



# 1st International Conference on Food as Medicine (ICFAM) 2026

**Bridging Nutrition and Science  
for a Healthier Future**

**13-15 JANUARY 2026**

**8AM-6PM**

**MONASH UNIVERSITY MALAYSIA**



## Message from the Head of Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia



A Vision for the Future: Welcome to the 1st International Conference on Food as Medicine (ICFAM 2026)

On behalf of the Jeffrey Cheah School of Medicine and Health Sciences at Monash University Malaysia, it is my great pleasure to welcome you to the inaugural International Conference on Food as Medicine (ICFAM 2026).

This conference marks a pivotal moment. We gather not only to share knowledge but to shape the future of healthcare. Under the theme “Bridging Nutrition and Science for a Healthier Future,” we address a fundamental truth: nutrition is the cornerstone of health, disease prevention, and sustainable well-being.

As we face a rising tide of non-communicable diseases and complex health challenges, the call for innovative, evidence-based solutions has never been more urgent. "Food as Medicine" represents a paradigm shift, moving beyond treatment to proactive, personalized prevention. However, as we stand on the frontier of this exciting field, we must navigate its future with both ambition and wisdom.

The next chapter of nutrition will be written with the tools of technology, from AI-driven personalized diets and advanced bioactive extraction to sustainable food production systems. This evolution presents immense opportunities, but it also demands a profound sense of responsibility. Our collective challenge is to ensure that technological advancement serves humanity ethically and equitably. We must champion innovations that enhance access to nutritious food, preserve the integrity of our ecosystems, and genuinely empower individuals to lead healthier lives.

ICFAM 2026 is designed to be the crucible for these critical conversations. Our diverse programme, with tracks in Bioactive & Non-communicable Diseases, Immunity and Microbiome, and Clinical and Community Health, will provide a platform to explore, debate, and define the responsible application of science and technology in nutrition. Through keynote lectures, dynamic forums, and collaborative workshops, we will forge the partnerships needed to translate cutting-edge research into tangible, positive health outcomes for communities worldwide.

I extend my sincere congratulations to the organizing committee for their vision and dedication in creating this landmark event. My deepest appreciation goes to our presenters, contributors, and delegates, whose work is the lifeblood of this conference.

May ICFAM 2026 inspire you, challenge your perspectives, and spark the collaborations that will build a healthier, more nourished future for all. I wish you a rewarding and transformative conference experience.

**Brig Gen Prof Datuk (Dr) Mohd Arshil Moideen (Rtd)**  
**Head**  
**Jeffrey Cheah School of Medicine and Health Sciences**  
**Monash University Malaysia**

## Message from the Chair, 1<sup>st</sup> International Conference on Food as Medicine



It is my great pleasure to welcome you to the 1st International Conference on Food as Medicine 2026 (ICFAM 2026), held from January 13–15, 2026, at Monash University Malaysia.

On behalf of the organising committee, I extend a warm welcome to all delegates, speakers, researchers, clinicians, industry partners, and policymakers joining us from around the world.

ICFAM 2026 was conceived in response to the growing recognition of food and nutrition as critical determinants of health and well-being. With the escalating burden of chronic diseases, immune-related disorders, and community health challenges worldwide, there is an urgent need to strengthen the scientific foundation supporting the use of food as a preventive and therapeutic strategy. This conference aims to serve as a dedicated platform for advancing evidence-based research and meaningful dialogue in this rapidly evolving field.

The programme features keynote lectures by distinguished experts, oral and e-poster presentations, interactive forums, and a post-conference workshop, all designed to encourage knowledge exchange, collaboration, and capacity building. We are especially grateful to our plenary and invited speakers, reviewers, and contributors whose high-quality submissions form the foundation of this abstract book.

I would like to express my sincere appreciation to the organising committee, Monash University Malaysia, and sponsors for their dedication and hard work in bringing ICFAM 2026 to fruition. I also thank all participants for your enthusiasm and commitment to advancing this important field.

I hope that this conference will inspire new ideas, foster lasting collaborations, and contribute to impactful research and practice that harnesses the power of food to improve health outcomes globally. I wish you all a stimulating, productive, and rewarding conference experience.

**Dr Kasthuri bai Magalingam**  
**Conference Chair**  
**1st International Conference on Food As Medicine (ICFAM 2026)**  
**Monash University Malaysia**

## Food as Medicine Research Strength, Jeffrey Cheah School of Medicine and Health Sciences



The Food as Medicine (FAM) Research Strength at Monash University Malaysia's Jeffrey Cheah School of Medicine and Health Sciences represents a pioneering and multidisciplinary initiative dedicated to advancing the scientific understanding of food as a powerful tool for health promotion, disease prevention, and disease management, which was established in 2024. The FAM research strength evolved from a strong foundation in nutrition research, which integrates nutrition science, biochemistry, molecular biology, clinical nutrition, public health, and bioinformatics to investigate the complex interactions between diet, nutrients, bioactive compounds, and human health.

The initiative is grounded in both modern scientific inquiry and the enduring principle articulated by Hippocrates: *"Let food be thy medicine."* This approach recognises food not only as a source of essential nutrients but also as a reservoir of biologically active compounds with therapeutic potential.

In the FAM context, food encompasses naturally derived macronutrients and micronutrients, phytonutrients, animal-based foods, microbial-derived products such as probiotics and postbiotics, as well as nutraceuticals. A growing body of evidence demonstrates that these components exert antioxidant, anti-inflammatory, immunomodulatory, and metabolic effects that are highly relevant to the prevention and management of non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, cancer, obesity, and neurodegenerative disorders.

Through interdisciplinary collaboration, translational research, and a strong commitment to public health impact, the Food as Medicine research strength at Monash University Malaysia is well-positioned to make meaningful contributions to the advancement of nutritional science and the development of sustainable, food-based strategies for improving global health and well-being.

**Professor Dr Ammu Radhakrishnan**  
**Lead, Food as Medicine Research Strength**  
**Monash University Malaysia**

## THE ORGANISING COMMITTEE

<b>Advisor:</b>	Professor Dr Ammu K Radhakrishnan Dr Muhamad Noor Alfarizal
<b>Chair</b>	Dr Kasthuri bai Magalingam
<b>Co-Chair</b>	Associate Professor Dr Snigdha Misra
<b>Secretary:</b>	Dr Faizatul Muhammad
<b>Treasurer:</b>	Dr Pang Kok Lun
<b>Program Committee:</b>	Associate Professor Dr Amutha Ramadas Associate Professor Dr Snigdha Misra Dr Ramlah Ibrahim
<b>Sponsorship and Marketing:</b>	Associate Professor Dr Snigdha Misra Dr Ramlah Mohamad Ibrahim Dr Saatheeyavaanee B. Dr Vengadesh Letchumanan
<b>Scientific Committee:</b>	Associate Professor Dr Badariah Ahmad Professor Dr Uma Devi Palanisamy Dr Reyhaneh Farghadani
<b>Abstract Book:</b>	Dr Kasthuri bai Magalingam Professor Dr Ammu K Radhakrishnan Dr Vengadesh Letchumanan
<b>Registration &amp; Participant Services Manager:</b>	Dr Saatheeyavaane B. Dr Usha Sundralingam
<b>Local Arrangements and Logistics:</b>	Dr Vengadesh Letchumanan Dr Pang Kok Lun Ms Indah Maisarah

# GENERAL INFORMATION

## THE MEETING VENUE

- Address: Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, 47500 Subang Jaya, Selangor
- **Conference Venue:** Auditorium 1 (Audi1), Building 5, Level 1.
- **Workshop Venue:** 6209 & 6210
- **Refreshment Venue:** The Porch
- **Conference Registration Venue:** Auditorium 1 (Audi 1) Foyer
- **Sponsor Exhibitions:** The Rock
- **Poster Presentation:** Monash University Library



## WHERE TO PARK?

There are several public parking facilities available to the general public near the campus:

- **Western Car Park:** Located along **Jalan Lagoon Selatan**, on the **western side of the Monash campus grounds**, near the campus buildings and not far from the main entrance. It's a pay-per-entry parking lot (about RM3 per entry)
- **BRT Car Park:** Multi-storey park opposite the main campus near the SunU-Monash BRT station (paid, RM7/day).
- **Sunway University Car Park:** Pay-to-park lot at Sunway University (about a 5–10 min walk via the elevated canopy).
- **Sunway Pyramid Car Parks:** Large multi-level paid parking (B1, B2, B3) at the mall, ~10–15 min walk via canopy walkway.
- **Sunway Medical Centre / Sunway GEO Car Parks:** Other paid lots around Sunway that you can walk from.

## SCIENTIFIC PROGRAMME ICFAM 2026

### DAY 1 (13<sup>th</sup> January 2026)

Time	Description	Venue
8.00 am - 9.00 am	<b>Registration &amp; Collection of registration kit</b>	<b>AUDI 1 Foyer</b>
9.00 am - 9.10 am	<b>Welcome &amp; Housekeeping Announcements</b>	<b>AUDI 1</b>
9.10 am - 9.20 am	Welcome Address by Organising Chair <b><i>Dr Kasthuri bai Magalingam</i></b>	
9.20 am - 9.30 am	Opening Remarks by President and Pro Vice-Chancellor, Monash University Malaysia <b><i>Professor Emeritus Dato' Dr Adeeba Kamarulzaman</i></b>	
<b>ICFAM 2026 Photography session</b>		
9.45 am - 10.45 am	<b>Tea Break, Networking &amp; Poster Viewing</b>	<b>The Porch, Exhibition area Monash Library</b>
10.45 am - 11.45 am	<b>PLENARY 1:</b> Level up your health: Addressing adolescent nutrition gaps  <b><i>Associate Professor Dr Hazreen Majid</i></b> Health Sciences University, UK  <b><i>Chair: Dr Kasthuri bai Magalingam</i></b>	<b>AUDI 1</b>
11:45 am - 12:45 pm	<b>PLENARY 2:</b> Precision nutrition & you: Global nutrigenomic approaches to disease and health  <b><i>Professor Dr Vimal Karani</i></b> University of Reading, UK  <b><i>Chair: Associate Professor Dr Amutha Ramadass</i></b>	
12.45 pm - 2.00 pm	<b>Lunch, Networking &amp; Poster Viewing / Judging</b>	<b>The Porch, Exhibition area Monash Library</b>
2.00 pm - 3.15 pm	<b>SYMPOSIUM 1: BIOACTIVES &amp; HEALTH</b>  ❖ Unlocking the Bioactive Potential of Natural Pigments and Functional Foods  <b><i>Associate Professor Dr Wee Sim Choo</i></b> Monash University Malaysia	<b>AUDI 1</b>

	<ul style="list-style-type: none"> <li>❖ Unlocking tropical fruits bioactives for health and sustainable diets <b>Professor Dr Amin Ismail</b> Universiti Putra Malaysia</li> <li>❖ Modulation of the microbiota-gut-brain axis by bioactives improves brain health <b>Dato' Professor Dr Abu Bakar Abdul Majeed</b> Universiti Teknologi Mara</li> <li>❖ Ellagitannins as nutritional bioactives: Bridging polyphenols and human health <b>Dr Usha Sundralingam</b> Monash University Malaysia</li> </ul> <p><b>Chair:</b> <i>Professor Dr Ammu Radhakrishnan</i></p>	
<p>3.15 pm - 4.15 pm</p>	<p><b>YOUNG INVESTIGATOR COMPETITION</b></p> <ul style="list-style-type: none"> <li>❖ Consumption of wild and underutilized foods and diet diversity: A pilot survey in the Philippines <b>Ms Charina Javier</b></li> <li>❖ Nature's Antidote: Evaluating detoxifying mineral ratios (Zn: Cd, Se: As) in Sri Lankan Rice varieties against dietary heavy metal safety benchmarks <b>Ms Jayani Wathsala Gunawardana</b></li> <li>❖ Dietary factors and associated health effects among patients with Vitamin D deficiency <b>Ms Maisha Mehjabin</b></li> <li>❖ Vitamin E-derived Tocotrienols demonstrate potent anticancer activity in 2D, 3D, and patient-derived TNBC models <b>Dr Shaza Mohamedahmed</b></li> </ul> <p><b>Chair:</b> <i>Associate Professor Dr Snigdha Misra</i></p>	<p><b>AUDI 1</b></p>
<p>4.15 pm - 4.45 pm</p>	<p><b>Day 1 Closing Remarks</b></p>	
<p>4.45 pm - 6.00 pm</p>	<p><b>Tea Break, Networking &amp; Poster Viewing</b></p> <p style="text-align: right;"><b>The Porch, Exhibition area Monash Library</b></p>	

**DAY 2 (14<sup>th</sup> January 2026)**

<b>Time</b>	<b>Description</b>	<b>Venue</b>
<b>8.30 am - 9.00 am</b>	<b>Arrival of Participants, Speakers and Exhibitors</b>	
<b>9.00 am - 10.00 am</b>	<p><b>PLENARY 3:</b> Lifestyle intervention in the prevention &amp; management of sarcopenia: Translating science into practice</p> <p><b>Professor Dr Chan Yoke Mun</b> Universiti Putra Malaysia</p> <p><b>Chair:</b> Associate Professor Dr Snigdha Misra</p>	<b>AUDI 1</b>
<b>10.00 am - 10.45 am</b>	<b>Tea Break &amp; Networking</b>	<b>The Porch, Exhibition area Monash Library</b>
<b>10.45 am - 12.00 pm</b>	<p><b>SYMPOSIUM 2: NUTRITION &amp; HEALTH</b></p> <ul style="list-style-type: none"> <li>❖ Transforming Diets for Sustainability: Evidence, Impacts, and Opportunities in Plant-Based Eating <b>Associate Professor Dr Snigdha Misra</b> Monash University Malaysia</li> <li>❖ Edible insects as a sustainable food source for Malaysians <b>Dr Lim See Meng</b> Universiti Kebangsaan Malaysia</li> <li>❖ Digital nutrition for better health: Insights From behaviour change and peer-support research <b>Associate Professor Dr Amutha Ramadas</b> Monash University Malaysia</li> <li>❖ AI-integrated personalized nutrition: Current applications, clinical outcomes, and implementation challenges <b>Dr Adam Feizrel Linoby</b> Universiti Teknologi MARA, Malaysia</li> </ul> <p><b>Chair:</b> Associate Professor Dr Badariah Ahmad</p>	<b>AUDI 1</b>
<b>12.00 pm - 1.00 pm</b>	<b>Lunch, Networking &amp; Poster Viewing</b>	<b>The Porch, Exhibition area Monash Library</b>

<p>1.00 pm - 2.00 pm</p>	<p><b>PLENARY 4:</b> Functional foods in sports</p> <p><b>Professor Dr Mahenderan Appukutty</b> Universiti Teknologi MARA, Malaysia</p> <p><b>Chair:</b> <i>Dr Kasthuri bai Magalingam</i></p>	
<p>2.00 pm - 3.00 pm</p>	<p><b>SYMPOSIUM 3: IMMUNITY &amp; MICROBIOME</b></p> <ul style="list-style-type: none"> <li>❖ The association of gut microbiota, ethnicity and obesity <b>Associate Professor Dr Chong Chun Wie</b> Monash University Malaysia</li> <li>❖ Next-generation probiotics <b>Professor Dr Foo Hooi Ling</b> Universiti Putra Malaysia</li> <li>❖ Personalised nutrition and microbiome diversity <b>Dr Polly Yap</b> Monash University Malaysia</li> </ul> <p><b>Chair:</b> <i>Associate Professor Dr Amutha Ramadas</i></p>	
<p>3.00 pm - 4.00 pm</p>	<p><b>POTPOURRI 1: ORAL PRESENTATIONS</b></p> <ul style="list-style-type: none"> <li>❖ Histological evidence of neuro-protection by tocotrienol-rich fraction in type 2 diabetes rat model <b>Mr Lee Yeong Zher</b></li> <li>❖ Computational insights into Coenzyme Q10-TREM2 signalling: A nutritional perspective on neuroinflammation in Alzheimer's Disease <b>Mr Ram Narayanan Ravi</b></li> <li>❖ From waste to wellness: Exploring the nutritional and functional potential of banana inflorescences for community health <b>Dr Sreelakshmi Sankara Narayanan</b></li> <li>❖ The relationships of health literacy and health-promoting behaviours on healthy cooking behaviour among food handlers <b>Dr Prem Ananth Palaniappan</b></li> </ul> <p><b>Chair:</b> <i>Dr Faizatul Muhammad</i></p>	<p><b>AUDI 1</b></p>

4.00 pm - 4.30 pm	Tea Break, Networking & Poster Viewing	The Porch Exhibition area Monash Library
4.30 pm - 5.15 pm	<p><b>POTPOURRI 2: ORAL PRESENTATIONS</b></p> <ul style="list-style-type: none"> <li>❖ Dietary factors and the gut microbiome in healthy Asian adults: A scoping review <i>Ms Tan Huey Shin</i></li>   <li>❖ Effect of palm mixed-carotenes on periodontal regeneration using human periodontal ligament stem cells <i>Mr Sun Yixin</i></li>   <li>❖ Identification of potential antivenom activities from Malaysian Herb <i>Alpinia purpurata</i> against Malaysian venomous snakes using Liquid-Chromatography-Tandem mass spectrometry approach <i>Dr Syafiq Asnawi</i></li> </ul> <p><i>Chair: Dr Faizatul Muhammad</i></p>	AUDI 1
5.15 pm - 6.00 pm	Awards presentation and Closing ceremony	

**DAY 3 (15<sup>th</sup> January 2026)**

<b>Time</b>	<b>Workshop</b>	<b>Venue</b>
9.00 am - 10:30 am	<b>DIET &amp; NUTRITION WORKSHOP</b> <i>Associate Professor Dr Snigdha Misra</i> <i>Associate Professor Dr Amutha Ramadas</i>	6209
	<b>GUT HEALTH &amp; METAGENOMIC ANALYSIS WORKSHOP</b> <i>Dr Polly Yap</i>	6210
10.30 am - 11.00 am	<b>Morning Break</b>	Outside respective venues
11.00 am - 12.30 pm	<b>DIET &amp; NUTRITION WORKSHOP</b> <i>Associate Professor Dr Snigdha Misra</i> <i>Associate Professor Dr Amutha Ramadas</i>	6209
	<b>GUT HEALTH &amp; METAGENOMIC ANALYSIS WORKSHOP</b> <i>Dr Polly Yap</i>	6210

**BIOGRAPHIES:**  
**PLENARY SPEAKERS**



**Associate Professor Dr Hazreen bin Abdul Majid**

*Reader in Dietetics,  
School of Health and Rehabilitation  
Sciences Ethics Lead,  
Health Sciences University,  
Bournemouth  
United Kingdom  
Email: HMajid@aecc.ac.uk or  
hazreen@um.edu.my*

Dr Hazreen Majid obtained his PhD from King's College London and completed a fellowship attachment at the Harvard T.H. Chan School of Public Health under the supervision of Professor Walter Willett's team. He has extensive clinical experience as a specialist dietitian, having practised in tertiary acute hospitals in Kuala Lumpur and London, as well as in community settings in Liverpool. Dr Majid is actively engaged in both clinical and public health research. He currently operates a gastrointestinal clinic that utilizes the FODMAP approach to manage patients with irritable bowel syndrome (IBS).

His research portfolio includes the development of collaborative partnerships at local, state, and national levels for cohort and community-based studies funded nationally and internationally. He serves as the principal investigator for the Malaysian Adolescent Cohort Study (MyHeARTs), which investigates cardiovascular risk factors among adolescents. Findings from this study revealed that rural adolescents consuming unhealthy diets, particularly girls, exhibited greater weight and body fat gain over time compared to boys. This work has fostered collaborations with multiple organisations, including the Ministry of Health, UNICEF Kuala Lumpur, and the University of Bristol. Supported by the Newton Fund (MRC-ASM), his team has conducted metabolite analyses related to cardiovascular risk and developed a feasibility intervention targeting school canteen operators, known as MyHeART-BeAT, for potential implementation in Malaysian secondary schools.

In addition, Dr Majid has contributed to projects examining sodium excretion among low-income urban populations and designing healthy lifestyle interventions for individuals at risk of non-communicable diseases. He is currently leading research on population-level salt reduction strategies and serves as co-investigator for studies on dietary intake among breast cancer survivors in Malaysia. His clinical nutrition research remains active, particularly in intensive care settings, with a focus on prebiotics and probiotics. Dr Majid has authored two books, several book chapters and was appointed as a Fellow of the Malaysian Dietitians' Association in 2022. He currently serves as Ethics Lead for the School of Health and Rehabilitation Sciences, Health Sciences University, with ongoing research centred on post-ICU nutritional rehabilitation. Additionally, he holds an honorary professorship at the University of Malaya.



### **Professor Dr Vimal Karani S**

*Professor of Nutrigenetics &  
Nutrigenomics  
University of Reading,  
United Kingdom  
Email: [v.karani@reading.ac.uk](mailto:v.karani@reading.ac.uk)*

Professor Vimal Karani is a Professor in Nutrigenetics & Nutrigenomics at the University of Reading, UK. He is a member of the Scientific Advisory Board of the Scottish Government's Environment, Natural Resources, and Agriculture (ENRA) and the Deputy Director of the Institute for Food, Nutrition, and Health at the University of Reading, UK. He joined the University of Reading after completing his postdoctoral training at the MRC Epidemiology Unit (Cambridge, UK) and holding a senior research fellowship at University College London (London, UK).

Professor Vimal Karani has published extensively in areas related to nutrigenetics and non-communicable diseases, with more than 125 peer-reviewed publications (including those in premier biomedical journals such as Nature Genetics, Lancet, BMJ, PLoS Medicine, and PLoS Genetics) and book chapters. He has received significant global media attention for his work on nutrition, lifestyle, and cardiometabolic diseases. He has received funds as a PI and Co-I from various funding bodies and, in the last ten years, the grants that he has been associated with are of the value ~£3.9 million. He won the UK Nutrition Society Silver Medal award for 2020 for his contributions to the global nutrition field and the UK-Malaysia Education Institutional Partnership Award 2023 for delivering a significant impact at the regional level and demonstrating substantial value creation to the education sector in Malaysia and the UK.



**Professor Dr Chan Yoke Mun**

*Professor,  
Faculty of Medicine and Health Sciences  
Universiti Putra Malaysia  
Email: [cym@upm.edu.my](mailto:cym@upm.edu.my)*

Professor Chan is a distinguished academician and dietitian at Universiti Putra Malaysia (UPM), as well as a leading expert in Dietetics and Gerontology. As the Program Head of Medical Gerontology at the Malaysian Research Institute on Ageing, UPM, she also spearheads the Research Centre of Excellence in Nutrition and Non-communicable Diseases (RCoE NNCD) at UPM. A passionate advocate for nutrition-focused research, Prof. Dr. Chan specializes in renal nutrition, geriatric nutrition, capacity building, health promotion, and digital innovation in the field of dietetics.

Her interdisciplinary research encompasses nutritional interventions, health promotion, epidemiology, and mobile health solutions, with the goal of enhancing patient and community self-efficacy. With an impressive portfolio, she has led 27 research projects and authored over 100 publications, including peer-reviewed journal articles, national guidelines, modules, and books. Recognized as a key opinion leader, she serves on expert panels for various national and international committees, contributing to the development of crucial policy documents. Her unwavering commitment to research excellence, innovation, and community empowerment underscores her mission to strengthen the scientific ecosystem in the region while shaping the future of nutrition and health sciences.



**Professor Dr Mahenderan  
Appukutty**

*Professor,  
Faculty of Sports Science and Recreation  
Universiti Teknologi MARA,  
Malaysia  
Email: mahen@uitm.edu.my*

Professor Mahenderan Appukutty is a professor in Sports and Exercise Nutrition and a former Head of the Centre of Postgraduate Studies, as well as Coordinator of the Sports and Wellness Clinic at the Faculty of Sports Science & Recreation, Universiti Teknologi MARA, Shah Alam, Selangor. He holds a PhD in Nutritional Sciences focusing on nutrition, immunity, and exercise performance from Universiti Kebangsaan Malaysia, an MSc in Sports Science from Universiti Sains Malaysia, and a BSc (Hons) in Nutrition and Community Health from Universiti Putra Malaysia.

Currently, he serves as the President of the Nutrition Society of Malaysia (NSM) and is a Fellow of the NSM (FNSM). He also serves as Vice President of the Malaysian Association of Sports Medicine (MASM) and Council member of the Malaysian Society of Body Composition (MSBC). He was also elected to the Executive Council of the Federation of Asian Nutrition Societies (FANS) from 2019 to 2023. In 2021, he was elected as the Scientific Advisor of the International Life Sciences Institute (ILSI) Southeast East Asia Region.

He also serves on the Clinical Care Committee for the World Obesity (WO) Federation and is a Fellow of the Malaysian Association for the Study of Obesity (MASO). His research interests and focus are on functional food and exercise science. He has chaired the Malaysian Vegetarian Dietary Guidelines (MoH) and contributed as a key writer for the Malaysian Dietary Guidelines. He has worked closely in the capacity building of Nutritionists in the region (Southeast Asia Nutrition Leadership Program, SEAMEO-RECFON, Indonesia) and served as Chairperson of the Malaysian Nutrition Leadership Program (MyNLP) and Southeast Asia Public Health Nutrition Leadership Programme (SEAPHN LP).

**BIOGRAPHIES:**

**SYMPOSIUM SPEAKERS**

## **SYMPOSIUM 1: BIOACTIVES & HEALTH**

### **Associate Professor Dr Wee Sim Choo**

*School of Science,  
Monash University Malaysia*

Associate Professor Wee Sim Choo completed a Bachelor of Science in Food Studies, majoring in Food Quality Management with a First-Class Honours, and a Master of Science in the field of Food Chemistry and Biochemistry from the Universiti Putra Malaysia. She then joined the Malaysian Palm Oil Board as a research officer before moving to the University of Otago in New Zealand to complete her Ph.D. in Food Science. She is currently working at the School of Science, Monash University Malaysia. She serves as an Associate Editor for Sustainable Food Processing (a specialty section of Frontiers in Sustainable Food Systems), an editorial board member of the International Journal of Food Science and Technology, and an editorial advisory board member of ACS Food Science and Technology. She is a member of the 2025-2030 Food Ingredients Expert Committee at the United States Pharmacopeia (USP) and has been on Stanford University's list of the World's Top 2% Scientists for 2024 and 2025.

### **Professor Dr Amin Ismail**

*Department of Nutrition, Faculty of Medicine and Health Sciences,  
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor.*

Dr. Amin bin Ismail is a Professor of Nutrition at the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM). He served as Director of the Centre for Quality Assurance (2017–2024) and has been a Senate member since 2016. A quality assurance expert for the Malaysian Qualifications Agency, he contributes to national nutrition research, policy, and food composition initiatives. A Registered Food Analyst, his research focuses on food chemistry, food composition databases, and health-promoting food components. He has published over 330 journal articles, achieving an h-index of 60 with more than 15,000 citations. Recognized as a World Top 2% Scientist (2022–2024), he is a Fellow of several professional societies. Dr. Amin received the Malaysia Research Star Award in 2018 for high-impact papers in agricultural science and in 2025 for outstanding research in phytochemistry. He has supervised over 45 postgraduate students, making a significant contribution to capacity building in nutrition science.

### **Dato' Professor Dr Abu Bakar Abdul Majeed**

*Faculty of Pharmacy, University Teknologi MARA (UiTM)  
Cawangan Selangor, Kampus Puncak Alam,*

Abu Bakar Abdul Majeed is a Registered Pharmacist with the Board of Pharmacy, Malaysia. He is in his third stint as the Board's Executive Council Member 2024-2027, after his previous appointments (1996-1999 and 2016-2022). Abu Bakar has a Bachelor of Pharmacy degree from El-Zagazig University, Egypt (1983), PhD in Neurophysiology from Sheffield University United Kingdom (1988), and a Master's in Business Administration (MBA) from Universiti Sains Malaysia, Penang (1996). In 1992-1993, Abu Bakar was a visiting scientist at Laboratory for Neural Information Processing, Brain Research Institute, RIKEN, Japan. In 2002 he became Dean of the Faculty of Pharmacy, Universiti Teknologi MARA (UiTM). Between 2009-2014 he was Assistant Vice-Chancellor (AVC) for Research and then AVC for Medical and Dental Campus. Abu Bakar became Rector of UiTM Selangor in 2017. He was made the Director, Research Management Centre, UiTM from 2021-2022. In August 2022, he returned as

Dean of the Faculty of Pharmacy, UiTM. He has also been a member of Board of Governors, IMU University & IMU College, Kuala Lumpur since 2019, and Board of Director, UiTM Holdings Sdn. Bhd. since 2024. At the national level, Abu Bakar is Head, Clinical and Health Cluster, Research Grant Scheme (RGS), and Member, Task Force for High Impact Centre of Excellence (HiCoE) of the Ministry of Higher Education (MOHE), Malaysia. He is also a founding member of National Bioethics Council, under Ministry of Science, Technology and Innovation, Malaysia, becoming its Chairman between 2016-2018. As an avid writer of science and technology, Abu Bakar has written and edited over 20 academic books more than 100 research articles in respectable journals. His research interests are Alzheimer's disease, drug delivery to the brain and bioethics. Abu Bakar is a winner of the 2023 Helen-Clark-JoPPP Award for Pharmaceutical Policy and Practice Research based on "the scientific merit of his work, as well as the impact of his work on patients, decision-makers and governments".

### **Dr Usha Sundralingam**

*School of Pharmacy,  
Monash University Malaysia.*

Dr Usha Sundralingam is a lecturer and researcher at the School of Pharmacy, Monash University Malaysia, whose work focuses on the interface of polyphenol science, the gut microbiome, and human health. Her research centres on ellagitannins and their microbiome-derived metabolites, particularly urolithins, exploring how dietary substrates, microbial ecology, and advanced delivery technologies shape their bioactivity and therapeutic potential. Her recent work highlights the valorization of local fruit by-products, such as ellagitannin-rich rambutan rind, as sustainable prebiotic substrates. It integrates phytochemical characterization, in vitro fermentation models, and metagenomic insights to better understand urolithin biosynthesis. She further employs nanostructured lipid carriers and nano-phytosomal systems to enhance the stability, absorption, and targeted delivery of these natural bio-actives. An award-winning educator and passionate advocate for translational science, Dr Usha's research sits at the intersection of food-as-medicine, natural therapeutics, and precision nutrition, with the goal of advancing accessible, microbiome-informed strategies to support human health.

## **SYMPOSIUM 2: NUTRITION & HEALTH**

### **Assoc Prof Snigdha Misra**

*Jeffrey Cheah School of Medicine and Health Sciences  
Monash University Malaysia*

Associate Professor Dr. Snigdha Misra is an academic and researcher in Human Nutrition at the Jeffrey Cheah School of Medical and Health Sciences, Monash University Malaysia. She is a Fellow of the Nutrition Society of Malaysia and has extensive experience in public health nutrition, with research interests spanning maternal and child nutrition, micronutrient deficiencies, gestational diabetes, sustainable diets, geriatric nutrition, and cardiometabolic health. Dr. Misra has contributed to curriculum development, community-based nutrition programmes, and multidisciplinary research projects across Malaysia and the Asia-Pacific region. She actively supervises postgraduate students, serves as an external examiner, and is committed to translating research into policy-relevant and community-focused nutrition solutions.

### **Dr Lim See Meng**

*Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti  
Kebangsaan Malaysia, 50300 Kuala Lumpur, Malaysia*

Dr Lim See Meng is a Senior Lecturer in the Nutritional Sciences Programme and the Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM). His research encompasses laboratory and preclinical studies, as well as human studies, with a primary focus on food sustainability and functional foods. He currently serves as the Assistant Honorary Secretary of the Malaysian Association for the Study of Obesity (MASO) and is a lifetime member of both MASO and the Nutrition Society of Malaysia (NSM).

### **Associate Professor Dr Amutha Ramadas**

*Jeffrey Cheah School of Medicine and Health Sciences,  
Monash University Malaysia*

Dr Amutha Ramadas is a Registered Nutritionist and Associate Professor at Monash University Malaysia, specialising in nutritional epidemiology, clinical and community nutrition, digital health interventions, and biostatistics. Her research focuses on the prevention and management of nutrition-related non-communicable diseases, including diabetes, obesity, metabolic syndrome, and cardiovascular diseases, with particular emphasis on behaviour change, digital, and peer-led interventions. She has led community-based projects targeting vulnerable and low-income populations and has published widely in indexed journals. Dr Amutha collaborates with government agencies, NGOs, and healthcare providers and has contributed to national nutrition policy through roles with the Ministry of Health technical working committees.

**Dr Adam Feizrel Linoby (UTM)**

*Faculty of Sports Science and Recreation,  
Universiti Teknologi MARA*

Adam Linoby is a Senior Lecturer at Universiti Teknologi MARA (UiTM), Negeri Sembilan Branch, Malaysia, specializing in Applied Human Physiology and Emerging Health Technologies. Adam Linoby expertise encompasses health and exercise science, high-performance nutritional aids, emerging health technologies, and oxidative stress. Adam has made contributions to the study of the biosignaling properties of dietary gasotransmitter donors and has led numerous technology-based projects. His initiatives include the development of innovative exercise intensity monitoring systems and the creation of more than thirteen mobile applications. His pioneering work has earned him multiple accolades, including patents and 61 gold medals and special awards both nationally and internationally, for inventions such as the color-coded heart rate monitoring system, virtual health coach and exercise trainers. Adam has published in Scopus and Web of Science-indexed journals, advancing knowledge in sports technology, cardiovascular health, and human performance. In addition to his research endeavors, he is passionate about leveraging artificial intelligence for academic purposes. As the leader of a social networking group with more than 1,000 members, Adam has been invited to speak at various workshops focused on utilizing AI in academic work. Furthermore, he has founded startup companies that employ AI to enhance health and academic outcomes. Adam Linoby's various contributions to both academia and technology underscore his commitment to advancing academics and health through innovative research and practical applications.

## **SYMPOSIUM 3: IMMUNITY & MICROBIOME**

### **Associate Professor Dr Chong Chun Wie**

*(FUTURE) Monash Malaysia Microbiome Research Centre,  
School of Pharmacy  
Monash University Malaysia*

Dr. Chong Chun Wie is a leading figure in gut microbiome science in Malaysia. His work bridges the fields of microbial ecology, public health, and digital technology. He is the Director of the (FUTURE) Monash Microbiome Research Centre at Monash University Malaysia. In collaboration with the ROME foundation, the centre is embarking on the quest to collect the world's largest microbiome dataset for the disorder of gut-brain interaction. Dr Chong also co-led the 1000MYMicrobiome Project, a pioneering initiative to map the gut health of Malaysia's multi-ethnic population. His significant research impact is demonstrated through his leadership of large-scale, multidisciplinary studies on the gut-brain axis and his successful acquisition of competitive funding from both national bodies and global industry partners, including DSM firmenich and Amway. Through his research, which spans neurodegenerative disorders, nutrition, and metabolic diseases, he has published over 100 research articles. He is also a dedicated mentor, having supervised over 20 postgraduate students to completion.

### **Professor Dr Hooi Ling Foo**

*Department of Bioprocess Technology,  
Faculty of Biotechnology and Biomolecular Sciences,  
Universiti Putra Malaysia  
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Professor Dr. Foo Hooi Ling is the head of the Institute-Driven Research Program of Lactic Acid Bacteria (LAB) Biota Technology at the Institute of Bioscience. She has primary research interest in Industrial Biotechnology, which encompasses: A) Production, characterisation and optimisation of various preparations of probiotics, postbiotic metabolites (PM) and paraprobiotics derived from LAB and their applications as health supplements, B) Production, optimisation and characterisation of various preparations of postbiotic metabolites produced by LAB and their applications in cancer prevention and treatments, C) Production, optimisation, purification, characterisation and applications of extracellular hydrolytic enzymes produced by LAB, D) Applications of bacterial cultures as a biotransformation agent, E) Bio-transformation of agro wastes and value-added products mediated by bacterial cultures, F) Optimisation of culture condition for the production of bioactive peptides, enzymes and valuable biological compounds. With her extensive experience in commercialisation, she has been appointed as an executive council member for the Malaysia Laboratories for Academia-Business Collaboration (MyLAB), Programme by the Ministry of Higher Education of Malaysia. With the long-standing collaboration between Okayama University of Japan and Universiti Putra Malaysia, she has been appointed as the coordinator for the Okayama University Japan Education Information Centre (OJEIC) at the Faculty of Biotechnology and Biomolecular Sciences. She is also an active member of various scientific societies. She has been the elected Vice President of the Asian Federation of Societies for Lactic Acid Bacteria (AFSLAB) since 2019. She has also been the elected President of the Malaysian Society for Lactic Acid Bacteria (MSLAB) since 2021. Additionally, she has a long-standing record of contributions with the Malaysian Society for Microbiology (MSM). She served as Honorary Secretary from 2004 to 2006, Honorary Treasurer from 2006 to 2015, Vice President from 2015 to 2017, and Honorary Auditor from 2017 to 2019.

## **Dr Polly Yap**

*Jeffrey Cheah School of Medicine and Health Sciences  
Monash University Malaysia*

Dr Polly is currently a Lecturer at the Jeffrey Cheah School of Medicine & Health Sciences, Monash University Malaysia. She combines culture-based and advanced sequencing techniques to enhance pathogen characterisation and surveillance - critical first steps in preventing disease transmission. She is also the Project Manager of the 1000MYMicrobiome study, which aims to build a reference database of 1,000 healthy Malaysian microbiomes.

**ABSTRACTS:**

**PLENARY SPEAKERS**

## **Associate Professor Dr Hazreen bin Abdul Majid**

*Reader in Dietetics,  
School of Health and Rehabilitation Sciences Ethics Lead,  
Health Sciences University, Bournemouth  
United Kingdom  
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### **Level up your health: Addressing Adolescent Nutrition Gaps**

Unhealthy dietary patterns and insufficient physical activity are major contributors to the rising prevalence of obesity among Malaysian adolescents. According to recent NHMS data, obesity among individuals under 18 increased from 12.9% in 2015 to 14.3% in 2022, reflecting a consistent upward trend. A longitudinal cohort study was conducted among 13-year-old students from 15 public secondary schools in Kuala Lumpur, Selangor, and Perak. The study aimed to assess how lifestyle factors during early adolescence influence cardiovascular, pulmonary, and bone health in early adulthood. Participants were selected using stratified sampling. Baseline data included socio-economic status, lifestyle behaviours (smoking, physical activity, fitness), seven-day diet histories, anthropometric measurements, blood pressure, handgrip strength, and bone mineral density. Blood samples were analysed for fasting glucose, lipid profiles, renal and bone markers, and serum vitamin D. Obese rural adolescents consumed significantly more energy and sugar ( $1987.6 \pm 374.0$  kcal/day;  $48.9 \pm 23.0$  g/day;  $p < 0.001$ ). Physical activity declined across all groups, with a marked reduction among rural girls ( $p = 0.006$ ). Female adolescents exhibited increased body fat and higher cholesterol levels, while physically active students achieved better academic performance in core subjects. Longitudinally, rates of overweight and obesity, suboptimal dietary intake, and iron deficiency increased. Estimated glomerular filtration rate (eGFR) declined from 6.1% (2012) to 40.2% (2016), with greater reductions among males, rural students, and those with morbid obesity. Protein intake appeared to moderate the decline in eGFR. Physical activity has a positive influence on academic achievement, while early decline in kidney function signals emerging risks of non-communicable diseases. Comprehensive, structured interventions and strengthened policies are crucial for promoting healthy lifestyles and preventing chronic conditions among adolescents.

## **Professor Dr Vimal Karani S**

*Professor of Nutrigenetics & Nutrigenomics  
University of Reading, UK  
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### **Precision Nutrition & You: Global Nutrigenomic Approaches to Disease and Health**

The ability of Nutrigenetics to determine what nutrients will produce the desired impact on metabolic balance (as influenced by individual genetic make-up) is at the core of Precision Nutrition. Nutrigenetics has highlighted the complexity of gene-diet interactions, but it offers opportunities to re-evaluate the criteria used to set dietary guidelines and the contribution of genetic variation to optimal nutrition for individuals from different ethnic groups. In line with this, a large-scale collaborative project called GeNuIne (Gene-Nutrient Interactions) Collaboration has been initiated, aiming to develop precision nutrition strategies based on evidence from nutrigenetics, nutrigenomics, metabolomics, epigenetics, and gut microbiomics, using cohorts from various ethnic groups. If the interactions between genetic variations and nutritional requirements are better understood in various ethnic groups, dietary recommendations could be personalized according to genotype, ultimately promoting health and reducing disease risk.

## **Professor Dr Chan Yoke Mun**

*Professor, Faculty of Medicine and Health Sciences  
Universiti Putra Malaysia  
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### **Lifestyle intervention in the prevention & management of sarcopenia: Translating science into practice**

Sarcopenia, characterised by age-related loss of muscle mass and muscle strength, is increasingly recognised as a major contributor to frailty, disability, and reduced quality of life in older adults. While advances in diagnostic frameworks, such as the Asian Working Group for Sarcopenia (AWGS) 2025 and recent global conceptual consensus, have improved recognition of the condition, effective translation of scientific evidence into practical lifestyle strategies remains a critical challenge. This presentation will synthesize current evidence on lifestyle interventions for the prevention and management of sarcopenia, with a particular emphasis on protein- and nutrition-based approaches. Drawing on Asian population data and real-world clinical insights, this session aims to bridge the gap between research and practice, providing clinicians, dietitians, and allied health professionals with actionable strategies to implement lifestyle interventions that meaningfully preserve muscle health across ageing populations.

## **Professor Dr Mahenderan Appukutty**

*Professor, Faculty of Sports Science & Recreation,  
Universiti Teknologi MARA, Shah Alam, Selangor Malaysia  
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### **Functional Foods In Sports**

The concept of food as medicine is increasingly relevant in sport, where targeted dietary strategies are central to maintaining health, supporting training demands, and optimising recovery. Foods that provide adequate macronutrients are essential for meeting energy requirements, regulating substrate metabolism, and facilitating tissue repair. Micronutrients and naturally occurring bioactive compounds play a significant role in influencing immune competence, oxidative balance, and musculoskeletal function. Food-based interventions provide a sustainable and clinically meaningful approach to enhancing athletic performance. The expanding availability of sports-related functional foods has outpaced the strength of evidence supporting many product claims, with variable ingredient composition, limited mechanistic validation, and uncertainty regarding bioavailability. The presence of novel compounds or concentrated extracts raises concerns related to product safety and the potential for unintentional anti-doping violations. Although advances in regulation and manufacturing quality have reduced some risks, inconsistencies remain between scientific evidence, commercial innovation, and applied practice in high-performance settings. This plenary presentation will examine how functional foods can be positioned within a credible framework of food as medicine for sports. Key research priorities will be discussed, including dose optimisation, timing and periodisation, inter-individual variability, and the application of systems biology and omics technologies. Emphasis will be placed on translational research that connects mechanistic insights with meaningful health, performance, and recovery outcomes, supporting safer and more effective food-first strategies for athletes.

**ABSTRACTS:**

**SYMPOSIUM SPEAKERS**

## **ABSTRACT: SYMPOSIUM SPEAKERS**

### **Associate Professor Dr Wee Sim Choo**

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### **Unlocking the Bioactive Potential of Natural Pigments and Functional Foods**

Functional foods and their bioactive components are reshaping the landscape of preventive health and nutrition science. Advances in extraction technologies and analytical methods have opened new opportunities to harness phytochemicals and naturally occurring pigments as agents of health promotion. A key component of this work involves pioneering investigations into betalains, a group of natural-coloured pigments that demonstrate diverse and significant bioactivities. These include antibacterial, antibiofilm, and antiviral properties, as well as anti-amyloid  $\beta$  aggregation activity for Alzheimer's disease, highlighting their potential as functional ingredients for enhancing health and supporting disease prevention. Through the integration of analytical techniques, biological assays, and application in various food systems, this work contributes to advancing the concept of food as medicine, providing scientific evidence to support the development of next-generation functional foods and nutraceuticals.

### **Professor Dr Amin Ismail**

*Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor.  
Email: aminis@upm.edu.my*

### **Unlocking Tropical Fruits Bioactives for Health and Sustainable Diets**

Bioactive compounds derived from tropical fruits have shown strong potential in preventing metabolic disorders and chronic diseases. Cocoa (*Theobroma cacao*) is rich in flavanol monomers and procyanidins with antioxidant, anti-inflammatory, anti-diabetic, and anti-obesity effects. Human and experimental studies suggest that flavanol-rich cocoa can improve metabolic syndrome outcomes by reducing glycaemic response, blood pressure, and lipid profiles. Tropical underutilized fruits, including *Mangifera pajang*, *Canarium odontophyllum*, *Momordica cochinchinensis* (gac fruit), and *Lepisanthes fruticosa*, are rich in bioactive compounds that exhibit antioxidant, anti-adipogenic, anti-proliferative, and anti-angiogenic activities. The health-promoting properties of these bioactive compounds underscore the potential of tropical fruits as functional foods that support human health and sustainable diets.

### **Dato' Professor Dr Abu Bakar Abdul Majeed**

*Dean, Faculty of Pharmacy, University Teknologi MARA (UiTM) Cawangan Selangor, Kampus Puncak Alam,  
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### **Modulation of the microbiota-gut-brain axis by bioactives improves brain health**

According to the World Health Organization, brain health is the desired state of brain functioning across cognitive, sensory, social-emotional, behavioural, and motor domains. Cognitive frailty (CF) is a serious brain health condition that affects older adults, characterized by both physical frailty (weakness, slow walking, low activity) and mild cognitive impairment (memory/thinking decline, but not dementia). It highlights the deep connection between the body, particularly the gut, and the brain. Aging seems to induce the 'leaky gut' syndrome with presentations of low-grade chronic inflammation (inflammaging), impaired immune response (immunosenescence), and reduced gut microbiota diversity (dysbiosis). Changes in gut microbes and immune function contribute to the development of CF. We investigated the relationship between CF parameters, gut

microbiota, intestinal permeability, and intestinal inflammatory markers in older adults (aged 65 years and above) recruited under the Transforming Cognitive Frailty to Later Life Self-Sufficiency (AGELESS) Project. The present study also assessed the impact of a multidomain intervention, including food bioactives, on shaping gut microbiota to improve CF. Stool samples from 137 volunteers were collected, homogenized, extracted for DNA, and the 16S rRNA gene sequenced (V3-V4 regions). We found that ageing promoted pathobionts while reducing protective bacteria in the gut. There were also stronger correlations of the gut microbiota, intestinal permeability, and intestinal inflammatory markers with CF than with chronological age. Our multidomain intervention demonstrated an increase in short-chain fatty acid (SCFA)-producing bacteria in the gut of older adults with CF, which may have conferred protection to the intestinal epithelial barrier (IEB). The gut microbiota could be potentially modified in favour of the desired brain health. Dietary and other microbiome-based strategies (probiotics) may be useful for microbial restoration of lost strains in older adults with CF.

### **Dr Usha Sundralingam**

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### **Ellagitannins as Nutritional Bio-actives: Bridging Polyphenols and Human Health**

Ellagitannins, high-molecular-weight polyphenols found in fruits such as pomegranate, raspberries, and locally abundant rambutan, represent a unique class of nutritional bio-actives with growing relevance to human health. Once ingested, these compounds rely on the gut microbiome for conversion into urolithins, postbiotic metabolites with potent antioxidant, anti-inflammatory, and mitochondrial-enhancing properties. However, urolithin production varies widely between individuals due to differences in microbial composition and functional capacity, presenting a key challenge to realising their full therapeutic potential. This presentation examines the biochemical and microbiome-mediated pathways that connect dietary ellagitannins to systemic health outcomes, including benefits for skin health, ageing, inflammation, and metabolic resilience. Drawing on recent work with Malaysian fruit by-products, particularly ellagitannin-rich rambutan rind, we explore how substrate selection, phytochemical characteristics, and microbial ecology shape downstream metabolite formation. Metagenomic insights further reveal that urolithin biosynthesis is governed not by a single organism, but by distributed metabolic networks with shared functional genes, underscoring the importance of a prebiotic-to-postbiotic systems perspective. Integrating natural products chemistry, microbiome science, and advanced delivery technologies—such as nanostructured lipid carriers (NLCs) and nano-phytosomal systems, the talk highlights strategies to enhance the stability, absorption, and bioavailability of ellagitannin-derived metabolites like urolithin A. By bridging fundamental polyphenol science with translational research and sustainable substrate utilisation, this session charts the future of ellagitannins in food-as-medicine, precision nutrition, and integrative healthcare.

## **Associate Professor Dr Snigdha Misra**

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### **Transforming Diets for Sustainability: Evidence, Impacts, and Opportunities in Plant-Based Eating**

Food systems play a pivotal role in shaping both human health and planetary sustainability. This presentation examines the growing evidence on plant-based eating as a strategy to address diet-related non-communicable diseases while reducing environmental pressures. Drawing on global assessments and regional perspectives, it highlights the impacts of dietary patterns on greenhouse gas emissions, land and water use, and population health outcomes. The session further explores nutritional adequacy and institutional opportunities that support sustainable dietary transitions. Framed within the “food as medicine” paradigm, the presentation emphasises plant-based diets as a viable, evidence-based pathway toward healthier populations and more resilient food systems.

## **Dr Lim See Meng**

*Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia, 50300 Kuala Lumpur, Malaysia  
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### **Edible Insects as a Sustainable Food Source for Malaysians**

While entomophagy is practised globally as a sustainable nutritional source, its acceptance in Malaysia beyond specific cultural contexts remains poorly understood. Our study found generally low acceptance, with fewer than 10% of young Malaysian adults willing to consume insects and only 6.5% prepared to incorporate them into their daily diets. Additionally, our preclinical findings revealed that a cricket-based diet provided no significant advantage over casein in enhancing growth and body composition. Overall, acceptance of entomophagy in Malaysia remains limited. These findings highlight the need for targeted interventions to address consumer perceptions and for further research to establish any unique health benefits to promote entomophagy in Malaysia.

## **Associate Professor Dr Amutha Ramadas**

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Monash University Malaysia  
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### **Digital Nutrition for Better Health: Insights from Behaviour Change and Peer-Support Research**

This talk synthesises evidence from behavioural science and applied digital nutrition research to inform scalable health interventions. Drawing on findings from a prior meta-analysis of digital and behaviour change-based nutrition interventions, it highlights key mechanisms underpinning effectiveness, including self-regulation, social support, and contextual tailoring. These insights are illustrated through MYCardioPEER, a peer-led digital cardiovascular health programme implemented in Malaysian communities. The talk then introduces an upcoming extension of the PERSUADE intervention for healthcare professionals, which integrates digital components with peer support to reduce the risk of developing metabolic syndrome. Collectively, the talk demonstrates how theory-driven digital nutrition strategies can be translated across community and clinical contexts to improve health outcomes.

## **Dr Adam Feizrel Linoby**

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*Universiti Teknologi MARA Cawangan Negeri Sembilan, Kampus Seremban, Negeri Sembilan, Malaysia*

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### **AI-Integrated Personalized Nutrition: Current Applications, Clinical Outcomes, and Implementation Challenges**

Artificial intelligence (AI) is revolutionizing personalized nutrition by transforming how we assess dietary needs, predict metabolic responses, and deliver individualized interventions at scale. This presentation examines the current state of AI-integrated personalized nutrition, demonstrating how machine learning, digital health technologies, and precision medicine converge to create adaptive dietary strategies that respond to individual biology, behaviour, and context. Current applications show that AI models effectively integrate multiomics data, including genomics, metabolomics, and microbiome profiles, with real-time behavioural information from wearable devices and mobile applications to generate clinically meaningful dietary recommendations. These systems achieve measurable outcomes in managing obesity, diabetes, and cardiovascular diseases, where digital twins and health knowledge graphs support dynamic adjustments to interventions. Our recent validation studies demonstrate that structured AI frameworks, utilizing expert consensus criteria and large language models, can deliver superior weight loss outcomes compared to conventional digital approaches, highlighting the importance of systematic prompt engineering in clinical applications. Findings indicate that AI-driven platforms outperform traditional dietary assessment methods by reducing errors common in self-reporting and providing precise nutrient analysis through visual recognition and deep learning approaches. However, critical challenges persist. Algorithmic bias threatens equitable access when training datasets underrepresent diverse populations, while limited generalizability across ethnic groups and geographic contexts constrains widespread clinical deployment. Data privacy concerns and the lack of explainable AI frameworks create barriers to institutional adoption and clinician trust. Moving forward, addressing these challenges requires collaboration between technology developers, healthcare professionals, policymakers, and researchers to transform AI-supported personalized nutrition into a reliable, clinically applicable practice that makes effective nutrition interventions accessible to global populations.

## **Associate Professor Dr Chong Chun Wie**

*(FUTURE) Monash Malaysia Microbiome Research Centre,*

*School of Pharmacy*

*Monash University Malaysia*

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### **The association of gut microbiota, ethnicity and obesity**

Malaysia's multi-ethnic population exhibits distinct lifestyles and dietary patterns that may influence the risk of non-communicable diseases, including obesity. Our studies identified ethnicity as a major confounder of gut microbial composition. Interestingly, our data also suggested obesogenic taxa are ethnicity-specific, alongside lower salivary amylase and higher calprotectin levels in overweight and obese individuals. Microbial metabolic simulations revealed fibre-driven, ethnicity-dependent flux differences. An association between ethnicity-related dietary patterns and obesity, as well as microbiota, was observed, highlighting the importance of specific foods and dietary practices. Further studies are needed to establish causal links between ethnic microbiome profiles, diet, and metabolic health outcomes.

## **Professor Dr Hooi Ling Foo**

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Faculty of Biotechnology and Biomolecular Sciences,  
Universiti Putra Malaysia  
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### **Next Generation Probiotics**

Lactic acid bacteria (LAB) play an essential role in the food, agricultural, and health supplement industries. The LAB live-cell preparations are well accepted as probiotic health supplements and have been extensively reported for various health-promoting effects. However, the research focus has been on developing prebiotics, paraprobiotics, postbiotics and cytobiotics over the past two decades to address the challenges associated with viable probiotic preparations and applications. We have introduced a new concept of probiotic preparations derived from LAB isolated from Malaysian foods in 2003. I will share the myths and the latest prospects of postbiotics and paraprobiotics preparations, applications, and innovations - the paradigm shifts of probiotics in my presentation.

## **Dr Polly Yap**

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### **Personalised nutrition and microbiome diversity**

Diet plays a central role in shaping health by modulating the gut microbiota. While many studies have examined the effects of individual nutrients, a clear need remains for research that considers overall dietary patterns. Such insights are crucial for understanding how combined food intake affects the gut microbiota and for translating this knowledge into practical nutritional recommendations that cater to diverse dietary needs and preferences. To address this knowledge gap, we conducted a cross-sectional analysis integrating gut microbiota profiles and dietary screener data from adults enrolled in the 1000MYMicrobiome Project. We focused on a subset of participants with habitual sago consumption, where sago serves as a traditional dietary staple, to examine associations with gut microbiota composition, microbial functional potential, and host-derived urinary metabolites. We identified several bacterial taxa that were enriched among individuals who consumed sago daily.

**ABSTRACTS:**

**YOUNG INVESTIGATOR COMPETITION**

## **Consumption of Wild and Underutilized Foods and Diet Diversity: A Pilot Survey in the Philippines**

**Javier CA, <sup>1,3</sup> \* Muir G, <sup>2</sup>, Goyena EA<sup>1</sup>, Desnacido JP<sup>1</sup>, Maniego MLV<sup>1</sup>, Ducay AJD<sup>1</sup>, Escote JZE<sup>1</sup>, Angeles-Agdeppa I<sup>1</sup>, Pastores MC<sup>2</sup>**

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Globally, about 29.6% of people were moderately to severely food insecure according to the Food and Agriculture Organization of the United Nations. Identifying alternative sources of food with low input requirements, such as underutilized biodiverse foods, is crucial for addressing hunger and food insecurity. Wildly gathered foods, such as fruits, vegetables, roots and tubers, mushrooms, nuts, insects, and bushmeats, are sources of supplementary foods in times of food insecurity, as well as a source of nutrition; however, data is limited in terms of use, availability, and consumption. This study aimed to assess the consumption of wild foods and neglected and underutilized species (NUS) in selected areas in the Philippines and their correlation to diet diversity. A total of five provinces and one highly urbanized city were selected, which were part of the 2023 National Nutrition Survey (NNS). A Household Food Frequency Questionnaire on Wild Foods was developed and used in the pilot survey, along with a One-day Household Food Weighing and an Individual 24-hour Food Recall. A total of 941 households were covered in the pilot survey areas. At the household level, vegetables were the most consumed wild foods and NUS, with 77.6% of households consuming and a mean intake of 298.5 grams per day. At the individual level, Saluyot (Jute) leaves, Bamboo shoots, and Alugbati (Malabar nightshade) leaves were the most consumed food items. The majority (58.1%) of respondents have a medium diet diversity score (DDS), consuming 4-5 food groups per day. The total wild food count had a weak but positive correlation with DDS ( $r = 0.1815$ ,  $p < 0.001$ ). This study demonstrated that consuming wild foods and NUS can enhance the dietary diversity of the population, thereby encouraging support for the sustainable consumption of biodiverse foods gathered from the natural environment to improve nutrition.

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## **Nature's Antidote: Evaluating Detoxifying Mineral Ratios (Zn:Cd and Se:As) in Sri Lankan Rice Varieties Against Dietary Heavy Metal Safety Benchmarks**

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*<sup>2</sup>Sabaragamuwa University, Sri Lanka;*

*<sup>3</sup>International Medical University, Malaysia*

Health risk assessments of dietary heavy metal exposure often disregard essential element: heavy metal ratios (e.g., Zn:Cd, Se:As) that capture protective interactions relevant to food safety. This study proposes a novel 'detoxifying ratio' framework evaluating nutritional safety in commonly consumed Sri Lankan rice varieties. Benchmark ratios for Zn:Cd and Se:As were developed using Recommended Daily Allowances (RDA) for Zn, Se and European Food Safety Authority Tolerable Daily Intakes (TDI) for Cd, As in a 70 kg adult. Rice from widely consumed Sri Lankan varieties was analyzed for Cd, As, Zn, and Se using ICP-MS and compared with the recommended daily intake of cooked rice for Sri Lankan adults (682.5 g/day). Zn:Cd  $\geq$  256.01:1 and Se:As  $\geq$  2.76:1 were classified as 'detoxifying ratios'. Mean  $\pm$  SD Zn:Cd and Se:As were 1486.31  $\pm$  2012.08 and 1.14  $\pm$  0.98, respectively. 79.17% of samples exhibited detoxifying Zn:Cd ratios. 87.5% showed non-detoxifying Se:As ratios due to low Se levels. Detoxifying ratios for Zn:Cd decreased in the order: improved > traditional/heirloom > imported. The Se:As ratio varied significantly across the three rice varieties (traditional/heirloom > improved > imported). Within improved varieties, Samba rice exhibited superior detoxifying ratios compared to Nadu (U,  $p > 0.05$ ) and Kekulu (U,  $p < 0.05$ ). White rice demonstrated higher Zn:Cd ratios than red rice (U,  $p > 0.05$ ), whereas red rice showed higher Se:As ratios (U,  $p > 0.05$ ). Parboiled rice exhibited significantly higher Se:As ratios than non-parboiled rice (U,  $p < 0.001$ ). This study demonstrates that 79.17% of Sri Lankan rice varieties possess naturally occurring protection against Cd toxicity through high Zn:Cd ratios, highest being Samba. Red, parboiled, and traditional/heirloom varieties achieve more favourable Se:As ratios, indicating its capacity for As mitigation. The superiority of locally grown varieties over imported Basmati underscores the importance of indigenous agrobiodiversity. The detoxifying elemental ratios found in several varieties of Sri Lankan rice indicate that they could be marketed as a viable food-based strategy to mitigate dietary heavy metal exposure.

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## **Dietary Factors and Associated Health Effects among Patients with Vitamin D Deficiency**

**Mehjabin M<sup>1\*</sup>, Shirin M<sup>2</sup>**

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*<sup>2</sup>Institute of Public Health Nutrition, Mohakhali, Dhaka, Bangladesh.*

Vitamin D deficiency is prevalent among both men and women, often left untreated, particularly in developing countries. Vitamin D deficiency and the associated health problems can be reduced if dietary intake is properly maintained. The study objective is to understand the dietary habits and the problems faced by patients in a hospital in Dhaka due to Vitamin D deficiency. One hundred thirty-three patients were randomly selected, and their vitamin D levels were collected from their medical records. Other data were collected from a previously set questionnaire. There were 56 men and 77 women among the patients. In this study, 31.6% of the vitamin D-deficient individuals were obese. 17 out of 133 people still had severe (level < 12mg/ml) vitamin D deficiency even after getting treatment and needed more. The number of eggs and milk intake among the participants was satisfactory, but milk intake was low among them. Around 66.1% of the patients were taking vitamin D supplements at the time of the study. However, there is no significant association between dietary intake and Vitamin D deficiency. However, the status of vitamin D is associated with chronic health problems, such as hypertension and diabetes mellitus, as well as with the intake of vitamin D and calcium supplements (p-value < 0.05). Bone pain, joint pain, hair fall, anxiety, depression, etc., were some of the problems that the patients faced before receiving treatment.

**Keywords:** Vitamin D, Deficiency, Dietary habits, Supplements, Health problems.

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## Vitamin E-Derived Tocotrienols Demonstrate Potent Anticancer Activity in 2D, 3D, and Patient-Derived TNBC Models

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Triple-negative breast cancer (TNBC) remains a highly aggressive subtype due to the lack of hormone receptors and HER2 expression, leaving patients with few targeted treatment options and generally poor outcomes. Tocotrienol-rich fraction (TRF), a derivative of vitamin E, has shown anticancer potential; however, its activity in advanced preclinical models, particularly three-dimensional (3D) cultures and patient-derived organoids, has not been thoroughly explored. We evaluated the cytotoxic and molecular effects of TRF in TNBC cell lines (MDA-MB-231 and MDA-MB-468) cultured in traditional 2D monolayers, 3D spheroids, and patient-derived organoids. Cultures were treated with TRF (0–100 µg/mL) for up to 72 hours (2D/spheroids) or six days (organoids). Viability assays were performed, and proteomic profiling using LC-MS/MS was conducted on MDA-MB-468 2D and 3D cultures, followed by bioinformatic pathway analyses. The differently regulated proteins (DEPs) were further evaluated for clinical significance using Kaplan–Meier survival and Cox regression analysis. TRF significantly inhibited proliferation in 2D cultures ( $IC_{50} \approx 18\text{--}24$  µg/mL) and reduced spheroid viability at higher concentrations ( $\approx 39\text{--}49$  µg/mL), reflecting the greater treatment resistance typically observed in 3D systems. Microscopy demonstrated clear spheroid breakdown and loss of structure. Patient-derived organoids displayed notable sensitivity, with  $IC_{50}$  values falling to 8 µg/mL by day 4 and 3.23 µg/mL by day 6. Proteomic analysis revealed distinct model-dependent responses: 2D cultures exhibited reduced protein synthesis and stress-response pathways, whereas spheroids displayed suppression of mitochondrial import, cytoskeletal dynamics, and the unfolded protein response. TRF also downregulated RHO GTPase signalling, a pathway central to invasion and metastasis. Several proteins suppressed by TRF (including CALR, VDAC1, and RCN1) were associated with poor prognosis in breast cancer datasets. TRF demonstrated robust anticancer activity across multiple TNBC models, highlighting its potential value as a candidate for preclinical evaluation in translational breast cancer research.

**Keywords:** Triple-negative breast cancer (TNBC); Tocotrienol-rich fraction (TRF); 3D spheroids; Patient-derived organoids; Proteomics

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**ABSTRACTS:**

**POTPOURRI**

## **The Relationships of Health Literacy and Health Promoting Behaviours on Healthy Cooking Behaviour Among Food Handlers**

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The shift from home-cooked meals to dining out has contributed significantly to Malaysia's escalating burden of non-communicable diseases. Food handlers play a crucial role in determining the nutritional quality of meals consumed outside the home. While health literacy and health-promoting behaviours are recognized as essential for fostering healthy workplace practices, their influence on healthy cooking behaviours among food handlers in Malaysia remains underexplored. This study examines the relationship between health literacy, health-promoting behaviours, and healthy cooking practices among Malaysian food handlers, including the mediating role of health-promoting behaviours. The study involved a cross-sectional study involving 200 food handlers working at 51 food premises in Kota Marudu, Sabah. Those who are 18 years and above, Malaysian and proficient in Malay were included. Those who work in fast food chains, bakeries, and are not involved in the cooking process were not included. Simple random and convenience sampling were applied, and validated questionnaires on health literacy (HLSF-12), health-promoting behaviours (HPLP-II), healthy cooking behaviour (HCI-M), together with sociodemographic characteristics, were utilized. Descriptive analysis, univariable and multivariable linear regression, and mediation analysis were employed in this study. The main results showed a significant positive association between health literacy and health-promoting behaviours ( $p < 0.001$ ) and between health-promoting behaviours and healthy cooking behaviours ( $p < 0.05$ ). No significant association was found between health literacy and healthy cooking behaviour ( $p > 0.05$ ). However, the indirect effect of health literacy on healthy cooking behaviour through health-promoting behaviours was not significant ( $p = 0.096$ ), indicating that no mediation occurred. In conclusion, food handlers represent a crucial workforce capable of shaping healthier food environments. These findings highlight the need for tailored interventions to enhance health literacy, health-promoting behaviours, and healthy cooking behaviour among food handlers. Future longitudinal research is recommended to establish causal pathways between these factors.

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## Computational Insights into Coenzyme Q10-TREM2 Signaling: A Nutritional Perspective on Neuroinflammation in Alzheimer's Disease

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Alzheimer's disease (AD) is a major neurodegenerative disorder characterised by progressive cognitive decline and chronic neuroinflammation, and current pharmacotherapies offer only symptomatic relief, highlighting the need for safe, nutrition-based strategies targeting underlying molecular mechanisms. This study aimed to investigate the potential neuroprotective effects of Coenzyme Q10 (CoQ10), a diet-derived, lipid-soluble antioxidant, through its interaction with Triggering Receptor Expressed on Myeloid Cells 2 (TREM2), a key microglial receptor involved in amyloid-beta clearance and neuroimmune regulation. An in-silico workflow was employed, integrating molecular docking and network pharmacology analyses to evaluate CoQ10-TREM2 binding and associated signalling pathways relevant to neuroinflammation, oxidative stress, and microglial activation in AD. Molecular docking demonstrated a strong binding affinity between CoQ10 and TREM2, while network pharmacology identified CoQ10-linked targets that converge on pathways implicated in microglial phenotypic modulation, redox balance, and neuroinflammatory signalling. These results suggest that CoQ10 may support the restoration of microglial homeostasis and the attenuation of neurodegenerative processes through TREM2-mediated mechanisms. In conclusion, this computational study provides mechanistic insights into CoQ10 as a food-derived modulator of TREM2-associated signalling in AD, supporting further preclinical validation of CoQ10-based precision nutrition approaches as adjunctive, molecularly targeted interventions against neurodegeneration.

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## **From Waste to Wellness: Exploring the Nutritional and Functional Potential of Banana Inflorescences for Community Health**

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Banana inflorescences, often discarded as agricultural by-products, represent a sustainable and nutrient-dense food resource with potential applications in community nutrition and health promotion. As the nutritional composition and antioxidant activity of Malaysian banana inflorescences remain underexplored, this study evaluated the physical properties, proximate composition, amino acid, fatty acid, dietary fibre, mineral profiles, and antioxidant activity of bracts and flowers of two indigenous cultivars—Berangan (*Musa acuminata*, AAA) and Nangka (*Musa acuminata* × *Musa balbisiana*, AAB). Moisture content was determined using the oven-drying method (AOAC 930.15), protein by the Kjeldahl method (AOAC 991.20), lipid by Soxhlet extraction (AOAC 945.16), and ash by dry ashing (AOAC 923.03). Carbohydrates were calculated by difference from proximate values. Amino acids were profiled using Ultra Performance Liquid Chromatography (UPLC), fatty acids analysed using Gas Chromatography–Flame Ionization Detection (GC-FID), and dietary fibre quantified with the K-TDFR-200A Total Dietary Fibre Assay Kit (Megazyme Limited, Ireland). Mineral composition was determined using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES), while antioxidant activity was assessed via ABTS and DPPH assays. Proximate analysis revealed higher protein and ash contents in flowers, while bracts showed greater moisture, fat, and carbohydrate levels. UPLC identified 16 amino acids, with isoleucine, lysine, threonine, and valine as dominant essential amino acids in both cultivars. GC-FID detected 13 fatty acids in flowers and 8 in bracts, with palmitic, oleic, and linoleic acids as major types. Bracts were rich in insoluble dietary fibre (53.93–63.20%), whereas flowers contained higher soluble fibre (7.89–14.16%), supporting gastrointestinal health. Sixteen mineral elements were identified, with higher concentrations in flowers than in bracts, and antioxidant activity was also higher in flowers. These findings highlight banana inflorescences as nutrient-rich, sustainable plant components with potential for developing functional foods and nutraceuticals that enhance community nutrition, reduce agricultural waste, and support Malaysia's sustainable food systems.

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## **Dietary Factors and the Gut Microbiome in Healthy Asian Adults: A Scoping Review**

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The gut microbiome plays a vital role in metabolic regulation, immune modulation, and disease prevention. Diet is one of the strongest determinants of microbial composition, yet most available evidence is derived from Western populations. Asian dietary patterns, traditionally rich in plant-based and fermented foods but increasingly Westernised, provide a distinct context for understanding how diet modulates the gut microbiome. This scoping review aimed to systematically map existing evidence on how habitual diets, nutrients, and food components influence gut microbial diversity, composition, and function among healthy Asian adults, in order to clarify regional dietary effects and identify research gaps. Four electronic databases (PubMed, Web of Science, Scopus, and EBSCOhost) were systematically searched for articles published between January 2014 and December 2024. Eligible studies involved Asian adults aged 18 to 60 years with a body mass index of 18.5 to 30 kg/m<sup>2</sup>, published in English, and reporting microbiome outcomes such as microbial diversity, taxonomic abundance, or functional pathways. A total of 39 studies met the inclusion criteria, including 27 intervention and 12 cross-sectional studies, primarily conducted in China, Japan, and Korea. Diet–microbiome associations were classified into seven categories: whole food items, functional foods, dietary patterns, fasting, micronutrients, habitual diets, and others. The gut microbiota of healthy Asian adults was predominantly composed of Firmicutes, Bacteroidetes, Actinobacteria, and Proteobacteria. Fibre-rich, plant-based, and traditional diets high in vegetables, legumes, grains, and fermented foods were associated with greater microbial diversity and enrichment of beneficial taxa. Conversely, high-fat or processed diets and behaviours such as betel nut chewing and late-night eating were linked to lower diversity and pro-inflammatory profiles. In conclusion, dietary patterns modulate the gut microbiome through complex, context-dependent mechanisms. Future research incorporating multi-omics, longitudinal, and standardised approaches is needed to develop precision nutrition strategies and culturally relevant dietary recommendations for Asian populations.

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## **Histological Evidence of Neuro-Protection by Tocotrienol-Rich Fraction in Type 2 Diabetes Rat Model**

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Type 2 diabetes mellitus (T2D) is associated with anxiety, depression, and other mental disorders in diabetic individuals. Oxidative stress and chronic inflammation are key contributors to neuronal damage. The tocotrienol-rich fraction (TRF) of vitamin E possesses potent antioxidant and anti-inflammatory properties and has shown promising neuroprotective effects in various clinical studies and animal models. However, direct evidence correlating physiological and cellular-level neuronal changes in T2D remains limited. This study investigates histological changes in the hippocampus, amygdala, frontal cortex, and cerebellum of T2D rats and evaluates the neuroprotective effects of TRF supplementation. T2D was induced using a high-fat diet (HFD) for 16 weeks. From week 17 to 28, diabetic rats continued on HFD and received oral TRF supplementation. Brain tissues were harvested at week 28 for histological examination. Neuronal density, cellular morphology, and signs of neurodegeneration were assessed. T2D rats exhibited marked neuronal loss, cytoplasmic shrinkage, and pyknotic nuclei in the hippocampus, especially in the CA3 and dentate gyrus regions, as well as in the amygdala and cerebellum. In contrast, TRF-treated rats showed a dose-dependent preservation of neuronal architecture and reduced histopathological damage. The high-dose TRF group demonstrated the most significant neuroprotective effects. In conclusion, TRF supplementation mitigates neurodegenerative changes in key brain regions of T2D rats, supporting its potential as an adjunctive therapy to preserve mental and neurological health in individuals with diabetes.

**Keywords:** tocotrienol-rich fraction, type 2 diabetes, neuroprotection, hippocampus, amygdala, frontal cortex, cerebellum, dentate gyrus, histology, oxidative stress

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## Identification of Potential Antivenom Activities from Malaysian Herb *Alpinia purpurata* against Malaysian Venomous Snakes using Liquid-Chromatography-Tandem Mass Spectrometry Approach

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Snakebite envenomation (SBE) remains a major public health issue in ASEAN countries, affecting approximately 243,000 individuals and causing around 16,000 deaths annually. Conventional antivenoms, produced by immunising equines with non-lethal doses of venom, are limited by high cost, regional specificity, and risks such as anaphylaxis. Medicinal plants, particularly those from the *Alpinia* genus, are rich in bioactive compounds with therapeutic potential. Among these, *Alpinia purpurata* (red ginger) has demonstrated diverse biological activities, yet its potential as an antivenom remains largely unexplored. This study investigated the antivenom potential of *A. purpurata* against seven Malaysian snake species using protein precipitation assays, cell viability assays on CCD-18Co and HEK-293 cells, LC-MS/MS protein identification, and in-silico molecular docking. Protein precipitation assays showed positive interactions between lyophilised crude *A. purpurata* extract and venoms from *Naja sumatrana* and *Naja kaouthia*. Cell assays revealed significantly increased viability in both cell lines when venom ( $\times 1$  EC<sub>50</sub>) was pre-incubated or post-treated with non-toxic concentrations of the extract, indicating potential venom neutralisation. LC-MS/MS identified 54 proteins from *N. sumatrana* and 42 from *N. kaouthia* that interacted with *A. purpurata* proteins. These included cytotoxin isoforms and members of the three-finger toxin (3FTx), phospholipase A<sub>2</sub> (PLA<sub>2</sub>), L-amino acid oxidase (LAAO), and cobra venom factor families. Interacting *A. purpurata* proteins included thioredoxin-domain-containing protein, bulb-type lectin-domain protein, PIWI domain-containing protein, and a hypothetical Malaysian banana protein. In-silico docking revealed strong protein-protein binding affinities (docking scores  $< -200$ ; confidence  $> 0.7$ ), with *A. purpurata* residues interacting at the active sites of *N. sumatrana* and *N. kaouthia* toxins. These findings highlight *A. purpurata* as a promising natural source of antivenom bioactives warranting further purification and mechanistic studies.

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## Effect of palm mixed-carotenes on periodontal regeneration using human periodontal ligament stem cells

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Periodontitis leads to the progressive destruction of the periodontal ligament and alveolar bone, whereas current regenerative strategies largely rely on passive grafting materials or exogenous biological agents, which provide limited functional restoration. Palm mixed-carotenes (PMC), a naturally occurring antioxidant complex derived from palm oil, has demonstrated cytoprotective and pro-regenerative properties; however, its effects on human periodontal ligament stem cells (hPDLSCs) remain insufficiently characterised. This study aimed to identify the optimal PMC concentration that enhances proliferation, migration, and bone remodelling-related gene expression in hPDLSCs. Primary hPDLSCs were isolated and characterised based on mesenchymal stem cell markers (CD73<sup>+</sup>/CD90<sup>+</sup>/CD105<sup>+</sup>; CD34<sup>-</sup>/CD45<sup>-</sup>/HLA-DR<sup>-</sup>). Cells were treated with varying concentrations of PMC (0–100 µg/mL). Cell proliferation was assessed using the MTT assay, while migratory capacity was evaluated using a wound-healing assay over a 72-hour period. Osteogenic differentiation and bone remodelling were examined by RT-qPCR analysis of relevant genes, including osteoprotegerin (OPG), osteopontin (OPN), and osteocalcin (OCN). The negative control consisted of DMEM supplemented with 0.1% DMSO, whereas the positive control comprised complete medium containing 10% fetal bovine serum, 1% antibiotics, 1% GlutaMAX, and 1% vitamin C. Data were analysed using one-way ANOVA with Tukey's post-hoc test and mixed design ANOVA with small effect post-hoc pairwise comparisons. Statistical significance was set at  $p < 0.05$ . PMC at 6.25 µg/mL produced the highest proliferative response and significantly enhanced cell migration in a time-dependent manner, with peak migration at 72 hours. RT-qPCR analysis revealed that treatment with 6.25 µg/mL PMC significantly upregulated OPG expression, induced a modest increase in OCN expression, and did not significantly affect OPN expression. In conclusion, PMC at 6.25 µg/mL demonstrated the most favourable regenerative profile in hPDLSCs by enhancing cell proliferation, migration, and bone remodelling-related gene expression, supporting its potential as a bioactive agent for periodontal tissue regeneration.

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**ABSTRACTS:**

**POSTER PRESENTATIONS**

## Impact of Lactium-Containing Nutritional Supplement on Clinical Outcomes in Liver Cancer: A 6-Month Retrospective Analysis

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Hepatocellular carcinoma (HCC) remains a leading cause of cancer-related mortality worldwide, often arising in the setting of chronic liver disease and cirrhosis. While conventional therapies focused on antiviral treatment, locoregional therapy, and systemic agents, there is growing interest in the impact of psychoneuroimmunology on cancer progression and treatment tolerance. Lactium, a bioactive decapeptide derived from casein, is gaining attention for its anxiolytic properties through modulation of the GABA-A receptor. This study explored the potential adjunctive role of Lactium in the supportive care of patients with HCC, with a focus on nutrition optimization, stress modulation, sleep regulation, and immunological impact in relation to overall survival. A retrospective analysis was conducted on a total of 40 patients diagnosed with liver cancer. Among them, 20 patients received a milk supplement containing Lactium, a milk protein hydrolysate, over a 6-month period, while the remaining 20 patients served as the control group and did not receive the supplement. Comparative assessments were made between the two groups on the following parameters: body weight, albumin levels, sleep quality scores, anxiety scores, normalization of inflammatory markers, liver enzyme levels, and median survival duration. The median survival in the intervention arm was 590.7 days, compared to 245.8 days in the control group (p-value: 0.0034). At the end of 6 months, patients in the intervention group showed statistically significant improvement in bodyweight (Mean: 2.7 SD: 5.99 95%CI: [0.17,5.24] p < 0.001) and albumin level (Mean: 7.8, SD: 8.61 95%CI : [3.65, 11.95],p-Value:0.00094). Additionally, 60% of patients in the intervention group experienced a reduction in anxiety levels (p = 0.0362), and 80% of patients reported an improvement in their sleep scores (p = 0.0041). However, only 40% experienced a reduction in liver enzymes (p = 0.42), whereas 20% showed normalization of inflammatory markers (p = 0.362). Psychological stress and disrupted sleep are commonly reported in hcc patients and may contribute to poorer outcomes. Increasing evidence suggests that stress-induced immunosuppression and neuroendocrine dysregulation can influence cancer progression. In this context, lactium, a milk-derived peptide with anxiolytic properties, presents a promising agent for enhancing the quality of life and potentially influencing the disease trajectory. Lactium may represent a safe and valuable addition to the arsenal of supportive care for hepatocellular carcinoma. By addressing the often-overlooked axis of stress, sleep, and immunity, it aligns with the growing emphasis on holistic cancer care. While more oncology-specific data are needed, its excellent safety profile and plausible biological rationale make it worth consideration in appropriate patients under medical supervision.

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## Ameliorative effects of dietary cannabinoid $\beta$ -caryophyllene on sleep deprivation-induced cognitive impairment in zebrafish

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A highly prevalent issue in modern society, sleep deprivation (SD) is associated with deficits in memory, attention, and executive functioning. Processes such as inflammation, oxidative stress, and neuronal loss are said to underlie SD-induced cognitive decline.  $\beta$ -caryophyllene (BCP) is a dietary cannabinoid found in herbs and spices such as cloves, black pepper, and oregano. A non-psychoactive compound that acts selectively on CB2 receptors, BCP has been garnering attention for its anti-inflammatory, antioxidant, and neuroprotective properties. This study investigated the effects of acute BCP administration on SD-induced cognitive impairment, with a focus on the role of the cannabinoid receptor CB2. Following sleep deprivation via 7-day exposure to light, zebrafish underwent acute treatment of either BCP, melatonin (positive control), or AM630 (CB2 receptor antagonist). Subsequently, changes in anxiety-like behaviour, spatial learning and memory, and gene expression were examined via the novel tank test, T-maze test, and RT-qPCR respectively. BCP significantly alleviated SD-induced anxiety-like behaviour and impairments in spatial learning and memory. These improvements were abolished by administration of AM630, implying that the CB2 receptor plays a significant role in mediating these behavioural effects. RT-qPCR analysis revealed that none of the treatments significantly affected expressions of CB1 and CB2 receptors (*cnr1* and *cnr2*), brain-derived neurotrophic factor (*bdnf*), and acetylcholinesterase (*ache*), most likely due to short exposure time to pharmacological treatments. Even so, changes in protein expression in response to these treatments is a crucial part of gaining a more complete understanding of CB2 receptor regulation and its effects on SD-induced cognitive impairment. In conclusion, acute BCP treatment was effective in ameliorating anxiety-like behaviour and impaired spatial learning and memory in sleep-deprived zebrafish. Acute BCP administration was insufficient to significantly alter gene expression, however, its effects on protein expression should be studied to elucidate the underlying mechanism driving BCP-induced behavioural effects on SD-induced cognitive impairment.

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**Patient-Driven Success: Acceptability and Mechanisms of Adherence to Perioperative Immunonutrition in Gynecological Cancer under ERAS protocols**

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Perioperative immunonutrition (IMN) is a key component of Enhanced Recovery after Surgery (ERAS) protocols, designed to attenuate surgical stress and improve outcomes. While its clinical benefits are established, research exploring patient perceptions and adherence challenges is limited, yet critical for successful implementation. This study aimed to evaluate patient acceptability and explore the behavioural mechanisms that drive adherence to IMN among gynaecological cancer (GC) patients in an ERAS setting. A parallel-convergent mixed-methods design, with the qualitative arm focusing on patient acceptability to contextualize and explain the effectiveness observed in a prior Randomized Controlled Trial (RCT). Sixteen newly diagnosed GC patients were purposively sampled for semi-structured, in-depth interviews at Institut Kanser Negara, Putrajaya, Malaysia, between November 2024 and March 2025. Qualitative data underwent thematic analysis by two independent researchers. The final integration phase used a triangulation protocol to identify convergence between clinical effectiveness and patient acceptability. The study identified strong convergence between patient-reported benefits and the high clinical adherence rate observed in the RCT (81%). Six major themes detailed the basis for acceptability. The primary mechanism driving adherence was the perceived effectiveness of the nutrition, with patients reporting tangible improvements like enhanced energy, faster wound healing, and reduced post-operative symptoms. Adherence was strongly influenced by trust in clinicians, clear explanations, and proactive involvement by dietitians. Challenges, including nausea and formula taste aversion, were overcome through coping strategies, motivation, and professional guidance, demonstrating patients' resilience in prioritizing medical advice. In conclusion, perioperative IMN is positively perceived by GC patients, with their subjective benefits strongly supporting the objective efficacy data. This clear link between patient satisfaction and adherence confirms that a dedicated, multidisciplinary care model built on patient education and trust is crucial. These findings are essential for successfully scaling IMN by ensuring a scientifically grounded, patient-informed implementation within ERAS protocols.

## **Beyond Weight Loss: Meal Replacement Therapy Maximizes Fat Loss While Augmenting Muscle Mass in Prehabilitation of Bariatric Surgery**

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Prehabilitation is a critical phase in bariatric surgery, achieving preoperative weight loss and liver volume reduction to minimize postoperative complications. This study aimed to determine the differential outcomes of various preoperative dietary strategies (PDS) on body composition during this phase. This retrospective analysis included 88 bariatric patients across three PDS regimens: a 14-day inpatient Basic Bariatric Diet Plan (BBDP) (n=22, a whole-food Very Low-Calorie Diet); a 14-day inpatient Meal Replacement Therapy (MRT) (n=31, a sole enteral regime high in whey protein), and a 1-month outpatient Low-Calorie Diet (LCD) (n=35). Data were analysed after a 14-day or 1-month period. The results show that while all PDS led to weight loss, the MRT group demonstrated the greatest mean weight loss (-6.4 kg;  $p < 0.0001$ ) and the largest reduction in fat percentage (-3.1%;  $p = 0.009$ ). The BBDP group also exhibited substantial weight loss (-5.0 kg,  $p = 0.018$ ). Crucially, the MRT group was the only PDS to result in a significant increase in both fat-free mass (+0.7 kg,  $p < 0.0001$ ) and muscle mass (+0.8 kg,  $p = 0.007$ ). The BBDP and LCD groups both experienced a decrease in muscle mass. The 14-day inpatient PDS (BBDP and MRT) demonstrated superior results compared to the 1-month outpatient LCD, particularly in preserving muscle mass. MRT was unique in that it maximized fat loss while simultaneously increasing muscle mass. While outpatient LCDs are preferred for most candidates, high-intensity, inpatient strategies like MRT are reserved for high-risk patients who require rapid, guaranteed weight loss and liver shrinkage for surgical safety. In conclusion, Meal Replacement Therapy (MRT) is the most effective preoperative strategy studied, uniquely maximizing fat loss while preserving and increasing muscle mass. This evidence supports reserving this body composition-optimizing strategy for bariatric candidates requiring critical pre-surgical improvement.

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## **Antioxidant, Enzyme-Inhibitory, and Anti-Adipogenic Properties of Palm-Derived Delta-Tocotrienol in 3T3-L1 Adipocyte Differentiation**

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Obesity is associated with disturbances in lipid metabolism and an increase in oxidative stress. Although Orlistat is commonly prescribed as a first-line treatment, it is often associated with undesirable side effects. Natural compounds such as delta-tocotrienol have emerged as potential alternatives due to their ability to suppress adipogenesis and counteract oxidative stress. This study investigates the antioxidant capacity, enzyme-inhibitory activity, and anti-adipogenic effects of delta-tocotrienol. Antioxidant properties were quantified using DPPH and ABTS assays, with Trolox serving as the reference compound. Pancreatic lipase inhibition was measured through a colorimetric assay employing porcine lipase and p-nitrophenyl palmitate. The 3T3-L1 preadipocytes were cultured in complete medium, induced to differentiate with a differentiation medium, and subsequently matured using insulin-containing media. Cells were treated with delta-tocotrienol or Orlistat (positive control) during the differentiation period. Cell viability was assessed using the CCK-8 assay. Lipid accumulation was evaluated using Oil Red O staining followed by spectrophotometric analysis. Delta-tocotrienol demonstrated dose-dependent antioxidant activity, with  $IC_{50}$  values of 98.4  $\mu\text{g/mL}$  (DPPH) and 250  $\mu\text{g/mL}$  (ABTS), although its potency was lower than that of Trolox. It also inhibited pancreatic lipase in a concentration-dependent manner ( $IC_{50} = 58.7 \mu\text{g/mL}$ ), showing activity comparable to Orlistat ( $IC_{50} = 47.2 \mu\text{g/mL}$ ), but Orlistat remained significantly stronger when interaction effects were considered. Delta-tocotrienol did not exhibit cytotoxicity at any of the tested concentrations. When applied at equivalent doses (50  $\mu\text{g/mL}$  and 100  $\mu\text{g/mL}$ ), delta-tocotrienol and Orlistat produced similar reductions in lipid accumulation. In conclusion, the findings suggest that delta-tocotrienol holds potential as a natural or adjunct therapeutic option for obesity management due to its antioxidant action, lipase-inhibitory effect, and ability to suppress adipogenesis in 3T3-L1 preadipocytes.

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## Modulation of Long Non-Coding RNAs in Triple-Negative Breast Cancer Cells By Tocotrienol-rich Fraction from Palm Oil

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Breast cancer is the leading cause of cancer-related mortality among women worldwide. Triple-negative breast cancer (TNBC), representing ~15% of cases, disproportionately contributes to this burden due to its aggressive growth, absence of targeted therapies, and high rates of chemoresistance. Tocotrienol-rich fraction (TRF), a vitamin E mixture with documented cytotoxic effects in preclinical models, represents a promising therapeutic candidate for TNBC. However, its mechanisms of action, especially the involvement of long non-coding RNAs (lncRNAs), key mediators of tumour progression and drug response, remain poorly understood. This study investigated the role of lncRNAs in mediating the cytotoxic effects of TRF in TNBC. MDA-MB-468 cells were treated with TRF (17 µg/ml, 72 hours), and transcriptomic profiling was performed using the Clariom™D microarray. Differentially expressed genes were identified ( $|\text{fold change}| > 2$ ,  $p < 0.05$ ) and then used to construct a lncRNA-mRNA co-expression network (Pearson's correlation,  $|r| > 0.99$ ,  $p < 0.05$ ). Pathway enrichment analysis of the co-expressed mRNAs was carried out using the clusterProfiler package and the Reactome database. The network was visualised with Cytoscape, and the hub genes were identified via cytoHubba with the Maximal Clique Centrality algorithm. TRF treatment altered the expression of 2,481 genes, including 306 lncRNAs (200 upregulated, 106 downregulated). The top enriched pathways identified by the functional enrichment of co-expressed mRNAs were related to the cell cycle and endoplasmic reticulum stress (ERS) pathways. Notably, *DLGAP1-AS2* was identified as a highly upregulated hub gene and was correlated with the increased expression of *PERK* and *CHOP*, two key effectors of the unfolded protein response, an ERS pathway, which is capable of triggering apoptosis. These findings identify lncRNAs as important mediators of TRF-induced cytotoxicity in TNBC, and implicate *DLGAP1-AS2* as a potential regulator of ERS-mediated apoptosis via the *PERK/CHOP* axis.

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## Effects of Oil Palm Polyphenols on Antioxidant Activities and Adipocyte Differentiation in 3T3-L1 Preadipocytes

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Obesity is a global health crisis linked to non-communicable diseases, with current pharmacological treatments causing various adverse effects; therefore, alternatives are needed. This study aims to investigate the antioxidant and enzyme-inhibitory properties of oil palm polyphenols (OPP) at different concentrations, as well as their anti-adipogenic effects on 3T3-L1 preadipocyte differentiation. The antioxidant activity of OPP and Trolox (the standard) was assessed using DPPH and ABTS assays. Pancreatic lipase inhibition was measured using a porcine pancreatic lipase and a colorimetric assay with p-nitrophenyl palmitate as substrate. 3T3-L1 preadipocytes were cultured, differentiated, and matured, then treated with OPP and orlistat (standard). Cell viability was evaluated using the CCK-8 assay. Oil-Red O staining was conducted using mature 3T3-L1 preadipocytes, and lipid accumulation was then quantified to determine relative lipid content. The results showed that OPP exhibited a dose-dependent antioxidant activity in both DPPH and ABTS assays (IC<sub>50</sub> of 1080.410 and 1189.791 µg/mL, respectively). It demonstrated pancreatic lipase inhibitory properties in a dose-dependent manner (IC<sub>50</sub> value of 435.020 µg/mL). It showed no cytotoxic effects, and Oil Red O staining demonstrated a dose-dependent reduction in lipid accumulation, with lipid accumulation in 3T3-L1 preadipocytes reduced across concentrations of 100 to 1000 µg/mL. While Trolox and orlistat, as the positive controls, showed higher efficacy at lower doses, this was expected given that OPP is a complex mixture of natural compounds. In conclusion, this research furthered the understanding of the knowledge gaps regarding 3T3-L1 preadipocyte differentiation and demonstrated the potential antioxidant, antiadipogenic, and lipase-inhibitory effects of natural products as a safe alternative for treating obesity.

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**Correlation between Diabetes, Hypertension, and Hyperlipidemia:  
Associated Factors Including Dietary Habits among Patients from BIRDEM  
General Hospital, Dhaka**

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Non-communicable diseases are global health concerns now, including diabetes, hypertension, and high cholesterol. Some associated factors of these diseases that should be worked on for prevention. The study hypothesis is that diabetes is associated with hypertension and high cholesterol, as well as dietary habits, which will aid in developing a combined treatment. The purpose of this study was to investigate the association between diabetes and other non-communicable diseases, socioeconomic factors, and dietary intake. The study is a cross-sectional descriptive study conducted from June 2024 to June 2025. The sample consisted of 300 diabetic adults receiving treatment at BIRDEM General Hospital, Dhaka, Bangladesh. The patients were randomly selected, and all data were collected using a questionnaire, the latest medical reports, height, and a weight-measuring scale. 72% of the total study population had type 2 diabetes mellitus, and 40% of them had been suffering for 6-10 years. No correlation was found between diabetes mellitus and hypertension; however, an association was observed between the diabetic condition and lipid profile in this study. A statistically significant correlation was found between triglyceride and random blood sugar, triglyceride, low-density lipoprotein, and systolic blood pressure (p value<0.05). Diabetes is associated with family history and body weight, but not with occupation, educational qualification, age, or sex. On the other hand, dietary factors like sugar, rice, egg, fruits, and vegetable intake were associated with diabetes (p-value <0.05). The lipid profiles should be thoroughly checked, and a proper diet should be provided; however, a lipid profile screening program at an affordable cost may also be beneficial.

**Keywords:** Diabetes, Hypertension, Hyperlipidemia, Dietary Intake

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**Immunomodulatory Effects of Palm-Derived Tocotrienol-Rich Fraction (TRF) in Healthy Volunteers Following Influenza Vaccination: A Randomised Clinical Trial**

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Most vitamin E immunity research focuses on tocopherols, but the tocotrienol-rich fraction (TRF) from palm oil may have stronger immunomodulatory effects via T-cell and antibody pathways. This study examined the effect of various TRF doses on the immune response to influenza (IFV) vaccination in healthy adults. In a double-blind, placebo-controlled trial, 150 participants were randomized to receive a placebo or TRF (50, 100, 200, or 400 mg) daily for two months, with an IFV vaccine administered on day 28. Blood samples collected on days 0, 28, and 56 were analysed for humoral and cellular immunity, antioxidant status, and vitamin E levels. The results show that supplementation of TRF significantly augmented anti-IFV antibody production. While the 400 mg group showed the highest IgG titre, there was no significant difference in the elevated amount observed among the lower doses. A Th1-type response was selectively enhanced, with significant IFN- $\gamma$  production in all TRF study groups. Serum IL-12p70 increased in the 400 mg group, while EBI3 was elevated in the 50, 200, and 400 mg groups. Increased SOD and CAT levels were observed in the supplemented groups, while MDA levels remained unchanged.  $\alpha$ -Tocopherol increased significantly, primarily in 400 mg, whereas most tocotrienols were undetectable. Lymphocyte subset frequencies remained unchanged. Conclusion: TRF enhances vaccine-induced immunity by modulating humoral and Th1 responses and improving antioxidant status. Critically, antibody production was increased similarly across all TRF doses. Therefore, lower-dose TRF offers a cost-effective strategy for supporting antibody production, while the 400 mg dose provides broader immunomodulatory benefits.

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## Metagenomic Insights into Urolithin Formation from Rambutan Rind Extract by Rat Faecal-derived Microbial Consortia

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Ellagitannins and ellagic acid are microbially converted into urolithins, metabolites with antioxidant, anti-inflammatory, and mitochondrial benefits. Although several human-derived Uro-producing strains have been identified, their enzymatic pathways remain incompletely characterised, and little is known about Uro biotransformation in non-human gut ecosystems. This study investigated uro production in the Sprague-Dawley (SD) rat microbiome supplemented with rambutan rind extract, an ET-rich fruit waste containing 35–40% geraniin. Rambutan rind extract supplementation reduced isobutyric acid levels, indicating a shift away from *in vivo* proteolytic fermentation toward polyphenol metabolism. Fermentation of hydrolysed RRE (113  $\mu\text{M}$  equivalent of ellagic acid) produced  $9.4 \pm 0.6 \mu\text{M}$  Uro C and  $12.5 \pm 0.6 \mu\text{M}$  IsoUro A by day 9, with metabolite appearance consistent with known dehydroxylation steps. The comparison with earlier studies suggests that substrate concentration may substantially influence conversion efficiency. Shotgun metagenomics revealed low relative abundance of *Actinobacteria* (< 0.009%), despite this phylum encompassing most known Uro producers, suggesting that non-canonical taxa, potentially Firmicutes or other polyphenol-degrading groups, mediated Uro biotransformation. Canonical Uro-associated genes, including punicalagin acyl hydrolase, pyrocatechol dehydroxylase, and the MetaCyc EA degradation pathway, were absent, implying the involvement of divergent or previously undescribed enzymatic machinery. Comparative analysis nonetheless showed KEGG pathway similarity between the rat microbiome and *Ellagibacter isourolithinifaciens* DSM 104140<sup>T</sup>. Broader screening identified NAD<sup>+</sup> synthase, a recurring marker in confirmed Uro producers in three species level genome bins, including *Escherichia coli*, *Enterococcus avium*, and *Enterococcus faecalis*, all of which encoded oxidoreductases and hydrolases that may support ET-derived metabolite formation. These findings highlight rambutan rind as a promising prebiotic substrate and suggest that the rat gut harbours alternative, non-canonical pathways of Uro biosynthesis, emphasising the need for discovery-driven approaches to identify new microbial contributors and functional markers.

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## **Prevalence and Associated Factors of Concurrent Anaemia among Orang Asli Mothers and Children Under Five**

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Anaemia remains a major global public health issue and often occurs concurrently among mothers and their young children, compounding health risks for both groups. Indigenous populations, including the Orang Asli (OA), are disproportionately affected due to socioeconomic disadvantages such as limited access to healthcare, education, employment, housing, and food security. This study aimed to determine the prevalence of concurrent anaemia and its associated factors among OA child–mother pairs in Selangor. A cross-sectional study was conducted among 155 OA children aged 2–5 years and their mothers from seven villages in Selangor. Face-to-face interviews were conducted with mothers to collect socio-demographic information and assess household food security. Anthropometric measurements (height and weight) were taken for both children and mothers, and haemoglobin levels were assessed using the finger-prick method. Multinomial logistic regression analysis was performed to identify factors associated with anaemia status in child–mother pairs. The main results show that overall, 21.3% of child–mother pairs had concurrent anaemia, while 18.1% were classified as child-anaemic/mother-non-anaemic pairs and 11.6% as child-non-anaemic/mother-anaemic pairs. Male children, stunting, underweight status, working mothers, maternal overweight or obesity, monthly household income of more than RM580, family size of 5-8, and household food insecurity were significantly associated with concurrent anaemia. In conclusion, multiple socio-demographic, household, and nutritional determinants were associated with anaemia among OA child–mother pairs. These findings highlight the need for targeted, context-specific interventions that address both individual and household-level risk factors to reduce the burden of anaemia in vulnerable indigenous communities.

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**Antioxidant spirulina-oil blend powder with desired fatty acid ratios:  
Development and characterization**

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The unhealthy fatty acid composition of dietary oils and fats has increased the risk and prevalence of non-communicable diseases worldwide. The World Health Organization recommends an S:M:P (saturated, monounsaturated, and polyunsaturated fatty acids) ratio of 1:1-2:1 for an optimal lipid profile, while many health experts suggest the consumption ratio for omega-6:omega-3 (n6:n3) at 1-4:1 to support good health. These desired ratios of fatty acids, however, cannot always be met from a single oil. Hence, this study aims to formulate an oil blend with both the desired S:M:P ratio and n6:n3 ratio by blending red palm oil, canola oil, and algal oil. Algal oil is a vegan and sustainable source of n3 fatty acids. To prevent oxidation, the oil blend was microencapsulated with spirulina extract, followed by spray-drying to form a stable spirulina-oil blend powder (SOBP). The SOBP achieved the targeted fatty acid ratios. The formulation with 33% oil loading exhibited a high encapsulation efficiency of 97.51%. The SOBP exhibited relatively high antioxidant activity, with a  $68.10 \pm 0.50\%$  ABTS radical scavenging capacity. Rancimat test at  $120^{\circ}\text{C}$  showed that the induction period of SOBP ( $29.96 \pm 0.26$  h) was about 14 times longer than that of the oil blend ( $2.19 \pm 0.02$  h), indicating that microencapsulation of oil blend with antioxidant spirulina extract significantly enhanced its oxidative stability. The powder was slightly acidic (pH 6.23) with an  $A_w$  of 0.32, supporting microbial stability. Its colour was light green with a yellow tint ( $L^*=77.3$ ,  $a^*=-4.6$ ,  $b^*=25.8$ ). The solubility was 83.24%, indicating its suitability for use in foods and beverages. The development of antioxidant SOBP with healthy fatty acid ratios supports the concept of dietary prophylaxis against non-communicable diseases. This project aligns with the Sustainable Development Goal (SDG 3) by promoting good health and well-being.

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## Development of Functional Crackers Enriched with Torch Ginger (*Etilingera elatior*) Inflorescence and Psyllium Husk Powder

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There is growing evidence supporting the role of functional foods as dietary prophylaxis against certain chronic diseases such as cardiovascular diseases and cancers. Torch ginger inflorescence is an underutilized source of antioxidants, while psyllium husk is a fiber-rich agricultural by-product. This study aimed to develop functional crackers using torch ginger inflorescence powder (TGIP) and psyllium husk powder (PHP) to enhance their antioxidant activity and dietary fiber content. The main ingredients of the control crackers include whole wheat flour, unsalted butter, baking powder, and salt. In Formulation 1 (F1), whole wheat flour was partially substituted with 3% TGIP and 3% PHP, while Formulation 2 (F2) was substituted with 6% TGIP and 6% PHP. The addition of TGIP and PHP to the formulations significantly improved the antioxidant activities of crackers, as indicated by DPPH radicals scavenging capacity (Control: 44.90%, F1: 47.84%, F2: 50.24%), total phenolic content (Control: 5.35, F1: 6.29, F2: 6.74 mg GAE/g), and total flavonoid content (Control: 1.78, F1: 2.03, F2: 2.35 mg QE/g). The dietary fiber content of F1 crackers (14.17%) was significantly higher than that of the control (7.11%). The moisture content of all samples ranges from 3.19% to 4.05%, indicating satisfactory crunchiness and microbial stability. The sensory attributes of the crackers were evaluated by 50 panellists using a 7-point hedonic scale. F2 cracker was the most preferred with an acceptance index of 80%. In conclusion, this study demonstrated that the underutilized TGIP and PHP can be utilized as functional ingredients to enhance the antioxidant activity and dietary fiber content of crackers. This project aligns with the global Sustainable Development Goals SDG 3 by promoting good health, and SDG 12 by supporting sustainable food production through the reduction of food waste.

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## **Comparative Analysis of Deferoxamine, Deferiprone, and Deferasirox on Nephrotoxicity in Transfusion-dependent Beta-Thalassemia Major patients**

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$\beta$ -thalassemia major constitutes a genetic hemoglobinopathy characterized by impaired synthesis of the  $\beta$ -globin chain, resulting in chronic anaemia and a lifelong reliance on blood transfusions. The frequent administration of transfusions leads to the accumulation of iron, thereby necessitating iron chelation therapy to avert potential organ damage. Among the prevalent iron chelators—deferoxamine (DFO), deferiprone (DFP), and deferasirox (DFX)—the risk of renal toxicity persists as a significant yet inadequately explored issue. The objective of this study was to conduct a comparative analysis of the impacts of these iron chelation therapies on renal function among transfusion-dependent  $\beta$ -thalassemia major patients in Karachi, Pakistan. A cohort of 90 transfusion-dependent  $\beta$ -thalassemia major patients was recruited and stratified into three groups according to their respective chelation therapy regimens. Renal function was evaluated through the measurement of serum creatinine, urea, blood urea nitrogen (BUN), glomerular filtration rate (GFR), and uric acid concentrations. Laboratory assessments were performed prior to blood transfusions to mitigate any confounding variables. The results demonstrated variable effects of iron chelators on renal parameters. Deferoxamine exhibited the most favourable renal profile, showing minimal nephrotoxic effects and stable renal markers. Deferiprone was associated with mild elevations in urea levels; however, these changes were clinically insignificant. In contrast, deferasirox showed increased renal parameters, indicating a comparatively higher risk of nephrotoxicity. Although deferasirox remains effective for iron chelation, its renal safety profile warrants careful monitoring. In conclusion, iron chelation therapies exert differential effects on renal function in transfusion-dependent  $\beta$ -thalassemia major patients. Deferoxamine appears to be the safest chelator for preserving renal function, while deferiprone shows acceptable renal safety. Deferasirox, although effective, is associated with a higher risk of renal impairment. Regular renal monitoring is crucial for optimizing chelation therapy and preventing long-term renal complications in patients with  $\beta$ -thalassemia major.

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## Nutritional and sensory evaluation of moringa-tempeh chips

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A study in the USA reported that 94% of the population snacks daily. Chips are popular snacks, but are often considered unhealthy due to high calorie content and low nutritional value. Therefore, this study aimed to enhance the nutritional values of tempeh chips with moringa leaf powder (MLP). Tempeh is a fermented soybean product rich in protein and minerals, while moringa leaf contains beneficial bioactive compounds with well-documented health benefits. The control chips were prepared without MLP, while Sample 1 (S1) and Sample 2 (S2) were coated in a marinade containing 2.5% and 5.0% MLP, respectively. Next, the tempeh slices were air-fried intermittently at 150 °C for 12 min. All samples had high protein content, increasing from 28.46% in the control to 28.98% in S1 and 29.33% in S2. The fat content was lower (21–22%) compared to that of typical potato chips. Ash content increased significantly from 3.15% (control) to 4.24% (S2), indicating higher mineral levels. Iron content also increased from 2.90 mg/100 g (control) to 4.33 mg/100 g (S2). Coating with MLP significantly enhanced the antioxidant activity of tempeh chips, with the ABTS radical scavenging capacity increasing from 36.13% (control) to 39.79% (S1) and 43.76% (S2) of the chips. The sensory attributes of moringa-tempeh chips were evaluated by 50 panelists using a 7-point hedonic scale. The S1 chip was the most preferred, with an acceptance index (AI) of 90%, which was higher than that of the control (AI = 85%). In conclusion, MLP enhanced the protein, mineral, and antioxidant content of tempeh chips. The moringa-tempeh chips with satisfactory sensory quality may serve as a healthier snack alternative. This project supports Sustainable Development Goal (SDG 3) by promoting good health through the innovation of functional foods.

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## **Tocotrienol-Rich Fraction Triggers Distinct Apoptotic Response in Glioblastoma Cells of Different MGMT Expression Profile**

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Glioblastoma (GBM) remains the most aggressive and malignant primary brain tumour in adults. Standard protocol constituting of surgical removal of tumour followed by radiotherapy and temozolomide (TMZ), offers limited clinical benefit, largely due to rapid tumour progression and chemoresistance driven by mechanisms such as elevated O6-methylguanine methyltransferase (MGMT). Tocotrienol-rich fraction (TRF), a natural vitamin E derivative, has demonstrated anticancer potential, yet its mechanistic role in GBM is not fully understood. This study aimed to evaluate the anticancer activity of TRF in two GBM cell lines with contrasting MGMT promoter methylation status: A172 (methylated, TMZ-sensitive) and LN-18 (unmethylated, TMZ-resistant). Cells were treated with TRF at IC50 concentrations at 72 hours. Annexin V flowcytometry assay and Label-free quantitative proteomic profiling were performed to identify cell death mechanism and underlying differentially expressed proteins (DEPs) and molecular mechanisms in response to TRF. Apoptotic cell death was observed in the two cell lines but on a different behavioural pattern: TRF triggered progressive early apoptosis in A172, whereas in LN-18 it exhibited a shift toward late apoptosis. Proteomic analysis indicated that TRF mediates cell death through MGMT-independent stress signalling. In A172, early changes involved cytoskeletal remodelling and redox regulation, while LN-18 primarily displayed mitochondrial dysfunction and proteostatic stress. Overall, these findings suggest that TRF induces GBM cell death through distinct, time-dependent apoptosis, highlighting it as a promising alternative therapeutic candidate for overcoming resistance in GBM.

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## **δ-Tocotrienol as a Promising Antiviral Against Dengue Virus: A Combined Molecular Docking and Systems Biology Approach**

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Dengue Virus (DENV) is a notorious and globally prevalent RNA virus responsible for causing millions of deaths annually with severe clinical manifestations and is responsible for significant mortality rates annually. The viral NS2B/NS3 protease is important for viral replications, and polyprotein processing, making it a key therapeutic target. This study investigates the potential of δ-tocotrienol as antiviral agents using an integrated in silico and network pharmacology approach. To assess the safety and drug likeness, in-silico toxicity prediction was performed followed by molecular docking against NS2B/NS3 protease (PDB ID: 2FOM) for determination of binding affinity and interaction profile. Human genes which are associated with the dengue disease and the δ-tocotrienol target genes were retrieved from the available databases and intersected using VENN ANALYSIS to narrow down the potential therapeutic targets. STRING is used to analyse the overlapping genes through protein-protein interaction network followed by identification of the hub genes using Cytoscape topology analysis. Protein class distributions have been analysed with PANTHER. ShinyGO is used to perform the functional enrichment analysis and the significant KEGG pathways are identified. The results indicate the acceptable safety profile and strong binding affinity of δ-tocotrienol against the targeted viral protease, suggesting effective viral inhibition. The network pharmacology analysis reveals the key host targets which are involved in the inflammation, immune response and viral infection pathways, with enrichment in immune related proteins, signalling molecules and enzyme modulators. Therefore, this study overall demonstrates the dual antiviral activity of δ-tocotrienol by not only inhibiting the viral protease but also by modulating the host immune response via regulating the inflammatory pathways, highlighting its potential as a broad spectrum and multi-target therapeutic candidate against dengue virus infection.

**Keywords:** Dengue Virus, Phytonutrients, δ-tocotrienol, Molecular Docking, Network Analysis

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## **In-Silico Analysis of Ursolic and Ursonic Acids as Potential Broad-Spectrum Antiviral Agents for Zika Virus-Related Diseases**

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The Zika virus (ZIKV) poses a major global health threat due to its severe neurological consequences, including Congenital Zika Syndrome (CZS) and Guillain-Barré syndrome. Despite this, effective antiviral treatments remain a critical unmet need. This study investigates the therapeutic potential of two natural phytochemicals, Ursolic Acid and Ursonic Acid, which are extracted from medicinal plants such as *Ziziphus jujuba* (Chinese red date), against ZIKV and its associated diseases. This study employs integrated in silico and multi-omics approaches to evaluate the broad-spectrum therapeutic potential of these compounds against ZIKV and its associated neonatal neurological disorders. Our investigation began with an evaluation of the ADME properties of ursolic and ursonic acid, which confirmed favorable pharmacokinetic profiles. To elucidate their mechanism of action, we applied a network pharmacology approach, utilizing the SwissTargetPrediction, SuperPred, OMIM, DisGeNET, and GeneCards databases. This analysis revealed shared gene targets between the compounds and Zika-related diseases, supporting their potential as broad-spectrum antiviral agents. To elucidate the mechanisms, Protein-Protein interaction networks, Gene Ontology, and KEGG pathway analyses were conducted. Cytoscape was employed to construct and visualize these interaction networks, highlighting crucial proteins involved in inflammatory responses and viral replication. This integrative analysis utilized the PANTHER, KEGG, and STRING platforms. Subsequent Molecular Docking studies with SwissDock and MZ Dock revealed strong interactions between the compounds and key targets in ZIKV-associated neurological pathways including PTGS2, PTGS1, PPARA, PTGER4, NR3C1, ESR2, and ESR1 with binding affinities ranging from -7.60 to -8.60 kcal/mol. These findings indicate ursonic and ursolic acid possess significant potential to inhibit ZIKV-related neurological disorders. Collectively, the results substantiate the promise of these compounds as antiviral and anti-inflammatory agents against Zika-related diseases.

**Keywords:** Zika Virus, Ursolic Acid, Ursonic Acid, Molecular Docking, Pathway Enrichment, Network Analysis, Inflammatory Response

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**Dual Action Formula**  
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**Anlene**  
DIRUMUS SECARA SAINTIFIK  
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**GOLD 5X**

**CholestoPro**

**TERBUKTI BERKESAN MERENDAHKAN KOLESTEROL\***

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**OMEGA 3 & 6**

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**VITAMIN B1, B2 & B5**

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**HIGH PROTEIN**

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**TERBUKTI BERKESAN MERENDAHKAN KOLESTEROL\***  
MAGNESIUM  
FIBROUS PROTEIN  
KOLAGEN & VITAMIN C  
VITAMIN B1, B2 & B5

\*12g plant sterol with 2 glasses daily.  
\*10g MEGMA in 2 daily servings.

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**FUNCTIONAL FOODS EVALUATION  
AND MICROBIAL ASSAY**

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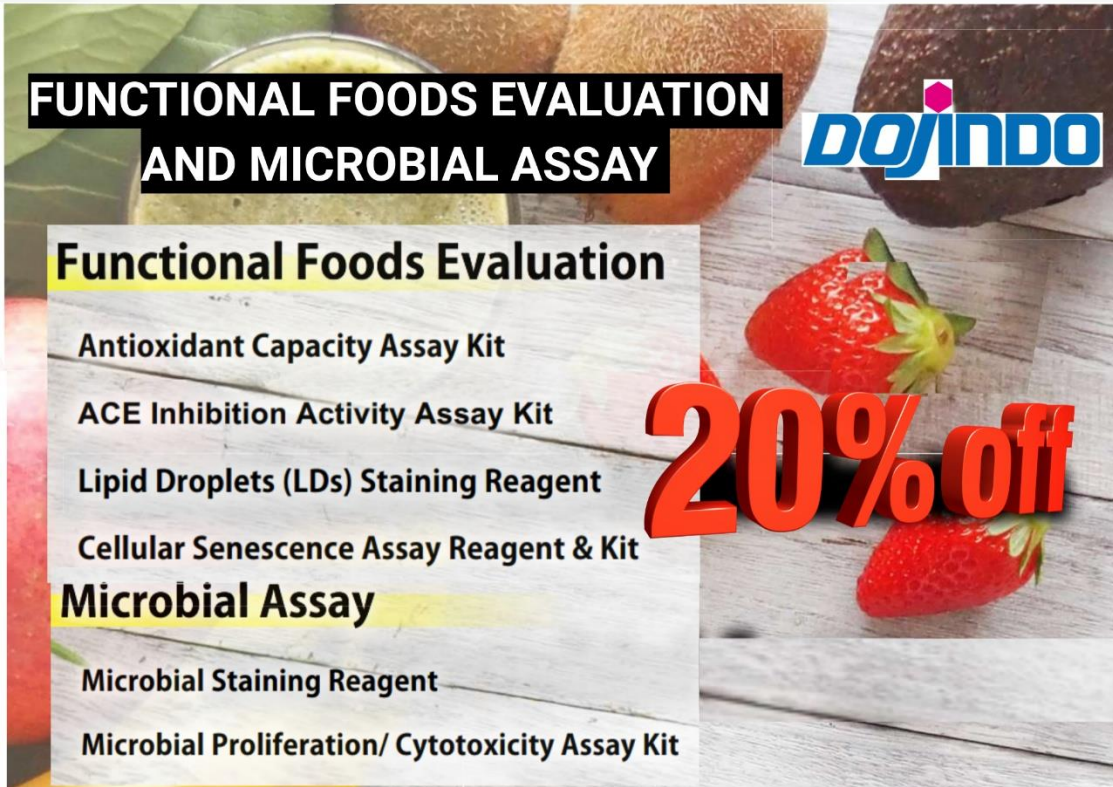
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