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Advancing Medical Science Through Interdisciplinary Research

ABSTRACT BOOK

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KEYNOTE

Advancing Medical Science through Interdisciplinary Research

EMERITUS PROFESSOR DR. NG KWAN HOONG, PHD, FASC

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Interdisciplinary research is driving advancement in biomedical science, enabling deeper understanding and more innovative approaches to solve complex global health challenges.

I would like to quote from a special issue of Nature (2015) on 'Interdisciplinarity': "To tackle the challenges facing society, energy, water, climate, food, health, scientists and social scientists must work together. Yet research that transcends traditional academic boundaries is still unfashionable and poorly rewarded. This special issue of Nature examines what governments, funders, journals, universities and academics must do to make interdisciplinary work a joy rather than a curse."

By integrating biology with physics, chemistry, engineering, computer science, and social sciences, researchers are pushing new frontiers in diagnosis, therapy, monitoring, prevention, and prediction. For example, the development of molecular imaging techniques combines biochemistry and physics to visualise disease processes at the molecular level. In regenerative medicine, tissue engineering merges cell biology and materials science to create artificial organs. Bioinformatics has increased our ability to analyse large-scale biological data for personalised medicine. I will share my experience on how to succeed in interdisciplinary research collaboration by building a workable and sustainable system.

The role of the polymath, or versatile person driven by curiosity, can connect ideas across disciplines, stimulating innovation. Today's researchers with diverse expertise continue the legacy of polymaths such as Leonardo da Vinci, Ibn Sina, Blaise Pascal, and Marie Curie, whose broad thinking has inspired scientific advancement. We have much to learn from them to extend the frontiers of knowledge.

PLENARY 1

Last Call at the Bar: Evolving Treatment Methodologies in Addictions

ADJUNCT PROFESSOR DR. PREM KUMAR SHANMUGAM

Solace Asia

This talk will explore the dynamic landscape of addiction treatment, focusing on the critical intersection of drug safety and efficacy. While the metaphor of "last call" underscores the urgency and potential for transformation in addressing addictive behaviors, the talk will delve into evidence-based and evolving therapeutic approaches that move beyond traditional models.

The session will critically examine the safety considerations associated with various treatment modalities, including pharmacological interventions and behavioral therapies. It will address the potential risks and benefits of different drug classes used in medication-assisted treatment (MAT), emphasizing the importance of individualized assessment and careful monitoring to ensure patient safety and optimize outcomes. Furthermore, the presentation will explore the efficacy of contemporary psychological interventions, such as motivational interviewing, cognitive behavioral therapy (CBT), dialectical behavior therapy (DBT), and acceptance and commitment therapy (ACT), 1 highlighting their empirical support in promoting sustained recovery.

Drawing upon the latest research and clinical insights, this talk will discuss the integration of pharmacological and psychosocial approaches to enhance treatment efficacy and address the complex interplay of biological, psychological, and social factors in addiction. It will also touch upon emerging trends and innovative strategies aimed at improving long-term outcomes and reducing the risk of relapse, ultimately advocating for a holistic and patient-centered approach to addiction treatment that prioritizes both safety and effectiveness.

PLENARY 2

The Dynamism of Scientific Understanding in Relation to Research. A Forensic Anthropology and Legal Perspective

DR. CHANDROTH NAVIN PANKAJAKSHAN

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Scientific knowledge is constantly evolving across all fields, often at a rapid pace. What is accepted as fact today can be overturned by novel discoveries tomorrow. In forensic anthropology, significant advancements have occurred since the Second World War. The field has expanded beyond simply providing biological profiles of unidentified skeletal remains. Today, it involves a multidisciplinary approach, working alongside forensic archaeology, forensic pathology, and law enforcement. Global meta-analyses show that new research not only complements but also challenges long-standing scientific understandings. A key challenge lies in ensuring that non-scientific audiencessuch as legal professionals and juries—can keep up with these advancements. This becomes especially important when forensic anthropologists are summoned to court as expert witnesses. While courts rely heavily on scientific evidence to deliver justice, novel theories and the use of emerging scientific techniques brings both opportunities and challenges. As scientific methods evolve, the legal system must also adapt to ensure these developments are applied accurately and fairly.

PLENARY 3

Discovering New Treatments for Heart Failure using Patient Stem Cell-Derived Cardiomyocytes

PROFESSOR DR. DEREK HAUSENLOY

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Heart failure (HF) is one of the leading causes of death and disability worldwide. New treatments are needed to improve cardiac function in order to improve clinical outcomes in patients with HF. We generate human induced pluripotent stem cell-derived cardiomyocytes (IPSC-CM) from patients with heart failure to model the cardiac disease in the disease to elucidate underlying mechanistic pathways and discover new treatment targets for preventing the onset and progression of heart failure. Using this platform we have discovered new treatments for heart failure due to inherited cardiomyopathies (such as hypertrophic cardiomyopathy) and more recently heart failure due to diabetes.

PLENARY 4

From Tooth to Bone: Osteoprotective Potential of the Toothache Plant

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Introduction: *Acmella oleracea* (*A. oleracea*), also known by the synonym *Spilanthes acmella*, is a plant widely used in traditional medicine to relieve toothache. Several *in vitro* and *in vivo* studies have demonstrated its bone anabolic activities, indicating its potential for treating osteoporosis.
Objectives: The objective of this study was to assess the *in vitro* bone-related effects of *A. oleracea* extract.
Methods: The leaf extracts were tested using *in vitro* antioxidant assays (DPPH, ABTS, and FRAP). The effects on MC3T3-E1 cells were assessed using the MTT assay, Sirius Red staining, ALP activity, and Alizarin Red staining. The phytochemical content of *A. oleracea* extracts was evaluated using GCMS and LCTOFMS, along with TPC and TFC analyses.
Results: *A. oleracea* extract exhibited both antioxidant and bone anabolic activities. Positive correlations were observed between TPC and TFC with antioxidant (ABTS and FRAP) and anabolic activities. Several phytochemical compounds, identified by GCMS and LCTOFMS, were confirmed to contribute to these effects. *A. oleracea* was able to prevent ovariectomy-induced changes in bone histomorphometry parameters and maintain bone biomechanical strength. *A. oleracea* may protect bones by modulating OPG/RANKL levels and through antioxidative mechanisms.
Conclusion: These studies confirm that *A. oleracea* contains bioactive compounds that may protect bones against osteoporosis by reducing oxidative stress

SYMPOSIUM 1

Exploring the Anticancer Potential of a Prophetic Medicine, Ginger (*Zingiber officinale* Roscoe), Against Glioblastoma Multiforme (GBM) Brain Tumor: *In Vitro* and *In Silico* Molecular Docking and Dynamics Simulation Approaches

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Introduction: Prophetic medicine is medicinal plants, foods, and drinks recommended by the great Prophet Muhammad (SM) for the treatment of diseases. Scientists are recently interested in the therapeutic benefits of Prophetic medicines. Glioblastoma multiforme (GBM) is a devastating brain cancer. Despite surgery, radiation treatment, and chemotherapy, the median survival rate is 14.6 months. In this study, we investigated the activity of 6-shogaol, a phytocompound of ginger, against GBM and elucidation of its underlying mechanism of action.

Methodology: The proliferation of GBM (T98G cells) and fibroblast was determined by MTT assay. Apoptosis inducing effect, the mitochondrial membrane potential, and Intracellular ROS were determined by flow cytometry. The expressions of pro-apoptotic and anti-apoptotic genes were measured by Western blot analysis. Pharmacokinetic and toxicity prediction were determined *in silico* by SwissADME server. The PyRx tools AutoDock Vina and virtual screening were used in the molecular docking study.

Results: 6-Shogaol showed potential cytotoxic effect against T98G cells (IC50 :14.08 µM), better than temozolomide (IC50:94.5) - the only drug for GBM treatment. 6-shogaol showed better apoptosis-inducing ability compared to temozolomide via enhanced intracellular ROS mediated autophagy, depolarization of MMP, downregulation of anti-apoptotic protein Bcl-2 and Bcl-xL and upregulation of pro-apoptotic protein Bax. Molecular docking studies resulted good binding affinities of 6-shogaol with Bax, BcL-2, BcL-xL, MCL1 target proteins (-7, -6.4, -7.2 and -7.4 Kcal/mol, respectively), better than temozolomide. ADME/T analysis resulted in lipophilic nature and permeability of 6-shogaol to cross the BBB; whereas temozolomide is hydrophilic and impermeable to cross the BBB. The toxicity of 6-shogaol against fibroblast is 10%, better than temozolomide (25%).

Conclusion: Our study demonstrated better cytotoxicity, permeability to BBB, and very less toxicity of 6-shogaol to normal cells than that of temozolomide. Thus, 6-shogaol may be a prospective drug candidate for successful treatment of GBM. However, further pharmacological and clinical studies are required.

SYMPOSIUM 2

Microscopic Age Estimation Using Bone

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Microscopic age estimation using bone histology has become a vital tool in forensic anthropology for estimating individuals' age at death (ADD), particularly in cases where only skeletal remains are available. Initially developed using long bones such as the femur and tibia, this technique now includes non-weight-bearing bones like the rib and clavicle. The rationale behind histological age estimation lies in the continuous remodelling of cortical and trabecular bone over an individual's lifetime. Bone remodelling, characterized by the formation and resorption of osteons, reflects chronological ageing, allowing forensic experts to quantify microstructural features for age estimation. Key histological features include intact and fragmentary osteons, osteon population density (OPD), and the dimensions of the Haversian system. Established methods, such as those by Kerley and Ubelaker (1965, 1978) and Stout and Paine (1992), have provided reliable formulas for age estimation based on osteon counts in different bone types. However, variations in remodelling rates due to factors such as physical activity, sex, genetic differences, and pathological conditions can affect the accuracy of age estimation. New developments, including geometric morphometric approaches and deep learning for automatic segmentation of osteonal structures, are being explored to improve the precision of age estimates. This presentation highlights the effectiveness and challenges of microscopic bone histology in age estimation and suggests future research directions to account for physiological and methodological variations.

SYMPOSIUM 3

Omega-3 Fatty Acid: The Impact of Diabetes on Cognitive Function

HAFANDI AHMAD

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Diabetes mellitus, a chronic metabolic disorder characterized by prolonged high blood glucose levels, has been strongly associated with an increased risk of cognitive impairment and neurodegenerative conditions. Mechanisms underlying diabetes-related cognitive impairment begin with insulin deficiency, leading to hyperglycemia, which subsequently activates other metabolic signaling pathways. The widespread incidence of cognitive disorders due to diabetes necessitates the implementation of numerous preventative strategies, including ensuring the intake of omega-3 fatty acids. Numerous studies indicate that omega-3 fatty acids, specifically docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), provide a protective effect in preserving cognitive ability by regulating neuroinflammation, augmenting synaptic plasticity, and promoting neuronal survival. Later on, several omega-3 fatty acids studies have demonstrated an advantageous effect on diabetes mellitus disorder. Therefore, understanding the interplay between omega-3 fatty acids and diabetes-related cognitive dysfunction may offer novel therapeutic strategies for preserving cognitive health in diabetic populations. However, despite promising findings, some clinical trials report mixed outcomes, so there is a need for further large-scale studies to optimize supplementation strategies.

SYMPOSIUM 4

Protective Effects of Ejiao on Joint in an Ovariectomised Rat Model of Osteoarthritis

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Introduction: Recent pharmacological studies showed that Ejiao, a traditional Chinese medicine used to replenish blood, has anti-osteoporosis effects. As subchondral bone sclerosis mimicking osteoporosis is a principal component of Ejiao, we wonder if Ejiao could prevent osteoarthritis.
Objectives: This study aims to investigate the effects of Ejiao on knee joints in an ovariectomised rat model of osteoarthritis induced by monosodium iodoacetate.
Methods: Thirty-six adult Sprague-Dawley female rats (~ 3 months old, 200-250 g) were randomised equally into normal control, osteoarthritis control, osteoarthritis groups treated with low- (0.26 g/kg), medium- (0.53 g/kg) and high-dose Ejiao (1.06 g/kg) and glucosamine sulphate (0.25 g/kg). Osteoarthritis was induced with monosodium iodoacetate one month after bilateral ovariectomy. Treatment was initiated one day after induction for 5 weeks.
Results: Ejiao-treated rats showed a reduction in joint width and an improvement in grip strength compared to initial induction. However, these changes were not significant compared to the osteoarthritis control ($p>0.05$). Medium-dose Ejiao significantly decreased Mankin scores of the joint, while low-dose Ejiao consistently improved subchondral bone parameters in rats with osteoarthritis ($p<0.05$). Protein expression of sclerostin, Dickkopf-1 and total beta-catenin in the cartilage of osteoarthritic joints were not significantly different among the study groups ($p>0.05$). However, phosphorylated beta-catenin levels were significantly higher in the medium-dose Ejiao group compared to the rest of the groups ($p>0.05$).
Conclusion: Ejiao demonstrates potential in preventing osteoarthritis in rats with oestrogen deficiency, mimicking postmenopausal women. The Wnt signalling pathway may mediate its action. However, each dose studied seems to affect distinct joint compartments. Further dose refinement will be needed to optimise the joint protective effects of Ejiao.

OC2

Antileukemic Properties of Curcumin and Diarylpentanoid Analogue on Bcr-Abl-Positive Leukemic Cells

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Introduction: The Philadelphia chromosome, a chromosomal translocation between chromosomes 9 and 22, is the most common cytogenetic abnormality in chronic myeloid leukemia (CML). The resulting gene product, Bcr-Abl protein, has constitutively active tyrosine kinase activity, which drives leukemogenesis. Curcumin is a natural bioactive compound isolated from the spice turmeric. It possesses a wide range of biological activities, including neuroprotective, antioxidative, anti-inflammatory, anti-diabetic, antimicrobial, and anticancer properties. However, the clinical application of curcumin is limited by its poor water solubility and bioavailability. Chemical modification of the curcumin keto-enol bridge can effectively improve its bioavailability without compromising its safety or biological properties. Our group has recently synthesized 1,5-bis(4-hydroxy-3-methoxyphenyl)-1,4-pentadiene-3-one (MS13), a diarylpentanoid analogue with a keto-enol bridge modification, which has demonstrated promising anticancer activity against cancers of several origins.
Objectives: This study aims to determine the cytotoxicity and mode of cell death induced by curcumin and MS13 in Bcr-Abl-positive CML K562 cells, as well as the key pathways involved.
Methods: The 24-, 48-, and 72-hour cytotoxicity of curcumin and MS13 on K562 CML cells was assessed using the MTT assay. Subsequently, the mode of cell death following 24-hour treatment was determined using the Annexin V-FITC/PI dual-labeling assay in conjunction with flow cytometry. The involvement of mitochondria and caspase activation was evaluated via mitochondrial TMRE staining and the caspase-GLO luminescent assay, respectively.
Results: Curcumin and MS13 exhibited cytotoxicity against K562 cells in a time- and concentration-dependent manner. MS13 was more potent than curcumin at all treatment times, with lower half-maximal inhibitory concentration (IC50) values. Mechanistically, MS13 induced apoptosis but not necrotic cell death, with mitochondrial membrane potential loss and executioner caspase activation.
Conclusion: MS13 is effective against CML and more potent than curcumin. It primarily induces apoptosis through mitochondrial membrane potential loss and executioner caspase activation. Further studies are needed to elucidate its molecular mechanisms of apoptosis.

OC3

Effects of *Caesalpinia sappan* L. Extract, Wheatgrass, Vitamin E, and Their Combinations as Antioxidants on Lipid Profile Status in Rats (*Rattus Norvegicus* L.) Under Iron Overload Conditions

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Introduction: The abundance of iron, which acts as a free radical in thalassemia patients, contributes to the formation and propagation of lipid peroxidation, leading to tissue damage and cell death. Iron overload is closely associated with increased oxidative tissue damage, and chelation therapy is commonly used to prevent its harmful effects. Thalassemia patients often exhibit a weakened antioxidant status due to a compromised antioxidant defence system, including low levels of vitamin E and reduced activity of superoxide dismutase enzymes in red blood cells and plasma.
Objectives: To evaluate the effects of *Caesalpinia sappan* (L) extract, wheatgrass, vitamin E, and their combinations on lipid profiles in rats conditioned with iron overload (Fe^{3+} dextran).
Methods: The parameters measured were total cholesterol (TC), triglycerides, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) levels. Fe^{3+} dextran was administered at a cumulative dose of 375 mg/kg body weight (BW) orally in five doses. Treatments included *Caesalpinia sappan* (L) extract at 200 mg/kg BW/day and 400 mg/kg BW/day, wheatgrass at 400 mg/kg BW/day, vitamin E at 60 mg/kg BW/day, their combinations, and desferal, administered orally three hours after Fe^{3+} dextran. The study lasted fifteen days, with blood collected via cardiac puncture on the 17th day after anaesthesia. Data were analyzed using variance analysis at a 95% confidence interval, followed by Duncan's Multiple Range Test if differences were detected.
Results: Fe^{3+} dextran significantly altered the lipid profile, evidenced by increased TC, triglycerides, and LDL levels but decreased HDL. The combination of *Caesalpinia sappan* (L) extract (200 mg/kg BW/day), wheatgrass, and vitamin E optimally suppressed lipid peroxidation by reducing cholesterol levels. Additionally, *Caesalpinia sappan* (L) extract alone at 200 mg/kg BW/day effectively reduced TC, triglycerides, and LDL levels, but increased HDL levels.
Conclusion: These findings highlight the potential of *Caesalpinia sappan* (L) extract, wheatgrass, and vitamin E in mitigating iron overload-induced lipid profile abnormalities.
Keywords: *Caesalpinia sappan* L; free radical; iron overload; lipid profile

OC5

Potential Utilization of *Caesalpinia sappan* L as a JAK2 Inhibitor for Splenomegaly Treatment In β-Thalassemia Patients: An *In Silico* Molecular Docking Study

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Introduction: Natural compounds, particularly flavonoids derived from plants, have gained significant attention as potential therapeutic agents for managing splenomegaly and inhibiting Janus kinase 2 (JAK2).

Objectives: This study aimed to evaluate the inhibitory activity of metabolites from *Caesalpinia sappan* L heartwood on splenomegaly-associated proteins using *in silico* molecular docking analysis.

Methods: Molecular docking and virtual screening were conducted to elucidate ligand-binding mechanisms, predict drug-like chemical constituents with favorable absorption, distribution, metabolism, excretion, and toxicity properties, and identify potent JAK2 inhibitors.

Results: Most *C. sappan* heartwood constituents exhibited binding energies comparable to the native ligand (ruxolitinib), with values around -8.42 kcal/mol. Among all identified compounds, terpenoids, protosappanin A dimethyl acetal, and sappanone A demonstrated the highest docking scores, outperforming ruxolitinib with binding energy values of -9.04, -8.88, and -8.85 kcal/mol, respectively. These findings suggest that *C. sappan* heartwood contains bioactive compounds with potential JAK2 inhibitory activity.

Conclusion: This study highlights the potential of *Caesalpinia sappan* L as a natural JAK2 inhibitor. The findings provide a foundation for further research into developing novel therapeutic agents for preventing and treating splenomegaly in β-thalassemia and related conditions.

OC7

Potential of *Litsea garciae* Methanolic Bark Crude Extract in Treating Okadaic Acid-Induced Alzheimer's-Like Model in Zebrafish

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Introduction: Alzheimer's disease (AD) is a debilitating neurodegenerative disorder characterized by cognitive decline, memory impairment, and behavioural disturbances.

Objectives: To evaluate the effects of methanolic *Litsea garciae* (LG) bark crude extract on anxiety, locomotion, learning, and memory, as well as its impact on AD-associated oxidative stress biomarkers and related molecular pathways

Methods: AD-like behavior was induced in zebrafish via intraperitoneal administration of okadaic acid (OKA) twice a week. The zebrafish were immersed in LG-treated water for 21 days. Behavioral assessments, including the novel tank test for anxiety-locomotion and the T-maze for learning-memory, were performed, with data collected on days 7, 14, and 21. Brain tissues were harvested for immunoblot analysis and oxidative stress biomarker evaluation.

Results: Behavioral assessments revealed that methanolic LG bark extract significantly ($p<0.05$) reduced anxiety and enhanced locomotor activity, memory, and learning in a zebrafish model of AD compared to the control. Immunoblot analysis demonstrated that LG extract significantly ($p<0.05$) reduced the expression of active phospho-GSK3β (Tyr216) at a minimum concentration of 50 mg/l and phospho-Tau (Ser9) at 25 mg/l. Furthermore, LG extract significantly ($p < 0.05$) alleviated oxidative stress, as indicated by reductions in lipid peroxidation (LPO) at 25 mg/l and increases in superoxide dismutase (SOD) activity at 50 mg/l.

Conclusion: This study underscores the potential of the LG bark crude methanolic extract in mitigating oxidative stress and inhibiting the activation of GSK3β, leading to improved cognition potentially due to reduced Tau phosphorylation.

Keywords: Alzheimer's disease; *Litsea garciae*; cognitive studies; oxidative stress; GSK3β; Tau

OC8

Psychometric Evaluation of the Chinese Version of the Perceived Stress Scale in Pregnant Women

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Introduction: The 10-item Perceived Stress Scale (PSS-10) extensively assesses overall perceived stress across several clinical and research contexts. Nonetheless, evidence is scarce regarding the reliability and validity of the Chinese version of the PSS-10 (CPSS-10) in pregnant women in mainland China.

Objectives: To validate the psychometric properties of the CPSS-10 in the Chinese pregnant population.

Methods: This is a cross-sectional study focusing on 428 Chinese pregnant women recruited from a large tertiary general hospital in northern China. The sample was randomly categorized into two groups. The factor composition of the CPSS-10 was analyzed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The scale was subjected to additional tests, including convergent, discriminant, concurrent validity, and internal consistency verification.

Results: EFA provided two factors with eigenvalues of 3.900 and 2.086, representing 59.869% of the variance. The six elements that made up Factor 1 indicated "negative feelings," while the four items that made up Factor 2 indicated "positive feelings." There was a range of item loadings from 0.658 to 0.833. CFA exhibited that the two-factor model provided an acceptable fit to this sample. High regression weights (0.615-0.821), average variance extracted (AVE) (0.434-0.558), and composite reliability (CR) (0.754-0.883) were indicators of convergent validity in the data. The square roots of AVE for both factors were greater than their respective correlation coefficients, indicating sufficient discriminant validity. The overall CPSS-10 had a Cronbach's alpha of 0.804, while the values of both subscales varied from 0.749 to 0.881. Acceptable concurrent validity was demonstrated by the fact that the CPSS-10 has a significant negative correlation with social support.

Conclusion: The CPSS-10 exhibits good psychometric features and is considered a valid and reliable instrument for evaluating perceived stress in pregnant women.

OC9

Investigating the Role of Dynamin-Related Protein 1 and Its Phosphorylation in Breast Lesions of Malaysian Women

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Introduction: Breast cancer is the most common cancer among Malaysian women, with 70-75% oestrogen receptor positivity. Dynamin-related Protein 1 (Drp1) is involved in mitochondrial dynamics and linked to various cancer progressions. Recent studies suggested Drp1 as a potential prognostic factor in breast cancer. However, the expression of Drp1 and its phosphorylation at serine 616 (pDrp1-Ser616) in ER-positive breast cancers in the Malaysian population has not yet been investigated.

Objectives: Our study aims to explore the expression of Drp1 and pDrp1-Ser616 in ER-positive breast cancer and noncancerous breast growth in Malaysian women.

Methods: Ninety-two breast tissue samples (46 benign breast lesions and 46 ER-positive malignant lesions) were collected from the Pathology Department, Hospital Tuanku Ja'afar, Seremban, after NMRR approval. The protein expression of oestrogen receptor (ER), Drp1 and pDrp1-Ser616 was done by immunohistochemistry (IHC). The data was analysed by IBM SPSS (V28.0). The chi-square test and student's t-test were used to analyse the data.

Results: The number of benign and malignant breast lesions is highest in Malay (75%), followed by Indian (13%) and Chinese (12%), which aligns with the population distribution of these ethnic groups in Malaysia. The mean age of malignant lesions is 58.99 (SD-11) years. Our analysis showed that women over 40 years old have a 20 times higher risk of malignancy than those who are under 40 years old (95% CI: 5.50-75.44; $P < 0.001$). Among ER-positive malignant breast lesions, 39 (84.8%) showed positive progesterone receptor expression, and 11 (31.4%) showed positive Her2 expression. Drp1 protein is positively expressed in the glandular structure of normal mammalian, benign, and malignant glands, but high immunoreactivity of Drp1 and pDrp1-Ser616 was found in malignant glands.

Conclusion: The study found that Dpr1 expression in malignant tumours is inconclusive, but pDrp1-Ser616 showed higher staining intensity in malignant breast lesions, suggesting potential prognostic value.

OC10

Preliminary Development of a Health Education Program to Improve Psychological Distress among Patients with Oesophageal Cancer and their Partners

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Oesophageal cancer is a prevalent form of upper gastrointestinal cancer. People with oesophageal cancer and their partners often experience higher levels of psychological distress compared to the general population due to its high mortality and incidence rates, which can negatively impact disease prognosis and health-related quality of life. There is an increasing recognition of the necessity to provide support for patients with oesophageal cancer and their partners, to assist them in managing psychological distress. The objective of this study was to collect preliminary data to identify the components required for the development of a health education program. As a result, these two components, diet and physical activity, were identified as effective approaches in improving psychological distress among patients with oesophageal cancer and their partners. Furthermore, behavioural activation is a psychoeducational skill that has been shown to have promising potential in improving psychological distress. This might occur in two ways: firstly, behavioural activation can have a direct effect on improving psychological distress by alleviating depression; secondly, an indirect effect by increasing positive reinforcement for activities and behaviours. Therefore, the development of a health education program based on the above components (diet plus physical activity with behavioural activation approach) is proposed as a potentially effective choice to help address the psychological distress issues of patients with oesophageal cancer and their partners. This study will provide favourable information for the related body of knowledge, future research, and clinical practice. The proposed health education program (diet plus physical activity with behavioural activation approach) is expected to provide a low-risk, cost-effective, feasible, and comprehensive approach to promoting psychological regulation and lifestyle modification among patients with oesophageal cancer and their partners, and also to improve their mental health and well-being.

OC11

A Novel Therapeutic Approach for Osteoarthritis: *In Vivo* Chondro-Regeneration via Activated Growth Factor (AGF) from Platelets Modulation of Anabolic Pathways

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Introduction: Osteoarthritis (OA) is a prevalent degenerative joint disease characterized by progressive cartilage degradation and limited regenerative capacity. Current treatments primarily focus on symptom management, highlighting the need for disease-modifying therapies. This study investigated the therapeutic potential of Activated Growth Factor (AGF) represents an advanced form of PRP, where platelets are activated using a specific protocol to maximize the release of growth factors, particularly TGF-β, in promoting chondro-regeneration in a rat model of OA.

Methods: AGF was prepared from rat platelets using a CaCl2 and thrombin activation protocol, optimized for TGF-β expression. Thirty Wistar rats were divided into six groups: normal control, negative control (OA induction), positive control (intra-articular saline), AGF with TGF-β 0.1 ng/mL, AGF with TGF-β 1 ng/mL, and AGF with TGF-β 10 ng/mL. OA was induced in all groups except the normal control via intra-articular injection of monosodium iodoacetate (MIA). Treatments were administered intra-articularly weekly for four weeks. Chondrocyte expression was assessed using immunohistochemistry for collagen type II. Anabolic pathway markers (Akt, mTOR, SOX9, COMP, Smad2/3) were quantified in cartilage samples via Western blotting.

Results: Histological analysis revealed significant cartilage degradation in the negative control group compared to the normal control. AGF treatment, particularly at 1 ng/mL and 10 ng/mL TGF-β, demonstrated improved cartilage structure, increased collagen type II expression. Western blot analysis showed increased expression of Akt, mTOR, SOX9, COMP, and Smad2/3 in the AGF-treated groups, indicating activation of anabolic pathways crucial for chondrocyte regeneration.

Conclusion: AGF exhibits promising chondro-regenerative potential in a rat OA model by modulating key anabolic pathways. These findings suggest that AGF may represent a novel therapeutic strategy for OA treatment.

Keywords: Activated growth factor; anabolic pathways; Akt; chondro-regeneration; COMP; platelet-rich plasma; mTOR; Osteoarthritis; SOX9; Smad2/3; TGF-β

OC12

Phyto-Nanoemulsion of Lemon Myrtle Essential Oil: Development and Larvicidal Efficacy against *Aedes aegypti* L.

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Introduction: Mosquito-borne diseases remain a significant global health concern, with *Aedes aegypti* serving as the primary vector for multiple viruses, including the dengue virus. The rapid emergence of resistance to synthetic insecticides has compromised the effectiveness of vector control strategies. Therefore, the development of novel and efficient insecticides is crucial for sustainable mosquito management. Lemon myrtle (*Backhousia citriodora*) essential oil (LMEO) demonstrates potent antimicrobial, antifungal, antibiofilm, and insecticidal activities, but its hydrophobicity and susceptibility to environmental instability limit its efficacy.

Objectives: This study aims to develop a phyto-nanoemulsion-LMEO system (LMEON) and evaluate its larvicidal efficacy against *Ae. aegypti.*

Methods: The main constituents of LMEO were identified using gas chromatography-mass spectrometry (GC-MS). LMEON was prepared using the high-energy ultrasonication method, incorporating LMEO, Tween 80, corn oil, and deionized water at optimized concentrations. The fabricated LMEON were characterized using a dynamic light scattering particle size analyzer. The larvicidal study was then performed following the standardized protocol established by the World Health Organization (WHO).

Results: GC-MS analysis identified neral and geranial as two major phytochemicals in LMEO. Characterization of the selected formulations revealed that Formulation A (containing 5% Tween 80) and Formulation B (containing 10% Tween 80) exhibited nanoscale droplet sizes. Stability testing over 28 days at three different temperatures (4°C, 25°C, and 37°C) indicated that Formulation A

was the most stable, as no phase separation was observed, and droplet size remained consistent throughout the observation period. Larvicidal assays demonstrated that Formulation A achieved a higher lethal effect at a lower concentration compared to LMEO, suggesting its potential as an effective and sustainable approach for integrated mosquito control programs.

Conclusion: These findings highlight the potential of nanoemulsified LMEO as an eco-friendly and effective alternative to synthetic insecticides for *Ae. aegypti* control.

OC13

Psychometric Validation of the Chinese Rapid Geriatric Assessment (C-RGA) Scale in Long-Term Care Settings

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The Rapid Geriatric Assessment (RGA) is a multidimensional screening tool integrating geriatrics, nutrition, rehabilitation medicine, and cognitive science to assess frailty, sarcopenia, malnutrition, and cognitive impairment in older adults. This study aimed to translate and validate the Chinese version of the RGA (C-RGA) for interdisciplinary applications in elderly care settings. Content validity was assessed using the Content Validity Index (CVI), including item-level (I-CVI) and scale-level (S-CVI) evaluations. Confirmatory factor analysis (CFA) was conducted to assess structural validity, demonstrating a good model fit (χ^2/df = 1.122, RMSEA = 0.024, GFI = 0.929, AGFI = 0.906, CFI = 0.905, TLI = 0.888). Reliability analysis confirmed strong internal consistency (Cronbach's α = 0.839, subscale range 0.752-0.927) and test-retest reliability above 0.800, ensuring the scale's stability. The results validate the C-RGA as a reliable and effective screening tool for frailty, sarcopenia, malnutrition, and cognitive function in Chinese elderly populations. Its implementation in nursing homes, community healthcare services, and hospitals can facilitate early detection, risk stratification, and targeted interventions. The study underscores the importance of interdisciplinary collaboration in aging research, highlighting the role of geriatrics, nutrition, and rehabilitation in improving elderly health outcomes. These findings contribute to advancing medical science by promoting comprehensive geriatric assessments that support personalized and preventive healthcare strategies for older adults.

OC14

The Effect of 3.5 Ghz Exposure on the Parameters of Libido in Male Rats

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The human fertility rate has shown a concerning decline in recent years. Various studies have been conducted to evaluate the relationship between Wi-Fi exposure and fertility, but research on its impact on male libido is sparse. Thus, this study assessed the effect of 3.5 GHz Wi-Fi from 5G network technology on the libido of male rats and its relationship with the pregnancy rate of female rats. Eighteen male Sprague Dawley rats (n=18) were randomized into two groups (n=6), namely control and Wi-Fi-exposed groups. Control group did not receive Wi-Fi exposure while the latter received Wi-Fi exposure 7 hours/day for 60 days. Around 50 days of exposure, a female Sprague Dawley rat was introduced to the male's cage in 1:1 ratio and the copulatory behavior was recorded. Findings from the study showed that exposure to Wi-Fi had no significant differences in mount latency, intromission frequency, and post-ejaculatory interval compared to the control group. However, for mount frequency and ejaculation latency, both parameters increased in group 3.5 GHz compared to the control group, with p-values of 0.047 and 0.008, respectively. In conclusion, exposure to Wi-Fi networks does not inhibit male libido but leads to an increase in mounting frequency and ejaculation latency.

OC15

Ultrasound Combined with FNA-Tg Predicts the Lateral Cervical Lymph Node Metastasis in Papillary Thyroid Carcinoma

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Objective: Accurate lateral cervical lymph node metastasis detection is crucial for papillary thyroid carcinoma (PTC). Our study goal is to analyze typical ultrasound manifestations and fine-needle aspiration thyroglobulin (FNA-Tg) levels to investigate their association with lateral cervical lymph node metastasis in patients with PTC.

Methods: The data of 139 PTC patients with ultrasonically suspected cervical lymph node metastasis treated in our hospital from December 2022 to November 2023 were retrospectively analyzed. All included patients underwent ultrasound examination of cervical lymph nodes, fine needle aspiration cytology (FNA-C), and FNA-Tg. Typical ultrasound signs for diagnosing cervical lymph node metastasis (US-M) and FNA-Tg for diagnosing cervical lymph node metastasis were compared and analyzed. Receiver operating characteristic (ROC) curves were plotted to test the value of US-M, FNA-Tg, and a combination of US-M + FNA-Tg in predicting lateral cervical lymph node metastasis in patients with PTC.

Results: Results indicate that among 139 PTC patients with ultrasonically suspected cervical lymph node metastasis, 71 patients were diagnosed with lateral cervical lymph node metastasis through surgery and subsequently included in the metastatic group, while the remaining 68 patients were included in the non-metastatic group. The FNA-Tg value in the metastatic group was higher than that in the non-metastatic group, and the difference was statistically significant ($P<0.001$). The AUC values for diagnosing lateral cervical lymph node metastasis in PTC patients using US-M, FNA-Tg, and US-M+FNA-Tg were 0.854, 0.927, and 0.952, respectively. When the cut-off value of FNA-Tg was 229.1 ng/ml, the sensitivity and specificity for diagnosing lateral cervical lymph node metastasis in PTC patients were 84.5% and 89.5%, respectively.

Conclusion: Ultrasound-guided FNA-Tg level is closely related to cervical lymph node metastasis in patients with PTC. The combination of ultrasound and FNA-Tg significantly enhances the accuracy of predicting lateral cervical lymph node metastasis in patients with PTC.

OC16

Pain Management for Primary Liver Cancer Patients Undergoing Transarterial Chemoembolization: A Scoping Review

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Background: Hepatocellular carcinoma (HCC), the most common primary liver cancer, has a high global incidence and mortality. Transarterial chemoembolization (TACE) is a standard therapy for intermediate-stage HCC, but pain is a common and challenging complication. Variability in pain management practices exists, and a consensus on the best protocols is lacking.

Objective: This scoping review aimed// to comprehensively overview current pain management strategies for HCC patients undergoing TACE, identify the effectiveness of various protocols, highlight practice gaps, and propose optimization recommendations.

Methods: Guided by Arksey and O'Malley's framework and following PRISMA-ScR guidelines, relevant studies were searched in Pubmed, Web of Science, Cochrane Library, Scopus, and CIHAHL. The search terms combined pain-related terms, TACE, and liver cancer-related terms. Two researchers independently reviewed titles, abstracts, and full-texts, and extracted data on study characteristics and pain management interventions.

Results: Of the 1,515 initially identified articles, 29 were included. Most studies focused on pharmacological interventions (72.7%), with dexamethasone and lidocaine being the most studied agents. Non-pharmacological strategies, including psychological, physical, and others (music therapy, health education, comprehensive nursing), were also reported. Visual Analog Scale (VAS) and Numeric Rating Scale (NRS) were the most commonly used pain assessment tools.

Conclusion: Pharmacological interventions, especially dexamethasone and lidocaine, dominate current pain management for TACE patients, but there is a lack of consensus on their use. Non-pharmacological interventions offer valuable adjuncts. Standardized pain management protocols incorporating both pharmacological and non-pharmacological approaches, tailored to individual patient needs, are needed. Future research should focus on large-scale, multicenter trials to determine the most effective pain management strategies.

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OC17

The Biochemical Signaling Pathway Affected by the Tocotrienol-Rich Fraction in Brain Cells

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Objective: This scoping review aims to analyze how Tocotrienol-Rich Fraction (TRF) contributes to maintaining neuronal health.

Methods: Twenty-four relevant papers were identified after a thorough search on PubMed, Scopus, and Web of Science databases using Boolean operators with the following phrases: ("tocotrienol-rich fraction") AND (("neuroprotective*") OR ("cognit*") OR ("brain")). Only studies meeting the following criteria were included in the review: (i) Investigations examining the impact of TRF on the brain; (ii) Studies that specifically explore biochemical pathways related to the expression of genes and proteins; and (iii) Original research articles with accessible full-text content. Studies focusing solely on tocopherol, tocotrienol, or TRF combined with other substances, without isolating the unique effects of TRF, were excluded. Additionally, studies investigating TRF's biological activity in organs other than the brain were not included in the analysis.

Results: The findings of our review revealed that TRF primarily modulates key biochemical pathways involved in regulating inflammation, cell survival, growth, and stress responses in the brain. Specifically, TRF altered the expression of genes and proteins in neuronal cells through the NF-κB, PI3K-AKT-mTOR, and MAPK signaling pathways, impacting processes such as axonal transport, ubiquitin-proteasome activity, calcium signaling, mitochondrial function, and ER protein processing.

Conclusion: TRF modulates key brain pathways and cellular processes highlighting its potential for neuroprotection and therapeutic applications in neurological disorders.

OC18

D-Galactose Induced Senescent Male Rats as an Osteoporosis Model

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D-galactose (D-gal) can induce aging-like skeletal changes in rodents. Thus, the D-gal-induced osteoporosis rodent model is a popular platform for screening potential therapeutic agents for osteoporosis. However, discrepancies regarding the optimal dose of D-gal for osteoporosis induction exist in the literature. This study aims to establish the optimal dose of D-gal for inducing osteoporosis in rats based on bone mineral density (BMD) and biomechanical properties. Three-month-old male Sprague-Dawley rats were assigned to four groups (n=6/group): a control group (saline injection) and three D-gal groups receiving 150, 300, or 600 mg/kg/day of D-gal subcutaneously for 8 weeks. Body weight was recorded weekly. Dual-energy X-ray absorptiometry was used to assess BMD at weeks 0, 4, and 8. After euthanasia, the left femurs and tibias were collected for biomechanical strength testing. Results showed that body weight increased rapidly in all groups during weeks 0–4, but the rate was slower in the D-gal groups during weeks 4–8 compared to controls ($P < 0.05$). At week 8, the left femoral BMD significantly decreased across all D-gal groups ($P < 0.05$), with the largest reduction observed at the 300 mg/kg dose ($P < 0.001$). Left tibial BMD showed reductions in all D-gal groups, with a significant difference at 150 mg/kg ($P < 0.05$), although higher doses (300 mg/kg and 600 mg/kg) did not show significant differences. Biomechanical testing revealed greater bone fragility in the D-gal-treated groups, with significant differences in the 300 mg/kg and 600 mg/kg groups ($P < 0.05$). Flexural strength tests demonstrated significantly reduced bone strength in the same groups, indicating increased brittleness ($P < 0.05$). In conclusion, D-gal effectively induces aging-related osteoporosis-like changes, reducing BMD and bone strength while increasing fragility. The 300 mg/kg dosage produced the most pronounced effects, suggesting it as an optimal dose for modeling osteoporosis in male Sprague-Dawley rats. This model provides a reliable platform for studying osteoporosis and evaluating potential treatments.

OC19

Oral Supplementation of Astaxanthin Promotes Bone Fracture Healing in an *In Vivo* Model

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Bone fracture is defined as a complete or partial disruption in the continuity of bone structure causing a significant burden on healthcare and economic sectors. Fractured bone healing is a coordinated process involving growth factors, cytokines and bone cells. This process could be negatively affected by the overproduction of reactive oxygen species at the fracture site, accompanied by impaired angiogenesis to bone ends. Therefore, antioxidants are a rational approach to suppress the destructive effects of free oxygen radicals, promoting healing of fractured bones and potentially lowering the risk of non-union. Astaxanthin (AST) as a powerful antioxidant has been proven to prevent the progression of various bone diseases, however its potential in fracture healing is yet to be explored. Thus, in this study, we aimed to evaluate the effect of AST on the fracture healing process in a rodent model. The fracture procedure was performed on the right tibiae of male Sprague-Dawley rats and stabilized using plate fixation method. Rats were randomly assigned into two groups (n=6) which were supplemented with palm oil and 10 mg/kg AST, respectively for 8 weeks following fracture procedure. Whole-body and regional bone mineral density (BMD) was also measured using dual-energy x-ray absorptiometry (DEXA). At the end of treatment, right tibia samples were harvested. The strength of fractured bone was assessed through mechanical testing. After 8 weeks of treatment, AST groups has demostrated enhanced bone strength, as evidenced by significant high, stress, strain, stifness and Young's Modulus. Furthermore, AST supplementation increased BMD and bone mineral content (BMC), indicating increased bone formation activity during the healing process of fracture.

OC20

Screening of Environmental Samples for Bacteriophages Targeting Multidrug-Resistant *H. Pylori* Strains

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Introduction: *Helicobacter pylori* (*H. pylori*) has been known as bacteria that colonise the human stomach. It has been known as a cause of peptic ulcer disease and gastric cancer in infected population. The bacteria can be eliminated with antibiotic therapy; however, the emergence of multidrug-resistant *H. pylori* strains presents a significant challenge to eradication treatment. The multidrug-resistant *H. pylori* infection reduces the efficacy of standard regimens, necessitating alternative treatment strategies and the development of novel therapeutic approaches.

Objectives: This study aims to isolate potential bacteriophages from environmental samples targeting multidrug-resistant *H. pylori* strains.

Methods: Environmental samples were collected from HCTM sewage, household septic tank, seawater, river, pond, drain, and four algae samples. These samples were processed for phage particle extraction, and the resulting phage lysates were screened against 25 multidrug-resistant *H. pylori* strains using growth method (OD600 value) and spot test assay.

Results: Initial screening using the growth method indicated that six lysates exhibited lower optical density (OD) values towards all strains compared to the positive control, while lysates from seawater and algae samples A, C, and D displayed higher OD values. Further screening of the phage lysates demonstrated that five environmental samples (HCTM sewage, household septic tank, river, pond, and drain) produced positive results in the spot test against seven *H. pylori* strains. Specifically, lysates from HCTM sewage, household septic tank, river, pond, and drain show lysis against 2, 3, 3, 2, and 1 *H. pylori* strains, respectively. The lysis zone diameter ranging from 1 - 10 mm.

Conclusion: This study identified potential bacteriophages from environmental samples with activity against multidrug-resistant *H. pylori*. Further characterization and optimization are necessary to assess their efficacy and host range. This highlights their potential as an alternative therapeutic strategy to address antibiotic resistance.

OC21

Nursing Care of a Patient Undergoing 3D-Printed Prosthetic Replacement for Giant Cell Tumour of the Distal Right Radius: A Case Report

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Introduction: A giant cell tumor (GCT) is a low-degree malignant lesion, which is locally invasive and prone to lung and bone metastasis. The distal end of the radial bone is the third most affected site after the distal end of the femur and the proximal end of the tibia. 3D printing technology is based on a computer 3D design model through software layered discrete and numerical control molding system.

Objectives: To summarize the nursing process of a patient receiving 3D-printed prosthesis replacement for right distal osteomegalocytoma, and to improve and share the key points of nursing practice

Methods: A case study

Results: The patient's right wrist has long-term pain and discomfort. He was treated in a hospital in Xi'an. After medical treatment, he did not see a significant improvement, so he went to our hospital. In order to clarify the diagnosis, MRI imaging of the right wrist joint and the exploration of the incision and right radius of the distal radius tumor were carried out. A pathological diagnosis made was a giant cell tumor at the distal end of the right radius. We established a medical team and consulted relevant literature, discussed the nursing experience of 3D printing prosthesis replacement and postoperative functional exercise to jointly formulate the perioperative care plan for patients. They provided effective psychological counseling and health guidance to patients, and worked closely with doctors during surgery. After surgery, nurses provided patients with targeted pain care, prosthetic implant rejection care, personalized functional exercise guidance and postoperative follow-up. The postoperative incision of the patient was well-healed without complications. Six months later, his wrist function was well restored and his self-living ability had improved.

Conclusion: "Integrated medical care" nursing provides patients with accurate perioperative care solutions, conducive to dynamic and continuous evaluation of patient's condition and optimization of nursing services.

OC22

Comparative Analysis of Osteoporotic Fracture Care in Malaysia: Standard Tertiary vs. Fls-Accredited Hospitals

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Introduction: Osteoporotic fractures significantly impact healthcare systems, particularly among older adults. Effective management and secondary prevention are crucial for reducing adverse outcomes. This study compares care quality between standard tertiary care hospitals and a Fracture Liaison Service (FLS)-accredited hospital in Malaysia.

Objectives: To assess differences in care quality, treatment efficacy, and adherence to secondary fracture prevention between these healthcare models.

Methods: A retrospective analysis of patient data from 2021 was conducted across three standard tertiary care hospitals and one FLS-accredited hospital. Data included demographics, clinical interventions, and post-fracture care.

Results: The FLS-accredited hospital demonstrated superior care quality, marked by higher rates of prompt surgical interventions ($p=0.005$). This contributed to more comprehensive post-fracture management, with significantly higher prescription rates of anti-osteoporosis medications at discharge and follow-up ($p<0.001$). Supplement prescriptions and bone mineral density testing were also notably higher in the FLS setting ($p<0.001$). Patients treated in the FLS-accredited hospital showed better post-fracture mobility ($p=0.037$) and independence levels ($p<0.001$) compared to those in standard tertiary care hospitals.

Conclusion: The study reveals substantial differences in osteoporotic fracture care between standard and FLS-accredited hospitals. These findings highlight the critical need for broader implementation of structured fracture care programs to enhance patient outcomes in Malaysia. By adopting these programs on a larger scale could lead to marked improvements in the quality of care for osteoporotic fracture patients.

ABSTRACTS FOR YOUNG PRESENTERS AWARD

YIA 01

Impact of Maternal Diabetes During Pregnancy on Offspring Arterial Health Access Through Vascular Ultrasound: A Systematic Review

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Introduction: Maternal diabetes during pregnancy is linked to adverse metabolic and cardiovascular outcomes in both mothers and their offspring. However, the impact of maternal diabetes on arterial vascular alterations, particularly in the carotid artery of offspring, have not been systematically reviewed.

Objective: To compare the structural and functional changes in the carotid artery from fetal life to adulthood in offspring of diabetic mothers.

Methods: A systematic review was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines guidelines, with a literature search performed in PubMed, Scopus, and Web of Science up to October 17, 2024. The Newcastle-Ottawa Scale was used to assess the risk of bias.

Results: Out of 4,456 screened papers, six studies met the inclusion criteria comprising three on infants (IDM), two on children (CDM), and one on adults (ADM) born to diabetic mothers. Carotid intima-media thickness (CIMT) in IDM exposed to gestational diabetes mellitus (GDM) showed no significant difference from controls. However, IDM exposed to GDM, type 1, or type 2 diabetes mellitus, particularly when maternal insulin use was reported, exhibited a significantly increased CIMT. In CDM, CIMT was elevated compared to controls and positively correlated with higher maternal fasting plasma glucose (FPG) levels. Additionally, carotid arterial function was impaired, as evidenced by increased carotid-femoral pulse wave velocity (cf-PWV) and augmentation index (AIx), alongside increased arterial stiffness and reduced arterial distensibility and strain. In ADM, exposure to maternal type 2 diabetes mellitus was linked to reduced carotid artery distensibility, suggesting persistent vascular alterations into adulthood.

Conclusion: The findings suggest that maternal diabetes is associated with subtle, yet progressive carotid artery alterations from infancy to adulthood. Early vascular ultrasound assessments may facilitate the early detection and management of cardiovascular or atherosclerosis risks in this population.

Keywords: Cardiovascular risk in offspring; maternal diabetes; ultrasound; vascular alterations

YIA 02

The Combination Effects of Orchidectomy and Antibiotics on Bone in Male Rats

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Gut microbiotas play a critical role in maintaining bone health. While the influence of oestrogen deficiency on the gut-bone axis is well-established, evidence regarding testosterone deficiency is relatively scarce. This study aims to investigate the effects of the interaction between gut microbiota and testosterone deficiency induced by orchidectomy (ORX) on the skeletal system in male rats. Three-month-old Sprague Dawley male rats were assigned to four groups (n=6/group): sham (SHAM), ORX, SHAM+antibiotics (SHAM+ANT), and ORX+antibiotics (ORX+ANT). The ORX groups underwent bilateral orchidectomy, while the ANT groups received a combination of ampicillin, sulfamethoxazole, and trimethoprim for three months. At the end of the study period, the rats were sacrificed, and their faeces and femurs were harvested for analysis. Mild side effects, including diarrhoea, weight loss, and reduced appetite, were observed in the ANT groups. Faecal DNA analysis confirmed a significant reduction in gut microbiota in the ANT groups. Whole-body bone mineral density (BMD) and bone mineral content (BMC) showed no significant differences among groups ($p>0.05$). However, the femoral BMC of the SHAM+ANT group was significantly lower than that of the ORX group in the first month and lower than that of the SHAM group in the second month ($p<0.05$). Bone biomechanical strength analysis revealed that the SHAM+ANT group had lower Young's modulus values than the ORX group ($p<0.05$). The ORX+ANT group exhibited reduced maximum force, stress, and stiffness compared to the ORX and SHAM groups ($p<0.05$), while displacement and strain values were higher ($p<0.05$), suggesting increased bone fragility. In conclusion, testosterone deficiency, in combination with gut dysbiosis, profoundly impacts the skeletal health of male rats.

YIA 03

Biancaea sappan Extract Ameliorates Iron Overload Induced in Rat (*Rattus norvegicus* L.) by Regulating Iron Homeostasis, Hepatic Iron Accumulation and Immune System Response

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Introduction: Iron accumulation in transfusion-dependent thalassemia patients can lead to organ damage and immune system dysfunction. Excessive iron affects iron-regulating proteins and the body's immune response. The liver plays a crucial role in regulating iron levels by expressing proteins such as hepcidin and ferroportin while supporting immune function through phagocytosis and inflammatory cytokine production. *Biancaea sappan* contains 25% brazilin and has iron-chelating and immunomodulatory properties.

Objectives: This study aims to evaluate the protective effects of *Biancaea sappan* extract against iron overload-induced toxicity in rats by assessing its role in regulating iron homeostasis, reducing hepatic iron accumulation, and modulating immune system response

Methods: This study employed a post-test-only control group design using rats with iron overload induced iron dextran administration. The subjects were divided into eight groups: a normal control group, a positive control group, a negative control group, and five treatment groups with *Biancaea sappan* extract at 50 mg/kg body weight (BW), 75 mg/kg, 100 mg/kg, 150 mg/kg, and 200 mg/kg. The collected data were analyzed using univariate and bivariate analyses to examine relationships between variables with a 95% confidence level.

Results: *Biancaea sappan* extract at a dose of 50 mg/kg BW reduced iron levels by 46%, ferritin levels by 18%, serum iron by 47%, and transferrin saturation by 48% in the liver. A 100 mg/kg BW dose increased transferrin levels by 42%. At a dose of 200 mg/kg, *Biancaea sappan* extract reduced ferritin levels by 55.6%, serum iron by 60%, liver iron concentration by 37.1%, and transferrin saturation by 84.7%, increased transferrin levels by 23.4% and total iron-binding capacity by 62%. At 200 mg/kg BW, *Biancaea sappan* extract increased the expression of iron-regulating proteins,

ferroportin, and hepcidin. Additionally, *Biancaea sappan* extract significantly increased interleukin (IL)-10 levels but decreased IL-6 and TNF-α levels.

Conclusion: *Biancaea sappan* extract exhibits protective effects against iron overload-induced toxicity by reducing hepatic iron accumulation, regulating iron homeostasis through hepcidin and ferroportin modulation, and improving immune response by increasing IL-10 while reducing IL-6 and TNF-α levels. These findings suggest that *Biancaea sappan* extract has a potential as a natural therapeutic agent for managing iron overload conditions.

YIA 04

Establishing an *In Vitro* Endothelial-Mesenchymal Transition by TGF-β1 Induction

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Introduction: Endothelial-mesenchymal transition (EndMT) is one of the crucial processes in fibrosis and cardiovascular diseases, where the endothelial cells lose their identity and acquire mesenchymal characteristics. Transforming growth factor beta 1 (TGF-β1) is a key driver of EndMT, activating multiple signaling pathways such as Smad, Notch and PI3K/AKT to promote mesenchymal transition. Developing a reliable *in vitro* model of TGF-β1 induced EndMT is essential for studying its molecular mechanisms and identifying potential therapeutic targets.
Objectives: To establish an *in vitro* EndMT model via TGF-β1 stimulation and characterize the resulting phenotypic changes.
Methods: Human coronary artery endothelial cells (HCAEC) were treated with TGF-β1 (20 ng/ml, 50 ng/ml and 100 ng/ml) for a duration of 72 hours (Day 3) and 120 hours (Day 5) to induce phenotypic changes. Immunocytochemistry (ICC) was performed to evaluate the endothelial marker expression (CD31, CD34, vWF) and mesenchymal markers (CD105, CD90, and CD73) to characterize the phenotypic changes.
Results: TGF-β1 treatment for 72 and 120 hours induced morphological changes in endothelial cells, promoting a mesenchymal-like transition characterized by reduced expression of endothelial markers (CD31, CD34, and vWF), but increased expression of mesenchymal markers (CD105, CD73, and CD90). Although this qualitative observation appears promising, further quantitative analysis is required to confirm these findings.
Conclusion: This preliminary study demonstrates the feasibility of a time-dependent *in vitro* model of TGF-β1-induced EndMT. These findings lay the groundwork for future studies to further elucidate the molecular mechanisms of EndMT and explore potential therapeutic strategies for vascular diseases.

YIA 05

Identification of Yeast Species Isolated from Dental Plaque of Periodontitis Patients and Healthy Subjects Using TYI-S-33 Medium

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Yeast are ubiquitous microorganisms that exist primarily as commensals in the oral cavity, but they may transition into opportunistic pathogens under certain conditions, potentially contributing to periodontitis. This study investigated the yeast composition in subgingival dental plaque from 15 periodontitis patients and 15 healthy subjects at Hospital Pakar Universiti Sains Malaysia. The samples were cultured in TYI-S-33 medium, yielding 16 viable yeast isolates which were identified by MALDI-TOF mass spectrometry, while their density was estimated using the McFarland method. Six yeast species were identified, where *Pichia kudriavzevii* and *Candida tropicalis* were present in both groups, whereas *Candida glabrata* and *Candida albicans* were exclusive to periodontitis patients, while *Candida dubliniensis* and *Diutina rugosa* were found only in healthy individuals. Although the median yeast density was higher in periodontitis patients, the difference was not statistically significant (p=0.0562). These findings highlight the diversity of yeast in subgingival dental plaque and suggest their potential involvement in periodontal disease. The distinct species distribution between health and disease states underscores the need for further research into yeast-microbiome interactions. A deeper understanding of these interactions may provide valuable insights into host-pathogen relationships and inform targeted therapeutic strategies for periodontitis management.

ABSTRACTS FOR POSTER PRESENTATION

P2

Neuroprotective Effects of Kelulut Honey in an Alzheimer's Disease Rat Model

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Introduction: Alzheimer's disease (AD) is a progressive neurodegenerative disorder marked by cognitive decline and memory impairment, driven by amyloid-β plaques and neurofibrillary tangles. Current treatments focus on symptom management rather than disease modification. Kelulut honey (KH), produced by stingless bees native to Southeast Asia, contains bioactive compounds with potential neuroprotective properties. These compounds may counteract oxidative stress and inflammation, key contributors to AD pathogenesis.

Objective: This study evaluated the effects of KH in an AD-induced rat model, focusing on the frontal lobe and cerebellum.

Methods: Twenty-four male Sprague-Dawley rats were divided into control (C), AD-induced (Aβ), and AD-induced with KH supplementation (KS) groups. The Aβ and KS groups received stereotaxic amyloid-β induction, followed by four weeks of KH administration in KS. Brain tissues were analyzed using H&E staining, TUNEL assay, and enzyme-linked immunosorbent assay (ELISA) for superoxide dismutase (SOD), malondialdehyde, NFκB, Aβ42, and p-tau levels.

Results: Pyramidal cell counts in the frontal lobe were significantly preserved in KS compared to Aβ ($p<0.05$). No significant differences in apoptotic cell counts were detected via the TUNEL assay. ELISA revealed reduced SOD levels in the cerebellum of Aβ compared to controls ($p<0.05$), while KH supplementation significantly increased SOD levels ($p<0.05$). Other ELISA markers showed no notable intergroup differences.

Conclusion: KH may slow AD progression by reducing amyloid plaque accumulation and enhancing SOD levels in the cerebellum, mitigating oxidative stress. Preservation of pyramidal cell counts in the frontal lobe suggests a role in maintaining neuronal integrity crucial for cognitive function. These findings highlight KH as a potential therapeutic agent for AD, warranting further exploration of its bioactive compounds and long-term effects.

P3

Effects of Ejiao on Hepatic Antioxidant Profile

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Introduction: Menopause brings many physiological changes in women, including chronic low-grade oxidative stress. Ejiao (donkey hide gelatin) is a traditional Chinese medicine used to nourish the blood in women. Since Ejiao has demonstrated anti-inflammatory and antioxidant activities, it can potentially prevent these changes due to menopause.
Objective: This study aimed to investigate the effects of Ejiao on oxidative stress parameters in the liver of ovariectomised (OVX) rats.
Methods: Three-month-old female Sprague-Dawley rats were randomised into six groups (n=8). Ovariectomy was performed on all groups, except the sham group, 4 weeks before treatment. The sham and OVX control groups received tap water, the glucosamine sulphate-supplemented group received glucosamine sulphate at 250 mg/kg/day, and the Ejiao-supplemented groups received Ejiao aqueous solution at 0.26 (low), 0.53 (medium), and 1.06 (high) g/kg/day via oral gavage. All rats were treated for four weeks, after which they were euthanised, and the liver was harvested for oxidative stress assay.
Results: Liver weight showed no significant changes across all study groups. Ovariectomy did not alter catalase activity compared to sham-operated rats. Glucosamine sulphate significantly elevated liver catalase activity compared to both sham and OVX groups. Similar effects were absent in groups treated with low- or high-dose Ejiao. Surprisingly, medium-dose Ejiao significantly reduced catalase activity compared to all study groups, except high-dose Ejiao. Treatment with glucosamine sulfate, low-dose and high-dose Ejiao showed reduced malondialdehyde levels compared to OVX control. However, medium-dose Ejiao did not show a similar reduction.
Conclusion: Ejiao at low and high doses might offer antioxidant benefits, but not the medium dose. However, this speculation requires additional investigation to confirm.

P4

Cytotoxicity and *In Vitro* Osteogenic Differentiation Potential of Alpha-Asarone on Mc3t3-E1 Cells

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Introduction: Alpha-asarone is a naturally occurring phenylpropanoid bioactive compounds present in various plants, including *Piper sarmentosum* (Kaduk), a local therapeutic plant, reported to possess osteoporosis-protective properties. Alpha-asarone is known for its diverse pharmacological activities, including anti-inflammatory, antioxidant, and neuroprotective effects. However, its direct effects on osteogenic differentiation remain unexplored.
Objectives: This study aimed to evaluate the cytotoxicity and osteogenic potential of alpha-asarone on the MC3T3-E1 pre-osteoblast cell line *in vitro*.
Methods: The cytotoxicity of alpha-asarone was assessed using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-2H-tetrazolium bromide assay (MTT) assay at concentrations ranging from 0 to 800 µM. For osteogenic differentiation, MC3T3-E1 cells were treated with alpha-asarone (1-20 µM) for 21 days, and cell viability was monitored using the MTT assay. The differentiation potential was evaluated using alkaline phosphatase (ALP) enzyme activity assays and von Kossa staining for mineralized matrix formation. Untreated cells acted as the negative control, while cells treated with 50 µg/mL ascorbic acid and 10 mM β-glycerophosphate served as the positive control.
Results: The cytotoxicity assay demonstrated a dose-dependent effect, with alpha-asarone exhibiting no cytotoxicity at osteogenic concentrations. Von Kossa staining showed an increased mineralized matrix deposition as evidenced by dark brown staining with 95.1% increment after 21 days. The ALP enzyme activity also showed 179.9% increment in MC3T3-E1 cells after treatment, with 1 µM alpha-asarone resulted in the highest mineralization and ALP enzyme activity.
Conclusion: These findings showed that alpha-asarone can induce the differentiation of MC3T3-E1 cells into osteoblast cells and has the potential to be used in bone regenerative therapy. Given its ability to enhance ALP enzyme activity and mineralized matrix deposition without cytotoxic effects, alpha-asarone may serve as a promising natural osteogenic agent.

P5

Alcoholic Fatty Liver Disease Progression: The Interplay of Molecular and Cellular Dynamics

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Introduction: Alcohol-related liver disease (ALD) is a major global health concern, contributing to high rates of liver-related morbidity and mortality. It encompasses a spectrum of conditions, ranging from simple steatosis to hepatitis, and can progress to advanced fibrosis, cirrhosis, and hepatocellular carcinoma. The COVID-19 pandemic has further exacerbated ALD prevalence, with increased alcohol consumption leading to a rise in ALD-related hospitalizations. Despite its growing burden, no FDA-approved therapies exist for ALD, making alcohol abstinence the primary management strategy. However, the mechanisms underlying alcohol-induced hepatic fat accumulation, the earliest stage of ALD, remain poorly understood, limiting the development of targeted treatments.
Objectives: This review aims to: (i) examine the molecular mechanisms by which alcohol induces hepatic steatosis, (ii) compare alcohol-induced fatty liver with metabolic-associated fatty liver disease (MAFLD), and (iii) identify key gaps in the current understanding of ALD pathogenesis to suggest future research directions.
Methods: A comprehensive literature search was conducted in PubMed, Scopus, and Web of Science using keywords related to ALD, hepatic lipid metabolism, and inflammatory pathways. Studies published between 2016 and 2024 were included. Eligible studies involved human subjects or relevant experimental models that provide mechanistic insights into alcohol-induced fatty liver and its progression.
Results: Alcohol-induced hepatic steatosis is driven by impaired β-oxidation, enhanced de novo lipogenesis, and altered very-low-density lipoprotein (VLDL) secretion. Disease progression involves oxidative stress, inflammation, hypoxia, and defective autophagy. While there is mechanistic overlap with MAFLD, ALD exhibits unique alcohol-mediated pathways, particularly in mitochondrial injury and immune signaling. Study heterogeneity limits direct comparisons, emphasizing the need for standardised research approaches and deeper exploration of ALD-specific molecular drivers.
Conclusion: Alcohol disrupts hepatic lipid metabolism via multiple pathways, driving ALD progression. Key gaps persist in understanding the link between lipid dysregulation and other pathological mechanisms. Further studies are needed to address these gaps and develop effective therapies for ALD.

P6

Do Indonesian Adolescent Immigrants Face Mental Health Disorders During COVID-19 Pandemics?

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Introduction: Adolescents face stress and difficulties in adapting to life events during adolescence. Family and teachers' roles are important in curbing adolescents' risky social behavior. Peer social support contributes to good mental health. Life events, such as the COVID-19 pandemic, have an impact on health status.

Objective: To explore factors, barriers, and ways to solve mental health problems among adolescents

Methods: A thematic analysis study was conducted in Indonesia and Malaysia, involving Indonesian adolescents who attended secondary schools. Participants were selected using snowball sampling. Five informants from international Indonesian teachers, three adolescents from Malaysia, and three adolescents in Indonesia participated in the study. NVIV0 software was used and statistical analysis was performed using thematic analysis.

Results: The interviews with teachers revealed five important themes, including an integrated mental health curriculum, health insurance, behavioural problems, and document issues. The 10 important themes from student interviews were parental divorce, academic stress, peer-related stress, parent-child relationships, negative and positive stigma, coping strategies, self-reflection, deep thought exploration, understanding of mental health literacy, and social influence. Factors influencing emotional changes among adolescent, immigrant in Malaysia were peer problems, lack of support from school counsellor teachers, parental divorce problems, and academic problems. Schools had not implemented the SDQ measurement tool to measure behavioral disorders in learning; there were still adolescents who were not registered in Indonesian schools in Kuala Lumpur and could not use health insurance facilities because the documents were still in management. The school solution was parenting webinar to provide insight into mental health. The Full Bright Scholarship was a scholarship and recalibration program to control adolescent problems in Malaysia by repatriating them back to Indonesia by providing scholarships.

P7

Profiling of Estrogen-Regulated RNA Expression by NGS in Estrogen Receptor Positive MCF7 Breast Cancer Cell Line

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Introduction: As one of the most prevalent cancers among women, breast cancer remains a major health challenge, requiring continuous advancements in research and treatment strategies. Next Generation Sequencing (NGS) is a revolutionary technology that allows DNA and RNA to be decoded to study genetic variation associated with diseases or other biological phenomena. This precision methodology approach will bring more effective and targeted treatments.
Objectives: This study aimed to profile and analyzed estrogen-regulated RNA expression in the estrogen receptor-positive MCF7 breast cancer cell line using NGS.
Methods: MCF7 was treated with 10nM 17β-estradiol (E2) for 24 and 48 hours, with ethanol as a control. After treatment, RNA was extracted using the RNeasy® RNA Extraction Mini Kit (Qiagen). Purified RNAs were then used for RNA sequencing on the Illumina Nova 6000 platform. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment analyses were conducted to identify affected biological processes. Enrichment map analysis was used to visualize related pathways.
Results: Estrogen treatment significantly altered RNA expressions of over 300 genes after 24 and 48 hours. Those genes are linked to cell growth, survival, and mitochondrial function. GO analysis highlighted genes involved in energy production, cell growth, and apoptotic signaling pathways. Enrichment map analysis showed gene sets related to mitosis, cell growth, and apoptotic signaling pathways, suggesting that estrogen significantly impacts these processes. Further, KEGG enrichment analysis showed the involvement of PPAR, VEGF, Hippo, and mTOR signaling pathways regulated by estrogen.
Conclusion: These findings demonstrate that estrogen treatment significantly alters RNA expression in MCF7 breast cancer cells. Several key genes associated with cell proliferation and apoptosis were significantly upregulated or downregulated in response to treatment. Continuously, we are focusing on the mitochondrial-regulated genes involved in breast cancer progression.

P8

miR-196A-5P Modulates Angiogenesis-Related Protein Expression in Human Umbilical Vein Endothelial Cells from Hypertensive Pregnancies

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Offspring of women with hypertensive disorders of pregnancies (HDP) exhibits endothelial dysfunction due to impairment of angiogenesis, and it may lead to the development of cardiovascular disease (CVD) in the future. Dysregulation of microRNA may contribute to the impairment, yet it is not well-elucidated. miR-196a-5p expression was found to be the significantly upregulated in HUVEC exposed to HDP based on the previous RNA-sequencing result. Therefore, this study aims to unravel miR-196a-5p role in regulating angiogenesis in HUVEC exposed to HDP. HUVEC isolated from the umbilical cords of normal and hypertensive groups were transfected with mimic and inhibitor of miR-196a-5p. The expression of miR-196a-5p post-transfection was validated through stem-loop RT-qPCR. The protein levels of the selected angiogenesis markers in post-transfected HUVEC were determined using ELISA. Results revealed that miR-196a-5p expression in normal HUVEC transfected with mimic were significantly upregulated while inhibition of miR-196a-5p in hypertensive HUVEC significantly downregulated miR-196a-5p ($p < 0.01$). miR-196a-5p mimic in normal HUVEC significantly increased PDGFRA ($p < 0.001$), while significantly reduced VEGF ($p < 0.05$), and bFGF ($p < 0.001$) protein levels. Inhibition of miR-196a-5p in hypertensive HUVEC significantly decreased PDGFRA ($p < 0.01$), and significantly increased VEGF ($p < 0.05$), and bFGF ($p < 0.01$) concentrations. These angiogenesis markers are the important markers that play the key role in HDP pathogenesis and also, crucial in CVD. Hence, these findings may prove that miR-196a-5p may play a role in regulating angiogenesis and could be used as a therapeutic target in the future.

P9

Assessment of Knowledge, Attitude and Practice Among Nurses in Hospital Canselor Tuanku Muhriz on Needle Stick Injuries

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Needle stick injury is one of the most serious occupational hazards among nurses in which it may lead to possible severe consequences such as HIV infection, Hepatitis B and C virus transmission. The aim of the study was to explore and compare the knowledge, attitude and practice (KAP) among the nurses in Hospital Canselor Tuanku Muhriz (HCTM) regarding needle stick injury. A cross-sectional study was conducted with a total of 352 self- administered questionnaires collected from the nurses in HCTM. The data was collected via a universal sampling method. Components evaluated were demographic data and scores on KAP regarding needle stick injury of the nurses. Out of 352 nurses who were recruited for the study, 14.4 % of them had a history of needle stick injury during practice, with 9.9% of the injury occurring in their current posted department. There was no significant association ($p>0.05$) between history of needle stick injury and practice of the nurses. This study has demonstrated that there were no significant correlation between Knowledge - Attitude ($r=-0.034$, $p>0.05$) and Knowledge - Practice ($r=0.020$, $p>0.05$), Attitude - Practice ($r= 0.151$, $P>0.05$) of nurses in HCTM. In conclusion, these findings showed that the level of knowledge, attitude and practices are satisfactory among the nurses hence reducing the incidence of needle stick injury in HCTM. However, health education courses & programs with regards to needle stick injury and prevention measures are required to increase the awareness of danger of needle stick injuries.

P10

A Short Palmitoyl-Conjugated Peptide: The Promising Therapeutic for Skin Wound Healing

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Introduction: Wound healing in diabetes-induced skin ulcers and burning represents a major health burden. Researchers are actively seeking ideal biomaterials for clinical wound healing. Small, cost-effective molecules that stimulate the production of endogenous healing agents are of particular interest.

Objectives: To investigate the *in vivo* therapeutic effects of a novel fatty acid conjugated tetrapeptide (palmitic acid-glycine-aspartic acid-proline-histidine), Palmitoyl-GDPH on a full-thickness excision wound model, including histological and hematological analyses, based on its previously demonstrated strong proliferative activity and ability to promote migration in normal human dermal fibroblast (NHDF) cells, supporting its potential as a novel wound treatment approach.

Methods: Palmitoyl-GDPH was designed based on RIGINTM, a market product developed by SEDERMA, which is also known as Palmitoyl tetrapeptide-7, with the sequence of Gly-Glu-Pro-Arg (Palmitoyl-GQPR). Tetracycline was employed as a standard control drug following its significance in wound healing, including biologically active and antimicrobial effects. The peptide in liquid form was applied to a 4 cm2 full-thickness wound surgically induced at the dorsum of Sprague Dawley (SD) rats.

Results: Palmitoyl-GDPH showed a strong wound healing-promoting activity in an SD rat model of the full-thickness dermal wound. The *in vivo* wound treatment with Palmitoyl-GDPH for 18 days demonstrated nearly perfect healing histologically, evidenced by increased re-epithelialization, enhanced collagen deposition and diminished scar formation compared to the controls. In addition, the well-developed epidermal-dermal junction and ultimate stimulation of hair follicle growth in the Palmitoyl-GDPH treated group indicated the wound healed as functionally viable tissues. In general, the much lower hemogram values in the Palmitoyl-GDPH group indicated that the ongoing healing is en route to earlier recovery. The liver, kidney and pancreas function biomarkers were within

normal limits, suggesting the relatively non-toxic nature of Palmitoyl-GDPH for the dosage used. **Conclusion:** Our findings supported the great potential of this newly synthesized Palmitoyl-GDPH as an effective therapeutic agent for wound healing.

P11

A Scoping Review of The Effects of Imatinib on Male Reproductive Gonads

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Imatinib, as a tyrosine kinase inhibitor (TKI), has revolutionized the treatment of chronic myeloid leukemia (CML), but its potential reproductive toxicity, particularly on male fertility and testicular function, still requires further investigation. This study systematically reviews the literature to comprehensively evaluate the impact of imatinib on male reproductive gonads, with a particular focus on its effects on spermatogenesis, testicular function, and changes in the reproductive system, as well as its toxic mechanisms. Following the PRISMA guidelines, a literature search was conducted across multiple databases (PubMed, Scopus, and Web of Science) to identify original studies related to the effects of imatinib on male reproductive health. The studies covered cell experiments, animal models, and human trials. A total of 11 studies were selected that examined various aspects of imatinib's impact on male reproductive gonads. The studies revealed that imatinib primarily exerts its effects by inhibiting the c-Kit and PDGFR receptors, leading to testicular cell apoptosis, a reduction in spermatogonia, and impaired testicular function, ultimately resulting in impaired spermatogenesis and structural changes in testicular tissue. Additionally, long-term use of imatinib may decrease testosterone levels and reduce sperm quality. In conclusion, while imatinib has significantly improved survival rates in CML patients, its potential adverse effects on the male reproductive system have garnered increasing attention, especially for pubescent and reproductive-age male patients. Future studies should further investigate the long-term effects of imatinib on reproductive health and develop optimized treatment strategies to protect male fertility.

P12

The Effects of S-Allyl Cysteine on Kidney Injury Induced by Myocardial Ischemia-Reperfusion in Ovariectomized Rat Model

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Introduction: Acute kidney injury (AKI) secondary to myocardial ischemia-reperfusion injury (IRI) is a severe complication driven by oxidative stress and inflammation that exacerbate renal dysfunction. Although reperfusion restores oxygenation to ischemic tissues, it exacerbates reactive oxygen species generation, worsening renal dysfunction. The efficacy of S-allyl cysteine (SAC) in mitigating AKI under estrogen-depleted conditions remains unexplored.

Objective: This study investigates SAC's effects in ovariectomized (OVX) rats subjected to myocardial IRI.

Methods: Thirty-two adult female Wistar rats were allocated into four groups (n=8): Sham, OVX-IR, OVX-IR-SAC, and OVX-IR-SAC-PAG (propargylglycine, a cystathionine-γ-lyase inhibitor). Bilateral ovariectomy was performed, followed by a 3-week recovery period to ensure estradiol depletion. Myocardial IRI was induced via 30-minute left anterior descending coronary artery ligation, followed by 2-hour reperfusion. SAC or PAG was administered via the right carotid artery at reperfusion onset. Kidney tissues were analyzed biochemically and histologically.

Results: SAC administration reduced oxidative stress, as evidenced by the lowest malondialdehyde levels, and enhanced glutathione, but not superoxide dismutase (SOD). SAC did not alter renal hydrogen sulfide production. Histological analysis showed OVX-IR exhibited tubular epithelial swelling, dilation, and inflammatory cell infiltration. SAC treatment preserved glomerular morphology, and mitigated renal damage with less loss of architecture and atrophy.

Conclusion: SAC attenuates myocardial IRI-induced renal injury in estrogen-depleted rats by attenuating oxidative stress, enhancing antioxidant defences and preserving renal architecture. Future studies should elucidate its nephroprotective mechanisms and potential benefits in postmenopausal populations.

P13

Effects of Insulin Receptor Knockdown in Liver on Bone Mineral Content and Density in Rats

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Insulin is a hormone produced by the pancreas that plays a critical role in regulating glucose homeostasis. Insulin level was correlated with the expression of osteocalcin (a bone formation marker), thus recognised as an anabolic agent for bone. Individuals with insulin resistance are at a higher risk of poor bone health, emphasising the crucial role of insulin in bone metabolism. Although the relationship between insulin levels/resistance and bone health has been well-established, the impact of insulin receptor silencing on bone quality remains unexplored. This study aimed to investigate the effects of insulin receptor knockdown on bone mineral content (BMC) and bone mineral density (BMD) in rats. Female Sprague-Dawley rats were divided into two groups (n=8/group): control and insulin receptor knockdown group. Normal saline was injected into the control group. Plasmid containing short hairpin ribonucleic acid (shRNA) targeting insulin receptor was injected to knockdown insulin receptor in the liver of rats. The BMC and BMD at whole body, right femur and tibia were measured using dual-energy X-ray absorptiometry at baseline and first month. The control group showed increased whole-body BMC from baseline to month 1 ($p<0.05$). The knockdown group presented decreased right femur BMD, and right tibia BMC ($p<0.05$). In conclusion, the knockdown of insulin receptors impairs bone quality, suggesting that type 2 diabetes mellitus (characterised by the lack of insulin action) affects bone metabolism by influencing the insulin signaling pathway.

P14

A Novel Compound from *Parkia speciosa* with Cardiomyocyte Antihypertrophic Activity

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Introduction: Plants are a valuable source of bioactive compounds with cardioprotective properties. *Parkia speciosa* has demonstrated antihypertrophic effects, but the specific bioactive compounds remain unidentified.

Objectives: This study aimed to isolate and characterize a novel compound from *P. speciosa* and assess its antihypertrophic effects in cardiomyocytes.

Methods: A compound was isolated from the ethyl acetate fraction of *P. speciosa* ethanol extract and characterized using nuclear magnetic resonance (NMR) spectroscopy. Angiotensin II (Ang II)-induced hypertrophied H9c2 cardiomyocytes were treated with the compound (54 μM), valsartan (positive control), or vehicle for 24 hours. Untreated cells served as the control. Cell size and protein expression of hypertrophic markers-calcineurin, phosphorylated GATA4, and nuclear factor of activated T cells (NFAT)-were analyzed.

Results: The compound was identified as a coumarin glycoside. It significantly reduced cardiomyocyte hypertrophy and downregulated calcineurin, p-GATA4, and p-NFAT expression.

Conclusion: A coumarin glycoside from *P. speciosa* exhibited antihypertrophic effects in cardiomyocytes by inhibiting the calcineurin-GATA4-NFAT pathway, highlighting its therapeutic potential.

P17

Evaluating the Effect of SGLT-2 Inhibitors on Lipid Parameters in Type 2 Diabetic Patients with Coronary Artery Disease

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Background: Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder that increases the risk of cardiovascular disease, primarily due to excessive fat accumulation and impaired lipid metabolism. Sodium-glucose cotransporter-2 inhibitors (SGLT-2i), originally designed to treat hyperglycemia, have shown significant cardioprotective effects, especially in improving lipid outcomes in patients with coronary artery disease (CAD). However, the clinical effects between SGLT-2i and lipid profiles are rarely discussed, particularly in T2DM patients with CAD within the Malaysian population.

Objectives: To investigate the effects of SGLT-2i on lipid parameters among Malaysian T2DM patients with CAD.

Methods: A total of 360 T2DM patients with CAD on stable oral antidiabetic therapy (OAD) for at least three months, were enrolled in the study. Participants were assigned to either the SGLT-2i group (receiving dapagliflozin 10 mg/day or empagliflozin 10-25 mg/day) or the non-SGLT-2i group (receiving other OADs). Demographic data and lipid assessments were performed at baseline and after six months. Changes in lipid parameters were evaluated using Wilcoxon rank sum test and paired sample t-tests in a per-protocol analysis of 302 patients (151 in each group) who completed the study.

Results: After six months, the SGLT-2i group showed significant improvements in lipid parameters (high-density lipoprotein, low-density lipoprotein, total cholesterol and triglycerides) in the SGLT-2i group ($p<0.001$ for all parameters).

Conclusion: SGLT-2i therapy enhances lipid metabolism and may improve cardiovascular outcomes in Malaysian patients with T2DM. These pleiotropic effects underscore the potential of SGLT-2i as a key treatment in addressing both cardiovascular and cardiometabolic risks in T2DM.

P18

Effects of Calcium Phosphate Cement Incorporated with Palm Tocotrienol on Structural Bone Histomorphometry in Rats Subjected with Ovariectomy and Bone Defect

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Introduction: Calcium phosphate cement (CPC) is a biomaterial commonly used as a bone graft due to its biocompatibility, osteoconductivity, resorbability, injectability and mouldability. However, the limited biomechanical strength and low osteogenic potential restrict its clinical applications. Tocotrienol (T3) has been widely studied for its potential role in promoting bone health.

Objectives: To investigate the effects of CPC doped with palm tocotrienol on structural bone histomorphometry in ovariectomised rats with tibial bone defects.

Methods: Female Sprague-Dawley rats (n=6/group) were divided into four experimental arms: (a) sham-operated normal controls; (b) ovariectomised rats; (c) ovariectomised rats with bone defect implanted with CPC; (d) ovariectomised rats with bone defect implanted with CPC added with tocotrienol. A bone defect was created 11 weeks after ovariectomy, followed by the implantation of the bone graft for a duration of eight weeks. At the end of the study, the left tibia was excised for evaluating structural bone parameters.

Results: Our findings showed that the bone volume/total volume (BV/TV) of the ovariectomised rats was lower than the sham-operated normal controls. Meanwhile, the BV/TV of the ovariectomised rats with bone defects implanted with CPC added with tocotrienol was higher than the ovariectomised rats.

Conclusion: The incorporation of palm tocotrienol into CPC promotes bone regeneration.

P20

Mechanistic and Therapeutic Investigations into MiRNA-129-5p in Non-Alcoholic Steatohepatitis (NASH) and NASH-Related Hepatocellular Carcinoma (NAHCC)

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Non-alcoholic fatty liver disease (NAFLD) is a major global health burden, encompassing a spectrum from simple steatosis to non-alcoholic steatohepatitis (NASH) and fibrosis. The progression of NAFLD is driven by complex interactions between metabolic dysregulation, oxidative stress, and epigenetic alterations, including miRNA regulation, DNA methylation, and histone modifications. Despite extensive research, effective pharmacological interventions remain limited, highlighting the urgent need for novel therapeutic strategies. This study investigated the therapeutic potential of miRNA-129-5p in NASH. Bioinformatic analysis revealed a significant downregulation of hepatic miRNA-129-5p and upregulation of KRT23 in NASH, with KRT23 linked to the activation of the TGF-β/Smad signaling pathway. To validate its therapeutic effects, a NASH mouse model was established using a high-fat, high-cholesterol (HFHC) diet combined with diethylnitrosamine (DEN) injections, followed by adeno-associated virus vector-mediated miRNA-129-5p agomir delivery. RT-qPCR confirmed increased hepatic miRNA-129-5p expression post-treatment. In NASH mice, miRNA-129-5p agomir administration significantly reduced liver weight, liver-to-body weight ratio, serum cholesterol, hepatic and serum triglyceride levels, ALT, AST, and inflammatory markers (TNF-α, IL-6, CCL-2, Mcp1). Histological analysis showed improvements in liver architecture, with reduced steatosis, inflammation, and fibrosis. Methylation-specific PCR, RT-qPCR, and western blot demonstrated that miRNA-129-5p increased KRT23 promoter methylation, leading to a reduction in KRT23 mRNA and protein expression, thereby inhibiting TGF-β/Smad signaling pathway activation. These findings indicate that miRNA-129-5p overexpression mitigates NASH progression by epigenetically silencing KRT23 and suppressing the TGF-β/Smad signaling pathway. This suggests a potential therapeutic approach for NASH treatment. Future studies should focus on optimizing miRNA delivery strategies and evaluating long-term safety and efficacy to facilitate clinical translation.

P21

Histological Analysis of the Liver and Kidney of Rats Treated with Nano-Hydroxyapatite Encapsulating Tocotrienols-Rich Fraction

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Tocotrienols-rich fraction (TRF) belongs to the large family of lipid-soluble vitamin E and is well-known for its potent antioxidant and anti-inflammatory properties. To date, many studies have explored the therapeutic potential of TRF in various diseases, including bone diseases. However, its application is limited due to its poor oral bioavailability. Nano-hydroxyapatite (nHA) has been proposed as a potential nanocarrier for TRF owing to its excellent biocompatibility, biodegradability and osteogenic properties. The nHA-encapsulating TRF (nHA/TRF) has been successfully developed as a strategy to improve the bioavailability and efficacy of TRF on bone. This study aimed to evaluate the histology of the liver and kidney of healthy rats following oral administration of nHA/TRF. Male Wistar rats (n=24) were randomly divided into four treatment groups: (a) vehicle control (Olive oil, 60 mg/kg), (b) nHA (~270 mg/kg), (c) TRF (60 mg/kg), and (d) nHA/TRF (~800 mg/kg). All treatments were administered once via oral gavage and the rats were sacrificed after 24 hours of treatment. The liver and kidneys were harvested and fixed in 10% neutral buffered formalin for histological analysis. No significant structural alterations were observed in both liver and kidney of rats following treatment of nHA/TRF compared to the nHA, olive oil and TRF treatment groups. In conclusion, the oral administration of nHA/TRF is potentially non-toxic as shown by the normal histology of the liver and kidney.

P22

Unlocking the Potential of Wnt Signaling in Bone Health: A Systematic Review of Modulators and Therapeutic Opportunities

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Introduction: The Wnt signaling pathway is a crucial regulator of bone formation and homeostasis, playing a pivotal role in osteoporosis pathophysiology. Its dysregulation can lead to significant bone health issues, making it a key area of research for therapeutic interventions.

Objective: This systematic review aims to map the key compounds and proteins modulating Wnt-induced osteogenesis, providing insights into potential therapeutic strategies for osteoporosis.

Methods: We conducted a systematic search of major databases, including Ovid and Scopus, for studies published between 2017 and 2024. The review followed established guidelines for scoping reviews, with two independent reviewers screening titles, abstracts, and full texts for eligibility. Data were extracted and synthesized narratively.

Results: Our search identified several key categories of molecules involved in Wnt-induced osteogenesis. External regulators such as nanoparticles and plasma derivatives effectively stimulate the Wnt pathway, enhancing osteogenesis. Molecular compounds like sitosterol and fluoxetine also modulate the pathway, offering novel therapeutic avenues. Additionally, internal regulators like specific lncRNAs and transcription factors can either inhibit or activate the Wnt pathway, impacting bone health. The review highlights the complex interplay between Wnt signaling and other pathways, further elucidating bone remodeling mechanisms.

Conclusion: This review underscores the dual role of Wnt pathway modulators in bone health: stimulators promote bone formation, while inhibitors contribute to osteoporosis. By identifying these modulators and their mechanisms, this work contributes to the development of targeted osteoporosis therapies and personalized interventions based on genetic markers.

P23

Comparing the Effects of Palm Tocotrienol and α-Tocopherol on Wnt Signalling Markers in the Cartilage of Male Rats with Osteoarthritis Induced by Monosodium Iodoacetate

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Tocotrienols and α-tocopherol have demonstrated joint-protective effects in various studies. However, a direct comparison between these two forms of vitamin E has not been conducted. This study aims to compare the protective effects of palm tocotrienol mixtures and α-tocopherol in a rat model of osteoarthritis (OA) induced by monosodium iodoacetate (MIA) and to investigate their mechanisms of action through the expression of Wnt signalling markers. Three-month-old male Sprague Dawley rats were randomised into five groups (n=6/group): sham control, OA control, and OA treated with α-tocopherol (100 mg/kg/day), palm tocotrienol (100 mg/kg/day), or glucosamine sulphate (250 mg/kg/day). Following OA induction with MIA, the treatment groups received oral gavage administration of their respective agents for four weeks. At the end of the study, the rats were euthanised, and their joints were harvested for analysis. Safranin O-stained joint histology slides were scored using Mankin's system. The mRNA expression of key Wnt signalling markers-Ctnnb1 (β-catenin), Dkk1, Wnt1, and Sost-was determined using real-time quantitative polymerase chain reaction. The results showed an increase in total Mankin's scores in the OA group compared to the sham group, but the difference was not statistically significant ($p>0.05$). Only glucosamine sulphate significantly reduced Mankin's scores in OA rats ($p<0.05$). No significant differences were observed in the expression levels of Ctnnb1, Dkk1, and Wnt1 between the sham and OA groups ($p>0.05$), except for Sost, which was significantly upregulated ($p<0.05$). α-tocopherol increased the expression of Sost and Ctnnb1 in OA rats ($p<0.05$), whereas this effect was not observed with palm tocotrienol. Additionally, glucosamine sulphate significantly increased Dkk1 expression in OA rats ($p<0.05$). In conclusion, glucosamine sulphate and α-tocopherol are more effective than palm tocotrienol in mitigating OA in rats.

P24

Human Corneal Epithelium Secretomes in ADSC Differentiation Towards Corneal Epithelium

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Introduction: Adipose derived stem cells (ADSC) showed potentials as an alternative source for tissue engineering toward ectodermal lineage cells such as corneal epithelium. Corneal differentiation of ADSC involves several important pathways such as TGFbeta, and Wnt-signalling pathways that may be altered during chemically induced or co-culture methods of differentiation. The molecular and cellular responses during differentiation may involve various secretomes and exosomes being released into or taken up from the culture media, and they are still poorly understood.

Objectives: To elucidate the secretomes from human corneal epithelium (hTCEpi) and ADSC lines, and to evaluate the effects of hTCEpi secretomes on OCT4, CX43 and CK3 genes and proteins expressions during ADSC differentiation towards corneal epithelium.

Methods: Conditioned media from hTCEpi (CM2) and ADSC (CM1) were collected for secretome identification, quantification and proteomics analyses. ADSC was cultured for 15 days in a differentiation medium supplemented with the CM2 to induce corneal differentiation to mimic a co-culture differentiation method. Corneal differentiation was assessed by gene and protein expressions of OCT4, CK3, and Connexin 43.

Results: Spectrophotometry and proteomics analyses identified 1113 proteins from a total of 1188 proteins detected from the secretomes of both ADSC and hTCEpi. Most proteins are involved in integrin and growth factors signalling pathways. There were increased in CK3 and CX43, but decreased OCT4 expressions.

Conclusion: Together, these findings suggest that hTCEpi secretomes may have induced corneal differentiation in ADSC mainly via integrin and growth factors (EGF & FGF) signalling pathways. The Wnt and TGF-beta signalling were also shown to be involved in the corneal differentiation to a lesser extent. Suggesting that the hTCEpi secretomes hold greater potentials and integrin signalling pathway plays a major role in stem cells' differentiation towards cornea via co-culture method.

P25

Radiomics for Non-Small Cell Lung Cancer (NSCLC) Subtype Classification: A Systematic Review

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Introduction: Non-small cell lung cancer (NSCLC) accounts for approximately 85% of all lung cancer cases globally. Accurate classification of subtypes is crucial for personalized treatment and prognostic assessment. However, traditional histological analyses are often limited by insufficient biopsy samples and technical challenges, reducing their diagnostic utility. Radiomics, a non-invasive imaging technique, extracts high-dimensional features from CT and PET/CT scans, providing a detailed assessment of tumour heterogeneity. This approach presents a promising alternative for NSCLC subtype classification with significant clinical implications.

Objective: To evaluate the radiomic potential for NSCLC subtype classification.

Methods: This systematic review was registered in the PROSPERO database (Registration No: CRD42025562018). A systematic search of PubMed, Cochrane, and Web of Science (March 2021-April 2024) was conducted using MeSH terms and keywords on PET radiomics for differentiating adenocarcinoma (ADC), squamous carcinoma (SCC), and large cell carcinoma (LCC). Two independent reviewers assessed study quality using the Radiomics Quality Score (RQS). Due to heterogeneity, findings were summarised qualitatively without meta-analysis.

Results: Ten high-quality studies published between 2021 and 2024 were included. Radiomics demonstrated substantial efficacy in NSCLC subtype classification, achieving accuracies up to 87.5% (Area Under the Curve = 0.934) when integrating CT and PET imaging modalities. However, challenges such as small sample sizes, lack of multicentre validation and platform variability hinder broader applications. The median sample size across studies was 280 patients, with strong inter-reviewer agreement (Interclass Correlation Coefficients = 0.95, 95% Confidence Interval = 0.805-0.988). No significant differences were observed in Radiomics Quality Score domain analyses.

Conclusion: Radiomics is a promising non-invasive tool for NSCLC subtype classification with strong clinical potential. Future research should focus on multicentre collaboration, standardizing feature extraction, and robust validation. A unified diagnostic standard and data-sharing platform will enhance reproducibility. Advancements in precision medicine and data analysis will further improve diagnostic accuracy, personalize treatments, and enhance patient outcomes.

P26

Unraveling the Impact of Disease Severity and Smoking on MMP-9 Expression among Coronary Artery Disease Patients

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Matrix metalloproteinase-9 (MMP-9), also known as gelatinase B, belongs to the matrix metalloproteinase family. It plays a crucial role in the pathogenesis and progression of coronary artery disease (CAD) by contributing to processes such as extracellular matrix degradation, vascular remodeling, atherosclerosis progression, and plaque instability. Smoking, a major risk factor for CAD, is known to induce inflammatory responses that upregulate MMP-9 expression. This study aimed to determine the protein levels of MMP-9 among smokers with CAD. Serum samples were isolated from whole blood collected from patients in three main CAD groups: acute coronary syndrome (ACS), chronic coronary syndrome (CCS), and controls. The patients were further grouped into ACS and smoker (n = 27), ACS and non-smoker (n = 15), CCS and smoker (n = 20), CCS and non-smoker (n = 11), control and smoker (n = 20), and control and non-smoker (n = 23). In smokers, MMP-9 protein levels were significantly higher in both the ACS (378.1 $\pm$ 265.4 ng/mL) and CCS (462.0 $\pm$ 322.5 ng/mL) groups compared to the control group (84.29 $\pm$ 55.83 ng/mL). Among non-smokers, MMP-9 levels were also significantly elevated in ACS (456.8 $\pm$ 338.8 ng/mL) compared to CCS (186.9 $\pm$ 84.23 ng/mL) and control (76.37 $\pm$ 45.22 ng/mL). Additionally, among CCS patients, smokers exhibited significantly higher MMP-9 levels than non-smokers ($p = 0.0186$). The elevated MMP-9 levels in ACS and CCS groups suggest its association with disease progression and greater plaque instability. Smoking further amplifies MMP-9 expression in CCS, emphasizing the combined detrimental effects of smoking on CAD through MMP-9 upregulation. In conclusion, MMP-9 is suggested as a potential biomarker and therapeutic target for managing coronary artery disease, particularly in smokers.

Keywords: Acute coronary syndrome; cardiovascular diseases; chronic coronary syndrome; coronary artery disease; matrix metalloproteinase; smoking

P27

Protective Effects of *Spilanthes acmella* on Bone Oxidative Stress Markers in Ovariectomized Rats

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Deterioration of antioxidant enzymes activities and oxidative stress levels have recently been linked with the pathogenesis of postmenopausal osteoporosis. Estrogen replacement therapy (ERT) is helpful for the prevention and treatment of postmenopausal osteoporosis. Despite its effectiveness, long-term use of ERT was associated with an increased risk of endometrial and breast cancers. *Spilanthes acmella* (SA), a herbal plant with antioxidant properties have exhibited anti-osteoporosis effects. The present study set out to discover the osteoprotective effects of SA on bone oxidative stress markers of ovariectomized rats, the model for postmenopausal osteoporosis. Twenty-four Sprague-Dawley female rats were designated into four groups (n=6 per group), namely; (Sham) sham-operated, (OVX) ovariectomized control, (OVX+E) ovariectomized and supplemented with Premarin 64.5 µg/kg and (OVX+SA) ovariectomized and supplemented with 100 mg/kg of SA ethanolic leaves extract. The rats received their respective treatments via daily oral gavage for 12 weeks. After this period, all rats were euthanized, and the right femurs were dissected for bone oxidative stress measurements. The activities of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and malondialdehyde (MDA) in the bone tissue homogenate were measured using Enzyme-linked Immunosorbent Assay (ELISA) technique. Ovariectomy led to a significant decrease in SOD and GPx levels while increasing MDA levels. There was no significant change in the CAT activity. Treatment with 100 mg/kg of SA ethanolic leaves extract and 64.5 µg/kg of Premarin reversed the effects of ovariectomy by increasing SOD and GPx activities and reducing MDA levels. In conclusion, SA ethanolic leaves extract was comparable to Premarin in reducing oxidative stress in the bones of a postmenopausal osteoporosis rat model. Therefore, SA has potential in treating osteoporosis through its antioxidative properties.

Keywords: Bone; enzyme-linked immunosorbent assay; osteoporosis; ovariectomized rat; oxidative stress markers; *Spilanthes acmella*

P28

Clinical Efficacy of Arterial Embolisation in the Treatment of Lower Urinary Tract Obstruction Symptoms due to Benign Prostatic Hyperplasia: A Systematic Review

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Introduction: Benign prostatic hyperplasia (BPH) is one of the most prevalent urological conditions among aging men, which can lead to lower urinary tract symptoms (LUTS) and impact patients' quality of life. Pharmacological treatments offer symptomatic relief but are often associated with limited long-term efficacy and adverse effects. Transurethral resection of the prostate (TURP) remains the gold standard for BPH treatment. However, it carries a considerable risk of complications. Prostatic artery embolization (PAE) has emerged as a promising minimally invasive alternative.

Objectives: This study aims to systematically evaluate the clinical efficacy and safety of PAE in alleviating LUTS associated with BPH.

Methods: A systematic review was conducted by retrieving and analyzing relevant studies on PAE as a treatment for BPH from recent years. The search strategy included key terms such as "prostatic artery embolization", "benign prostatic hyperplasia" and "lower urinary tract symptoms". Studies evaluating the clinical efficacy of PAE in managing LUTS due to BPH, with International Prostate Symptom Score (IPSS), maximum urinary flow rate (Qmax), prostate volume (PV), and quality of life (QoL) as primary outcome measures were included.

Results: The literature showed that PAE demonstrated a high technical success rate (93%-97%). Follow-up assessments at 6-12 months post-procedure indicated a significant reduction in IPSS (by 25%-50%), improvements in Qmax, and a decrease in PV by 20%-40%. Compared to TURP, PAE was associated with shorter hospital stays, faster recovery, and a lower incidence of complications. Only mild adverse effects, such as transient voiding difficulties (10%-30%) and urinary tract infections (5%-15%), were observed.

Conclusion: PAE is an effective minimally invasive treatment for LUTS associated with BPH, particularly for patients who are poor surgical candidates or those seeking to avoid TURP-related complications. Future research should focus on optimizing long-term outcomes and refining embolic materials to further enhance the clinical applicability of PAE in BPH management.

P29

Bioactive Compounds in Edible Bird's Nest for Myocardial Ischemia/Reperfusion Injury: Insights from a Network Pharmacology Study

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Introduction: Myocardial ischemia/reperfusion injury (MIRI) is a paradoxical phenomenon that occurs following reperfusion therapy for myocardial infarction. Despite extensive research, no gold-standard therapy specifically targeting MIRI has been established. Edible bird`s nest (EBN), a traditional Chinese medicine, is rich in protein and carbohydrate-based glycoproteins with antioxidant and anti-inflammatory properties. However, its protective effects against MIRI remain unexplored.

Objective: This study elucidates the pharmacological effects of bioactive compounds in EBN against MIRI using an in-silico network pharmacology approach.

Methods: Bioactive compounds in EBN were identified through a literature review. Potential target genes of these compounds were predicted using the SwissTargetPrediction and SuperPred databases, while MIRI-associated genes were sourced from the Online Mendelian Inheritance in Man (OMIM), DisGeNet, and GeneCards databases. The interaction between the identified compounds and MIRI genes was determined through protein–protein interaction (PPI) network analysis, gene ontology examination, and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis.

Results: Among the 75 analyzed compounds, four met the screening criteria, leading to the identification of 250 potential gene targets. Of these, 110 overlapped with MIRI-associated genes. Further analysis linked these target genes to biological processes involving inflammation and hypoxia, as well as apoptosis and Tumor Necrosis Factor-related signaling pathways. PPI network analysis identified Interleukin-6, a gene encoding a pro-inflammatory cytokine, as the most highly connected target gene.

Conclusion: This study provides new insights into the potential pharmacological effects of EBN bioactive compounds against MIRI, which paves the way for developing novel targeted therapies for this condition. While network pharmacology offers valuable insights and hypotheses, experimental validation is essential to confirm the pharmacological effects of EBN bioactive compounds against MIRI.

P31

Enhancing Midwifery Internship Outcomes Through Competency-Based Pre-Internship Training Reform

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Introduction: The transition from theoretical learning to clinical practice poses significant challenges for midwifery students. Bridging this gap is essential for enhancing their practical skills and preparing them for professional roles.

Objectives: This study aims to reform pre-internship training by aligning it with job competency requirements, thereby improving students' practical skills and internship outcomes.

Methods: A modular workbook curriculum was developed, integrating real-world clinical cases into teaching scenarios. Each scenario combines nursing procedures with key knowledge points and incorporates interactive activities such as role-playing and scriptwriting. Additionally, the curriculum aligns with the nurse licensure exam syllabus, featuring fill-in-the-blank exercises and knowledge linkage sections to reinforce theoretical understanding.

Results: Preliminary findings demonstrate that the reformed pre-internship training significantly enhances students' technical proficiency, problem-solving abilities, and confidence in handling complex clinical situations. Participants also exhibit improved clinical judgment and operational skills during internships, alongside higher satisfaction with their learning experience.

Conclusion: This study underscores the importance of designing pre-internship training programs tailored to specific job competency requirements. By integrating innovative teaching strategies and practical scenarios, the proposed framework effectively bridges the gap between theoretical knowledge and clinical application, equipping midwifery students for successful professional transitions.

P32

Phytochemical Profiling of *Clitoria ternatea* Flower Extract and Its Effect on Corneal Epithelial Cells

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Introduction: *Clitoria ternatea* (CTE) is traditionally used for its therapeutic benefits. The flower extract is rich in flavonoids, anthocyanins and other bioactive compounds. It has antioxidant, anti-inflammatory, and wound-healing properties.
Objectives: This study explored the potential of CTE flower extract as a natural supplement to enhance human corneal epithelial cells (hTCEpi) proliferation.
Methods: The LC-MS analysis was conducted to identify the total bioactive compounds of extract. The analysis of total anthocyanin content, DPPH radical scavenging activity, and total polyphenol level were measured for their antioxidant properties. The hTCEpi was cultured in the keratinocyte basal medium and used to determine the effect on the corneal epithelial cells proliferation. The 10% serial dilutions of the extract were used to determine the effect on the proliferation of hTCEpi via MTT assay.
Results: The LC-MS study results revealed 14 peaks on the chromatography, representing the 51 bioactive compounds found in extract. The extract contains 33.06 mg/g of cyanidin-3-glucoside compounds and exhibits a radical scavenging activity of 33.8% as well as total polyphenol content equivalent to 24.14 mg/g GAE. The extract concentration at 0.08 mg/ml demonstrated the highest hTCEpi cell viability.
Conclusion: In conclusion, CTE flower extract contains 51 bioactive compounds with antioxidants properties that promote proliferation of the corneal epithelial cell.

P33

Untargeted Liver Metabolites Profiling and Oxidative Stress and Inflammatory Markers Expression in Sprague Dawley Rats Supplemented with Palm Tocotrienol-Rich Fraction and Its Effect on Hepatic Changes During Ageing

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Introduction: Ageing causes alterations in liver metabolism and function, contributed by oxidative stress and inflammation. The link between oxidative stress, inflammation and liver metabolism in ageing and the potential of tocotrienol-rich fraction (TRF) to mitigate age-related changes in the liver has yet to be explored.

Objective: This study elucidates the effect of oxidative stress and inflammation on liver metabolism in ageing rats and how TRF modulates these changes.

Methods: Sprague Dawley (SD) rats ages 3, 9, and 21 months were divided into control and treated groups. They received either palm olein or TRF from Sime-Darby Plantation Berhad. Liver tissues from the rats underwent untargeted metabolomics profiling using LCMS/MS. Histological assessments, antioxidant enzyme and IL-6 analysis was performed using H&E staining, colorimetric assays and ELISA, respectively.

Results: Superoxide dismutase (SOD) activity significantly decreased as the rats aged, indicating age-related changes in antioxidant enzyme function. A significant reduction in SOD activity was observed in adult control and old control rats compared to young rats ($p<0.05$). A similar reduction was observed in adult and old rats treated with TRF compared to young rats treated with TRF, reinforcing the declining enzymatic activity with age. However, no significant change was observed between groups in catalase activity and interleukin (IL-6) level. Liver morphology was different for control groups compared to TRF-treated groups. The control groups showed more fibroblasts and inflammation than the TRF-treated group. Metabolomic profiling showed that with ageing, taurine and hypotaurine metabolisms are altered. Metabolites such as uridine and uracil are altered, affecting the pyrimidine metabolism. Malate and glutamate are altered, affecting the TCA cycle and energy metabolism.

Conclusion: TRF's role in modulating age-related liver oxidative stress and inflammation, which subsequently affects liver metabolism, offers potential new knowledge for ageing prevention. Metabolomics deepens our understanding of molecular mechanisms in the ageing liver.

P34

Therapeutic Potential of Human Wharton's Jelly Mesenchymal Stem Cell-Derived Exosomes: Isolation, Characterization, and Cardioprotective Effects in Hypoxia-Injured Cardiomyocytes

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Introduction: Ischemic heart disease is a leading global cause of mortality. Myocardial damage resulting from hypoxia in IHD leads to complications such as ischemic cardiomyopathy and heart failure. Emerging therapies aim to mitigate this damage, with mesenchymal stem cell (MSC)-derived exosomes showing promise due to their ability to enhance cell survival and modulate oxidative stress.

Objectives: This study aimed to isolate and characterize human Wharton's jelly MSC (hWJ-MSC)-derived exosomes using a modified tangential flow filtration (TFF) method and evaluate their effects on cardiomyocyte viability under hypoxic injury.

Methods: Exosomes were isolated via modified TFF and characterized using nanoparticle tracking analysis (NTA), transmission electron microscopy (TEM), and flow cytometry. The viability of hypoxia-injured cardiomyocytes treated with various exosome concentrations (5-100 µg/mL) was assessed using the MTT(3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide) assay.

Results: NTA confirmed an average exosome size of 81 nm with a concentration of 4.0×10^9 particles/mL. TEM imaging revealed spherical vesicles with a lipid bilayer, while flow cytometry confirmed exosome identity via positive CD9 (3.3-23%) and CD63 (11.7-29.1%) expression. The MTT assay demonstrated that hypoxia significantly reduced cardiomyocyte viability compared to control normoxic control cells ($p < 0.001$). Exosome treatment at 50 µg/mL ($p < 0.05$), 75 µg/mL ($p < 0.0001$), and 100 µg/mL ($p < 0.01$) significantly improved cell viability compared to untreated hypoxic cardiomyocytes.

Conclusion: These findings highlight the potential role of hWJ-MSC-derived exosomes in protecting cardiomyocytes from hypoxia-induced injury. By improving cell viability, exosomes may serve as a novel therapeutic approach for mitigating myocardial damage in IHD. Further studies are warranted to elucidate their mechanisms of action and optimize their therapeutic application.

P35

Use of Medicinal Plants and Natural Products for Treatment of Osteoporosis and Its Complications

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Long-term use of glucocorticoid medications are major causes of osteoporosis. Glucocorticoids negatively impact bone remodeling, leading to reduced bone formation and increased bone resorption. Free radicals promote osteoclastic activity and are harmful to osteoblasts. prevention and early treatment of osteoporosis are important to avoid its complications. Amongst the natural products, we had explored the effects of vitamin E, *Piper sarmentosum* extract and kelulut honey. These studies aimed to determine the effects of the natural product in bone protection against glucocorticoid induced osteoporosis. In these studies, we used glucocorticoid induced osteoporosis rats model using adrenalectomized Sprague Dawley male rats treated with intramuscular injection of glucocorticoid. The rats then were supplemented with either vitamin E, *Piper sarmentosum* extract or kelulut honey, comparing the treated group with the Sham and positive control groups. The treatments were given for two months. At the end of the study period, the rats were euthanized, and their femoral bones were harvested for analysis. In all the studies we analyzed the changes of bone histomorphometry, biomechanical strength and the bone formation as well as the resorption markers. The result of the studies showed that glucocorticoid treatment had caused osteoporotic changes observed from the histomorphometric analysis with significant decreases in the bone formation and increases in resorption markers. Supplementation of vitamin E, *Piper sarmentosum* extract and kelulut honey showed significant effects in maintaining the bone structure, biomechanical strength and the level of bone markers. Those findings indicated that vitamin E, *Piper sarmentosum* extract or kelulut honey have the potential to be utilized as a prophylaxis for individuals receiving long-term glucocorticoid therapy.

P36

α-Mangostin and *In Vitro* Diabetic Wound Healing: Enhancing Cell Migration and Reducing Il-6 Gene Expression

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Introduction: Diabetes mellitus is associated with impaired wound healing, often leading to chronic, non-healing diabetic foot ulcers (DFU). Current treatments for DFU are costly and may have limited efficacy. Alpha (α)-mangostin, a bioactive xanthone from the mangosteen pericarp, has demonstrated wound-healing potential, but its role in diabetic wound repair remains unclear.

Objectives: This study aimed to evaluate the effects of α-mangostin on cell migration and inflammatory gene expression in an *in vitro* diabetic wound healing model.

Methods: Human coronary artery endothelial cells (HCAEC), human dermal fibroblasts (HDF), and THP-1 macrophages were pre-treated with 35 mM glucose for 72 hours to simulate a hyperglycemic environment. Cells were subsequently treated with α-mangostin (0.15, 2.5 and 5 µg/mL), carboxymethyl cellulose (positive control), while negative controls were exposed to (i) glucose alone and (ii) culture medium alone. A scratch assay was performed to assess cell migration at 6, 12, and 18 hours. Additionally, IL-6 gene expression was quantified using qRT-PCR.

Results: α-Mangostin at 0.15 µg/mL significantly enhanced endothelial and fibroblast migration at 6, 12, and 18 hours ($p<0.001$, $p<0.01$). IL-6 gene expression was downregulated in HCAEC at all concentrations and THP-1 cells at 0.15 and 2.5 µg/mL.

Conclusion: These findings suggest that α-mangostin enhances endothelial and fibroblast migration while reducing inflammation via IL-6 suppression. This highlights its potential as a therapeutic agent for DFU management.

P37

Ficus deltoidea Extract Improves Bone Parameters in an Experimental Model of Postmenopausal Osteoporosis

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Introduction: Postmenopausal osteoporosis, characterized by bone loss due to cessation of ovarian function, is closely associated with oxidative stress and increased fracture risk. *Ficus deltoidea*, a plant rich in antioxidants, has shown potential in treating various oxidative stress-related conditions. This study investigates the effects of *Ficus deltoidea* extract on bone microarchitecture in an ovariectomized rat model of postmenopausal osteoporosis.
Objectives: To evaluate the impact of *Ficus deltoidea* extract on bone histomorphometric parameters in ovariectomized rats, focusing on trabecular bone structure and cellular changes.
Methods: Forty female Wistar rats were randomly assigned to five groups: baseline, sham-operated, ovariectomized control, and ovariectomized rats treated with 800 mg/kg body weight of *Ficus deltoidea* extract orally for 56 days. At necropsy, bone samples were collected for histomorphometric analysis.
Results: The histomorphometric analysis revealed significant improvements in trabecular bone structure among ovariectomized rats treated with *Ficus deltoidea* extract. Specifically, these rats showed an increase in trabecular bone volume (BV/TV), trabecular thickness (TB.TH), and trabecular number (TB.N) compared to the ovariectomized control group. Additionally, the treatment resulted in reduced trabecular separation (Tb.Sp), indicating a more compact bone structure. Cellular analysis demonstrated an increase in osteoblast surface, which is indicative of enhanced bone formation, while the osteoclast surface was decreased, suggesting reduced bone resorption. These changes collectively indicate that *Ficus deltoidea* extract promotes a favorable bone microarchitecture in the context of postmenopausal osteoporosis.
Conclusion: *Ficus deltoidea* extract demonstrated a positive effect on bone histomorphometry in ovariectomized rats, suggesting its potential as a therapeutic agent for postmenopausal osteoporosis. The extract appears to enhance trabecular bone structure and promote a balance between bone-forming and bone-resorbing cells. Further research is warranted to elucidate the mechanisms underlying these beneficial effects and to explore its clinical applications.

P38

Localization of Neurotrophin-3 in the Adult Zebrafish Brain and Therapeutic Implications in an MPTP-Induced Parkinson's Disease Model

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Introduction: Parkinson's disease (PD) is the second most prevalent neurodegenerative disease, is characterized by dopaminergic neuronal degeneration in the substantia nigra. Neurotrophin-3 (NT3, encoded by ntf3) is a neuroprotective growth factor may exhibit potential for PD treatment by promoting neuronal development and survival.

Objectives: This study aims to localize NT3-expressing cells in the adult zebrafish brain and investigate NT3's role in a zebrafish PD model.

Methods: Cellular localization of NT3 in adult zebrafish brains was conducted using in situ hybridization and immunohistochemistry. Adult zebrafish PD model were induced with an intraperitoneal injection of 100 µg/g body weight (bw) of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), followed by treatment with 400 ng/g bw of recombinant NT3 (rNT3) via intracranial injection. Behavioral, gene expression, dopaminergic neuronal immunohistochemistry, and protein analyses were conducted on days 3, 5 and 10 post-MPTP injection.

Results: ntf3 mRNA-expressing cells were widespread in the adult zebrafish brain, particularly in neurons, including dopaminergic neurons. MPTP injection resulted in reduced locomotor activity, down-regulated dopamine-related genes (dat and th1), and decreased dopaminergic neuronal population. rNT3 administration significantly improved locomotor activity, up-regulated th1, dat, ntf3 and bdnf gene expressions, and increased dopaminergic neurons, compared to MPTP-induced zebrafish. ELISA analysis indicated elevated glutathione-S-transferase (GST) and reduced caspase-3 levels on day 3 post-MPTP injection.

Conclusion: This study has provided a detailed NT3 localization in the adult zebrafish brain, notably in the ventricular regions and posterior tuberculum area. rNT3 administration exhibits notable trophic effects in the zebrafish PD model. Further investigations are essential to determine optimal dosage and long-term effects of NT3 in PD therapy.

Keywords: Danio rerio; dopaminergic neuron; neurodegenerative disease; neuronal survival; neurotoxin; neurotrophin-3

P39

Dysregulation of Amygdala Dopamine Neurotransmission in Polydrug Dependence

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Introduction: Current treatments for polydrug abuse, which affects a significant portion of the drug-dependent population, are often ineffective. While the effects of individual drugs have been studied, little is known about the neurochemical changes occurring during polydrug withdrawal, particularly in stimulant-opiate combinations.

Objectives: In the current study, we endeavor to elucidate the neurobehavioral and neurochemical modifications occurring within brain regions involved in positive and negative reinforcing effects of drugs of abuse, such as the striatum and amygdala during abstinence from chronic polydrug intake.

Methods: Seven-week-old male Sprague-Dawley rats (n= 40) were divided into five groups: control, morphine, methamphetamine, polydrug 1 (methamphetamine + morphine), and polydrug 2 (methamphetamine + morphine). Groups received subcutaneous injections twice daily for two weeks, with increasing dosages over time. After withdrawal, exploratory and locomotive behaviors were assessed on days 1 and 28 using the open-field test. Brain tissue was analyzed through immunohistochemistry to assess dopamine D1 receptor (D1R) and tyrosine hydroxylase (TH) expression.

Results: Polydrug-withdrawn rats exhibited increased open field locomotion and higher TH expression in the amygdala. While D1R expression was reduced in the amygdala of polydrug-withdrawn rats, it was significantly elevated in the striatum compared to other groups on day 28 of withdrawal. Striatal TH expression was also elevated in polydrug-withdrawn rats compared to

control and methamphetamine groups.

Conclusion: Our findings reveal that D1R, and dopamine expression patterns differ between polydrug and monodrug withdrawal, across brain regions (striatum and amygdala) and over time (days 1 and 28).

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Exploring Differential Protein Expression in the Livers of Hepatocarcinogenesis-Induced Rats Treated with Tocotrienols via 2D-Gel Proteomics

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Introduction: Liver cancer is a leading cause of death worldwide. Numerous natural products have been studied for their potential as therapeutic agents. Tocotrienols (T3), known for their strong antioxidant properties, also demonstrate notable anticancer effects. The 2-D gel electrophoresis (2-DE) proteomics technique holds promise for identifying previously unrecognized chemoprotective and hepatoprotective proteins. This study aims to identify the proteins influenced by tocotrienol in the chemoprevention of liver cancer.

Methods: Forty-two male Wistar rats were divided into seven groups: Control, T3 Control, Hepatocarcinoma-induced group (HCC), HCC+T3 125 mg/kg, HCC+T3 250 mg/kg, HCC+T3 500 mg/kg, and HCC+butylated hydroxyanisole (BHA) 100 mg/kg. Hepatocarcinogenesis was induced by administering diethylnitrosamine (DEN) and 2-acetylaminofluorene (2-AAF). The rats then received different doses of T3 and BHA. After 17 weeks, the rats were sacrificed, and liver tissues were collected for 2-DE analysis.

Results: The 2-DE analysis revealed significant differences in the upregulation and downregulation of protein spots between the treatment and control groups. These protein spots are believed to be linked to chemoprevention and hepatoprotection.

Conclusion: The differential expression of protein spots offers valuable insights into the mechanisms by which tocotrienols may provide chemoprevention and hepatoprotection. Further identification of these proteins through mass spectrometry is required to fully understand their roles.