross the blood-brain barrier. Most compounds were predicted to be metabolized directly in the liver. Molecular docking studies have identified ten compounds with comparatively good binding energy ranging from -10.48 kcal/mol to -17.70 kcal/mol. Hydrogen bonding was found as the main binding interaction between the binding site residues and labdane diterpenes. **Conclusion**: Several labdane diterpenes in the present study have exhibited drug likeness, good oral bioavailability as well as considerable drug distribution and blood-brain-barrier penetration based on *in silico* prediction. Ten compounds were shown to have relatively good binding within the binding site of BChE from the docking studies.

Keywords: Labdane diterpenes; butyrylcholinesterase; Alzheimer's disease; molecular docking; *in silico* pharmacokinetics.

MONASH INITIATE 2023

25 - 26 October 2023

Translating Research into Practice: Revolutionizing healthcare delivery and outcomes

PRESENTERS DRUG DELIVERY

Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-DD-05	**Mr Mohammed Semol Ahmed** Evaluation of Protective Effect of Drugs in Diabetes-Induced Cognitive Impairment in Rats	2:00 PM
OP-DD-06	**Mr Gabriele De Rubis** Berberine-Loaded Nanoparticles Attenuate TGF-β-Induced Remodelling Features in Human Bronchial Epithelial Cells	2:15 PM
OP-DD-08	**Ms Deni Anggraini** Preparation and Hair Growth Activity Test of Microemulsion Ethanol Extract of Cayenne Pepper (Capsicum Frutenscens L)	2:30 PM
OP-DD-09	**Mr Hazem Choukaife** Preparation and Characterization of Alginate Beads and Microbeads Using Dripping and Electrospray Method	2:45 PM
OP-DD-10	**Ms Gressy Novita** Improving Mechanical Properties of Ibuprofen via Multicomponent Crystal	3:00 PM
OP-DD-12	**Ms Nur Zahirah Binti Mohamad Zin** Optimizing Doxorubicin-Loaded Solid Lipid Nanoparticles via Solvent-Diffusion Method	3:15 PM

Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-DD-13	**Dr Keshav Raj Paudel** Zerumbone Liquid Crystalline Nanoparticles Protect Against Oxidative Stress, Inflammation and Senescence Induced by Cigarette Smoke Extract In Vitro	3:30 PM
OP-DD-11	**Ms Wira Noviana Suhery** Utilization of Pregelatinized Sweet Potato Starch of White, Yellow, and Purple Varieties as Suspending Agent in The Formulation of Ibuprofen Suspension	4:00 PM

Oral Presenters		
Date: 26 October 2023 (Thursday)		
ID	**Presenters**	**Time**
OP-DD-15	**Dr Rajesh Dodiya** Porous Swellable Hypromellose Composite Fortified with Bioactive Extracted from Eucalyptus camaldulensis Leaf to Mitigate Dermal Wound Infections	2:00 PM
OP-DD-19	**Dr. D. Senthil Rajan** Pharmaceutical Optimization of Polyelectrolyte Complexing Topical Formulation of Loratadine With Vitamin-C for Rheumatoid Arthritis	2:15 PM
OP-DD-16	**Associate Professor Dr. Rohan Krishna Barse** Formulation Development, Optimization and Evaluation of a Novel *In Situ* Gel for the Treatment of Glaucoma	2:30 PM

Evaluation of Protective Effect of Drugs in Diabetes-Induced Cognitive Impairment in Rats

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Introduction: Diabetes mellitus causes deficits in remembering, learning new things, concentration or decision making and poor glycemic control has been associated with progression of cognitive dysfunction. Cognitive dysfunction with its wide range from mild cognitive impairment to dementia is one of the chronic complications of diabetes mellitus. **Objectives:** The study was designed to evaluate the protective effect of allantoin, β-cyclodextrin and gelucire 44/14 and the combinations of allantoin + β-cyclodextrin and allantoin + gelucire 44/14 in diabetes induced cognitive impairment in rats. **Methodology:** Diabetes was induced in male rats by administrating streptozotocin (53mg/kg,i.p). A total number of 54 male wistar rats were divided into 7 different groups. 5 groups of diabetic rats were treated with allantoin (200mg/kg,p.o), β-cyclodextrin (31.5mg/kg,p.o) and gelucire 44/14 (200mg/kg,p.o) and treatment with the combination drugs of allantoin (200mg/kg,p.o) + β-cyclodextrin (31.5mg/kg,p.o) and allantoin (200mg/kg,p.o) + gelucire 44/14 (200mg/kg,p.o) for eight weeks. After eight weeks, degree of cognitive impairment was determined using Barnes maze, T-maze, Elevated plus maze, and Passive avoidance test. Glycosylated haemoglobin, brain levels of dopamine, serotonin, GABA, nor-adrenaline was measured by spectrofluorimeter whereas anti-cholinesterase by spectrophotometer and antioxidants by UV-Visible spectrophotometer. And calculated using One Way Analysis of Variance (ANOVA) followed by Dunnet multiple comparison test. **Results:** Treatment with allantoin, β-cyclodextrin and gelucire 44/14 and combinations of allantoin + β-cyclodextrin and allantoin + gelucire 44/14 significantly improved memory and learning performances when compared with diabetic and control rats. The treated rats also showed a significant decrease in glycosylated haemoglobin and significantly elevated body weight, anti-oxidant status compared to diabetic and control rats. Also significantly corrected the altered neurotransmitters levels in the brain when compared to diabetic & control rats. **Conclusion:** Allantoin, β-cyclodextrin and gelucire 44/14 provides beneficial effects on cognitive deficits seen in diabetic rats and can be used to delay onset / prevent progression of the diabetes induced cognitive impairment.

Keywords: Diabetes, cognitive impairment, allantoin, β-cyclodextrin and gelucire 44/14, behavioural studies, neurotransmitters.

Berberine-Loaded Nanoparticles Attenuate TGF-β-Induced Remodelling Features in Human Bronchial Epithelial Cells

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Introduction: Pathologic airway remodelling, characterized by aberrant activation of epithelial reparation and migration, extracellular matrix (ECM) deposition, and epithelial-to-mesenchymal transition (EMT), is a common pathophysiological feature of respiratory diseases such as chronic obstructive pulmonary disease (COPD) and asthma. The main activator of remodelling is Transforming Growth Factor-β (TGF-β). Current treatments available for asthma and COPD have limited efficacy and do not target airway remodelling. Berberine is a phytochemical with multifaceted therapeutic activity, whose clinical application is hampered by poor solubility and unfavourable pharmacokinetics. **Objectives:** To encapsulate berberine in monoolein-based liquid crystalline nanoparticles (BM-LCNs) and to test its potential in inhibiting *in vitro* remodelling features exerted by stimulating human BEAS-2B bronchial epithelial cells with TGF-β. **Methodology:** BEAS-2B cells were stimulated with 5 ng/mL recombinant human TGF-β for 48 h and co-incubated with 0.5 µM BM-LCNs for 24 or 48 h. The *in vitro* activity of BM-LCNs was assessed by measuring: inhibition of TGF-β-induced cell migration (wound healing migration assay); changes in the levels of remodelling-related proteins (Human XL Cytokine Array); measurement of nitric oxide (NO) levels (Griess reagent). **Results:** Stimulation of BEAS-2B cells with TGF-β significantly increased their migration by 25% (24 h) and 40% (48 h). Treatment with BM-LCNs reduced the migration to levels comparable to the untreated group at both time points. Furthermore, BM-LCNs significantly reduced the expression of TGF-β-induced effector proteins (endoglin, basic FGF, myeloperoxidase, thrombospondin, VEGF), and restored the production of Cystatin C and NO, two negative regulators of remodelling downregulated by TGF-β, to levels comparable to the untreated group. **Conclusion:** We demonstrate potent *in vitro* therapeutic efficacy of BM-LCNs in counteracting TGF-β-induced epithelial remodelling. This study supports the suitability of berberine-loaded drug delivery systems to target airway remodelling, with potential application as treatment strategy against pathologies characterized by aberrant tissue remodelling such as COPD and asthma.

Keywords: Airway remodelling; COPD; asthma; berberine; nanoparticles

Preparation and Hair Growth Activity Test of Microemulsion Ethanol Extract of Cayenne Pepper (*Capsicum Frutenscens L*)

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Introduction: Cayenne pepper contains capsaicin which has activity as a hair growth agent. Microemulsion is an oil and water dispersion system with a particle size of 10-200 nm which can be used topically as a drug delivery system through the scalp. **Objectives**: The aim of this study was to prepare a microemulsion formulation as a topical preparation that is physically and chemically stable and has good hair growth activity. **Methodology**: Microemulsion was made with olive oil and tween 80 as surfactants and using a magnetic stirrer at 1000 rpm for 3 minutes. Three variations of the concentration of ethanol extract of cayenne pepper made in microemulsions were 0.1%, 0.2% and 0.3%. Microemulsion tests included organoleptic tests, specific gravity, pH, viscosity, freezing and thawing stability tests and hair growth activity tests on rabbits. **Results**: The results showed that microemulsion ethanol extract of cayenne pepper 0.1%, 0.2% and 0.3% was quite stable with a clear appearance and a particle size range of 27,7 nm – 167,8 nm. Hair growth length of 1.27 cm for 30 days. A two-way ANOVA statistical test showed that the hair length of rabbits using microemulsion was significantly different from the hair length of negative control animals at $p<0.05$. **Conclusion**: The ethanol extract of cayenne pepper can be formulated into a microemulsion to form a stable microemulsion during storage. Cayenne pepper ethanol extract microemulsion 0.2% can help hair growth with hair growth length of 1.27 cm after 30 days.

Keywords: Capsicum; hair growth; microemulsion

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Preparation and Characterization of Alginate Beads and Microbeads Using Dripping and Electrospray Method

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Introduction: The hydrogelling ability of alginate has garnered significant attention from pharmaceutical scientists due to its useful applications as hydrogel carriers for targeted drug delivery systems. Understanding the physical properties of alginate hydrogel particles is critical to facilitate the manufacturing process and overcome limitations associated with the final product. The electrospray technique is a novel method capable of producing particles within a controlled size range. In comparison with the dripping method, electrospray formulates monodisperse droplets in the range of nano- to millimeter range by applying electric field. **Objectives:** This study aims to investigate the effects of applying high voltage on the characteristics of alginate beads fabricated using the dripping method. Additionally, it examines how voltage affects other process parameters, such as alginate concentration, $CaCl_2$ concentration, and needle gauge, in relation to various particle characteristics. **Methodology:** Alginate beads and microbeads were prepared using the dripping and electrospray methods, respectively. The alginate solution was pumped through a dispensing needle at a constant flow rate with and without applying voltage on the tip of the stainless-steel needle. The extruded drops were received in $CaCl_2$ solution as a curing bath. Afterward, the formed beads/microbeads underwent two rounds of washing with distilled water, followed by drying at 40°C for 14 hours in a laboratory oven. **Results:** The outcomes of the central composite design demonstrated the factors that have a significant effect on alginate beads/microbeads characteristics. Applying voltage from 12 Kv reduced the size from 1.1 mm to 0.5 mm using the same parameter levels. The application of a high-power voltage significantly influenced water uptake, swelling, and erosion behaviors. Specifically, the results revealed a favorable impact on both swelling and water uptake, while concurrently inducing an adverse effect on the erosion of the microbeads. **Conclusion:** The electrospray technique is a valuable preparation method that provides greater control over the characteristics of resulting particles compared to the conventional dripping method. The application of voltage enables the production of controlled particles with a wide size range, thereby enhancing the versatility of this technique in various manufacturing processes.

Keywords: Alginate, Electrospray, ionic gelation, Beads, Microbeads

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Improving Mechanical Properties of Ibuprofen via Multicomponent Crystal

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Introduction: Ibuprofen is a non-steroidal anti-inflammatory analgesic (NSAID) that belongs to BCS class II. Generally, ibuprofen has a bad flowability because of a high cohesiveness. Another problem in manufacturing is the high tendency for sticking to the punches. Besides these detrimental properties, ibuprofen indicates bad dissolution behavior because of its hydrophobic structure. **Objectives**: To improve the properties of ibuprofen can be used co-crystallization method for multicomponent crystal with nicotinamide as co-former. **Methodology**: Ibuprofen-nicotinamide cocrystal formation by Solvent Drop Grinding (SDG) and Solvent Evaporation (SE). The characterization of the co-crystal formation included crystal morphology, powder X-ray diffractogram, and thermal behavior. The mechanical properties testing including flowability (angles of repose and compressibility index), solubility and dissolution rate were conducted on ibuprofen-nicotinamide multicomponent crystal and pure ibuprofen. **Results**: By forming the cocrystal, we demonstrated that the flow ability, compressibility index of the multicomponent crystal was improved from the parent drug. The multicomponent crystal of ibuprofen-nicotinamide in this case shows an improved solubility in water and buffer phosphate pH 7.2 media and a better dissolution profile in buffer phosphate pH 7.2. However, the dissolution rate in buffer phosphate pH 7.2 media was found to be essentially indifference. **Conclusion**: It can be concluded that the multicomponent crystal of ibuprofen-nicotinamide by the SDG and SE method can improve the mechanical properties of ibuprofen.

Keywords: Ibuprofen, Nicotinamide, Cocrystal, Mechanical Properties

Utilization of Pregelatinized Sweet Potato Starch of White, Yellow, and Purple Varieties as Suspending Agent in The Formulation of Ibuprofen Suspension

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Introduction: Research on the utilization of white, yellow, and purple sweet potato pregelatinized starch as a suspending agent has been carried out. Sweet potato starch contains amylose and amylopectin which can function as suspending agents. **Objectives**: The study aimed to determine the potential of sweet potato pregelatinized starch from white, yellow, and purple varieties as a suspending agent for better drug delivery in an ibuprofen suspension formula. **Methodology**: The stages of the research consisted of preparing pregelatinized starch, examining the physical and microscopic properties of pregelatinized starch (determination of starch moisture content, measurement of gelatination temperature, microscopic examination using SEM, and examination of the polarization properties of starch using a polarizing microscope), formulation and evaluation of ibuprofen suspension. The use of sweet potato pregelatinized starch as a suspending agent was 5% w/v, 10% w/v, and 15% w/v for each variety (F1-F9). **Results**: The results showed that on examination of the physical properties of sweet potato starch, the highest starch yields were respectively produced by white sweet potato starch, yellow sweet potato starch, and purple sweet potato. The microscopic form of white, yellow, or purple sweet potato starch using a polarizing microscope and SEM shows almost the same shape, namely the presence of several starch granules that have an irregular surface with a larger particle size compared to native starch which is spherical, oval and polygonal in shape. The resulting suspensions were evaluated for their sedimentation volume, viscosity and rheology, re-dispersibility, and stability studies were performed for 2 months. The results of the suspension preparation evaluation showed that there were no significant differences in the suspension evaluation results using variations of pregelatinized sweet potato starch such as sedimentation volume, redispersion time, and suspension viscosity. **Conclusion**: The use of sweet potato pregelatinized starch as a suspending agent at a concentration of 15% w/v has produced an ibuprofen suspension that meets the requirements and is stable during storage.

Keywords: Ibuprofen; *Ipomoea batatas*; Pregelatinized starch; Suspending agent.

Optimizing Doxorubicin-Loaded Solid Lipid Nanoparticles via Solvent-Diffusion Method

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Introduction: Breast cancer treatment remains an active focus of research, aiming to enhance outcomes through innovative approaches. This study explores solid lipid nanoparticles (SLNs) as carriers for the potent anticancer drug doxorubicin. SLNs show great promise as drug delivery systems, offering improved drug encapsulation and controlled release, potentially enhancing cancer therapy effectiveness. **Objectives:** The primary goal of this study is to investigate the formulation and preparation of SLNs containing doxorubicin, using the nanoprecipitation method through two mixing techniques: conventional mixing and static mixing. Additionally, we aim to assess the impact of different surfactants and lipid compositions on the size and uniformity of SLNs. Furthermore, we seek to evaluate the feasibility of using SLNs as drug carriers for targeted breast cancer therapy using the solvent-diffusion technique. **Methodology:** The study utilized the nanoprecipitation method via two mixing processes to prepare SLNs. Glycerol Monostearate (F23) was the focus due to its favorable characteristics. A static mixer and two syringe pumps facilitated the continuous mixing of lipids in an organic phase solution, followed by rapid mixing with a surfactant in a non-solvent solution to fabricate nanoparticles. **Results:** Among the formulations tested, Glycerol Monostearate (F23) exhibited the most promising results with a particle size of 302.6 nm, zeta potential of -17 mV, encapsulation efficiency of 90.67%, and drug loading of 22.35%. The research emphasized the significant influence of the mixing method, surfactant choice, and lipid composition on the size and uniformity of SLNs. **Conclusion:** The findings suggest that SLNs hold potential as drug delivery systems for improved breast cancer therapy. The nanoprecipitation method offers advantages of reproducibility, scalability, and efficiency compared to traditional batch processes. Efficiently encapsulating doxorubicin within SLNs opens new avenues for targeted drug delivery, revolutionizing breast cancer treatment and potentially benefiting other diseases.

Keywords: Breast cancer therapy, Solid lipid nanoparticles (SLNs), Doxorubicin, Nanoprecipitation, Drug delivery systems.

Zerumbone Liquid Crystalline Nanoparticles Protect Against Oxidative Stress, Inflammation and Senescence Induced By Cigarette Smoke Extract *In Vitro*

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Introduction: Cigarette smoke is among the main risk factors for chronic obstructive pulmonary disease (COPD), causing oxidative stress, inflammation and cellular senescence that exacerbate disease progression. The main cells responsible for the release of oxidative stress and inflammatory mediators are broncho-epithelial cells and alveolar macrophages. Although many treatment lines are available for COPD, these present important side effects as limitations. Alternative treatment strategies, such as those involving natural products, are hampered by issues such as poor solubility, poor bioavailability, and difficult drug targeting. **Objectives:** In this study we encapsulated zerumbone in liquid crystalline nanoparticles (ZER-LCNs) in order to increase its effectiveness against COPD hallmarks. **Methodology:** The nanoparticle formulation was subjected to *in-vitro* biological studies to understand the anti-inflammatory, antioxidant, and anti-senescence activity on cigarette smoke extract-treated RAW264.7 macrophage and BCi-NS1.1 basal epithelial cell lines. **Results:** The ZER-LCNs successfully reduced the expression of pro-inflammatory markers including IL-6, IL-1β, and TNF-α, as well as production of nitric oxide. Additionally, ZER-LCNs successfully reduced oxidative stress through reduction of reactive oxygen species levels and regulation of genes including Gpx2 and GCLC. Anti-senescence activity was also obtained, with reduction of SIRT1, CDKN1A and CDKN2A expression. **Conclusion:** This study demonstrates the *in vitro* strong activity of ZER-LCNs as anti-inflammatory, anti-oxidative stress, and anti-senescence therapeutic agents, highlighting the potential of this innovative formulation as suitable treatment for COPD.

Keywords: Zerumbone; liquid crystalline nanoparticles; monoolein; P407; anti-inflammatory; antioxidant

Porous Swellable Hypromellose Composite Fortified with Bioactive Extracted from *Eucalyptus Camaldulensis* Leaf to Mitigate Dermal Wound Infections

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Introduction: Wound healing after injuries and infection remains challenging due to the complexity of wound healing processes, cell-signaling events, and biochemical cataracts. Several conventional therapies include synthetic and natural healing promoters with the inclusion of gauze dressing; however, these treatments require multiple components and are mostly inadequate for complete healing. Therefore, effective treatment of injured skin and wounds requires comprehensive dressing with antibacterial, antioxidant, anti-inflammatory, and hemostasis effects. **Method:** Composite fortified with a phenolic rich Eucalyptus camaldulensis green extract (ECG) and Eucalyptus camaldulensis yellow extract (ECY) was prepared using a freeze-drying process. In brief, HPMC with glycerol as the composite forming fluid was prepared in de-ionized water. The porous composite with or without phenolic-rich extract at low and high content concerning composite forming fluid were Fabricated by cryodesiccation using a Lyophilizer. The test composites fabricated were denoted with low and high content of ECG and ECY extracts as ECGLC (Eucalyptus camaldulensis green low content), ECGHC (Eucalyptus camaldulensis green high content), ECYLC(Eucalyptus camaldulensis yellow low content), and ECYHC(Eucalyptus camaldulensis yellow high content), respectively, and the control composite was denoted as HPMCC(Hydroxy propyl methyl cellulose control). **Results and Discussions**; Infrared spectroscopy and thermal analysis of ECG and ECY fortified composite indicated significant hydrogen bonding-based cross-linking, while scanning electron microscopy image showed a porous structure. The chromatography profiling demonstrated 0.022±0.02 and 0.027±0.01 µg/mg of quercetin for the ECG and ECY fortified composite, respectively. The antibacterial and antioxidant activity of extract incorporated composite was significantly (p <0.001) higher than that of control. Biocompatibility results revealed that composites were compatible with >80% viability of HaCaT and RAW 264.7 cells. The results of the blood-coagulation and clotting kinetics showed time and dose-dependent hemostasis. *Eucalyptus camaldulensis* leaf hydrophilic extract incorporated composite significantly (p <0.001) attenuated the nitrite production against lipopolysaccharides-stimulated macrophage cells. Moreover, the HaCaT cell showed 48.12±1.85 (%) of migration treated with ECY incorporated composite after 24 h. Overall, the hydrophilic extract-incorporated composites showed multifarious biological properties, suggesting their potential for comprehensive wound healing dressing.

Keywords: Anti-inflammatory, *Eucalyptus camaldulensis*, Quercetin, Hypromellose, a phenolic rich Eucalyptus camaldulensis leaf hydrophobic extract (ECG), a phenolic rich Eucalyptus camaldulensis leaf hydrophilic extract (ECY)

Formulation Development, Optimization and Evaluation of A Novel *In Situ* Gel for the Treatment of Glaucoma

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Introduction: Glaucoma is the leading cause of blindness worldwide and affects around 80 million patients. Vision loss occurs in some glaucoma patients due to excessive intraocular pressure. Issues with the use of eyedrops for glaucoma treatment include short residence time, poor bioavailability and rapid precorneal drainage. **Methods:** The present work described formulation development (cold method) for dorzolamide-hydrochloride loaded poloxamer/HPMC based polymer matrix novel *in situ* gel for enhanced ocular retention. A 3^2 factorial study (resulting in formulation batches F1 to F9) was used and the optimal formulation was selected via evaluation of gelling capacity, viscosity and % cumulative drug release. The optimized batch was further evaluated via *ex vivo,* histopathology*, in vivo* and gamma scintigraphy studies. **Results:** Optimized formulation (F4) successfully sustained release of drug up to 5 hours in *ex vivo* goat corneal permeability study. Histopathology on goat cornea proved the presence of normal ocular surface structures. Comparative *in vivo* experiments in normotensive rabbits showed that the optimized formulation (F4) sustained therapeutic effect for up to 8 h with 31.22 ± 3.65% reduction in intraocular pressure whereas a marketed formulation showed immediate release effect with 18.22 ± 4.42% reduction in intraocular pressure for up to 2-3 h. Gamma scintigraphy revealed an increase in ocular residence for the *in situ* gel formulation (F4) compared to marketed eye drops. **Discussion and conclusion**: Our developed non-irritant *in situ* gel is a new viable alternative for glaucoma treatment which should be further evaluated for human use via clinical studies.

Keywords: *in situ* gel, poloxamer, *in vivo, glaucoma*

Pharmaceutical Optimization of Polyelectrolyte Complexing Topical Formulation of Loratadine With Vitamin-C for Rheumatoid Arthritis

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Introduction: The aim of this study was to develop and evaluate topical administration of poorly soluble drug Loratadine with Vitamin adjuvant by developing the Loratadine - Ascorbic acid polyelectrolyte complexing nanoparticles gel (LA-Gel). **Methods:** LA-Gel was prepared by polyelectrolyte complex (PEC) technique using chitosan & Sodium alginate. LA-Gel was characterized by measuring the morphology, particle size, Polydispersity index, zeta potential, encapsulation efficiency (% EE), and FTIR Compatibility studies. In-vitro and In-vivo studies were carried out to demonstrate anti-arthritic activity. **Results:** LA-G F3 and LA-G F2 possessed better result when compared to LA-G F1 , here the LA-G F3 shows PS of 45.59± 0.5 nm, PDI of 0.06 ± 0.02, ZP of - 7.3 ± 0.36 mV, % EE of 85.4 ± 1.5, pH of 6.28 ± 0.3, viscosity of 5556 ± 14 cP, and drug content of 93.49 ± 0.48%. LA-G F3 showed a zero order controlled release manner within 8 hrs by following Higuchi Kinetics Model. The LA-G F2 and LA-G F3 revealed note worthy results Characterization study, In-*vitro* activity anti inflammatory activity and In-vivo study showed the inhibition of paw thickness, arthritis score, reduced elevated level WBC, ESR , Reduction of paw thickness were observed in at the end of treatment period on Day 15. **Discussion and Conclusion:** In-vitro and In-vivo studies of LA-G F2 and LA-G F3 shows encouraging results to demonstrate anti-arthritic activity by comparing with standard gel against induced arthritis in wistar rats. The LA-G F3 exhibited better anti-arthritic activity when compared with Standard formulation. Polyelectrolyte Complexing Topical Formulation of Loratadine with Ascorbic acid can be an effective controlled release system of combined therapy that administered topically on the skin surface for the treatment of Rheumatoid arthritis.

Keywords: Polyelectrolyte complex, Loratadine, L-Ascorbic acid, Rheumatoid arthritis.

Poster Presenters	
ID	**Presenters**
PP-DD-01	**Ms Berlian Sarasitha Hariawan**
	Characterization of Amniotic Mesenchymal Stem Cell Metabolite Products Liposome Loaded to Bone-Scaffold
PP-DD-02	**Ms Devy Maulidya Cahyani**
	Biopharmaceutical Study of Ursolic Acid Prepared into Niosome Coated with Chitosan
PP-DD-03	**Ms Rifda Tarimi Octavia**
	Dissolving Microneedle Patch for Delivery of Amniotic Mesenchymal Stem Cells Metabolite Products as an Antiaging Product
PP-DD-04	**Prof Dr Gowthamarajan K**
	Management of Atherosclerosis by Formulating and Optimizing Nanotheranostic Particles using the Design of Experiment Approach
PP-DD-05	**Mr Prajyod Deepak Haryan**
	pH Responsive Ofloxacin Loaded Carbomer Based Sol-Gel Composite Formulation and Evaluation for the Management of Periodontitis
PP-DD-06	**Mr Mohamad Siddiq Bin Mohamad**
	Assessing the Potential of Nano-Delivery Systems Containing 18b-Glycyrrhetinic Acid in Mitigating Lung Cancer.
PP-DD-08	**Dr Fith Khaira Nursal**
	Design of Mometasone Furoate Loaded Niosomal System as Drug Delivery Carrier

Characterization of Amniotic Mesenchymal Stem Cell Metabolite Products Liposome Loaded to Bone-Scaffold

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Introduction: Xenograft is a bone scaffold obtained from a different species used in another. Xenograft is widely used due to its 3D structure and has properties similar to human bone. Xenograft has good biocompatibility properties but lacks osteoconductive, osteoinductive, and osteoconductive properties. Amniotic Mesenchymal Stem Cells Metabolite Products (AMSC-MP) is a secretome extracted from human placenta tissue that contains growth hormone and cytokines that can be used for bone regeneration therapy. Liposome is a vesicular bilayer that can deliver both lipophilic and hydrophilic drugs. Liposomes can avoid AMSC-MP burst release growth factors from the scaffold and enhance osteogenesis activity. **Objectives:** This study aims to evaluate the effect of different phospholipids on the physical characteristics of AMSC-MP liposome loaded to scaffold and its biocompatibility in vitro. **Methodology:** The thin layer hydration method was used to create the AMSC-MP liposome. AMSC-MP liposomes were composed of L-α-fosfatidilcoline (PC) as unsaturated, hydrogenated soybean (HSPC) as a saturated phospholipid, and three types of a charged phospholipid, which were cationic surfactant i.e 1,2-dioleoyltrimethylammoniumpropane (DOTAP), and anionic phospholipid i.e. 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (DOPE) dan non-ionic phospholipid i.e dipalmitoyl-phosphatidylglycerol (DPPG). Liposome AMSC-MP was embedded in the scaffold by incubating for 24 hours. MTT assay was conducted to determine biocompatibility in vitro. **Results:** The results showed that the liposomes with saturated phospholipids, HSPC-DOTAP (132.35±2.75), HSPC-DPPG (148.35±19.86) and HSPC-DOTAP (152.85±5.86) have larger particle sizes than the liposomes with saturated phospholipids, PC-DOTAP (139.355±2.75), PC-DPPG (99.05±1.90) and PC-DOTAP (91.85±0.07). Cationic phospholipids caused an increase in zeta potential. Moreover, based on the MTT viability test against 7f2 cells and MSC, the result shows that all the formulas have good biocompatibility in vitro. **Conclusion:** Different phospholipid types could affect the liposome's particle size and zeta potential; however, it does not affect biocompatibility in vitro.

Keywords: Bone regeneration, stem cell, scaffold, liposome.

Biopharmaceutical Study of Ursolic Acid Prepared into Niosome Coated with Chitosan

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Introduction: Ursolic Acid (UA) is a pentacyclic triterpenoid compound that effectively inhibits tumor growth through modulation of apoptosis, inhibition of cell cycle, and autophagy. However, UA has poor water solubility and permeability. Niosomes have been reported to improve the bioavailability of low water-soluble drugs. **Objectives:** This study aimed to evaluate the biopharmaceutic and in vivo oral absorption of UA niosome modified with chitosan layers. **Methodology:** UA niosomes were prepared using a thin layer hydration method, then chitosan was added by vortexing the mixtures. Biopharmaceutics study was then determined for solubility and permeability compared to free UA. The in vivo oral absorption was then determined in mice's gastric, duodenum, jejunum, ileum, and liver after 30 minutes, 1 hour, 2 hours, and 4 hours of oral administration of UA. **Results:** The results showed the addition of chitosan layers increase the solubility and permeability of UA niosome. Niosome coated with a chitosan layer produced higher absorption gastrointestinal tract, with the highest absorption in the duodenum. Moreover, the photomicrographs of the organs revealed that UA niosomes with the chitosan layer were highly accumulated in the liver after 4 hours of oral administration. **Conclusion:** It can be concluded that the chitosan layer successfully improved oral absorption of UA niosomes through enhanced permeability of UA.

Keywords: Ursolic acid, niosome, chitosan, absorption.

Dissolving Microneedle Patch for Delivery of Amniotic Mesenchymal Stem Cells Metabolite Products as an Antiaging Product

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Introduction: Microneedles have emerged as a promising technology for enhancing the delivery of Amniotic Mesenchymal Stem Cell Metabolite Product (AMSC-MP) in skin rejuvenation and aging management. AMSC-MP contains Growth Factors (GF) that regulate cellular activities, but its hydrophilic nature and high molecular weight (>75 kDa) pose challenges to effective delivery. **Objective:** This study aimed to develop and evaluate the characteristics and effectiveness AMSC-MP-loaded microneedle patches as a solution to overcome these barriers, compared to the previously developed transfersome. **Methodology:** Microneedles were fabricated using the double-casting method with three different formulations varying in AMSC-MP concentration. The physicochemical evaluation involved scanning electron microscopy (SEM), TA-TX2 Texture Analyzer, and EX-101 optical coherence tomography (OCT) microscopy, respectively, to assess microneedle morphology, mechanical resistance, and insertion properties on Parafilm® M layer and full-thickness neonatal porcine skin. In vivo effectiveness was evaluated by quantifying collagen fibroblast cell count and conducting a skin irritation study, then comparing the result with the transfersome system previously developed. **Results:** The AMSC-MP microneedles exhibited a pyramidal shape with sharp tips and a height of 500µm per needle. Mechanical resistance evaluation revealed sufficient strength and the highest insertion depths were observed in formulation 1 (F1) on Parafilm® M layer at 447.44 ± 37.21 and formulation 2 (F2) on full-thickness porcine skin at 717.92 ± 25.40 µm. These findings demonstrate the successful penetration of microneedles through the stratum corneum and viable epidermis. Collagen levels were higher in all microneedle formulations compared to the transfersome formulation, with F1 exhibiting the highest quantity of fibroblast cells. Evaluation of inflammatory cell count indicated minimal presence in microneedle formulations, suggesting no irritative effects. **Conclusion:** Microneedle patches have shown favorable characteristics, including good mechanical strength, effective delivery of AMSC-MP, and minimal irritation. Therefore, they hold potential as a technology for delivering anti-aging agents and promoting skin rejuvenation.

Keywords: Microneedle, AMSC-MP, anti-aging, drug delivery

Management of Atherosclerosis by Formulating and Optimizing Nanotheranostic Particles using the Design of Experiment Approach

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Introduction: Atherosclerosis is one of the leading causes of death due to non-communicable diseases. The progression of atherosclerosis might lead to several other complications, such as myocardial infarctions, stroke and congestive heart failure. Lipid-based nanotheranostic particles with suitable drug and imaging agents can be implemented to study the extent of the atherosclerotic plaques, and based on the imaging, the treatment can be altered. Design of Experiments (DoE) is implemented to study the effect of different concentrations of different lipids and the homogenization speed on the particle size of the lipid-based nanotheranostic particle with the help of a central composite design(CCD). **Objectives:** To develop a nanotheranostic particle for the imaging and therapy of atherosclerosis using the DoE method. **Methodology:** The methodology is initiated by identifying a suitable target. Once the target was identified, in-silico docking studies were carried out with a few drug molecules and the promising ones were chosen. Blank lipid-based nanoparticles were optimized using the CCD model with different lipid ratios as the factors. After optimization, they are loaded with the drug of choice and tagged with an imaging agent and the nanotheranostic particle is subjected to characterization and evaluation tests. **Results:** The target has been identified as the LOX-1 receptor, and for that, Ligand binding studies were conducted with different molecules. The promising molecules have been shortlisted, and the same is being studied for in-vitro results. **Conclusion:** The docking studies show promising results, and the same is expected in the in-vitro studies. If the results are favourable, the promising molecules can be used to develop a nanotheranostic particle for managing atherosclerosis.

Keywords: Nanotheranostics, atherosclerosis, molecular docking, Design of Experiments

pH Responsive Ofloxacin Loaded Carbomer Based Sol-Gel Composite: Formulation and Evaluation for the Management of Periodontitis

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Introduction: Gingival recession is characterized as periodontal disease also known as gum disease. Antibacterial medicine is necessary for the treatment of this persistent infection. The in situ forming system is initially in the form of a sol, and when gradually supplied, it transforms into a gel or solid depot. **Objectives:** Treatment of periodontitis using in situ gel. **Methodology:** Cold Method : This method involved slow addition of polymer in cold solvent with continuous stir. The formed mixtures were stored overnight at 4°C and studied for their gelation temperature to select optimum concentration of Polymer grades for effective in situ gel formulation. **Results:** In situ gel exhibited a pseudoplastic flow pattern. The optimized batch consist of 0.105 gm of Carbopol 934 and 0.125 gm of HPMC K 100 which is having desired gelation time of 1.30 min, 90% drug release at 4 hours and drug content was found to be 90.50%. The viscosity of the optimized batch was found to be 3312 centipoise. **Conclusion:** Ofloxacin-loaded pH-sensitive in situ gel was successfully formulated by a combination of Carbopol 934 and HPMC K-100. FTIR study indicates no sign of incompatibility between drug and excipients, likely to be the best candidate for in situ gel. Selected polymers were likely to be proper for periodontal in situ gel. The formulation remains in a liquid state at non-physiologic conditions (at pH 3-4) and forms gel at physiologic conditions (at pH 6-7.5). The developed formulation shows acceptable gelation time and drug release results, which were dependent on concentrations of Carbopol 934 and HPMC K-100.Amongst the various formulations (F1-F4) assorted, optimized batch consists of 0.105g of Carbopol 934 and 0.125g of HPMC K-100, which has having desired gelation time of 1.30min, 90% drug release at 4 hr, and drug content is found to be 90.50%.The viscosity of the optimized batch was found to be 3312 centipoise. Antimicrobial studies indicate that ofloxacin retained its antimicrobial activity when formulated as in situ gel delivery for the treatment of periodontitis

Keywords: Periodontitis, in situ gel, pH sensitive, ofloxacin

Assessing the Potential of Nano-Delivery Systems Containing 18b-Glycyrrhetinic Acid in Mitigating Lung Cancer

Siddiq Mohamad[3,4], Keshav Raj Paudel[1], Gabriele De Rubis[2,3], Ruby-Jean Reyes[2,3], Philip Michael Hansbro[1], Thiagarajan Madheswaran[4], Kamal Dua[2,3], Dinesh Kumar Chellappan[4]

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Introduction: 18β-Glycyrrhetinic acid (18β-Gly), a naturally occurring substance extracted from the licorice plant, has shown promising anti-cancer potential. However, the clinical application of free 18β-Gly is hindered by its poor physicochemical characteristics, such as limited bioavailability and low water solubility. This study aims to formulate nano-delivery system using Polylactic-co-glycolic acid (PLGA) for 18β-Gly to overcome these challenges. **Methods:** In this research, we formulate PLGA encapsulated 18β-Gly nano-formulation using adapted emulsion-evaporation method producing 18β-Gly-PLGA. After preparing the nano-formulation, we examined the physicochemical properties of nanoparticles and its anti-cancer effects on A549 lung cancer cells, comparing the effects of nano-formulation to free 18β-Gly. **Results:** Our study has yielded significant results, demonstrating that 18β-Gly-PLGA nano-formulation exhibits favourable physicochemical properties, including sustained in vitro drug release and high entrapment efficiency. Moreover, 18β-Gly-PLGA nano-formulation effectively inhibits the proliferation and migration of A549 cells. Underlying mechanisms of 18β-Gly-PLGA's anti-cancer effects involve the significant down-regulation of oncogenes such as KRT18, EGFR, BRAF, and KRAS. Furthermore, 18β-Gly-PLGA nano-formulation significantly reduces the expression of proteins associated with cancer proliferation and migration such as ErbB2, Survivin, M-CSF, and Mesothelin. **Discussion and Conclusion:** The nano-formulation of 18β-Gly-PLGA demonstrates an improved physicochemical profile and robust anti-cancer activities compared to free 18β-Gly.

Keywords: 18β-Glycyrrhetinic Acid, PLGA nanoparticle, A549 lung cancer cells

Design of Mometasone Furoate Loaded Niosomal System as Drug Delivery Carrier: optimization formula

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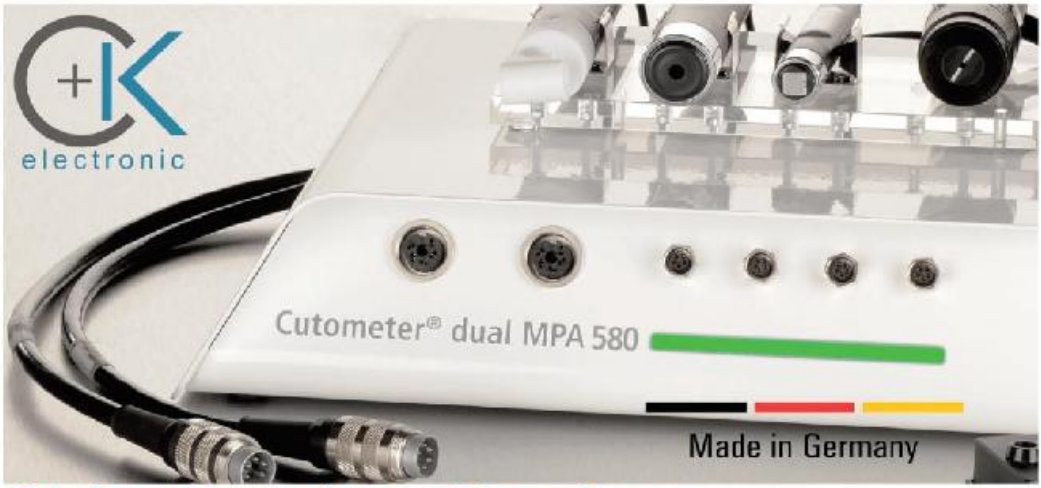
Introduction: Some topical applications of compounds combined with glucocorticoids and vitamin D can treat mild to moderate psoriasis, while systemic treatment is needed for severe psoriasis. Mometasone furoate (MF) is a steroidal anti-inflammatory compound that is reported to have clinical indications for treating psoriasis. Transdermal psoriasis therapy can be done by forming MF in the niosomal system, namely a nanovesicles so that the penetration power through the skin layers is higher and will increase the bioavailability of the drug. **Objectives:** This research aimed to develop a niosome formula containing MF, through optimization of surfactant combination (Tween 80 and Span 60), as well as the amount of cholesterol. **Methodology:** Optimization was designed using the Box Behnken experimental approach, and niosomes were made using the thin-layer hydration method. Evaluation of particle size, polydispersion index, zeta potential, and entrapment efficiency were used as the research's response variables. **Results:** The niosomes produced have the appearance of a cloudy liquid (dispersion), milky white in color, and odorless. The size of niosomal vesicles varies around 336.1 nm. In general, a zeta potential greater than ±30 mV is a good indicator of stability. All formulations have good stability so the tendency for aggregate formation or flocculation is lower. Measurement of entrapment efficiency was carried out spectrophotometrically by measuring free drug and drug entrapped in vesicles and obtained EE results ± 87%. The results show that MF can be formed using the niosomes system at MF concentration 1.396 mg/mL, cholesterol 0.5 M, and surfactant (combination) HLB value 4.7. **Conclusion:** This result indicated the formula can be developed for a transdermal drug delivery system.

Keywords: Niosomes, nanovesicle, mometasone furoat, surfactant.



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Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-LS-01	**Dr Mohammad Anas Shamsi** Repurposing Drugs for Bruton's Tyrosine Kinase Inhibition: A Combined Virtual Screening and Molecular Dynamics Study	2:00 PM
OP-LS-02	**Dr Saleha Anwar** Synthesis and Biological Activity of Bisindole Derivatives as Novel Mark4 Inhibitors	2:15 PM
OP-LS-03	**Ms Amanda Shen Yee Kong** In-silico analysis of nsSNPs in BCL-2 family proteins and their implications for colorectal cancer treatments	2:30 PM
OP-LS-04	**Mr Mohammad Yusuf Hasan** Protective Role of microRNA-21 as an Anti-Inflammatory Switch through α7nAChR Activation in Preventing Cerebral Ischemic Reperfusion (I/R) Injury	2:45 PM
OP-LS-05	**Ms Liyana Shafiqah Binti Sahul Hamid** Investigating the effects of 6-gingerol and 6-gingerol standardized *Zingiber Officinale* extract on chronic nicotine addiction in mice	3:00 PM
OP-LS-06	**Ms Nur Syahidah Binti Nor Hisam** In-Vitro Study: A Novel Action of Navitoclax on IL-3-Induced Human Endothelial Cells Angiogenesis Through PI3-AKT Signalling	3:15 PM

Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-LS-08	**Hui Yan Liew** Investigation of Cellular Traction Force as a Drug Testing Readout for In Vitro Cancer Metastasis	3:30 PM
OP-LS-09	**Dr Karniza Khalid** Alpha-1-Antitrypsin Deficiency: A Population-Based Study on Diagnosis, Clinical Manifestations, and Phenotypic Variations	4:00 PM
OP-LS-21	**En Li Soh** A systematic review: The ability of fermented herbal extract compounds in skin anti-ageing	4:15 PM
OP-LS-07	**Ms Hui Nee Hon** Development of 3D In Vitro Model using Organ-on-Chip to Modulate Breast Cancer Metastasis	4:30 PM
OP-LS-14	**Ms Kevina A/P N Yanasegaran** Single Nucleotide Polymorphisms Associated with Type 2 Diabetes Mellitus Control Among Malay Population: rs6265 Brain-Derived Neurotrophic Factor	4:45 PM

Oral Presenters		
Date: 26 October 2023 (Thursday)		
ID	**Presenters**	**Time**
OP-LS-10	**Mr Ludwig Hoon** minSNPs: From Derivation of Resolution-Optimised SNP Sets to Analysis of Nanopore Whole Genome	2:00 PM
OP-LS-11	**Ms Sofia Kokkinis** Curcumin-Loaded Liposomes Inhibit Cigarette Smoke Induced Senescence in Human Bronchial Epithelial Cells	2:15 PM
OP-LS-16	**Dr Sivaraman Dhanasekaran** Neurocognitive Investigation of Nano tailored therapeutics against Amyloid Beta Induced Neuropathological Implications	2:30 PM
OP-LS-17	**Dr Sufia Islam** Multidrug resistance isolates of Staphylococcus aureus in young children of Dhaka, Bangladesh	2:45 PM
OP-LS-18	**Mr Kian Christian J. Elman** Molecular Identification of *Campylobacter jejuni* and *C. coli* in the Raw Milk of Philippine Carabaos (*Bubalus bubalis*)	3:00 PM
OP-LS-19	**Ms Ira Oktaviani Rz** Physicochemical Analysis of Pangasius hypopthalmus Bone Gelatin Extract Using Organic Waste	3:15 PM
OP-LS-20	**Ms Rahimatul Uthia** Examining the Effects of Chia Seed Consumption on Body Weight and Cholesterol Reduction in Coturnix coturnix	3:30 PM

Repurposing Drugs for Bruton's Tyrosine Kinase Inhibition: A Combined Virtual Screening and Molecular Dynamics Study

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Introduction: Bruton's tyrosine kinase (BTK) is a protein kinase that plays a crucial role in various biological processes, including immune system function and cancer development and its overexpression is directly related to cancer progression and development. Thus, inhibition of BTK has been proposed as a therapeutic strategy for various diseases. Our study focuses on identification of new BTK inhibitors that can be implicated in cancer therapeutics. **Methods:** In this study, we aimed to identify potential inhibitors of BTK by using a drug repurposing approach. To identify potential inhibitors, we performed a molecular docking-based virtual screening using a library of repurposed drugs from DrugBank. We then used various filtrations followed by molecular dynamics (MD) simulations, principal component analysis (PCA), and Molecular Mechanics Poisson Boltzmann Surface Area (MM-PBSA) to further evaluate the binding interactions and stability of the top-ranking compounds.**Results:** Molecular docking-based virtual screening approach identified several repurposed drugs as potential BTK inhibitors, including Eltrombopag and Alectinib which have already been approved for human use. MD simulations provided insights into the binding interactions and stability of the identified compounds, which will be helpful for further experimental validation and optimization. **Discussion and Conclusion:** The study results demonstrate that drug repurposing is a promising approach to identifying potential inhibitors of BTK. The molecular docking-based virtual screening approach identified several repurposed drugs as potential BTK inhibitors, including Eltrombopag and Alectinib, which have already been approved for human use. This highlights the potential for drug repurposing in the discovery of new treatments for diseases, as it allows for the re-evaluation of existing drugs for new indications. This approach can save time and resources compared to traditional drug discovery methods, as these drugs have already undergone extensive safety and efficacy testing. Overall, our study demonstrates the importance of computational methods in drug discovery.

Keywords: Bruton's tyrosine kinase; drug repurposing; Eltrombopag; Alectinib; Virtual screening.

Synthesis and Biological Activity of Bisindole Derivatives as Novel MARK4 Inhibitors

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Introduction: Microtubule affinity regulating kinase 4 (MARK4) is a serine/threonine kinase that is directly associated with different types of cancer. Despite interest for pharmacological inhibition of MARK4, a small number of MARK4 inhibitors are currently available with most of them display low selectivity or bioavailability. Thus, we targeted the synthesis, structural characterization and evaluation of inhibitory effects of new bisindole derivatives as potent MARK4 inhibitors that can function with improved efficacy and selectivity. **Methods:** A series of bisindole derivatives were envisioned and synthesized. The actual binding affinity was measured with both fluorescence quenching and ITC. Enzyme inhibition assays investigated the effect of these bisindoles on the MARK4 functionality. Molecular docking was also performed to rationalise the molecular interactions within the catalytic site of MARK4. Cell proliferation assays were performed to check the effect of these bisindoles on inhibition of different cancer cell lines. **Results:** Bisindoles were found to bind with MARK4 with a significant affinity, depicted by fluorescence quenching and ITC. Enzyme inhibition assays established these as MARK4 inhibitors with IC50 values in the low micromolar range. Molecular docking revealed critical residues involved in the binding process. The antiproliferative activity of derivatives 18, 26, 33 and 20 was evaluated against A549, MCF7 and OVCAR-3 cancer cells. Among the tested compounds, 20 displayed the best cytotoxic activity against OVCAR-3 cells with GI50 = 7 ± 0.5 μM, TGI = 10 ± 0.8 μM and IC50 = 20 ± 1.2 μM and A549 cancer cells with GI50 = 4 ± 0.52 μM, TGI= 12.5± 0.8 μM and IC50= 32.5± 2.4 μM. In addition, compounds 18 and 26 induce apoptosis in A549 cells and deviated the cells from early to late apoptotic events. **Conclusion:** Overall, new bisindole derivatives possess significant antiproliferative properties, yet a non-selective cytotoxic effect was observed on normal MRC5 cells.

Keywords: MARK4; kinase inhibitors; Cell viability assays; cancer therapeutics; Molecular docking

In-silico Analysis of nsSNPs in *BCL-2* Family Proteins and their Implications for Colorectal Cancer Treatments

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Introduction: Colorectal cancer (CRC) is a complex disease characterized by abnormal cell proliferation in the colon and rectum. While the involvement of *BCL-2* family proteins in CRC development is acknowledged, the precise impact of genetic variations, particularly nonsynonymous single nucleotide polymorphisms (nsSNPs) within these proteins remains elusive. To unravel the pathogenic mechanisms underlying these nsSNPs in *BCL-2* family proteins, we conducted an *in-silico* study employing structure-based bioinformatic tools, aiming to uncover their molecular role in CRC pathogenesis. **Objectives**: We aim to identify pathogenic nsSNPs in *BCL-2* family proteins associated with CRC and explore potential molecular targets for anticancer treatment. **Methodology**: We retrieved nsSNPs of pro- and anti-apoptotic *BCL-2* genes (OMIM: 151430) from the NCBI genome database (GRCh37.p13). Pathogenicity was assessed using SIFT, PolyPhen-2, SNPs&GO, PhD-SNP, PANTHER, and Condel. Amino acid substitutions' impact on protein stability was evaluated through MutPred, PredictSNP, and I-Mutant2.0. Evolutionary conservation analysis utilized ConSurf, while Mutation3D and HOPE employed for protein functional analysis. Homology modelling with SWISS-Model and molecular docking analyses using AutoDock generated 3D structures of wild-type and mutated *BCL-2* family proteins and investigated their ligand interactions. **Results**: Ninety-four nsSNPs of *BCL-2* genes predicted as pathogenic; 31 nsSNPs showed decreased protein stability. Conservation analysis identified rs960653284, rs758817904, rs1466732626, rs569276903, rs746711568, rs764437421, rs779690846, and rs2038330314 as highly functional and exposed, while rs376149674, rs1375767408, rs1582066443, rs367558446, rs367558446, rs1319541919, and rs1370070128 were considered structural and buried. Molecular docking revealed lower binding affinity of G233D, R102C, and R102P towards d-Alpha-Tocopherol and Tocotrienol, indicating less favorable protein-ligand interactions, while R127C, R88C, R127P, G175D, and V34G exhibited higher binding affinity towards d-Alpha-Tocopherol. **Conclusion**: Our findings illuminate the role of pathogenic nsSNPs in *BCL-2* family proteins associated with CRC, elucidating their effects on protein stability, conservation, and function. Molecular docking analysis with Fluorouracil, d-Alpha-Tocopherol, and Tocotrienol revealed diverse binding patterns and interactions, indicating potential for targeted therapeutic interventions.

Keywords: Colorectal cancer, BCL-2 apoptosis regulators, Molecular docking, protein stability, targeted therapeutic.

Protective Role of microRNA-21 as an Anti-Inflammatory Switch through α7nAChR Activation in Preventing Cerebral Ischemic Reperfusion (I/R) Injury

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Introduction: Ischemic stroke is characterized by a sudden loss of blood flow in an artery leading to the brain. The activation of the α7-Nicotinic Acetylcholine Receptor (α7nAChR), which is found in immune cells such as microglia, has shown promising results in improving inflammatory profiles in stroke-induced rats but its exact mechanism of neuroprotection remains controversial. Analysis of known key microRNA's is an interesting avenue for the investigation to unravel the neuroprotection basis of α7nAchR activation. **Objectives:** To investigate the role of microRNA-21 in mediating inflammation via α7nAChR activation in preventing cerebral ischemia-reperfusion injury. **Methodology:** The mouse BV2 microglia cells were preconditioned with PNU-120596 (α7nAchR agonist) and then kept in hypoxia chamber (Oxygen-glucose-deprived) to mimic ischemic injury. Later the protein and gene expression of M1 (pro-inflammatory) and M2 (anti-inflammatory) markers as well as other downstream signalling pathways (NF-kB and STAT3) was measured by qRT-PCR and ELISA. Antagomir of microRNA-21 was transfected to investigate the protective role of microRNA-21. **Results:** The optimum time point of OGD was finalized after measuring cell viability at different time points (1,2,4,6,8 hour) using MTT assay. 4 hours was finalized as the optimum time as it showed more than 80% cell viability as well as successful inflammation.The activation of α7nAChR by an agonist PNU 282987 inhibited the OGD/R-induced elevation of pro-inflammatory markers (TNF-a, IL-6) while increasing the expression of the anti-inflammatory marker IL-10. It was also discovered that after OGD/R, NFkB-p65 levels increased significantly, whereas α7nAChR activation by agonist significantly reduced its expression. We have also reported that microRNA-21 regulates α7nAChR activation by switching proinflammatory M1 cytokines to anti-inflammatory M2 cytokines. **Conclusion:** The results demonstrated that activation of α7nAChRs inhibits the transformation of M1 microglia and promotes the M2 phenotype regulated by NFkB and STAT3 pathways and microRNA-21 provides a key role in this process.

Keywords: Ischemic Stroke; microRNA-21; a7nAChR; microglia; I/R injury.

Investigating the effects of 6-gingerol and 6-gingerol standardized *Zingiber Officinale* extract on chronic nicotine addiction in mice

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Introduction: Genetic studies have shown the interaction of serotonin subtype 3 receptor (5-HT3R) genetic variants and their association with nicotine-induced effects. Thus, we aim to further evaluate the implications of 5-HT3R antagonists; palonosetron (PAL), 6-gingerol (6G) and 6G-standardized ginger extracts (GE) on chronic nicotine addiction in mice. **Methods:** Swiss albino mice were divided into saline (SAL) and nicotine (NIC) groups, with the latter continuously administered with nicotine for 28 days to induce chronic nicotine addiction. Nicotine preferences were observed using the conditioned place preference (CPP) test (Test 2). Mice that developed preference were treated with PAL, 6G, bupropion (BUP), different doses of GE (70mg/kg, 100mg/kg, and 130mg/kg) and the CPP score was analyzed (Test 3). The mice brains were sectioned, and the prefrontal cortex was used to study genes involved in the pathophysiology of nicotine addiction such as serotonin receptor genes (*Htr3a, Htr3b, Htr2a, Htr2c*), acetylcholine nicotinic receptor genes (*Chrna4, Chrna7, Chrnb2*) and dopamine receptors genes (*Drd1, Drd2*) using RT² Profiler PCR array. **Results:** Mice treated with BUP, 6G and GE 100 showed significantly decreased nicotine preference on post-test 3. We found that mice receiving NIC showed increased trend of gene expression in *Htr3a*, *Htr2c, Chrnb2* and *Drd2* and reduced trends in some genes (*Htr3b, Htr2a, Chrna7* and *Drd1*). Increased trend of certain gene expression is seen in treatment groups; BUP [*Htr3a*, *Htr3b, Htr2c*], PAL (*Chrna4, Chrna7* and *Drd2*), 6G (*Htr2a, Htr2c, Chrna4*) and GE 100 [*Chrna4* ($p<0.05$), *Chrna7, Chrnb2* and *Htr3b*] when compared to NIC. **Conclusion:** Behavioural analysis shows that nicotine-addicted mice treated with 6G and GE100 effectively diminished nicotine preference, suggesting their potential use as a treatment to address nicotine dependency. The insight into gene expression levels may aid in a deeper understanding of the molecular mechanism involved in nicotine addiction.

Keywords: *Nicotine, Zingiber Officinale, Gingerol, 5-HT3; Conditioned Place Preference*

In-Vitro Study: A Novel Action of Navitoclax on IL-3-Induced Human Endothelial Cells Angiogenesis Through PI3-AKT Signalling.

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Introduction: Pathogenesis of cancer metastasis is comparable to intraplaque neovascularization in atherosclerosis which is predominantly contributed by endothelial cell activation modulated by interleukin such as interleukin-3 (IL-3). Navitoclax is well known as an apoptotic agent in solid and non-solid tumours. Hence, it is postulated that navitoclax can be developed as a novel therapeutic drug for intraplaque angiogenesis by regulating endothelial cell activation. However, limited evidence of the navitoclax effect on endothelial cell activity has been identified. **Objectives:** This study investigates the navitoclax effect on IL-3-induced endothelial cell angiogenesis that involves proliferative and migratory activities through the PI3K-AKT mechanism. **Methodology:** Primary endothelial cells isolated from human umbilical veins were utilized. Initially, MTT assay was conducted to determine the navitoclax safety concentration. Three groups which include; i) control; ii) 25ng/ml IL-3; iii) 25ng/ml IL-3 with 0.9µM navitoclax, were applied for subsequent experiments. BrdU colorimetric assay was done to examine cell proliferation after 24 hours of treatment. Then, cell migration at 0, 12 and 24 hours was monitored through scratch wound assay. Next, endothelial cells were seeded on Matrigel to observe the tube formation for 8 hours of treatment. Protein expression of CXCL-8, MMP-3, PI3K and p-AKT in cell lysate after 24 hours of treatment was analysed. **Results:** MTT assay showed 0.9µM navitoclax for 24 hours of treatment did not decrease cell viability significantly. Furthermore, only 3% of proliferating cells were inhibited by the navitoclax as compared to the control. However, navitoclax notably reduced cell migration and tube formation, which is consistent with CXCL-8 released and MMP-3 expressions that are associated with angiogenic and migratory mechanisms. Lastly, navitoclax also downregulated PI3K and p-AKT expressions significantly. **Conclusion:** These findings showed a novel effect of navitoclax as an anti-angiogenic agent by modulating cell motility through MMP-3 activity and PI3K-AKT signalling in IL-3-induced human endothelial cells.

Keywords: ABT-263, cell survival, HUVEC, motility, tube formation

Development of 3D In Vitro Model Using Organ-on-Chip to Modulate Breast Cancer Metastasis

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Introduction: Breast cancer continues to be the primary cancer influencing women globally, with metastasis being responsible for 90% of deaths. The initiation of breast cancer metastasis has been found to be influenced by increased extracellular matrix (ECM) rigidity. However, the current two-dimensional (2D) *in vitro* models for cancer metastasis cannot recapitulate the complex three-dimensional (3D) tumor microenvironment, thereby limiting comprehensive research on cancer metastasis. **Objectives:** Therefore, we seek to develop a 3D *in vitro* metastasis model utilizing an organ-on-chip (OoC) system, which is capable of housing 3D breast tumor spheroids embedded within a 3D ECM comprised of Alginate and Matrigel. This 3D model aims to investigate the influence of ECM rigidity on breast cancer metastasis, closely replicating the physiological conditions of the tumor microenvironment. **Methodology:** We first fabricated an OoC comprising a spheroids compartment and a chemoattractant compartment, interconnected by invasion channels. Next, we formed 3D breast tumor spheroids using MDA-MB-231 cells and embedded them into stiff (50kPa) and soft (25kPa) alginate/Matrigel matrices before seeding them into the OoC. Subsequently, we introduced 20% fetal bovine serum (FBS) as a chemoattractant to trigger metastasis. Live-imaging was then performed to observe the morphological changes of the spheroids, marking the initial stage of the invasion in metastasis. **Results:** Our result showed that MDA-MB-231 spheroids in the stiff ECM exhibited a significant decrease (68.94%) in circularity, whereas spheroids in the soft hydrogel showed a relatively smaller decrease of 29.92% from Day 0 to Day 2. This finding indicates that ECM with higher rigidity initiates cancer invasion on Day 2. **Conclusion:** Our OoC demonstrates a valuable 3D *in vitro* model to modulate breast cancer metastasis as it can accommodate 3D cultures and facilitate live-imaging of morphological changes in spheroids and invasion under different ECM rigidities, making it highly advantageous for comprehensive cancer metastasis research.

Keywords: Breast cancer metastasis, extracellular matrix rigidity, 3D spheroids culture, organ-on-chip

Investigation of Cellular Traction Force as a Drug Testing Readout for In Vitro Cancer Metastasis

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Introduction: Metastasis causes 90% of cancer-related deaths in solid tumours. While current in vitro models mainly focus on the antiproliferative effects of anticancer drugs, the impact of metastasis potential has always been neglected and remains unexplored. This is mainly due to the complexity and challenges associated with studying the intricate processes of metastasis, where cells migrate from the primary tumour to secondary sites, involving actin-myosin machinery to generate sufficient force for cell migration and invasion. **Objectives:** In this study, we aim to explore the use of cellular traction force as a drug testing readout for in vitro cancer metastasis models. **Methodology:** We first established invasive and non-invasive in vitro breast cancer models using MDA-MB-231 and MCF-7 cell lines, respectively. Subsequently, cisplatin and 5-fluorouracil(5FU) were selected as paradigm antimetastatic and non-antimetastatic drugs to evaluate the ability of in vitro cellular traction force to identify positive and negative metastatic drugs. We then conducted characterization of cell morphology, invasion assay, and traction force measurement after drug treatment on both in vitro cancer models. **Results:** Our results demonstrated that the invasive cancer model, MDA-MB-231, exhibited an elongated spindle-like morphology, compared to the more spherical shape of the non-invasive cell model, MCF-7. We also found that the MDA-MB-231 showed a higher average magnitude of force compared to MCF-7. When subjected to drug treatment, significant differences in the average cellular traction force of MDA-MB-231 in response to both antimetastatic and non-metastatic drugs were observed. By comparing cellular traction force with cell morphology and invasion assay, we demonstrated its potential to directly quantify the forces accountable for cell movement and assess the antimetastatic activity of drugs. **Conclusion:** Our findings suggest the immense potential of cellular traction force measurement in the context of drug testing for cancer metastasis and facilitating our understanding of cancer cell behaviour during metastasis.

Keywords: Breast cancer metastasis, cellular traction force, MCF-7, MDA-MB-231, drug testing readout

Alpha-1-Antitrypsin Deficiency: A Population-Based Study on Diagnosis, Clinical Manifestations, and Phenotypic Variations

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Introduction: Alpha-1-antitrypsin (AAT) deficiency is an inherited condition characterised by a deficiency in primary lung antiprotease, alpha-1 antitrypsin. This deficiency results in heightened protease-mediated tissue damage, leading to emphysema in adults. Additionally, the abnormal build-up of alpha-1-antitrypsin in the liver can lead to liver disease in both children and adults. A confirmed diagnosis is made when the serum alpha-1 antitrypsin is below 0.9 µmol/L. **Objectives:** We aimed to describe the clinical, biochemical, polymorphic, and pathological variances of AAT deficiency in a Malaysian population. **Methodology:** A retrospective analysis was performed using the database from the Special Protein Unit of the Institute for Medical Research, Kuala Lumpur, Malaysia. Clinical and biochemical data of samples sent for AAT phenotyping from January 1st, 2018, till December 31st, 2022, were collated. Data were presented descriptively, while presence of associations were tested with univariate analysis. **Results:** The study included 344 patients. Majority were infants (mean age 2.6±1.93 months), male (57.8%), and were Malays (57.5%). The overall mean AAT was 1.5±0.40 µmol/L. Hyperbilirubinemia/prolonged jaundice was the commonest reason for AAT phenotyping referral for neonates (30/43) and infants (121/186), hepatosplenomegaly for toddler/older paediatric age group (16/49), and respiratory symptoms for adults (15/66). Protease inhibitor (Pi) MM was the commonest normal variant found (70.7%). Nine were identified as AAT deficient; rare deficient variants included FM (1/9), and IM (1/9). There was a statistically significant difference in AAT value between different age groups ($F(3, 340)=13.08$, $p<0.001$). Post-hoc analysis determined that mean AAT was significantly lower in neonates vs. adults (95%CI:-0.458,-0.001, $p=0.049$), infants vs. toddler/older paediatric groups (95%CI:-0.354,-0.032, $p=0.012$), and infants vs. adults (95%CI: -0.497,-0.168, $p<0.001$). **Conclusion:** The epidemiology of this condition remains unknown in many countries as it often goes undiagnosed. We recommend the establishment of a more comprehensive patient registry to support future endeavours in AAT deficiency research and improved patient tracking.

Keywords: Alpha-1-antitrypsin, rare diseases, precision medicine, diagnostic, Malaysia

minSNPs: From Derivation of Resolution-Optimised SNP Sets to Analysis of Nanopore Whole Genome Sequence Data

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Introduction: Nanopore DNA sequencing technology is increasingly used in public health genomic surveillance. This is because it is portable and can generate long-read sequence data in real time. This, coupled with the large volume of publicly available sequencing data, allow for the development of optimised tools for genomic surveillance of microbial pathogens. **Objectives:** The objective was to develop a method to utilise resolution-optimised SNP sets and Nanopore sequencer-generated data to quickly assign microbial genomes into lineage within the relevant species. **Methodology:** We used minSNPs, an R package we created to derive SNP sets optimised for identifying the major lineages of *Staphylococcus aureus* with publicly available geographically diverse genomic data. We then extended minSNPs to do SNP calling with Nanopore-generated sequence data with short search strings. We also created a similar approach to determine the presence/absence of antibiotic-resistance (mecA) and virulence (lukS-PV, lukF-PV) genes. **Results:** The approach was tested with 24 isolates belonging to different major lineages, including a combination of antibiotic-resistant and virulence strains. These were previously sequenced with Illumina short-read sequencing. We performed DNA extraction with PureLink Mini Kit (Thermo Fisher), barcoded them with Rapid Barcoding Kit 96 and multiplex sequenced with Mk1C using R9 chemistry flow cell. Besides 2 failed sequencing, 5000 reads were sufficient for assigning samples to major lineages and detecting the tested genes irrespective of the basecalling method. **Conclusion:** minSNPs is an efficient and flexible tool for mining resolution-optimised sets of SNP markers that is applicable for microbial surveillance for biological entities for which there is extensive known genomic diversity. Extending minSNPs to make use of Nanopore sequencer provided a simple and quick way to make use of the surveillance markers.

Keywords: Nanopore sequencing, SNP mining, Microbial genomics

Curcumin-Loaded Liposomes Inhibit Cigarette Smoke Induced Senescence in Human Bronchial Epithelial Cells

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Introduction: Chronic obstructive pulmonary disease (COPD) is known to be one of the most common diseases caused by cigarette smoke. COPD causes an increase of goblet cells, mucus gland hyperplasia and fibrosis making the airways to become blocked reducing airflow. The wall lining begins to collapse and thicken due to the inflammation. Curcumin is derived from turmeric or *Curcuma longa* extract and has been used in traditional medicine for years. The anti-inflammatory properties make it a great dietary supplement. Curcumin has poor bioavailability due to its hydrophobic nature. The poor solubility of curcumin has called for new delivery systems to be implemented allowing the stomach to absorb a higher dose of the active. Liposomes can be used to encapsulate the curcumin within the lipid bilayer and protect it from the harsh conditions in the stomach and allow it to be absorbed by the stomach lining. **Objectives:** To assess the therapeutic potential of curcumin-loaded liposomes in inhibiting cigarette smoke-induced senescence *in vitro* in human broncho epithelial cells (BCiNS1.1). **Methodology:** The optimal safe concentration of curcumin liposome for BCiNS1.1 was identified with MTT assay. To induce senescence, the cells were exposed for 24 hours to 5% cigarette smoke extract (CSE). The anti-senescence effect of the curcumin liposomes was evaluated through X-gal staining and immunocytochemistry of key senescence markers; p16 and p21. **Results:** Pre-treatment with 2.5 µM of curcumin liposome for 24 hours before stimulation with 5% CSE significantly reduced X-gal positive cells compared to 5% CSE alone. Consistently, the protein expressions of p21 and p16 were significantly decreased (38.6% and 39.2% respectively), compared to CSE alone. **Conclusion:** The curcumin-loaded liposomes significantly protected BCiNS1.1 cells from CSE-induced senescence by targeting p16 and p21 expression. This highlights the promising potential of curcumin-loaded liposomes in reducing cigarette smoke-induced broncho-epithelial senescence in COPD.

Keywords: Curcumin, Liposomes, COPD, senescence

Single Nucleotide Polymorphisms Associated with Type 2 Diabetes Mellitus Control Among Malay Population: rs6265 Brain-Derived Neurotrophic Factor

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Background: Type 2 Diabetes Mellitus (T2DM) is a common polygenic lifestyle disease in Malaysia. Despite numerous studies linking specific genes and lifestyle factors to T2DM, information associated with single nucleotide polymorphisms (SNPs) and T2DM control in the Malay population is still limited. So, this study aimed to determine the potential genetic loci that influence or limit T2DM control, as indicated by HbA1c values, among Malays, by considering their physical activity level.

Methods: Participants were recruited from Universiti Kebangsaan Malaysia (UKM), Bangi by simple random sampling with informed consent. Socio-demographic data, anthropometric and biochemical blood measurements were collected. Disease status and physical activity level were determined by self-reported questionnaires and global physical activity questionnaires (GPAQ) respectively. Genotyping was performed using the MassARRAY System (Agena Bioscience). All descriptive data were reported in mean and standard deviations (mean ± SD) with simple regression analysis performed for SNP associations.

Results: Amongst the 363 T2DM individuals recruited, 67.8% participants were obese based on their body mass index (BMI) whilst 83.5% and 86.8% participants had been diagnosed with hypertension and hyperlipidaemia respectively. Males, increasing age, higher levels of waist-hip ratio, systolic and diastolic pressure, total cholesterol, triglyceride and low-density lipoprotein were associated with higher Hba1c values ($p<0.05$). Amongst the 17 T2DM associated SNPs analysed, rs6265 of brain-derived neurotrophic factor (BDNF) gene showed a positive correlation with HbA1c levels [adjusted β 95% (CI) = 0.240 (0.052, 0.429); $p<0.013$]. However, among those who are active (n=104), the heterozygous allele, CT of SNP rs6265 was associated with higher HbA1c level [OR 95% (CI) = 0.368 (0.131, 0.606); $p<0.003$].

Discussion and conclusion: BDNF gene regulates glucose metabolism and energy homeostasis, thus rs6265 of BDNF gene maybe a limiting factor for HbA1c control [1]. Further data validation in a larger cohort can be performed in association with dietary and exercise patterns.

Keywords: Type 2 Diabetes Mellitus; BDNF gene; SNP rs6265; Malay; HbA1c

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Neurocognitive Investigation of Nano tailored therapeutics against Amyloid Beta Induced Neuropathological Implications

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Background: Neurodegenerative disorders have become a greater challenge for healthcare providers in recent years since they have a detrimental influence on the socioeconomic well-being of societies all over the world. WHO forecast predicts that 75% of the people with dementia aged above 60 years may likely to reside in developing countries by the year 2025. Researchers attempting a versatile therapeutic approach to effectively combat the pathological complications associated with AD, wherein the shift of strategy towards nano-tailored therapeutics through novel delivery renders beneficial results. **Methods**: The present investigation aimed at the pre-clinical investigation on the neurocognitive potential of liposome-encapsulated neurotherapeutics (LENT) on (Amyloid beta) Aβ25-35-induced neuroinflammation and oxidative stress in mice. Animals were subjected to pretreatment with Liposome encapsulated hesperidin and chlorogenic acid through nasal drug delivery for the periods of 3 weeks dose-dependently, then received a single intra cerebro ventricular (i.c.v.) injection of Aβ25-35 (10µg/mouse) subsequent treatment for one-week post ICV injection. Cognitive behavioral changes were evaluated using different types of memory tasks, including short-term, long-term, exploratory, and working memory in the experimental animals. Quantification of brain level neurotransmitters, including metabolic enzymes, was ascertained using spectrometric techniques followed by estimation of pro-inflammatory cytokines. Brain histological investigation proceeded with immunohistochemistry and differential staining to advocate the neuromorphological changes between treatment groups. **Results**: The study findings revealed some promising outcomes, including a remarkable decrease in the level of inflammatory cytokine, which justifies the ameliorative and neuroprotective potential of the plant derived components like hesperidin and chlorogenic acid. **Discussion and Conclusion**: In conclusion, phytotherapeutics-loaded liposomes with targeted drug delivery advocate a novel strategy in the clinical management of AD and its complications.

Keywords: Neuroinflammation, Alzheimer's disease, Amyloid beta, Liposomes, Neurotherapeutics, Neurotransmitters.

Multidrug Resistance Isolates of *Staphylococcus aureus* in Young Children of Dhaka, Bangladesh

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Introduction: *Staphylococcus aureus* (*S. aureus)* is one of the causes of illness and mortality in children. Both continuous and intermittent nasal carriage of *S. aureus* can act as a reservoir for internal infections as well as external transmission to other people. Its systemic invasion from the nasopharynx increases the risk of infection in children. Therefore, the identification of *S. aureus* in the nasal carriage is essential. **Objective:** This study was conducted to determine the prevalence of *S. aureus* among Bangladeshi children of various age groups with antibiotic susceptibility profiles. **Methodology:** 163 schoolchildren, 5 to 15 years old, who were randomly chosen, had their nasopharynx sampled. The identification of bacterial isolates was done using conventional microbiological techniques. Antibiotic susceptibility testing was conducted using the disk diffusion method. The VITEK® 2 system (BioMerieux) was used to further confirm the multidrug-resistant (MDR) isolates, and isolates that were resistant to 30 g of cefoxitin were labelled as methicillin-resistant *S. aureus* (MRSA). **Results:** Out of 44 participants, 27% had *S. aureus* nasal carriage. Cefixime was 100% resistant, followed by ampicillin and penicillin (95.5% and 90.9%) respectively. Six or more antibiotics were resistant to about 57% of MDR isolates. Among 42 MDR strains, 40 samples were tested for methicillin-resistant *S. aureus* (MRSA), and 47.5% of them tested positive for MRSA. The MRSA strains exhibited 100% cefixime and ampicillin resistance. **Conclusions:** Multidrug-resistant *S. aureus* strains were found in the children's nasopharyngeal samples. Antibiotic usage with caution and regular antimicrobial resistance (AMR) testing should be encouraged throughout the country. The national AMR) surveillance program should be properly established in order to monitor and regulate the usage of antibiotics.

Keywords: *S. aureus*, multidrug resistance, antimicrobial resistance, methicillin-resistant *S. aureus*.

Molecular Identification of *Campylobacter jejuni* and *C. coli* in the Raw Milk of Philippine Carabaos (*Bubalus bubalis)*

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Introduction: *Campylobacter* is an important cause of food-borne diseases worldwide. In the Philippines, several studies on the prevalence of *Campylobacter* spp. in chicken meat and dog feces have been conducted but there are no studies yet on its presence in carabao's milk. As such, this study was the first to investigate *Campylobacter* spp., specifically, *C. jejuni* and *C. coli*, in raw carabao's milk. **Objectives**: To optimize a PCR amplification protocol that was used in the molecular detection of *Campylobacter* spp., particularly *C. jejuni* and *C. coli* in raw carabao's milk. **Methodology**: We collected 49 raw milk samples (100 ml each) from backyard farms associated with the Provincial Veterinary Office of Nueva Ecija, Philippines. Accordingly, we determined the presence of *C. jejuni* and *C. coli* by utilizing two methods, (1) using the traditional culture-based method, boiling lysis, to extract *Campylobacter* DNA and (2) using milk bacterial DNA isolation kit from Norgen Biotek. Extracted DNA were then amplified using primers for genes that encode the Lipid A markers. **Results**: For *C. coli,* results show a 4% prevalence rate using the traditional culture-based method and 14.2% using the milk bacterial DNA kit. No *C. jejuni* was detected from the 49 samples. **Discussion/Conclusion**: Results revealed that raw milk of carabaos from backyard farms can become a source of food-borne infection which necessitates the creation of protocols for its handling and storage. It also revealed a discrepancy in the results when traditional method of isolation is used and when milk bacterial isolation kit is utilized emphasizing the difficulty in isolating and culturing *Campylobacter* from milk using the traditional method. The difficulty arose from the presence of competing microflora in milk, and this can pose a problem in the surveillance efforts of the country.

Keywords: Conventional PCR, *lpxA*, *lpxa-RKK2m*, culture-based methods, and Lipid A markers.

Physicochemical Analysis of *Pangasius hypophthalmus* Bone Gelatin Extract Using Organic Waste

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Introduction: The utilization of gelatin derived from fish bones shows potential development, but has not been extensively employed yet. Organic waste of pineapples serves as a natural ingredient to hydrolyze gelatin. **Objective:** This study aims to assess the physicochemical characteristics of the bone gelatin from *Pangasius hypopthalmus* obtained through the use of pineapple waste under the prescribed standards for gelatin quality. **Methodology:** This experimental study encompassed multiple stages. The process started with preparing the pineapple waste liquid extract followed by gelatin extraction (comprising pre-treatment and main extraction stages). During the initial phase of the treatment, the bones were immersed in a solution consisting of pineapple waste liquid in a ratio of 1:5 (mass/volume). This process was divided into three durations; 24, 48, and 72 hours. In the primary extraction process, the ossein was subjected to water immersion at a temperature of 75°C for five hours. **Results:** The analysis revealed the following results: the yields of the three treatments were 2.55%, 2.56%, and 2.77%. The pH values were 4.58, 4.99, and 4.34. The water contents were 11.66%, 11.42%, and 11.02%. The ash contents were 17.71%, 17.71%, and 20.97%. The crude fat contents were 0.17%, 0.42%, and 0.05%. The protein contents were 64.71%, 63.37%, and 58.04%. **Conclusion:** Based on the analysis of various physicochemical characteristics of the gelatin, the samples examined met the predetermined quality standards for gelatin. Notably, the optimal immersing time for achieving desirable gelatin characteristics was 24 hours of immersion.

Keywords: Gelatin; *Pangasius hypopthalmus* Bone; Pineapple Waste

Examining the Effects of Chia Seed Consumption on Body Weight and Cholesterol Reduction in *Coturnix coturnix*

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Introduction: In the Riau Health Polytechnic under the Indonesian Health Ministry, employees consume chia seed (*Salvia hispanica*) as a drink to decrease body weight. Chia seeds contain phenolic compounds such as flavonols and phenolic acids (myricetin, quercetin, kaempferol, and caffeic acid). These compounds are primary and synergistic antioxidants that confer antioxidant activity to chia seeds. Antioxidants reduce cholesterol levels by inhibiting cholesterol absorption in the intestine and increasing the formation of bile acids from cholesterol which is excreted in feces. Besides that, chia seeds contain a relatively high protein which can reduce appetite. The high fiber content in chia seeds can also prolong satiety. **Objectives:** This study aims to evaluate the effect of chia seeds consumption on weight and cholesterol reduction in the common quail (*Coturnix coturnix)*. **Methodology:** Animals were divided into five groups; positive controls, negative controls and three treatment groups given chia seeds at different concentrations (n = 6 animals in each group). In treatment groups, chia seeds were administered once, twice, or thrice a day at 1.8 mg/200 g body weight for 30 days. Body weight and cholesterol levels were measured at baseline and the last day of treatment. Data was collected and analyzed using a one way ANOVA, Kruskal-Wallis, and Post Hoc tests. **Results:** The difference in average body weight from baseline in the five groups; negative controls, positive controls, thrice a day feeding, twice a day feeding, and once a day feeding were 42.93, 52.26, 44.16, 45.33, and 46.25 grams respectively. The average cholesterol levels in each group was 173.67, 333.17, 202.67, 210.00, and 240.00 mg/dL respectively. It was found that administration of chia seed thrice a day (1.8 mg/200 g BW) confers the most significant reduction of body weight and cholesterol levels ($p<0.05$). **Conclusion:** Administration of chia seeds thrice a day at 1.8 mg/200 g body weight can decrease weight and cholesterol levels in *Coturnix coturnix.*

Keywords: Chia seeds, bodyweight, cholesterol levels.

A systematic review: The ability of fermented herbal extract compounds in skin anti-ageing

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Introduction: Skin ageing is a multifactorial process where the environment (extrinsic factors) and genetics (intrinsic factors) both play a part in this complicated biological process. Existing reviews on the efficacy of herbal extracts for skin anti-ageing focus mainly on in vitro studies of unfermented extracts. Whereas reviews regarding in vivo comparative study of fermented versus unfermented herbal compounds or compared to placebo is scarce. This systematic review is conducted to determine the viability of the use of fermented herbal compounds as a topical formulation and oral administration in skin anti ageing by focusing on in vivo studies both in humans and animals. **Objective**: To determine the viability of the use of fermented herbal compounds as topical formulation and oral administration in preventing and reversing the signs of skin ageing by focusing on in vivo studies. **Methodology**: For this systematic review, the following online databases: Cochrane Central Register of controlled trials, Ovid Medline, and Embase via Ovid databases were searched and retrieved from Jan 2012 until Dec 2022. The articles generated were rigorously screened for eligibility using the Covidence software and manually as well. Data from eligible studies were then extracted and collated for synthesis and descriptive analysis. **Results**: After the final data extraction process, 9 studies satisfied the inclusion and exclusion criterias and were included in this review. The main findings from this systematic review are that fermented herbal extracts from pomegranate, honeybush, papaya, red grape, soybean, and S-equol from soy germ have shown promising skin anti-ageing results. These fermented herbal extracts could be utilized as a source of active ingredients for the development and production of effective products for preventing and reversing skin ageing. Fermented versions of the honeybush extract have been shown to be more effective than the unfermented honeybush extract in terms of reversing skin ageing caused by UVB irradiation. **Conclusion**: Our review of the 9 in vivo fermented herbal compounds studies suggests that fermented herbal compounds may have a beneficial effect on skin anti-ageing in women and men. However, this area still requires further research as other formulations such as topical formulations have not fully been explored and compared and the side-effect profile also needs to be explored. This is to ensure the safety and efficacy of the fermented herbal compounds if women and men would like to use these compounds in the future.

Keywords: Fermented, Herbal, Anti-Ageing, Topical routes and Oral routes

Poster Presenters	
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PP-LS-01	**Hetvi Saurin Shah** Insight into Kisspeptin and its Transcriptional Regulation in MDA-MB-231 Breast Cancer Cell Line
PP-LS-02	**Assistant Professor Leyon Varghese** Silibinin is a Strong Inhibitor of Bacterial Metalloproteinase (BEMPs): An In Silico and In Vitro Approach
PP-LS-03	**Dr Nor Syafinaz binti Yaakob** Investigating the Effects of 6-gingerol Standardised Ginger Extracts on Nicotine-Induced Toxicity in Mice Heart and Kidney
PP-LS-04	**Nursyamila binti Shamsuddin** Evaluation of 3'Untranslated Region of MIR497HG in Transiently Expressed Luciferase Reporter Vector for microRNA-lncRNA Interaction Study
PP-LS-05	**Hin Yee Thew** Exploring the Neuroprotective Effects of Xanthone in Alzheimer's Disease Models: An In-Vitro and Computational Investigations
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PP-LS-07	**Amelia Suhana binti Zamri** Identification of a Novel Bruton's Tyrosine Kinase Gene Mutation in X-Linked Agammaglobulinemia

Poster Presenters	
ID	**Presenters**
PP-LS-08	**Ms Ai Sze Wee** Chemical Constituents and Anti-Cholinesterase Profile of Essential Oil from *Murraya koenigii* Leaves
PP-LS-09	**Dr Suraiami Binti Mustar** Potential Neuroprotective Effects of Honey in the Treatment of Neurodegenerative Disorders
PP-LS-10	**Mr Christian Paul Munoz** Molecular Identification of Competing Microflora for the Optimization of Campylobacter Isolation from Raw Carabaos' Milk
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PP-LS-13	**Jun Le Cheah** Comparative Analysis of HPLC-UV-DAD Methods for Rapid, Effective and Economical Fucoxanthin Quantitation
PP-LS-14	**Ms Brittany Sue May Chang** What Phytochemicals Contribute Significantly to the Antioxidant and Anti-Inflammatory Activity of Tiger Milk Mushroom, *Lignosus rhinoceros*?

Insight into Kisspeptin and its Transcriptional Regulation in MDA-MB-231 Breast Cancer Cell Line

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Introduction: The KISS-1 gene, encoding the kisspeptin hormone, has been primarily studied for its influence on the hypothalamic-pituitary-gonadal axis (HPG). However, recent studies suggest a significant role for KISS-1 in suppression of metastasis in various cancers. Kisspeptin-10 (KP-10) is a short fragment of Kisspeptin which shows anti-tumour effects. Also, there are various signaling molecules and transcriptional factors associated with Kisspeptin which helps in suppression of metastasis.Objectives: The study mainly focuses on to elucidate the effect of how exogenous kisspeptin (KP-10) stimulated the intracellular signalling pathway of breast cancer MDA-MB-231 cell line and its effect with the interacting signalling molecules and transcriptional factors. **Methodology:** The study comprises dual methods as in vitro and in silico techniques. The MDA-MB-231 cells are cultured exogenous treatment of Kisspeptin-10 (KP-10) (Merck: K2644) is given at various concentration (10, 25, 50, 100,200,500, 1000 nM). Further cell viability assay (MTT Assay) and cell migration analysis is done. Concurrently, in silico analysis, docking experiments via HADDOCK, the interacting signalling molecules and transcriptional factors involved in breast cancer metastasis were identified. For MDA-MB-231 cell lines, RNA would be isolated by Trizol method (Invitrogen) and cDNA would be prepared and further RT-PCR. **Results:** Cell viability showcased the IC-50 to be 100 nM, further cell migration analysis confirmed that KP-10 inhibited the mobility of breast cancer cells. HADDOCK analysis confirmed: SP1, NMYC, PKC, Kiss1, Kiss1R as the transcriptional regulators and hence gene expression analysis of the same was done. **Conclusion:** Hence, the present study would provide a comprehensive understanding of the role KISS-1 in breast cancer. Our findings will likely provide information in the development of new therapeutic approaches, harnessing the potential of Kisspeptin as a target for breast cancer treatment.

Keywords: Kisspeptin, KP-10, MDA-MB-231, metastasis

Silibinin is a Strong Inhibitor of Bacterial Metalloproteinase (BEMPs): An In Silico and In Vitro Approach

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Introduction: Metalloproteinase are important in cell invasion and tissue remodeling; and are therefore promising drug targets in managing enteroinvasive pathogens. Silibinin a widely used dietary supplement with well known hepatoprotective roles have also projected for its anticancer properties. Here we examined the inhibitory potential of silibinin towards bacterial metalloproteinase (BEMPs) through a combination of in silico and in vitro approach. **Objective:** Study the binding affinity of silibinin towards different BEMPs and its validation using in vitro systems. **Methodology:** Molecular docking studies were conducted using silibinin as the ligand and different BEMPs as receptors. To analyze the stability of this silibinin-BEMP interactions, molecular dynamic (MD) simulation studies using GROMACS 5.7.4 package were performed. In vitro gelatinolytic activity assays including zymography were also conducted to validate the in silico findings. **Results:** Molecular docking studies showed strong binding affinity between silibinin and BEMPs such as coccolysin (-9.5 kcal/mol) and fragilysin (-9.3 kcal/mol). In the MD simulations studies, Root Mean Square Deviation of protein-ligand complexes were within 0.25nm throughout the simulation and the Root Mean Square Fluctuation also showed minimal residue fluctuation. The compactness of complex as well as the number of hydrogen bonds between them were also found consistent through the simulation time. To confirm these observation in vitro, spent fermentation broth of E. faecalis was mixed with silibinin to observe the inhibition of gelatinolytic activity. Further the gelatinase was separated on a gelatine-PAGE and its treatment with silibinin inhibited the gelatinolytic activity. **Conclusion:** Our results are clearly indicative of the direct inhibitory potential of silibinin towards different tissue remodeling gelatinase of enterobacteria. Since BEMPs are important in bacterial invasion and hence in its virulence, role of silibinin in the bacterial invasion can be explored further to determine if its supplementation will help reduce the occasional virulence of gut microbial species.

Keywords: Enteroinvasive, Gelatinase, Molecular Docking, MD Simulation, Virulence

Investigating the Effects of 6-Gingerol Standardised Ginger Extracts on Nicotine-Induced Toxicity in Mice Heart and Kidney

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Background: Our current studies are exploring the potential of natural products for smoking cessation. We have shown that 6-gingerol (6G, a bioactive compound in ginger) reduced nicotine addiction in mice models. As ginger extracts were shown to possess antioxidant properties, and it is well-known that chronic smoking can lead to nicotine-induced toxicity in vital organs, we aim to explore whether the ginger extract and compound possibly have concurrent effects in reducing nicotine addiction and nicotine-induced oxidative injuries. **Methodology:** Concentrations of 6G in soil-based and soilless ginger ethanolic extracts (GE) were quantified by HPLC. Mice with chronic nicotine addiction were divided into control groups [nicotine (Nic 1mg/kg) and normal saline] and treatment groups [(6G+Nic, 6G-standardised soilless ginger extracts with 3 doses (GE70+Nic, GE100+Nic, GE130+Nic)]. Mice were euthanized for heart and kidney harvest. Oxidative stress markers [total protein (TP), oxidation protein product (AOPP), malondialdehyde (MDA)] and antioxidant markers [glutathione (GSH), superoxide dismutase (SOD) and catalase (CAT)] were analysed to assess effects of the treatments on nicotine-induced organ toxicity. **Results:** The concentrations of 6G were similar in both ginger extracts, therefore the soilless GE was utilised downstream. For oxidative stress markers, TP concentration in the kidney remained consistent but was significantly reduced in heart tissues of Nic and 6G+Nic groups. Nic treatment induced AOPP and MDA increase that is not significantly affected by most treatments in both renal and heart tissues except in the 6G+Nic group where the MDA level in the heart was reduced. For antioxidant markers, the GE100+Nic group exhibited a significant increase of GSH content (vs Nic group) in renal tissue whereas no significant changes were observed in heart tissue for all groups.No significant changes were observed for SOD and CAT activities in both renal and heart tissues. **Discussion and Conclusion:** In parallel with our studies in exploring potential of 6G and GE to treat chronic nicotine addiction, these findings are essential in understanding their concurrent effects on vital organs, particularly the heart and kidney.

Keywords: Nicotine, Zingiber Officinale, Oxidative stress, Antioxidant, Mice

Evaluation of 3' Untranslated Region of MIR497HG in Transiently Expressed Luciferase Reporter Vector for microRNA-lncRNA Interaction Study

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Introduction: Sequence elements in the 3'untranslated region (3'UTR) of long non-coding RNA (lncRNA) can be used as a target site for multiple regulatory molecules such as microRNA (miRNA). However, little is known about the post-transcriptional mechanism that possibly regulate the lncRNA, microRNA-195-497 cluster host gene (MIR497HG) in hepatocellular carcinoma. Dual-luciferase assay is a sensitive and convenient way to examine the transcriptional activity of MIR497HG. The dual-luciferase assay system relies on Firefly luciferase (Fluc) as a primary reporter to monitor the transcriptional activity and Renilla luciferase (Rluc) as a control reporter for normalization. **Objectives**: This study aims to describe in detail step-by-step for miRNA and 3'UTR of MIR497HG target validation and application of reporter vector system through the measurement of dual-luciferase assay to monitor miRNA-lncRNA interaction. **Methodology:** A 1.5kb fragment of 3'UTR of MIR497HG was amplified by Polymerase Chain Reaction (PCR) from genomic DNA of human hepatocellular carcinoma cell line (HepG2 cell). To generate luciferase reporter plasmid, the purified PCR product was inserted into multiple cloning site (MCS) of pmirGLO Dual-Luciferase miRNA target expression vector. Restriction enzyme digestion was performed to further validate the ligation of insert. The ligated product was transformed into competent Escherichia coli, DH5α using heat-shock method. Positive clones were isolated from ampicillin agar plates and desired clone was confirmed by DNA sequencing. The HepG2 cells were transiently transfected with 40ng, 100ng and 200ng of pmirGLO-3'UTR MIR497HG construct or pmirGLO vector alone using the Fugene HD transfection reagent for 24 h. Later, the luciferase activity was detected by measuring the activity of the dual-luciferase reporter assay system. **Results:** Restriction enzyme digestion and DNA sequencing result confirmed that the luciferase reporter vector was successfully inserted by 3'UTR of MIR497HG. This recombinant plasmid was termed as pmirGLO_3'UTR MIR497HG. There was a significant decrease in the relative luciferase activity for the pmirGLO_3'UTR MIR497HG ($P<0.001$) compared to cells transfected with pmirGLO empty vector. **Conclusion:** This study demonstrates that 3'UTR of MIR497HG is a target for active miRNA in HCC cell lines. Taken together, this study highlights the post-transcriptional regulation of 3'UTR MIR497HG region by certain miRNAs in HCC cells. Computational analysis and quantitative Real-time Polymerase Chain Reaction (RT-qPCR) are required to identify this endogenous miRNA.

Keywords: Long non-coding RNA, MIR497HG, 3'untranslated region, microRNA, luciferase

Exploring the Neuroprotective Effects of Xanthone in Alzheimer's Disease Models: An In-Vitro and Computational Investigations

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Introduction: Alzheimer's disease (AD) is characterized by amyloid-β (Aβ) protein aggregation, leading to neuronal cell death. **Objectives**: This study explores the potential neuroprotective effects of α-mangosteen (α-M), a natural compound from Garcinia mangostana, against Aβ42-induced neurotoxicity, with α-M extracted through a solvent-based method. **Methodology**: The research comprises in-vitro experiments assessing α-M's impact on Aβ42 aggregation and toxicity, along with computational analyses employing molecular docking and dynamics simulations to investigate α-M's effects on Aβ42 aggregation and structure. **Results**: The in-vitro cell-based experiments showed that a 0.1 μM α-M pre-treatment significantly protected up to 21.09±3.39% of SH-SY5Y cells from Aβ42-induced neurotoxicity. Additionally, dot blot assays demonstrated a decrease in Aβ42 aggregation when exposed to 0.5 and 1.0 μM α-M, indicating its potential to mitigate Aβ42 oligomer formation. Furthermore, computational studies revealed interactions between α-M and the N-terminus and C-terminus regions of Aβ42, crucial for fibril formation. The molecular interaction between the Aβ42-α-M complex, with a binding energy of -6.55 kcal/mol, was verified through molecular docking and visualization. A hydrogen bond formed with the Gln15 residue of Aβ42, securing the Aβ42 monomer and inhibiting Aβ42 oligomer development. Molecular dynamics simulations of the Aβ42-α-M complex revealed a tightening of the C-terminal Aβ42 region, reducing the Rg value. Additionally, α-M's interaction with Gly33 and Gly37 residues at the N-terminus of Aβ42 disrupted the formation of surface features on the amyloid, diminishing Aβ42 aggregation. Principal component analysis (PCA) results further affirmed these computational findings, with a low root-mean-square deviation (RMSD) compared to Aβ42. **Conclusion**: The study suggests that α-M could serve as a lead compound for further exploration, facilitating the development of novel therapeutic agents targeting Alzheimer's disease more effectively. These valuable insights into α-M's neuroprotective properties open avenues for potential advancements in future AD therapies.

Keywords: Alzheimer’s disease, neuroprotection, mangosteen

Deciphering the Role of NAMPT and SIRT1 in Chemotherapy-Induced Cognitive Impairment

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Introduction: Chemotherapy-induced cognitive impairment(CICI)/chemobrain is defined by the long/short-term effects on cognition in cancer patients/survivors. However, heterogeneity in cancer and chemotherapy is a hurdle to understanding the molecular mechanisms underlying CICI. Chemotherapy inhibits nicotinamide phosphoribosyl transferase(NAMPT), which leads to a decrease in nicotinamide adenine dinucleotide(NAD+) levels, resulting in the susceptibility of cancer cells to oxidative damage and death, which may also suppress non-cancerous cells, particularly those found in the brain tissues. In general, dyscognition may be caused by the downregulation of the NAMPT-mediated NAD+/Sirtuin 1(SIRT1) pathway from the suppression by chemotherapy. **Objectives**: To evaluate the role of NAMPT and SIRT1 in CICI using in vitro and in vivo studies. **Methodology:** Differentiated SHSY5Y cell lines were treated with quercetin and its derivatives against Methotrexate and 5-Fluorouracil, which were selected after the insilico drug screening followed by subjecting to cytotoxicity assay, flow cytometry, and PCR analysis. For the in vivo study, Cyclophosphamide, Methotrexate, 5-Fluorouracil(CMF) along with the test drugs was administered to tumor-bearing mice for a 21-day chemotherapy cycle, followed by the assessment of cognition by Morris Water Maze, estimation of NAMPT, SIRT1 markers by western blotting. **Results:** Differentiated SHSY5Y cells were protected by the phytochemicals against MF toxicity, evidenced by cytotoxicity and flow cytometric analysis. PCR studies showed decreased mRNA expression of NAMPT and SIRT1 markers in MF-treated cells and increased in test-drug-treated cells. In the in vivo study, chemotherapy negatively affected spatial learning ability and reduced the expression of NAMPT and SIRT1 proteins. The test drugs ameliorated these cognitive impairments and enhanced the targeted proteins. **Conclusion:** The treatment of phytochemicals proved its possible ability to alleviate CICI and could pave the way for identifying treatment strategies to combat chemobrain. NAMPT and SIRT1 may be ideal candidates for resolving the molecular complexity in chemobrain by NAD+ regulation due to their neuroprotective functions.

Keywords: Cancer, Cognition, Chemobrain

Identification Of A Novel Bruton's Tyrosine Kinase Gene Mutation In X-Linked Agammaglobulinemia: A Case Report

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Introduction: X-linked agammaglobulinemia (XLA) is an X-linked recessive disease characterized by a profound deficiency of immunoglobulin isotypes and very low or absent B cells, resulting in recurrent bacterial infections. It has been associated with mutations in the Bruton's tyrosine kinase (*BTK*) gene that encodes a cytoplasmic protein crucial in B cell maturation. Its mutation blocks B cell differentiation at the pre-B cell stage leading to failure of immunoglobulins production, and is responsible for XLA. **Methodology:** In this report, a five-year-old boy suspected with XLA was studied. He was admitted at birth for presumed sepsis that required ventilation. At 4 months old, he had multiple admissions for otitis media, respiratory tract infections with persistent cough and frequent fever, followed by recurrent pneumonia at 26 months old. In between admission, he required several courses of antibiotics. BTK protein expression test by flow cytometry and immunoglobulins level test were carried out. Then, the blood samples from the patient, mother, and control were sent for *BTK* full gene analysis. **Results:** The patient had absent B cells and markedly reduced serum immunoglobulin G (IgG) and immunoglobulin A (IgA). Flow cytometric analysis showed he had only 3% of monocytes expressing BTK protein as compared to the control's (87.9%). Genetic analysis revealed a novel mutation at the exon 11 of *BTK* gene (NM_000061.3:c.953_956delCTGT;p.Ser318Cysfs*12). The four-nucleotide deletion resulted in a frameshift and premature termination, hence disrupting the protein structure. However, the mother did not carry the mutation and had normal BTK protein expression. **Conclusion:** Taken together, these findings confirmed the diagnosis of XLA in the patient. We concluded that this *BTK* gene mutation in our patient is a sporadic case and emphasizes the reliability and importance of *BTK* gene sequencing to diagnose XLA in not only inherited cases, but also in sporadic cases.

Keywords: X-linked agammaglobulinemia; *BTK* mutation; novel mutation; sporadic XLA

Chemical Constituents and Anti-Cholinesterase Profile of Essential Pil from *Murraya koenigii* Leaves

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Introduction: Traditionally, *Murraya koenigii* (L.) Spreng has been utilized as an ingredient in medicinal formulations. As of the present, several studies have reported on the potential of the leaves of *M. koenigii* to enhance learning and memory functions in animal models. However, these investigations have been limited, as they lack the identification of specific chemical fingerprints associated with the observed effects. **Objectives:** This study was aimed to identify the chemical constituents and anti-cholinesterase activity of the essential oil extracted from the leaves of *M. koenigii*. **Methodology:** The leaves of *M. koenigii* were collected from Air Itam, Penang. A voucher specimen (KLU50161) was deposited in the Herbarium at University Malaya. The chemical composition of the essential oil isolated by steam distillation of the leaves of *M. koenigii* was analysed by gas chromatography-mass spectrometry. Cholinesterase inhibitory activity was assessed using the Ellman's method with modification. Rivastigmine and donepezil served as the reference standards. **Results:** Forty-one compounds constituting 97.34% of the essential oil isolated from the leaves of *M. koenigii* were identified, with β-phellandrene (35.42%), β-caryophyllene (16.79%) and α-pinene (17.75%) as the major constituents. The essential oil of the leaves of *M. koenigii* showed inhibitory activity against the cholinesterase enzymes, particularly towards the acetylcholinesterase (AChE), with IC_{50} value of 36.89 ± 1.98 µg/mL. **Discussion and conclusion:** The results of the present study revealed that the essential oil of the leaves of *Murraya koenigii* have the anti-acetylcholinesterase potential and could hold significance in the endeavour to discover novel cholinesterase inhibitors.

Keywords: *Murraya koenigii*; essential oil composition; anti-acetylcholinesterase; Rutaceae.

Potential Neuroprotective Effects of Honey in the Treatment of Neurodegenerative Disorders

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The global rise in neurodegenerative disorders among the elderly has spurred heightened research efforts to address this issue. As pharmaceutical treatments often come with complex complications, natural products have emerged as promising alternatives for alleviating neurodegenerative diseases. Among these natural remedies, honey has garnered significant attention for its potential neuroprotective properties. Hence, the objective of this work is to provide a comprehensive overview of studies conducted in the last 10 years that explore the neuroprotective effects of honey. In this narrative review, the terms "honey" and "neurodegenerative" were used to search for articles published between January 2012 to December 2022 from three databases (PubMed, ScienceDirect, and Scopus). The selected articles were written in English and comprised research articles related to honey and its related compounds. Review articles and articles on other bee products such as propolis, beebread, beeswax and melittin were excluded. Sixteen articles were chosen out of 1,167, with six in vitro, eight in vivo, one combined research, and one clinical intervention. Most in vitro studies investigate the effect of honey/compounds on the inhibition of acetylcholinesterase and butyrylcholinesterase. For in vivo studies, rats were used as the animal model, comparing the neuroinflammation makers of the control group with the honey intervention group. The Tualang and Thyme honey were both found to be the best antioxidant, anti-inflammatory and anticholinesterase activity among the types of honey investigated, contributing to the deterrence and treatment of numerous neurological conditions including Alzheimer's disease. The high polyphenol content of honey, specifically quercetin and gallic acid in Tualang and Thyme, is found to be largely responsible for its neuroprotective effects. The exact mechanism of action causing its anti-neurodegenerative features is still unknown, but polyphenols show the potential to prevent and disintegrate the formation of protein clumps or aggregates in the brain, thus attenuating its neurotoxicity effects. In conclusion, honey appears to be an effective natural product to attenuate neurodegenerative diseases. To further verify these findings, more clinical research is needed.

Keywords: Honey, neurodegenerative, Alzheimer’s disease, polyphenol

Molecular Identification of Competing Microflora for the Optimization of Campylobacter Isolation from Raw Carabaos' Milk

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Introduction: Campylobacter sp. is one of the leading causes of milk-borne diarrhea and detecting their presence in milk is a necessary step in preventing outbreaks of diseases caused by this microorganism. However, detection and isolation of Campylobacter is difficult because of the presence of other microflora in milk. As a fastidious organism, Campylobacter are usually outgrown by other microorganisms, identifying the competing organisms will help in the successful isolation of Campylobacters. **Objectives:** This study aims to identify the non-Campylobacter colonies that grew on Modified charcoal-cefoperazone-deoxycholate agar (mCCDA) by using molecular methods in order that proper adjustment in the protocol for the isolation of Campylobacter can be done. **Methodology:** Forty six (46) non-Campylobacter colonies were picked from Modified charcoal-cefoperazone-deoxycholate agar (mCCDA) which was streaked with milk samples collected from 15 carabaos raised in backyard farms in an agricultural area in the Philippines. DNA were extracted using boiling lysis and amplified using 16S rRNA. The amplicons were sequenced with SeqStudio Genetic Analyzer and BLAST was used to compare the sequences to the those in the database and identify the microorganisms. **Results:** Results show that 61% of the isolates are Acinetobacter baumanii and 28% are *Pseudomonas aeruginosa*, two of the most significant pathogens in terms of multidrug resistance.
Klebsiella sp. and Pseudoroseomonas sp. are also identified from the isolates. **Conclusion:** Findings from this study will help in determining the antibiotics that can be added to the culture media to prevent the growth of unwanted microflora. It is therefore recommended that
antibiotic susceptibility testing should be conducted to identify the antibiotics that can be added to the culture media to suppress the growth of the competing microflora of Campylobacter.

Keywords: 16s rRNA; Acinetobacter sp; gene sequencing; Modified charcoal-cefoperazone-deoxycholate agar (mCCDA)

Effect of Hypothyroidism with Obesity in Male Infertility

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Introduction: Worldwide, nearly 48 million (15%) couples and 186 million people suffer from infertility. Infertility is commonly assumed to be a feminine issue, although 30% of infertility is due to male reproductive system issues. Few studies have found that hypothyroidism and obesity affect male fertility individually, but none have examined male infertility in hypothyroidism with obesity condition. **Objectives:** The objective of this study is to investigate the effect of hypothyroidism and obesity on male reproductive functions and whether thyroxine replacement reverses the effect. **Methodology:** ICR male mice have been divided into five groups i.e., Control, Hypothyroidism, Obese, Hypothyroidism with obese, and Hypothyroidism with obese group supplemented with thyroxine. Mice's body weight was measured. Hypothyroidism and obesity have been confirmed by serum thyroxine and leptin level evaluation. Mice were sacrificed and cauda epididymis and testis were collected for further analysis. **Results:** Mice body weight and serum leptin levels were significantly increased in the Obese and hypothyroid obese groups whereas serum thyroxine levels significantly decreased in hypothyroid, obesity with the hypothyroid group. Sperm count between groups was not significant, but abnormal sperm morphology, vitality, HOS, and DNA integrity have been found affected in the hypothyroid, obese, and hypothyroid obese groups, but thyroxine administration could reverse the effect. Altered levels of spermatogenic and steroidogenic markers have also been found in groups in comparison to control and surprisingly, the effects have been restored upon administration of thyroxine. **Conclusion:** Our findings suggested that hypothyroidism and obesity condition adversely affect sperm quality which may lead to infertility. Moreover, altered spermatogenic and steroidogenic marker expression indicates that hypothyroidism with obesity not only affects sperm quality but also affects spermatogenesis. Administration of thyroxine may improve the condition.

Keywords: Male infertility, hypothyroidism, obesity, thyroxine, sperm quality

Antiviral Activity of Polysaccharide Fraction Isolated from Medicinal Mushroom *Ganoderma neo-japonicum* Imazeki Against Enterovirus A71

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Introduction: Enterovirus A71 (EV-A71)-associated hand, foot and mouth disease (HFMD) outbreaks have been frequently reported in the Asia Pacific countries. Following the near-complete eradication of poliovirus, EV-A71 has been recognized as an important neurotropic enterovirus that causes fatal neurological complications. To date, there are still no licensed antiviral agents available to ameliorate EV-A71 infection. We have previously reported a crude aqueous *Ganoderma neo-japonicum* Imazeki (GNJI) extract (S2) demonstrated potent antiviral activity against EV-A71. GNJI is a medicinal mushroom that can be found in several Asian countries, including Malaysia. Recently, polysaccharides isolated from other *Ganoderma* species mushrooms were reported with antiviral activity. Therefore, we hypothesized that polysaccharide is one of the bioactive components present in S2. **Objectives:** This study aims (1) To identify the antiviral activity of the S2 polysaccharide fraction, and (2) To determine the bioactive composition of S2 and the polysaccharide fraction. **Methodology:** The crude polysaccharide fraction (S2-PG) was obtained by precipitating from S2 with 90% ethanol. A post-infection treatment antiviral assay was performed to compare the antiviral activity of S2-PG and S2 on human primary oral fibroblast (HPOF) cells. The total glucan, phenolic (TPC), carbohydrate and protein content of S2 and S2-PG were determined using standard biochemical assays. **Results:** S2-PG (1.25 mg/ml and 2.5 mg/ml) significantly reduced the virus titer of EV-A71-infected HPOF cells in a concentration-dependent manner. The S2-PG fraction has a higher total amount of carbohydrate (45.78 ± 1.871 g/100g) and glucan (19.5% w/w) than S2. β-glucan is the major glucan component as compared to the α-glucan. The total protein and TPC were significantly lower in the S2-PG fraction compared to S2. **Conclusion:** In conclusion, our findings have suggested that β-glucan polysaccharide could be one of the vital bioactive compounds responsible for the antiviral activity demonstrated by S2. This GNJI could be further developed into a promising antiviral agent against EV-A71.

Keywords: Hand, foot, and mouth disease, *Ganoderma neo-japonicum* Imazeki, antiviral, enterovirus A71, polysaccharide

Comparative Analysis of HPLC-UV-DAD Methods for Rapid, Effective and Economical Fucoxanthin Quantitation

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Fucoxanthin, a unique marine carotenoid found in brown algae, holds promise as a health supplement for improving conditions of metabolic syndrome through enhancing insulin sensitivity and secretion. However, existing quantification methods for this pigment lack technical and techno-economic optimization. This study aims to identify a high-performance liquid chromatography (HPLC) method that efficiently and economically quantifies fucoxanthin. Five HPLC methods from literature were adapted and customized for quantification using standards and samples from various algae species. Comparative analysis focused on performance aspects (linearity, repeatability, time efficiency) and cost-effectiveness. The findings reveal that a simple isocratic method utilising aqueous methanol, outperforms other approaches in terms of both performance and cost, enabling fucoxanthin identification within 5 min. Notably, this method demonstrates superior separation of fucoxanthin from other compounds, utilizes minimal organic solvents, and incurs a low cost of RM5.70 per HPLC analysis sample. This study offers a refined method that can be employed by the functional food industry to produce cost-effective, high-quality fucoxanthin products for consumers.

Keywords: Fucoxanthin, quantitation, HPLC-DAD, method performances, economical evaluation, quality assurance and control.

What Phytochemicals Contribute Significantly to the Antioxidant and Anti-inflammatory Activity of Tiger Milk Mushroom, *Lignosus rhinoceros*?

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Tiger milk mushroom, Lignosus rhinocerus supplementation is proven to effectively improve respiratory health by halting the prolonged inflammation and improving antioxidant status. However, the main contributors to the antioxidant and anti-inflammatory properties of this medicinal mushroom are not well validated yet. The current study is aimed to isolate and identify the primary bioactive compounds that contribute to the antioxidant and anti-inflammatory properties of Lignosus rhinocerus. The percentage of yield of derived fractions from crude ethanolic extract (CEE) prepared by 70% ethanol, i.e. aqueous fraction (AQF), ethyl acetate fraction (EAF) and butanol fraction (BUF) was ranged from AQF>BUF>EAF. The total phenolic content was significantly higher in BUF while EAF exhibited the highest total saponin content ($p < 0.05$). Through multiple antioxidant assays, EAF and BUF exhibited higher antioxidant activity than CEE and AQF, except for iron chelating activity. This study shows that the antioxidant activity of Lignosus rhinocerus is highly contributed by the phenolic composition and saponin ($p<0.05$). While for anti-inflammatory assay, all fractions show no significant difference in inhibiting heat-induced protein denaturation, suggesting that there is a synergistic effect between different compounds that contributes to the anti-inflammatory properties ($p < 0.05$).

Keywords: Tiger milk mushroom, Lignosus rhinoceros, saponins, phenolic compounds, antioxidant, anti-inflammatory

MONASH INITIATE 2023

25 - 26 October 2023

Translating Research into Practice: Revolutionizing healthcare delivery and outcomes

PRESENTERS CLINICAL PHARMACY & PHARMACY PRACTICE

Oral Presenters Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-CP-01	**Ms Roheena Zafar** Comparative Analysis of Potential Drug-Drug Interactions in Public and Private Hospitals Among Chronic Kidney Disease Patients in Khyber Pakhtunkhwa: A Retrospective Cross-Sectional Study	2:00 PM
OP-CP-03	**Dr Maseera Ahmedi** A Study On Usage Pattern Of Insulin Among Diabetic Patients With Or Without Thyroid Disorders	2:15 PM
OP-CP-04	**Mohd Farizh Che Pa** Predictors of Virological Failure among Patients on Antiretroviral Therapy	2:30 PM
OP-CP-05	**Fina Aryani** A Study on Behavioral Analysis of Drug Information Provision by Pharmacy Staff on Gastritis Self-Medication in Pharmacies in Pekanbaru	2:45 PM
OP-CP-06	**Mr Sunil Shrestha** Impact of Pharmacist-Led Intervention on Pain-Related Outcomes: An Umbrella Review of Published Systematic Reviews	3:00 PM
OP-CP-07	**Ms Nur Shahirah Mohd Yasin** Investigation into Educational Content in Developing of an Interactive multimedia-based application for Type II Diabetes Mellitus Patients	3:15 PM

Comparative Analysis of Potential Drug-Drug Interactions in Public and Private Hospitals Among Chronic Kidney Disease Patients in Khyber Pakhtunkhwa: A Retrospective Cross-Sectional Study

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Introduction: Chronic kidney disease (CKD) is a significant public health challenge due to its rising incidence, mortality, and morbidity. Patients with kidney diseases often suffer from various comorbid conditions, multiple prescribers and concomitant use of several drugs is often imposing increased risk of drug drug interactions making them susceptible to potential drug-drug interactions. Inappropriate prescriptions for CKD patients and their consequences in the form of potential drug-drug interactions are a major challenge in Pakistan. **Objective:** To compare the incidence of potential drug-drug interactions (pDDIs) and their risk factors among public and private sector hospitals in Khyber Pakhtunkhwa, Pakistan. **Method:** A retrospective cross-sectional study design was conducted to compare potential drug-drug interactions among public and private sector hospitals from January 2022 to December 2022. All adult patients aged 18 years and above, of both genders, who currently been diagnosed with chronic kidney disease (including all stages of CKD) were included. Data of the CKD patients admitted to the nephrology units of public sector hospital was obtained from manual medication orders while in private sector hospital, data was extracted from electronic medication order and administration record (MOAR). The evaluation of pDDIs was carried out with the help of Lexicomp UpToDate®, which classifies pDDIs, based on interaction risk rating, level of severity, reliability rating and level of documentation based on the availability of scientific evidences.

Results: A total of 358 patients' data was retrieved; with n=179 from each hospital. However, due to incomplete data, n=4 patients (n=2 in each hospital) were excluded from the final analysis. The majority of patients in the public hospital were male (74%), while in the private hospital, 58.8% were male. The highest percentage of patients in the public hospital (46.9%) were in the age group of 41-60 years, whereas in the private hospital, 48.0% were in the age group of more than 60 years. The maximum hospital stay in the public hospital was higher compared to the private hospital, with 57.1% staying for 3-4 days, while in the private hospital, 40.1% stayed for less than 2 days. The prevalence of pDDIs was found to be significantly higher in private hospitals (84.7%) than in public hospitals (26.6%) and patients in public hospitals having more comorbidities compared to those in private hospitals. The majority of pDDIs (79.0%) were of moderate severity, and a significant number of patients also experienced major pDDIs. In the private hospital, univariate analysis revealed a statistically significant association between pDDIs and patients aged 41–60 years (OR= 5.6; p=0.008), a hospital stay of 3-4 days (OR= 2.9; p=0.038), and a hospital stay of >4 days (OR=3.2; p=0.048). Patients admitted to the private hospital were also significantly more likely to be prescribed a higher number of drugs (OR=1.2; p=0.009). Most pDDIs had fair documentation in both public and private hospitals. An increase in the number of prescribed drugs was identified as an independent risk factor for pDDIs in both private and public hospitals. **Conclusion:** The prevalence of pDDIs was higher among CKD patients at private hospitals, while most of the pDDIs were of moderate severity. A considerable number of patients also experienced major pDDIs. The risk of experiencing pDDIs was found to be higher in older patients and among those prescribed a higher number of drugs.

Keywords: Comparative analysis; Drug-drug interaction; Private and public hospital; Polypharmacy; Documentation of drug interactions.

A Study On Usage Pattern Of Insulin Among Diabetic Patients With Or Without Thyroid Disorders

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Introduction: Thyroid dysfunction and diabetes mellitus are closely linked. Several studies have documented the increased prevalence of thyroid disorders in patients with diabetes mellitus and vice versa. Untreated thyroid dysfunction can impair the metabolic control of diabetic patients, and this association can have significant repercussions on the outcome of both disorders. **Objectives**: To study the prevalence of thyroid disorders among diabetic patients and evaluate insulin usage patterns among diabetes mellitus patients. During the study, it was also intended to report any drug-related effects among these two populations. **Methodology**: A cross-sectional observational study with simple random sampling was conducted in a tertiary care hospital over 6 months. In this study, Diabetic patients with or without thyroid disorders of both genders of all age groups were included and those patients not willing to participate or who have discontinued insulin and are on OHA's were excluded. **Results**: A total of 190 diabetic patients were included in this study out of which 149 patients did not have thyroid. In our study, patients were predominantly (117) females. About 21.85% of insulin was prescribed to thyroid patients compared to 78.1% of insulin to non-thyroid patients. About 24.6% of thyroid patients have more than 10% HbA1c values compared to 75.3% of non-thyroid patients. This shows that thyroid patients are better at maintaining their HbA1c values. On the day of admission (DOA), a high GRBS level of more than 200 mg/dl was observed in a larger proportion of non-thyroid patients (55.78%) compared to thyroid patients (15.78%). Similarly, on the day of discharge (DOD), a higher incidence of GRBS levels exceeding 200 mg/dl was predominantly seen in non-thyroid patients (38.42%) compared to thyroid patients (8.42%). **Conclusion**: Overall, during the study, it was observed that thyroid patients were better at maintaining their sugar levels.

Keywords: Diabetes Mellitus, Thyroid disorders, Insulin usage pattern

Predictors of Virological Failure among Patients on Antiretroviral Therapy

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Introduction: Virological failure among the patients on antiretroviral therapy is a significant challenge in treating HIV patients. **Objective**: To identify predictors of virological failure among HIV patients started on antiretroviral therapy. **Methods**: A multicentre retrospective cohort study was conducted in Hospital Sungai Buloh, Selangor and Hospital Tuanku Ja'afar, Seremban, Negeri Sembilan. Adult patients aged 18 years and above were selected using a simple random sampling method. Data from January 2010 to December 2020 were retrieved from patient's medical record. Patients with viral load result >1000 copies/ml in two consecutive results at least 3 months apart were categorized as virological failure. The model fitted and multivariate logistic regression analysis were performed with 95% confidence level and p values < 0.05 were taken as statically significant. **Results**: From the total of 355 patients were recruited in this study, 92 patients (25.9%) were considered virological failure. Virological failure was predicted by history of non-adherence (odds ratio (OR) = 14.046, 95% confidence interval (CI): 4.130-47.776), history of missed appointment (OR = 4.909, 95% CI: 1.984-12.150), social support (OR = 0.247, 95% CI: 0.065-0.937 and use of reminder (OR = 0.100, 95% CI: 0.038-0.264). **Conclusion**: Predictors of antiretroviral virological failure were patients with history of non-adherence, history of missed appointment, poor social support and not using reminder. Continuous patient education is important factors in delaying HIV virological failure.

Keywords: HIV, antiretroviral, predictors, virological failure.

A Study on Behavioral Analysis of Drug Information Provision by Pharmacy Staff on Gastritis Self-Medication in Pharmacies in Pekanbaru

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Introduction: The provision of drug information by pharmacy staff in self-medication is very important to prevent the occurrence of medication errors so that it could achieve the rational self-medication practices. **Objectives:** This study aims to analyze the provision of drug information behavior by pharmacy staff including pharmacists and pharmacy technicians in gastritis self-medication service at retail pharmacies in Pekanbaru, Indonesia. **Methodology:** This research was observational. The study population consisted of 90 pharmacy staff members, comprising 45 pharmacists and 45 pharmacy technicians. The sampling procedure employed was purposive sampling, guided by the criteria of individuals involved in providing care to gastritis patients, as delineated by the study scenario. The assessment tool utilized for data collection was a drug information provision checklist. This checklist was developed in accordance with the regulations set forth by the Ministry of Health of the Republic of Indonesia. The assessment of drug information provision was carried out using a Likert scale evaluation approach. The category of providing of drug information is divided into 5, very poor (0-20%), poor (21-40%), good enough (41-60%), good (61-80%) and very good (81-100%). **Results:** The results showed that there were no differences in the provision of drug information between pharmacists and pharmacist technicians with p value=0.00 ($p<0.05$). Based on the drug information provision checklist, it was known that pharmacists and pharmacist technicians provided of drug information only when asked by patients. The category of drug information by pharmacists are 46% (good enough) and pharmacy technicians are 37% (poor). **Conclusion:** The provision of drug information in gastritis self-medication service by pharmacist at retail pharmacies in Pekanbaru, Indonesia was found better than pharmacy technicians.

Keywords: Gastritis, Pharmaceutical technicinas, Pharmacist, Providing drug information, Self-medication

Impact of Pharmacist-Led Intervention on Pain-Related Outcomes: An Umbrella Review of Published Systematic Reviews

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Introduction: Pain is a pervasive and challenging healthcare issue, affecting millions worldwide. Addressing pain management effectively is becoming increasingly important in contemporary healthcare delivery. **Objective**: To systematically review published systematic reviews (SRs) examining the impact of pharmacist interventions on pain-related clinical, humanistic and economic outcomes. **Methods**: A review was conducted by searching the literature from six electronic databases [APA PsycINFO, Ovid MEDLINE(R), Embase, Cochrane Central Register of Controlled Trials, CINAHL, Scopus and DARE] from their inception to June 2023. Only review articles published in English were included. Two independent reviewers screened the titles and abstracts of the studies for selection based on the inclusion/exclusion criteria. The methodological quality of the studies was also assessed. **Results**: From a total of 2055 titles retrieved, 11 SRs reporting on the effectiveness of pharmacist-led pain management interventions were included. They covered a range of strategies, including educational sessions, medication reviews and adjustments, and multi-component interventions aimed at addressing various facets of pain management. The findings indicated that pharmacist-led interventions were effective in clinical outcomes (decreasing pain intensity and achieving pain relief, better pain medication management and adherence, identification and counteracting adverse drug reactions and drug-related problems, improved physical functioning and mental health, decreased length of stay and increased) and humanistic outcomes (better confidence among healthcare providers, healthcare utilization and quality of life, patient satisfaction as well as chemotherapy knowledge of cancer patients). The economic impact of pharmacist-led interventions was also investigated in four SRs. Two reviews reported statistically significant cost savings associated with pharmacist-led interventions. However, one study reported that pharmacist-led interventions were more expensive than usual care. **Conclusions**: Our findings suggest that pharmacist-led pain management interventions effectively improve clinical, humanistic, and economic outcomes, which can significantly reduce the burden of pain management on healthcare systems.

Keywords: Pharmacist, pain, Systematic review, umbrella reviews

Investigation into Educational Content in Developing of an Interactive multimedia-based application for Type II Diabetes Mellitus Patients

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Introduction: The development of interactive multimedia-based applications has become increasingly important in providing effective health education to Type 2 Diabetes Mellitus (T2DM) patients. Understanding the educational content required for such applications is crucial for designing a user-friendly and impactful tool for T2DM management. **Objectives:** This study aims to investigate the educational content necessary for developing an interactive multimedia-based application specifically tailored for T2DM patients. **Methods**: Semi-structured interviews were carried out with a sample of T2DM outpatients (n=16) at a tertiary referral university hospital in Kuala Lumpur between October 2022 and January 2023. The interviews were recorded, transcribed, and subjected to thematic analysis. **Results**: The majority of participants had been diagnosed with T2DM for less than ten years. The thematic analysis identified several key aspects related to the educational content required for the multimedia-based application. These include preference for educational material, essential content and interactive features. They proposed a discussion area that would allow them to communicate and receive immediate advice from healthcare professionals, thus eliminating the need for frequent hospital visits. **Conclusion**: The findings of this study highlight the significance of interactive multimedia-based applications in providing health education for T2DM patients. The identified essential content areas, such as insulin dose modification, hypoglycaemia management, and dietary recommendations, can inform the development of effective educational materials. The app developers should also include doctors, pharmacists, nutritionists, and psychologists who are experts in their fields to add more behavioural modification techniques in applications that assist patients.

Keywords: Educational material, diabetes mellitus, multimedia applications, health education, patient communication

Poster Presenters	
ID	**Presenters**
PP-CP-01	**Prof Dr Sajeeth C. I.**
	Quality of Life Among Women with Vulvovaginal Candidiasis in a Tertiary Care Centre in India
PP-CP-02	**Dr Wei Wen Chong**
	Development and Validation of an Instrument to Measure Patient-Centered Communication among Malaysian Hospital Pharmacists

Quality of Life Among Women with Vulvovaginal Candidiasis in a Tertiary Care Centre in India

Dr. C. I. Sajeeth[1], Dr. V.Karthikeyan[1], Irene V.R[2*], Dr. Sabitha.J[3]

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Introduction: Vulvovaginal candidiasis (VVC) is a frequent, irritating, and recurrent infection. These infections create a danger to the well-being of the women and have a detrimental impact on their quality of life (QoL). **Objective:** The aim of this study is to assess the quality of life (QoL), among women with VVC.The study design: prospective study design. **Methodology**: Study site: Paalana hospital of medical sciences, Study duration: 7month.The sample size n=130. Severity of VVC is determined by using VSQ questionnaire (Vulvovaginal symptom questionnaire) and Vulvar disease quality of life index (VDQoL questionnaire) used to assess the quality of life. Statistical analysis was carried out by using Graphpad prism software, un-paired student t-test to determine P-value between pre-treatment and post-treatment. **Result & Discussion**: In this study, 130 cases were collected; among the collected data; VVC was more common in women in the reproductive age range. Quality of life (QoL) is determined by VDQoL with sub-domains like (Nil effect, Mild, Moderate and Severe, Very severe effect). After the course of treatment, their QoL is determined by administering the same questionnaire to the patients. By comparing the Pre-test and Post-test, patients with Nil effect (p-value 0.66), Mild effect ($p<0.0001$), & Moderate effect ($p<0.0001$). **Conclusion**: Based on the findings of the study, it can be concluded that vulvovaginal candidiasis have a negative impact on the patient's quality of life. The majority of women having a mild effect of VVC on their QoL.

Keywords: Vulvovaginal Candidiasis (VVC), Prevalence, Candida albicans, VSQ, VDQoL

Development and Validation of an Instrument to Measure Patient-Centered Communication among Malaysian Hospital Pharmacists

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Introduction: Effective communication that prioritizes patient-centered care is important in all healthcare settings, including pharmacy. Currently, there is a lack of comprehensive tools to measure patient-centered communication (PCC) among pharmacists in Malaysia. **Objectives**: To develop an instrument that can measure PCC in Malaysian hospital pharmacists, and to establish the validity and reliability of the instrument. **Methodology**: A multi-step process was utilized to develop and validate the communication assessment instrument. Firstly, a comprehensive literature search was conducted to determine the core elements of the PCC instrument. Face and content validity were established by an expert panel of healthcare communication experts and hospital pharmacists. Pilot testing was then conducted using previous audio data of pharmacist-simulated patient communication. The resulting scores were compared to the Four Habits Coding Scheme (FHCS) to establish concurrent validity. Internal consistency, intra-rater reliability and inter-rater reliability were also assessed. **Results**: The final instrument consisted of 29 items rated on a three-point scale, covering six core elements: Building rapport, Exploring patient perspectives, Empathy and compassion, Shared decision-making, Patient education, and Self-efficacy. The total scores from the instrument and FHCS scores were significantly correlated ($p<0.05$). High internal consistency was demonstrated with a calculated Cronbach's alpha of 0.834. Furthermore, intra-rater reliability and inter-rater reliability, assessed using intra-class correlation, were deemed acceptable at 0.673 and 0.679, respectively. **Conclusion**: The developed instrument represents a valid and reliable tool for assessing PCC among hospital pharmacists in Malaysia. It may be useful in identifying communication gaps and evaluating the impact of communication training interventions on pharmacist-patient interactions.

Keywords: Healthcare communication, patient-centered, pharmacist-patient interaction

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PRESENTERS DIGITAL HEALTH

Oral Presenters		
Date: 25 October 2023 (Wednesday)		
ID	**Presenters**	**Time**
OP-DH-03	**Ms Sharmila Sathianathan** Approaches Used to Identify Health Misinformation on Social Media and Challenges Faced; a Qualitative Study	3:30 PM
OP-DH-04	**Ms Defin Allevia Yumnanisha** Comparing Mobile Teledermoscopy and Self-Screening Applications as the Future Skin Cancer Screening Tools: A Meta-Analysis of Diagnostic Accuracy Studies	4:00 PM
OP-DH-05	**Mr Muhammad Candrika Agyawisnu Yuwono** Delving into the Effects of Digital Meditation: Nurturing Adolescent Mental Health via Mindfulness App and Website Interventions: A Systematic Review and Meta-Analysis	4:15 PM

Approaches Used to Identify Health Misinformation on Social Media and Challenges Faced; a Qualitative Study

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Introduction: Health misinformation, a component of information disorder is information that is not true but is not constructed to ruin or cause harm. Social media caused half of the spread of health misinformation. It is still unclear how the general public identify health misinformation on social media and challenges faced in regards to this. **Objectives**: To explore the approaches employed by the general public in identifying health misinformation on social media and challenges faced in regards to this. **Methodology**: This was an exploratory qualitative study. Individual, semi-structured interviews were conducted with 22 people from the general public in Malaysia. Audio-taped interviews were transcribed verbatim and imported into Atlas Ti software. A thematic analysis method was used to identify themes from the qualitative data. **Results**: Respondents described the approaches they used to identify health misinformation on social media were looking at the characteristics of messages and the source of the message. They deemed messages were misinformation if they were illogical and exaggerated. Respondents believed in messages from the government and questioned messages that contradicted credible sources. Respondents perceived that anyone could spread misinformation with a tendency from older people, those with lower education background and from rural areas. Messages that were viral on social media and were long posed a difficulty in accuracy determination. Furthermore, misinformation that contained anecdotes and testimonials were challenging to differentiate especially if they contained academicians or health care workers endorsing them. **Conclusion**: This study allows us to understand the areas that pose a challenge in identification of health misinformation on social media faced by the general public. Interventions can be designed that allows a targeted approach to this problem.

Keywords: Approaches, health misinformation, social media

Comparing Mobile Teledermoscopy and Self-Screening Applications as the Future Skin Cancer Screening Tools: A Meta-Analysis of Diagnostic Accuracy Studies

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Introduction: Despite being one of the fastest-growing cancer cases worldwide, especially in Asia, skin cancer remains being frequently misdiagnosed or left untreated due to society's lack of awareness. Teledermatology tools, including mobile teledermoscopy and self-screening applications, are utilized to address this gap. This research aims to provide crucial insights into the effectiveness of aforementioned tools, offering valuable information to healthcare professionals, policymakers, and the public. Ultimately, the study's findings may precede the widespread adoption of innovative technologies, transforming how skin cancer is screened, diagnosed, and managed, thus contributing to the early detection and improved prognosis of this life-threatening disease. **Methodology**: The study systematically reviewed relevant clinical trials within the past 10 years from five databases (PubMed, Embase, ScienceDirect, Wiley, ProQuest) according to the PRISMA guideline. Included documents were assessed for risk of bias using QUADAS-2 and statistically analyzed with Meta-DiSc. The diagnostic accuracy for skin cancer was reported using sensitivity, specificity, true positive, true negative, false positive, and false negative. **Results**: The authors screened 805 titles and abstract, with eleven studies included in the analysis. The overall study quality assessed by the QUADAS-2 resulted in six "unclear" and five "low" risks of bias studies. Among 7.863 skin lesions, mobile teledermoscopy exhibited strong potential for detecting skin cancer, with a sensitivity of 94% (95% CI: 91-96%), specificity of 91% (95% CI: 90-91%), and Area Under the Curve (AUC) of 0.9605. In comparison, self-screening applications had lower sensitivity of 89% (95%CI: 0.86-0.92), specificity of 73% (95%CI: 0.70-0.76), and an AUC of 0.903 than mobile teledermoscopy. **Conclusion**: Mobile teledermoscopy showed higher accuracy in detecting skin cancer compared to self-screening applications. However, further research is required to evaluate other teledermatology methods, such as real-time consultations without dermoscopy, and to compare the cost-effectiveness and applicability of each tool.

Keywords: Teledermoscopy, mobile application, skin cancer

Delving into the Effects of Digital Meditation: Nurturing Adolescent Mental Health via Mindfulness App and Website Interventions: A Systematic Review and Meta-Analysis

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Introduction: Over 50% of adolescents undergo depression, stress, and anxiety. This is associated with some factors, including, age, separation from parents and friends, academic and organizational demands, and financial issues. Neglecting these concerns can lead to further physical and psychological issues. Mindfulness meditation refers to various types of mindfulness based psychotherapy, which are effective treatments to reduce stress and depression. Unfortunately, this solution may be costly and time-consuming. Therefore, mindfulness meditations, which are accessible through apps and websites, provide affordability, adaptability, and enhanced privacy.
Objective: To evaluate the effect of mindfulness app and website interventions on adolescent mental health. **Methodology**: This study followed the Preferred Reporting Item for Systematic Review and Meta-analysis (PRISMA). We systematically searched through PubMed, Scopus, Cochrane, Wiley, and ProQuest until August 22, 2023. Critical appraisal of included studies was performed with Cochrane Risk of Bias 2.0. Pooled mean, SD, and p-value were analyzed using a random-effects model. **Results**: Thirty-seven randomized studies yielding 5667 participants are included. Mindfulness app and website interventions showed a beneficial effect on depression (SMD: -0.71[0.93,-0.49], p<0.001), anxiety (SMD: -3.29 [-4.15, -2.43], p<0.001), stress (SMD: -0.72 [-0.98, -0.45], p<0.001), mindfulness (SMD: 1.20 [0.84, 1.56], p<0.001), and self-compassion (SMD: 0.98 [0.61, 1.34], p<0.001). We further assess a subgroup analysis to find the best duration of intervention and effect differences of intervention before and after COVID-19. **Conclusion**: Despite COVID-19 pandemic challenges, our meta-analysis indicates that digital mental health interventions for adolescents significantly reduce depression, anxiety, and stress while boosting mindfulness and self-compassion. Optimized intervention durations and best mindfulness practices should be implemented in today's 2 million mental health apps.

Keywords: Application, website, mental health, mindfulness

Poster Presenters	
ID	**Presenters**
PP-DH-01	**Dr Adliah Binti Mhd Ali**
	Machine Learning Methods in Determining Chronic Disease Patients' Belief Towards Medication and Associations with Medication Wastage

Machine Learning Methods in Determining Chronic Disease Patients' Belief Towards Medication and Associations with Medication Wastage

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Introduction: In Malaysia, the public healthcare system is heavily subsidize by the government and led to unnecessary cost spent. The study employs data analytics techniques to predict patients' related factor who were more likely to waste their subsidized medication and is important to evaluate the applicability of this method in the future. This study evaluate the suitability of machine learning methods in elucidating the high-risk group of chronic disease patients who were more likely to waste their subsidized medications.

Methodology: One thousand questionnaires were distributed to chronic disease patients receiving subsidize medications in six government healthcare settings in Malaysia. The questionnaire consist of patients' demographic characteristics and validated questionnaire on Belief about Medicines Questionnaire (BMQ) by Horne et al and Return and Disposal of Unused Medications (ReDiUM) by Sim et al. Data analytics used for this study were stacked ensemble learning (EL) and Support Vector Machine (SVM). Random Forest (RF), eXtreme Gradient Boosting (XGB) and Naive Bayes (NB) were use as base learners. The test error estimate is define by the root mean square error (RMSE) for evaluation of metric performance. Algorithms tested using the same validation data and SVM variable importance with backward elimination was use to select and rank important variables.

Results: Machine learning models constructed using the selected variables reported RMSE values of 5.144 ($p=0.359$) for best individual base learner (SVM) and 5.246 ($p=0.506$) for stacked EL model. The lower the RMSE, the better the model and its predictions. The Wilcoxon signed ranked test reported that there was no significant difference ($p<0.05$) between the predictions of the machine learning models and the actual scores. The significant variables identified from the SVM variable importance method were education, disease hypertension, BMQ Total Necessity, BMQ Total Concern and BMQ Total Harm. SVM is a set of supervised learning methods used for classification, regression and outlier detection.

Conclusion: Based on the result predicted using machine learning, this promising method may be use in the future to predict high–risk group of chronic disease patients' who were more likely to waste their medications compared to the conventional method.

Keywords: Chronic disease patients, medication wastage, prediction, machine learning

MONASH INITIATE 2023

25 - 26 October 2023

Translating Research into Practice: Revolutionizing healthcare delivery and outcomes

PRESENTERS PUBLIC HEALTH

Oral Presenters Date: 26 October 2023 (Thursday)		
ID	**Presenters**	**Time**
OP-PH-01	**Dr Kavita Jetly A/P Jagjit Kumar Jetly** The Mechanism Linking Cigarette Pack Factors, Point-of-Sale Marketing, and Individual Factors with Smoking Intention among School-Going Adolescents	2:00 PM
OP-PH-02	**Ye Shing Lourdes Loh** Price Control and Public Opinion: Investigating External Reference Pricing Perceptions	2:15 PM
OP-PH-04	**Dr Huysean Huot** Knowledge, Attitude and Practice of Antibiotics and Their Associated Factors Among People Living in Phnom Penh, Cambodia	2:30 PM

Oral Presenters		
Date: 26 October 2023 (Thursday)		
ID	**Presenters**	**Time**
OP-PH-05	**Ms Vottey Nara** The Prevalence of Stress, Anxiety, Depression, and Antipsychotic Drug's Use Among University Students in Phnom Penh, Cambodia	2:45 PM
OP-PH-06	**Ms Sidra Sabir** A Comparative Study of Physical Activity in Obese and Non-obese Individuals with Knee Osteoarthritis	3:00 PM
OP-PH-07	**Ms Sydney Tjandra** Where Is Health Fair? A Bibliometric Study Quantifying Global Health Disparities	3:15 PM
OP-PH-03	**Ms Zi Rong Chia** Interview to Understand the Demands That Lead to Burnout and Motivations Among Malaysian Community Pharmacists: A Cross-Sectional Study	3:30 PM

The Mechanism Linking Cigarette Pack Factors, Point-of-Sale Marketing, and Individual Factors with Smoking Intention among School-Going Adolescents

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Introduction: One of the most preventable causes of death is diseases caused by tobacco usage. In Malaysia, cigarette smoking among adolescents has not reduced over the years. Exposure to nicotine during adolescence can affect brain development and cause many health risks. **Objectives:** This study aimed to explore mechanisms linking cigarette pack factors, point-of-sale marketing, and individual factors (psychological reactant trait) to predict smoking intention among school-going adolescents. **Methodology:** This was a cross-sectional study conducted among six urban secondary schools in Selangor. A multi-stage simple random sampling procedure was done to select district education offices, schools, classrooms, and adolescents aged 13 to 16. A pre-tested and validated self-administered questionnaire consisted of personal factors (demographic status), family factors (parent education, parent smoking), social factors (peer smoking), psychological factors (psychological reactant trait), recall exposure to the point-of-sale marketing, cigarette pack factors (pack appraisal of the conventional pack, pack receptivity of conventional pack, pictorial warning negative affect) and the smoking intention was used. Data analysis for structural equation modelling was done using SMART-PLS v3.2.8. **Results:** A total of 386 adolescents fulfilling the inclusion criteria participated. The structural model controlled by personal, family, and social factors showed pictorial warning message reactance (β=0.153, *p*=<0.001), pack receptivity of conventional pack (β=0.297, *p*=0.004), and psychological reactant trait (β=0.174, *p*=<0.001) was positively related to smoking intention. Pictorial warning negative affect (β=-0.153, *p*=0.001) was negatively related to smoking intention. Psychological reactant trait was positively related to pictorial warning message reactance (β=0.340, *p*=<0.001). Pictorial warning message reactance also positively mediates the relationship between psychological reactant traits and smoking intention (β=0.05, *p*=0.001). The model has strong predictive power.—**Conclusion:** The finding revealed cigarette pack factors and psychological reactant trait is essential in predicting smoking intention. Hence, policymakers should consider these factors in developing smoking combat policies among adolescents.

Keywords: Cigarette pack factors, point-of-sale marketing, smoking intention

Price Control and Public Opinion: Investigating External Reference Pricing Perceptions

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Introduction: The Malaysian government conducted two public consultations in 2021 on the implementation of External Reference Pricing (ERP). ERP is a pricing system that sets local pharmaceutical prices by comparing them with international market rates from a selection of countries. However, certain aspects of stakeholders such as views of the general public in both public consultations were absent. This research is part of a larger study on medicine price controls that aims to analyse the views of key stakeholders which are greatly underrepresented in the policy evaluation process. **Methods:** Data were collected via 16 semi-structured interviews with pharmacists (n=2), medical doctors (n=2), policymakers (n=1), academicians (n=2), NGO policy advisors (n=1), pharmaceutical representatives (n=2), and the general public (n=6). Thematic analysis using NVivo v.12 informed by a theoretical perspective of interpretivism was conducted to capture the key themes derived from transcribed data. **Results**: Our findings are categorised into (i) public sentiments on the implementation of ERP, (ii) the challenges and shortfalls of the current Malaysian healthcare system, and (iii) recommendations from key stakeholders in addressing the said challenges. The results demonstrated mixed reactions to the implementation of ERP. Both policymakers and medical doctors have maintained a stance of neutrality, yet advocates for the implementation of ERP should recognise the potential complexities and challenges associated with the adoption of ERP. The general public together with academicians and NGO policy advisors, has shown great support for ERP. In contrast, pharmaceutical representatives and pharmacists are less enthusiastic about the policy, as ERP may affect the industry's profitability and the subsequent R&D into new drugs. **Discussions and Conclusion**: Implementing medicine price controls has remained a significant challenge in Malaysia, and its negotiation has reached an impasse. As such, the ERP policy entails pharmaceutical companies to make necessary concessions to improve the affordability of medicines. It is essential for the government to implement adaptable pricing structures and facilitate transparent communication between the pharmaceutical industry and the general public. Therefore, there is a need to revise the current policy practices and involve necessary stakeholders in designing a feasible health policy for all.

Keywords: Public Health, Health Policy, Pharmaceutical Pricing Policy, External Reference Pricing

Interview to Understand the Demands That Lead to Burnout and Motivations Among Malaysian Community Pharmacists: A Cross-Sectional Study

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Introduction: Malaysian community pharmacists experience burnout that leads to reduced job satisfaction and compromised patient care. There is currently no research on burnout among Malaysian community pharmacists, emphasizing the need for urgent attention. **Objective**: Our main objectives are to identify the factors that contribute to burnout, motivations, and engagement among Malaysian community pharmacists. The secondary aim includes examining the burnout status and job satisfaction level of the participants. **Methodology**: Between January to April 2023, a mixed-methods cross-sectional study was conducted among 30 selected Malaysian community pharmacists using purposive sampling. This approach involved both qualitative and quantitative data collection. The Jobs-Demands Resources (JDR) model was used to identify the factors contributing to burnout and motivation among participants. Participants were asked to rate the burnout status and job satisfaction on a likert scale of 1 to 5. Thematic analysis with both inductive and deductive approaches was performed on the interview data by using the NVivo software to derive codes, themes, and domains. Intercoder reliability tests (ICR) using Cohen's kappa were used to assess the agreement between 2 coders, to achieve kappa value >0.75. Data analysis is continued until data saturation, marked by 0% new information. **Results**: Data saturation reached at the 12th interview with a total of 36 codes. The analysis revealed three domains: job demands, job resources, and personal resources. The codes ‘Multitasking and heavy workload’, ‘Undersupport, underappreciation from government’, ‘Colleagues and management support’, ‘Hobby and leisure activities’ appear the most which are in 11 files out of 12 transcripts. Besides, Malaysian community pharmacists experience moderate burnout (mean score: 2.33, 95% CI: 1.77 to 2.89) but report high job satisfaction (mean score: 3.67, 95% CI: 3.33 to 4.01). **Conclusion**: Burnout among Malaysian community pharmacists is a prevalent issue and warrants urgent action. Future research could involve conducting larger quantitative studies with validated tools to enhance comprehension of our study.

Keywords: Burnout, Malaysian community pharmacists, semi-structured interview

Knowledge, Attitude and Practice of Antibiotics and Their Associated Factors Among People Living in Phnom Penh, Cambodia

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Introduction: The inappropriate use of antibiotics is one of the most global health concerns and a major cause of antibiotics resistance. **Objectives:** The aim of this study was to determine the knowledge, attitude and practice (KAP) of antibiotics among people living in Phnom Penh, Cambodia and their associated factors. **Methodology:** A cross-sectional survey was conducted within different area in Phnom Penh, Cambodia by using a convenient sampling in between May 2023 to July 2023. A total 250 respondents were enrolled in this study. The cut-off for the score of attitudes were categorized as negative (0.00-2.50), and positive (2.51-5.00). Knowledge and practice were categorized as low or poor (0.00-0.33), moderate (0.34-0.66), and high or good (0.67-1.00). The data collection was analyzed and reported as the descriptive results. Chi-square test was used to determine the association between sociodemographic and KAP. **Results:** The majority of respondents were male (n=132; 52.8%) and female (n=118; 47.2%). Most participants are from 18 to 28 years old (n=117; 46.8%), the level of education is in bachelor degree (n=149; 59.6%) and university students (n=111; 44.4%). Most participants have moderate knowledge (n=165; 66%), positive attitude toward antibiotics (n=240; 96%), and high practice of antibiotics (n=118; 47.2%). The Chi-square test showed significant relationship between education and attitude, education and practice, and occupation and practice toward antibiotics use, all with a p-value <0.01. **Conclusion:** These results demonstrate the ongoing need to enhance understanding and improve awareness of people living in Phnom Penh toward taking antibiotics in order to avoid antibiotic resistance, which is a public health risk. People with low KAP should also be given preferential attention in community engagement programs.

Keywords: Knowledge, Attitude, Practice, Antibiotics

The Prevalence of Stress, Anxiety, Depression, and Antipsychotic Drug's Use Among University Students in Phnom Penh, Cambodia

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Introduction: Mental health was deemed essential to human health by the World Health Organization. Stress, depression and anxiety (SAD) are common mental health disorders which are reported to be increased among college/university students and they can interfere with learning ability, affect academic performance and impair practice performance. **Objectives**: This study aims to determine the prevalence of SAD and its associated factors, and to improve awareness of health management toward SAD among medical students and non-medical students within 2 universities in Phnom Penh. **Methodology**: An online survey questionnaire was circulated to medical and non-medical students by using google forms. The questionnaire was divided into three parts, including demographic information, potential associated factors and the 21-item Depression, Anxiety, and Stress Scales (DASS-21). A total of 201 respondents were enrolled in this study. Descriptive data and chi-square tests were performed in the study. **Results**: It is found that among 201 university students participated in this survey was female (112, 55.7%), single (191, 95%), and Buddhism (190, 94.5%). The ages were ranged from 17 to 40 years old, with an average of 21.46 ± 2.74. Approximately, students were unemployed (141, 70.1%). Most are from bachelor degree (185, 92%) including pharmacy (42, 20.9%), dentist (34, 16.9%) and bachelor of English (25, 12.4%). Notably, the prevalence of severe and extremely severe depression was 28 cases (13.9%) and 36 cases (17%), respectively. Noteworthy also is the significant prevalence of extremely severe anxiety, recorded at 68 cases (33.8%). Listen to music (47, 23.4%), hanging out with friends (33, 16.4%) and play sports (29, 14.4%) were likely to do in order to manage the mental health problem. Stress was found associated with age ($p<0.05$) and education ($p<0.05$) while depression was only associated with students who have outside work ($p<0.05$). However, only 13 participants (6.46%) were using medication to deal with SAD including psychotic drugs (sleeping pills) (3, 6.03%) and nonpsychotic drugs (10, 20.1%). **Conclusion**: Notably, about one out of seven respondents had severe depression, while one out of three had severe anxiety. This finding suggests the need - of having mental health/support services and mental health prevention intervention at universities.

Keywords: Stress, depression, anxiety, antipsychotic drugs

A Comparative Study of Physical Activity in Obese and Non-obese Individuals with Knee Osteoarthritis

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Introduction: Knee osteoarthritis (KOA) is a debilitating musculoskeletal disease that affects a large proportion of the population. Obesity is a well-known risk factor for KOA and is associated with decreased physical activity. However, there is limited and insufficient data on the impact of obesity on physical activity levels among the KOA population. This study was carried out to comprehensively assess and compare physical activity levels in obese and non-obese individuals with KOA. **Methods:** A cross-sectional study was conducted involving 80 participants recruited from two physiotherapy clinics. Participants were divided into obese and non-obese groups based on their BMI (≥ 23 kg/m² and ≤ 22.9 kg/m², respectively). Physical activity level was measured using the Malay version of International Physical Activity Questionnaire (IPAQ). Both categorical and continuous scores were obtained. Pain severity was included as a covariate and measured using the Visual Analogue Scale (VAS). A one-way ANCOVA was employed to compare the results between the two groups. **Results:** The categorical scoring for the overall study population (N=80) showed that a greater proportion of participants (63.75%) had moderate level of physical activity, while the continuous scoring yielded a mean score of 1974.45 metabolic equivalent of task (MET) min/week**.** A Significant difference in the mean IPAQ scores was found between obese and non-obese groups**.** The adjusted mean score for the obese group (n = 53) was 1720.90 (MET) min/week, and 2472.15 MET min/week for the non-obese group (n=27). **Conclusion**: The considerable discrepancy in mean IPAQ scores between the two groups highlights the potential influence of BMI on activity levels in the KOA population. Further research is needed to unravel the complex relationship between BMI, physical activity, and KOA and provide valuable insights for tailored interventions and improved patient outcomes.

Keywords: Knee osteoarthritis, Physical activity level, Comparative Study

Where Is Health Fair? A Bibliometric Study Quantifying Global Health Disparities

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Introduction: Despite the massive progress in health, various determinants of health, such as income inequality, have led to worse health status. Inequity escalates the likelihood of premature mortality and heightened morbidity. Health is enhanced in equitable societies due to their elevated social cohesion, positive social relationships, and reduced stress levels. The presence of health disparities both among and within countries has led to a focus on enhancing the creation and utilization of global health inequality research in order to enhance the ability to take effective actions. **Objective:** This bibliometric analysis aims to visually represent how knowledge has developed in health inequality research to understand the research landscape and emerging trends regarding health inequalities. **Methodology:** This research utilized bibliometric analysis using metadata from published literature in the Scopus database. The search was conducted on August 27th, 2022, employing the keyword 'Health inequality' and its synonyms. The data was categorized into publication years: pre-COVID-19 (2017–2019) and during COVID-19 (2020–2022). VOSviewer and Biblioshiny were employed for network visualization analysis. Two independent reviewers carried out the selection of frequently occurring keywords and clusters of keyword co-occurrence. **Results:** Metadata from a total of 52761 publications were included for bibliometric analysis, comprised of two groups of datasets namely pre-COVID-19 (n=15842) and during COVID-19 (n=36919). Health disparities, social determinants of health, and health equity were among the top-occurring keywords in studies. Post-COVID-19, a marked rise in health services and systems research calls for governments to reform pandemic preparedness infrastructure and robust systems with more resilience. Studies on health inequalities were mostly reported by authors from the United States (n=28626), United Kingdom (n=5154), and Canada (n=3824); HIC inequity niches including sexual orientation are also identified. **Conclusion:** The dominance of HICs calls for more research from LMICs and LICs, considering their different trends in health inequality.

Keywords: Bibliometric, COVID-19, health inequality, health disparities, lower-middle-income countries

Poster Presenters	
ID	**Presenters**
PP-PH-02	**Ms Nur Khairah Badaruddin**
	Researching Virtual Clinics Implementation: Navigating the Stakeholder Engagement Experience
PP-PH-04	**Dr Carl Lexter B. Tan**
	The COVID 19 Pandemic Effect on Pre-Medical and Medical Students' on Pursuing the MD dream: A Scoping Review
PP-PH-05	**Dr Nurul Aain Binti Ahmad Fauzi**
	Characteristic Profiling in Rheumatoid Arthritis patients achieving low disease activity (LDA)/remission within 12 months of Biologic DMARDs treatment

Researching Virtual Clinics Implementation: Navigating the Stakeholder Engagement Experience

Nur Khairah Badaruddin[1], Esther Wong Min Fui[2], Tay Yea Lu[2], Noor Hasidah Ab Rahman[2], Nurul Iman Jamalul-lail[2], Nur Hidayati Abdul Halim[2], Nurul Atifah Mohamad Zake[2], Nurul Amirah Mohamad Murad[2], Zalilah Abdullah[2]

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Introduction: A research study was conducted to assess the implementation of virtual clinics (VC) in public primary healthcare in Malaysia. Engaging stakeholders to secure site approval, establishing rapport, and becoming familiar with the local system are crucial steps preceding the initiation of data collection. Identifying and addressing issues in the early stages of stakeholder engagement ensures a smooth data collection process. **Objectives**: This study aims to reflect on issues encountered by investigators at the early stage of stakeholder engagement at the research sites. **Methodology**: Qualitative content analysis of the observation notes gathered from all the investigators involved in VC research was done. All the investigators were female and possessed > 5 years of research experience. They are medical doctors, research officers or nurses with age between 29 to 50 years old. The data source encompassed discussion and reflective notes from researchers during their engagements with stakeholders from each healthcare facility under three different health state departments. The data were analysed thematically in an Excel sheet. **Results**: Investigators encountered significant challenges in conducting research at multiple sites due to variations in Standard Operating Procedures. Two main themes emerged namely communication (technical instruction) and bureaucratic structure. Under the bureaucratic structure, researchers had to establish tailored arrangements and direct communication with district health offices and clinics, which caused unforeseen delays. Furthermore, communication issues were observed, which were exacerbated by staff turnover at the study sites, resulting in a loss of accountability that disrupted the engagement process. **Conclusion**: This research has identified the communication issues within a bureaucratic structure during stakeholder engagement. Creating a transparent communication platform via a designated liaison can overcome these challenges by promoting synergy between researchers and stakeholders, facilitating the study's feasibility. This study's insights are valuable to guide future research strategies.

Keywords: Virtual clinic, reflective, challenges, engagement, site approval.

The COVID 19 Pandemic Effect on Pre-Medical and Medical Students' on Pursuing the MD dream: A Scoping Review

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Introduction: The COVID-19 pandemic has significantly affected the lives of the population. The pandemic affects not only the healthcare workers but also the potential future healthcare workers, the premedical and medical students. Even though healthcare professionals are in shortage, there has yet to be research on whether this subset of the population wants to pursue the MD dream. **Objectives:** This scoping review aimed to explore whether premedical students still want to continue pursuing their medical degree, as presented in the literature. **Methodology**: The scoping review was guided by JBI methodology on scoping review. A comprehensive search about enrollment, attrition rate, and dropouts of premedical or medical students was conducted in PubMed, Google Scholar, EBSCO host, Cochrane, and Web of Science, following a set of inclusion criteria that is free and available full articles written in English from December 2019 to December 2022. The initial search yielded twenty-six articles (Studies from China = 9; USA = 2; Pakistan = 1; UAE = 1). Thirteen papers were not included (No desired population = 2; No desired concept = 8; Not relevant = 1; Not accessible = 1; Not in English = 1), wherein thirteen journals were accepted, appraised using Critical Appraisal Skills Programme (CASP) checklist for qualitative research, and included in the scoping review. **Results**: Thirteen articles were categorized into different themes (motivators or demotivators) to subthemes (Psychological, Humanitarian, Societal, Scientific, or Extrinsic factors). Common primary motivators in pursuing medicine are helping others and benefiting society (10/13 articles). On the other hand, the main demotivators are fear of contracting the disease and mental stressors (7/13 articles). **Conclusion:** The scoping review showed that motivating factors outnumbered the demotivating factors, as exhibited by 10 of the 13 studies in this scoping review. Thus, even if the pandemic exposed the grueling side of the medical profession, premedical students still want to pursue medicine for the service and benefit of others. Although the results are reassuring, further research on the topic is needed.

Keywords: *COVID-19 pandemic, pre-medical student; medical student; enrollment; dropout; attrition*

Characteristic Profiling in Rheumatoid Arthritis patients achieving low disease activity (LDA)/remission within 12 months of Biologic DMARDs treatment

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Introduction: Biologic DMARDs is a cornerstone of rheumatoid arthritis therapy. This study profiled the characteristics of RA patients treated with biologic DMARDs and achieved low disease activity/remission within 12 months duration. **Methods**: Fifty-five RA patients enrolled between March 2022 to May 2023 were included. Subjects were categorised according to bDMARDs received, i.e., JAKi (Baricitinib, Tofacitinib) or non-JAKi (Adalimumab, Etanercept, Golimumab, Tocilizumab). Subjects were prospectively follow-up at baseline, 1-month, 3-month, 6-month, and 12-month, with HAQ-DI, clinical and laboratory assessment data collected. Thirty-six patients completed for one year duration while nineteen patients dropped out due to adverse events and/or inefficacy. **Results**: Our data demonstrated a median disease duration of 12.5 years (IQR 10.0) with 52.8% subjects was biologic-naïve. Median DAS28-CRP and HAQ-DI scores at baseline were 4.40 (IQR 1.29) and 1.313 (IQR 1.13). Our preliminary analyses showed that at one month of treatment initiation, DAS28-CRP LDA or remission was significantly achieved by the JAKi users (59.1%) as compared to the non-JAKi users (15.4%) ($p<0.05$). At 12 months of treatment however, no significant difference was observed ($p>0.05$) between these groups. A Wilcoxon-signed rank test showed that at 12 months of treatment, the non-JAKi group elicited a statistically significant improvement in all parameters measured: 28-TJC, 28-SJC, VAS (mm), PGA (mm), EGA (mm), HAQ-DI and DAS-28-CRP ($p<0.05$). Similar improvements are noted at completion among JAKi users, except CRP level ($p=0.07$). Comparisons of baseline, 1-month, 3-month, 6-month and 12-month values among JAKi and Non-JAKi users showed that most significant improvements in parameters measured occur only for the first month of treatment. **Conclusion**: We observed significant clinical improvement in term of clinical composite measures and DAS-28-CRP in RA patients treated with JAKi within one month of treatment. However, the clinical improvement was comparable after 12-month treatment in this RA population irrespective of biologic received.

Keywords: RA, bDMARDs, remission, disease activity

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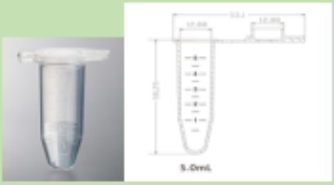

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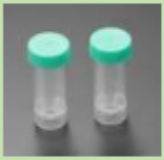

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