INTERNATIONAL CONFERENCE ON MEDICAL SCIENCE TECHNOLOGY (ICMST 2016)

"Continuing Challenges in the 21st Century Healthcare"

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The President / Chief Executive Officer
Universiti Kuala Lumpur

It is with great pleasure that I extend my warmest welcome and best wishes to all delegates in attendance at the International Conference on Medical Science Technology (ICMST 2016).

Universiti Kuala Lumpur is proud to organise this conference as we are resolute in contributing and making an impact to the development of medical science technology in Malaysia. The theme for this year's ICMST 2016, "Continuing Challenges in the 21st Century Healthcare" is in line with the dynamic and cross-cutting ethos of medical science technology field. This conference reflects the university's commitment to research and innovation in the pursuit to elevate its researchers, academia and students to greater height. I believe that ICMST 2016 will bring advantages to various sectors, not only the academia but also the industry with potential collaborations in various areas related to medical science technology. It is my utmost hope that this conference should continue to provide strategic opportunities for universities and research institutes for collaborations in scientific partnerships, networking, investing and knowledge gathering; thus bringing closer the research knowledge into successful application and commercialization.

I congratulate all of those who have worked hard to ensure the success of ICMST 2016. To Institute of Medical Science Technology (UniKL MESTECH) and Malaysian Institute of Chemical and Bioengineering Technology (UniKL MICET), the organisers of this conference and the organising committees, my heartfelt gratitude for making this conference a success.

I wish all the delegates a most fruitful and enlightening conference.

Prof. Dato' Dr. Mazliham Mohd Su'ud
President / Chief Executive Officer
Universiti Kuala Lumpur

The Dean of UniKL MESTECH
Universiti Kuala Lumpur

Assalamua'laikum w.b.t and good day,

It is with great honour and pleasure to welcome all of you to the first International Conference on Medical Science Technology (ICMST) 2016 with the Theme: Continuing Challenges in the 21st Century Healthcare. As the Dean and Head of Campus of Universiti Kuala Lumpur Institute of Medical Science Technology (UniKL MESTECH) I am welcoming you on behalf of our campus and Universiti Kuala Lumpur as a whole.

ICMST 2016 is the very first international conference organized by UniKL MESTECH and we are definitely honoured to have great international and local speakers joining our conference this year. I would also like to take this opportunity to welcome the international participants to Malaysia and my heartfelt gratitude for participating in our conference. I am sure with the vast research experience the speakers have, all of us would gain some new insights from the research and development perspectives and probably bring some new ideas back to the laboratory. ICMST 2016 aspires to change the way we think and expand our knowledge in scientific research and enhance the development of the healthcare sector.

By sharing knowledge and acknowledging the research done by others, this conference offers us the opportunity to exchange innovative scientific ideas and inspire new research. This would be an ideal venue for academician, researchers, students or even entrepreneurs to build new research networks and establish new contacts for future collaborations. This is in line with our two main objectives of the event which are:

1. To promote and disseminate research findings related to medical science technology.

2. To provide an international platform for the exchange of knowledge and expertise in medical science technology research and practice, in order to explore potential collaborations in future research.

Lastly, I would like to express my utmost appreciation and acknowledgement to the ICMST 2016 committee headed by Dr. Nur Azma Amin, for their substantial effort in planning and organizing this conference meticulously and making ICMST 2016 a reality.

Welcome once again and let us enjoy the thought-provoking presentations and discussions ahead.

Thank you.

Dr. Reezal Ishak
Dean / Head of Campus
UniKL MESTECH
Universiti Kuala Lumpur

The Dean of UniKL MICET
Universiti Kuala Lumpur

The International Conference on Medical Science Technology 2016 (ICMST 2016) is hosted by UniKL MESTECH and UniKL MICET. This conference also received active involvement and collaboration from

Institute for Medical Research, Bioeconomy Corporation and MARA.

The conference theme is “Continuing Challenges in the 21st Century Healthcare”. ICMST 2016 aims are to provide avenue for collaborations, exchanging information and sharing resources among researchers in related areas. It is my hope that this gathering of academicians, researchers, industrialists, and officials will enable them to explore new developments, innovations and working together in areas of medical science technology. ICMST 2016 will be the catalyst for further collaboration in our common goal for better advances in this field.

I would like to take this opportunity to extend my warmest welcome and appreciation to all participants who are here to enrich the diversity of perspective and content. My sincere appreciation also goes to the organising committees for their astounding support, which has made this conference possible.

Assoc. Prof Dr. Ahmad Naim Ahmad Yahaya
Dean / Head of Campus
UniKL MICET
Universiti Kuala Lumpur

The Director Centre for Research and Innovation
Universiti Kuala Lumpur

Universiti Kuala Lumpur (UniKL) is one of the country’s leading technical universities, focusing on high technical and vocational education and training (HTVET). In supporting the university’s tagline, “Where knowledge is applied”, the R&D activities are currently emphasizing on applied research which are focusing on providing industrial based solutions. The role of the Centre for Research and Innovation

(CoRI) is to coordinate, facilitate and mobilise research management and to expand research alliances via partnership with local and international institutions and industries. Quality research findings and outputs are our prime objectives, which aim towards commercialisation.

Particularly in the area of Biomedical Sciences, the knowledge has expanded tremendously over the years. Vibrant interaction and exchange of ideas and knowledge are therefore crucial, which usually happen through scientific conferences like this. In this era, researchers, scientists and academics can no longer work in isolation, but must reach out to the global research community and seed new scientific partnerships and future discoveries.

The ICMST 2016, a conference jointly organized by UniKL MESTECH and UniKL MICET in collaboration with MARA, Institute for Medical Research and Bioecenomy Malaysia marks the beginning of a stimulating and productive exchange of research ideas and knowledge between UniKL and the research communities worldwide. I hope this healthy and welcomed interactions among the researchers, scientists, and academicians in this two days event will nurture a successful and stimulating environment that can catalyse the growth of Biomedical Sciences and Healthcare sector as a whole.

I wish you all a fruitful discussion ahead. Thank you.

Assoc. Prof. Dr. Hisham Hamid
Director
Centre for Research and Innovation (CoRI)
Universiti Kuala Lumpur

The ICMST 2016 Convener
Universiti Kuala Lumpur

Assalamualaikum wbt and greetings,

It is my heartfelt desire to welcome delegates from all over the world to the “International Conference on Medical Science Technology 2016” (ICMST 2016). An inaugural event conducted by the Universiti Kuala Lumpur - Institute of Medical Science Technology (UniKL MESTECH) in collaboration with the various

groups from Universiti Kuala Lumpur - Malaysian Institute of Chemical & Bioengineering Technology (UniKL MICET), Institute for Medical Research (IMR), Malaysian Bioeconomy Corporation and MARA Selangor. I would like to extend my profound gratitude to our co-organisers who have supported this endeavour and worked extremely hard to bring this astounding conference to fruition. This inaugural conference marked a historical achievement that our institution, UniKL MESTECH has made, as it brings together a great number of intellectuals from different states and countries with various specialised area of research.

My sincere gratitude also goes to all delegates, key speakers, presenters and the attendants of the conference. We very much honoured to have all of you gathered here today. This two-day conference program will witness debates and discussions on several topics ranged from "Body System in Environmental Health, Nutritional in Healthcare, Clinical Laboratory & Biomedical Science and Entrepreneurship in Healthcare" which will be weaved through the Keynotes Speakers, Plenary Speakers and distinguished participants. The abstracts depict the depth of knowledge in this field; interweaved through valuable insights that are beneficial for the future advancements and the realisation of sustainable social, environmental and healthcare goals.

ICMST 2016 will be a platform to provide numerous opportunities for solid and sustained future network. Finally, as the conference convenor of ICMST 2016 I would like to take this opportunity particularly to the Organising Committees from UniKL MESTECH and UniKL MICET for putting great effort into making this conference a ravishing success.

Look forward to a memorable event for all involved in ICMST 2016.

Thank you.

Dr. Nur Azma Amin
Convener
ICMST 2016

CONFERENCE SCHEDULE

Day 1 (23rd November 2016 - Wednesday)

Time	Activities	Venue
0800 - 0900	Conference Registration	Foyer Grand Ballroom
0900 - 0945	Welcoming Speech & Opening Ceremony	Grand Ballroom
0945 - 1000	Conference Photograph Session	Foyer Grand Ballroom
1000 - 1015	Refreshment	Foyer Grand Ballroom
1015 - 1115	**Keynote Lecture 1:**	Grand Ballroom

	Fighting Viruses, Old and New Prof. Dr. Lisa Robert University of Leeds	
1115 - 1700	**Poster Presentation**	Grand Ballroom
1115 – 1215	**Plenary Lecture 1:** *Regional Travel, Connectivity & the Future of Artificial Intelligence in Public Health* Dr Dhesi Baha Raja Institute for Medical Research (IMR)	Grand Ballroom
	Plenary Lecture 2 : *The Obesity Epidemic: Are Genes, Lifestyle or Environment the Culprit?* Prof. Dr. Poh Bee Koon National University of Malaysia (UKM)	
	Entrepreneur Sharing Session 1 Mr. Isham Ishak Deputy Secretary General (Trade) Ministry of International Trade and Industry (MITI)	Cempaka Room
1215 - 1400	Lunch	Café Lavista
1400 – 1645	**Parallel sessions:**	
	Oral presentation Session 1	Grand Ballroom
	Oral presentation Session 2	Cempaka room
	Entrepreneur Sharing Session 2	UniKL MESTECH
1645 - 1700	Refreshment	Foyer Grand Ballroom
1700	End of Day 1	

Day 2 (24th November 2016 - Thursday)

Time	Activities	Venue
0830 - 0900	Arrival of participants	Foyer Grand Ballroom
0900 - 0945	**Keynote Lecture 2 *:*** *Impacts on Zika Virus Transmission in the Workplace* Prof. Dr. Rusli Nordin Monash University Malaysia	Grand Ballroom
0945 - 1000	Refreshment	Foyer Grand Ballroom
1000 - 1600	**Poster presentation**	Grand Ballroom
1000 - 1030	**Plenary Lecture 3 :**	Grand Ballroom

	How to Commercialize Research Dr. Nabisarr Mustan Cambridge Herbal Sdn Bhd	
1030 - 1100	**Entrepreneur Sharing Session 3** Prof. Dr. Abdul Manan Mat Jais Universiti Putra Malaysia (UPM)	
1100 - 1300	**Parallel sessions:**	
	Oral Presentation Session 3	Grand Ballroom
	Oral Presentation Session 4	Cempaka Room
1300 - 1400	Lunch	Café Lavista
1400 - 1500	**Plenary Lecture 4 :** *The impact of nanotherapeutics in transforming the medicine* Assoc. Prof. Dr. Md. Ezharul Hoque Chowdury Monash University Malaysia	Grand Ballroom
	Plenary Lecture 5 : *The Zika Virus, Dengue and the Mosquito - International Environmental Health Threats* Tony Lewis Chartered Institute of Environmental Health (CIEH)	
	Entrepreneur Sharing Session 4 Assoc. Prof. Dr. Manan Dos Mohamed UniKL Malaysian Institute of Chemical & Bioengineering Technology (UniKL MICET)	Cempaka Room
1500 - 1630	**Parallel sessions:**	
	Oral presentation Session 5	Grand Ballroom
	Oral presentation Session 6	Cempaka Room
1630 - 1645	Refreshment	Foyer Grand Ballroom
1645 - 1715	Conference Closing	Grand Ballroom

ORAL PRESENTATION SCHEDULE

GRAND BALLROOM
23rd NOVEMBER 2016 (WEDNESDAY)

1400 - 1420 **GEOMETRIC MORPHOMETRICS ANALYSIS OF HUMAN MANUBRIUM WITH OPEN-SOURCE SOFTWARE**

Dr. Helmi Mohd Hadi Pritam

1420 - 1440	**RESIBUFOGENIN PREVENTS LEPTIN-INDUCED INCREASES IN BLOOD PRESSURE AND MARKERS OF ENDOTHELIAL ACTIVATION DURING PREGNANCY IN *SPRAGUE DAWLEY* RATS** *Maryam Jameelah Md Hassan*
1440 - 1500	**ANTIHYPERTENSIVE EFFECT OF STANDARDISED AQUEOUS ETHANOLIC EXTRACT OF *FICUS DELTOIDEA TRENGGANUENSIS* IN SPONTANEOUSLY HYPERTENSIVE RATS** *Zurain Radjeni*
1500 - 1520	**ASSISTED REPRODUCTION IN MALAYSIA: CLINICAL ASPECTS OF THE PROCEDURE** *Dr. Tahmina Moonia*
1520 - 1525	**BREAK**
1525 - 1545	**AN ANALYSIS OF FACTORS AFFECTING COMPLIANCE WITH DIETARY AND FLUID RESTRICTIONS AMONG HEMODIALYSIS PATIENTS IN SELECTED HOSPITALS IN ILIGAN CITY** *Prof. Dr. Geraldine Sabate Ridad*
1545 - 1605	**PHYSICAL ACTIVITY AND FOOD INTAKE AMONG INDIAN STUDENTS IN UNVERSITI KEBANGSAAN MALAYSIA** *Arnida Hani Teh*
1605 - 1625	**POTENTIAL OF TWO SELECTED HYDROCOLLOIDS ON THE TEXTURE AND SENSORIAL PROPERTIES OF LOW FAT ICE CREAM** *Noor Soffalina Sofian Seng*
1625 - 1645	**EFFECTS OF PHYSICAL ACTIVITY AND CALCIUM INTAKE ON BONE MINERAL DENSITY IN MALAYSIAN YOUNG ADULTS** *Dr. Norlida Mat Daud*
1645 - 1700	**DISCUSSION & END OF SESSION**

ORAL PRESENTATION SCHEDULE

CEMPAKA ROOM
23rd NOVEMBER 2016 (WEDNESDAY)

1400 - 1420	**VITAMIN E IMPROVES BONE HISTOMORPHOMETRY IN ALCOHOL –INDUCED OSTEOPOROSIS RAT MODEL** *Dr. Seham Salem Abukhadir*

1420 - 1440	**RR MUTATION AT THE Q/R/N+1 SITES OF THE NMDA RECEPTOR REDUCED THE POTENCIES OF ALZHEIMER'S DISEASE CHANNEL BLOCKERS** *Dr. Izuddin Fahmy Abu*
1440 - 1500	**EFFECT OF STANDARDIZED AQUEOUS ETHANOLIC EXTRACT OF *FICUS DELTOIDEA KUNSTLERI* ON BLOOD PRESSURE AND URINARY ELECTROLYTES IN SPONTANEOUSLY HYPERTENSIVE RATS** *Dr. Norasikin Ab Azis*
1500 - 1520	**COMPARATIVE OSTEOPROTECTIVE EFFECTS OF *LABISIA PUMILA VAR ALATA* ROOTS AND LEAVES IN OVARIECTOMIZED *SPRAGUE-DAWLEY* RATS: A PILOT STUDY** *Tijjani Rabiu Giaze*
1520 - 1525	**BREAK**
1525 - 1545	**FREQUENCY OF PLATELET GLYCOPROTEIN POLYMORPHISM GPIIIA (PIA1/A2) IN PATIENT WITH TYPE 2 DIABETES MELLITUS** *Zahidah Abu Seman*
1545 - 1605	***FICUS DELTOIDEA ANGUSTIFOLIA* REDUCES BLOOD PRESSURE IN SPONTANEOUSLY HYPERTENSIVE RATS** *Mohd Saleh*
1605 - 1625	**ADVANCE IMMUNOHEMATOLOGY: CHALLENGES IN MALAYSIA BLOOD TRANSFUSION LABORATORY SETTING** *Mohd Ismail Armawai.*
1625 - 1645	**INTERFERON-STIMULATED GENE OF 20 KDA PROTEIN (ISG20) IMPEDING THE REPLICATION OF HEPATITIS B VIRUS** *Dr. Leong Chean Ring*
1645 - 1700	**DISCUSSION & END OF SESSION**

ORAL PRESENTATION SCHEDULE

GRAND BALLROOM
24th NOVEMBER 2016 (THURSDAY)

1100 - 1120	**EFFICACY OF TOPICAL STIGMASTEROL TREATMENT OF MRSA IN A SUPERFICIAL SKIN WOUND INFECTION RATS** *Dr. Tong Woei Yenn*

1120 - 1140	**HAS BENZIMIDAZOLE RESISTANCE MARKERS DEVELOPED IN *ASCARIS LUMBRICOIDES* ISOLATED FROM ORANG ASLI IN MALAYSIA?** *Dr. Mehru Nisha*
1140 - 1200	**ANTIMICROBIAL EFFICACY OF *PENICILLIUM AMESTOLKIAE* ELV609 EXTRACT TREATED COTTON FABRIC FOR HEALTHCARE APPLICATIONS** *Nur Amiera Syuhada Rozman*
1200 - 1220	**EFFECT OF RESPIRATORY SYNCYTIAL VIRUS INFECTION ON HOST TRANSLATIONAL INITIATION FACTOR** *Rusydatul Nabila*
1220 - 1240	**THE EFFECTS OF GELAM HONEY ON *EX VIVO* CORNEAL RE-EPITHELIALISATION** *Dr Muhammad Fairuz Azmi*
1240 - 1300	**DISCUSSION**
1300 - 1400	**LUNCH**
1500 - 1520	**ANTIMICROBIAL ACTIVITY OF CRUDE EXTRACT AND FRACTIONATED CONSTITUENTS OF *PUNICA GRANATUM* LEAF** *Nurhanis Syafiqah Mohd Nor Hamin*
1520 - 1540	**THE INTRODUCTION OF OCCUPATIONAL SAFETY WEBSITE AND LEVEL OF PSYCHOSOCIAL SAFETY CLIMATE (PSC) AMONG MALAYSIAN POLICE** *Dr. Irniza Rasdi*
1540 - 1600	**REVIEW ON VENTILATION SYSTEMS PERFORMANCES ON PATHOGENS TRANSMISSION OF HEALTHCARE ISOLATION ROOMS** *Ir. Mohd Hazzah Ahmad Siron*
1600 - 1620	**A STUDY ON THE COMPUTATIONAL FLUID DYNAMICS (CFD) MODEL FOR THERMAL COMFORT IN MALAYSIA** *Ahmad Siroji Mohamed Apandi*
1620 - 1630	**DISCUSSION & END OF SESSION**

ORAL PRESENTATION SCHEDULE

CEMPAKA ROOM
24th NOVEMBER 2016 (THURSDAY)

1100 - 1120	**MATERNAL AND CHILD HEALTH AND FAMILY PLANNING BELIEFS AND PRACTICES OF MARANAOS IN ILIGAN CITY** *Prof. Dr. Geraldine Sabate Ridad*

1120 - 1140	**A THERAPEUTIC COMMUNICATION ANALOG AS A MEANS OF ASSESSMENT OF PINK CLOUD SYNDROME AMONG SELECTED ADJUDGED DRUG USERS UNDER DEPARTMENT OF HEALTH – TREATMENT REHABILITATION CENTER (DOH-TRC) IN CAGAYAN DE ORO: A STEP TOWARDS PREVENTION OF RELAPSE** *Prof. Dr. Art Brian Sorongon Escabarte*
1140 - 1200	**A CASE STUDY ON THE AVAILABILITY, PRICING AND AFFORDABILITY OF ESSENTIAL MEDICINES IN A PRIVATE GP CLINIC IN MALAYSIA** *Voon Kaen Lee*
1200 - 1220	**HAIR MERCURY LEVELS AMONG PRIMARY SCHOOL CHILDREN IN NEGERI SEMBILAN** *Nurul Izzah Binti Abdul Samad*
1220 - 1240	**PRACTICES AND MANAGEMENT OF FATS, OIL AND GREASE IN FOOD SERVICE ESTABLISHMENTS, KAJANG, SELANGOR** *Masyita Mamot*
1240 - 1300	**DISCUSSION**
1300 - 1400	**LUNCH**
1500 - 1520	**BARRIERS TO ADHERENCE TO EXPANDED PROGRAM ON IMMUNIZATION AMONG PARENTS IN LANAO DEL NORTE** *Prof. Dr. Geraldine Sabate Ridad*
1520 - 1540	**PHYSICAL ACTIVITY AMONG BREAST CANCER SURVIVORS IN UKMMC: A PRELIMINARY STUDY** *Nurasyikin Zakaria*
1540 - 1600	**TRENDS IN PEDIATRIC INJURIES AMONG CHILDREN AGES 5 AND 10 ATTENDEES AT THE EMERGENCY AND TRAUMA DEPARTMENT IN THREE MAJOR HOSPITALS IN THE KLANG VALLEY** *Anne Noor Sri Juwaneeta Jamaluddin*
1600 - 1610	**DISCUSSION & END OF SESSION**

POSTER PRESENTATION SCHEDULE

GRAND BALLROOM
23rd NOVEMBER 2016 (WEDNESDAY)

LOT NO.	TITLE
1 – 1	**HSA-MIR-26A-5P IS UPREGULATED IN CHRONIC MYELOID LEUKAEMIA NON-RESPONSIVE TO IMATINIB THERAPY**

1 – 23	**HUMAN BETA DEFENSIN 9 SIGNALING PATHWAYS IN HUMAN CORNEAL EPITHELIAL CELL LINE** *Hana Zainal*
1 – 24	**A COMPARISON STUDY ON QUALITATIVE PERFORMANCE AND FEASIBILITY ASPECT OF PLATELET IMMUNOFLUORESCENCE TEST (PIFT) AND SOLID PHASE RED ADHERENCE ASSAY (SPRCA)** *Pang Jyh Chyang*
1 – 25	**TOTAL SERUM IGE LEVEL AND SHRIMP ALLERGY PATTERN IN YOUNG ADULTS WITH FOOD ALLERGY** *Nor Ezleen Qistina*
1 – 26	**EVALUATION OF THE ANTI-INFLAMMATORY AND ANALGESIC EFFECTS OF AROMATHERAPY WITH LAVENDER ESSENTIAL OIL IN RATS** *Teh Rasyidah Ismail*
1 – 27	**EFFECT OF LACTISOLE ON THE BITTERNESS TASTE BASED ON SAMPLES CALCIUM CONCENTRATION** *Ilyas Syafiq Darul Ridzuan*
1 – 28	**THE EFFECT OF 2.45 GHZ MICROWAVE RADIATION ON LEUKOCYTE PARAMETERS IN RATS** *Syahidatul Asraf Mohd Sapian*
1 – 29	**EFFECT OF MORPHINE EXPOSURE ON ERYTHROCYTE OF NEONATE RAT** *Nur Hidayah Hassan*

POSTER PRESENTATION SCHEDULE

GRAND BALLROOM
24th NOVEMBER 2016 (THURSDAY)

LOT NO	TITLE
2 – 1	**SCOPING REVIEW ON THE EFFECTS OF AMBIENT AIR POLLUTION AND PREGNANCY OUTCOMES** *Dr. Ruzanaz Syafira Ruzman Azlee*

2 – 23 **ANTI-INFLAMMATORY EFFECT OF *RHAPONTICI RADIX* VIA INHIBITION OF NF-KB, MAPK AND INDUCTION OF HO-1**

Dr. You-Chang Oh

2 – 24 **ACUTE AND SUBACUTE HAEMATOLOGY ANALYSIS ON TOXICITY OF ETHANOLIC EXTRACT OF *MARIPOSA CHRISTIA VESPERTILIONIS* LEAVES IN MALE *SPRAGUE DAWLEY* RATS**

Nurul Syahirah Binti Ahmad Sayuti

2 – 25 **A COMPARATIVE STUDY OF AVIATION AND MEDICAL SCIENCE STUDENTS ATTITUDE TO TECHNOPRENEURSHIP: A REVOLUTION OR REVELATION**

Noraini Mohd Zin

2 – 26 **A MANDATORY OR AN ALTERNATIVE OF A TECHNOPRENEURSHIP COURSE FOR UNDERGRADUATE HEALTHCARE STUDENTS: REPERCUSSION OR TRANSFORMATION?**

Mohamad Ramzan Mohamad

KEYNOTE SPEAKERS

FIGHTING VIRUSES, OLD AND NEW

PROF. DR. LISA ROBERTS

Deputy Vice-Chancellor: Research and Innovation, Professor of Virology,
University of Leeds, Leeds, United Kingdom LS2 9JT
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High profile outbreaks of Ebola and Zika virus infections have been the focus of global concern in recent years. No longer can we view any virus infection as a local issue – with increased travel and trade across the world, all infections must be viewed as global issues. At Leeds, we have a large virology group focused on understanding the pathogenesis of human viruses from polio, to Zika to hepatitis C and I will

provide a brief introduction to our research strengths and capabilities. I will also provide a more detailed overview of my own research interests in RNA viruses, “old” and “new”. Noroviruses, members of the calicivirus family, are the most significant cause of acute viral gastroenteritis cases worldwide. These viruses are readily able to cause outbreaks due to their high prevalence in the community, shedding of infectious virus particles from asymptomatic individuals and the high stability of the virus in the environment. Historically, the understanding of norovirus pathogenesis was hampered by the lack of a cell culture system, but in more recent years we and others have used the murine norovirus model and reverse genetics systems to understand the mechanisms of virus replication and virus-host interactions. I will review the work we have undertaken to understand the mechanism of calicivirus protein synthesis and more recent work on host cell entry mechanisms, including future directions. Our work is also now focusing on the newly emerging human enterovirus type 71 (EV71), which has emerged as a major cause of viral encephalitis in children worldwide. EV71 is a group of viruses that belong to the picornavirus family, which also includes viruses such as poliovirus and human rhinovirus. EV71 is widely known for its association with Hand Foot and Mouth Disease (HFMD), which generally affects young children. However, EV71 infection can also result in more severe neurological conditions such as encephalitis. We are interested in how EV71 enters cells, with a view to aiding antiviral design to block the first step in virus replication. Antiviral drug and vaccine development is urgently required to prevent emerging and re-emerging virus epidemics. Only by understanding the mechanisms of viral pathogenesis can we begin to fight viruses, old and new.

IMPACT OF ZIKA VIRUS TRANSMISSION IN THE WORKPLACE

PROF. DR. RUSLI NORDIN

Occupational Safety & Health, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, 47500 Subang Jaya, Selangor, Malaysia.

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On 1 February 2016, the World Health Organization (WHO) declared a Public Health Emergency of International Concern following the Zika Virus (ZV) explosive outbreaks in the Pacific and Latin America and with mounting evidence linking ZV infection in early pregnancy to microcephaly in babies and possibly serious neurological complications in adults (Guillain–Barré Syndrome, acute myelitis, and sensory polyneuropathy). ZV is principally transmitted to humans by infected female Aedes mosquitoes, notably Aedes Aegypti and also Aedes Albopictus, and there is now clear evidence of human to human transmission through sexual intercourse. The recent outbreak in Singapore, especially among foreign workers, and the first established case in Malaysia, highlights the seriousness and potentially explosive nature of endemic and possibly epidemic transmission in Malaysia. It is therefore clear that Malaysia is at risk of similar outbreaks given the proximity and heavy cross border movement of workers, especially Malaysian workers working in Singapore, and the abundant ecological reservoir of the Aedes mosquitoes in these countries. Despite the existence of local and international guidelines for surveillance, diagnostics, and management of exposed and infected individuals, there remains a large gap in the understanding of the nature of occupational transmission and exposure and the severe impact of ZV on the health and productivity of the Malaysian work force. Are Malaysian industries prepared to deal with the ZV epidemic in the workplace and what is the extent of preparedness so far? And what is the cost involved in the prevention, control, management and rehabilitation of workers exposed, infected and with serious complications? Key stakeholders that include the captains of industries, workers' unions, Social Security Organization (SOCSO), Ministry of Health (MOH), National Institute of Occupational Safety and Health (NIOSH), Department of Occupational Safety and Health (DOSH), Department of Labour, and the Department of Environment (DOE) must seriously consider the impact, both short term and long term, on the resilience and competitiveness of the Malaysian workforce in the current era of arboviral epidemic. ZV is the latest arbovirus to have spread globally beyond its initial restricted niche, and is unlikely to be the last. Innovative new methods for surveillance and control of vectors, especially those linked to workplaces, are needed in order to target and contain mosquito-borne diseases as a whole.

PLENARY SPEAKERS

REGIONAL TRAVEL, CONNECTIVITY & THE FUTURE OF ARTIFICIAL INTELLIGENCE IN PUBLIC HEALTH

DR. DHESI BAHA RAJA

Director's Office, Institute for Medical Research, Ministry of Health, Jalan Pahang, 50588 Kuala Lumpur, Malaysia.
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An outbreak elsewhere is an outbreak anywhere. In the digital age and connected environment, human movement, geographical terrain, and weather pattern are potential precursors to disease outbreaks. Globally, the existing work related to disease monitoring and control is limited to passive, pre-emptive and reactive. The analysis of health data is currently relying on conventional statistical method. In addition, the available health data is limited to time, location, and accumulated cases. Extra information that could be crucial for disease monitoring and outbreak prediction are not provided in a dynamic and real time manner. This presentation will give us insights on how the Institute of Medical Research will be exploring the potentials of machine learning capabilities by utilizing artificial intelligence as the primary modus operandi for disease surveillance. This novel innovation will also showcase its mobile application capabilities, adopting the Pokemon-Go concept for community engagement in order to stop deadly outbreaks in Malaysia.

THE OBESITY EPIDEMIC: ARE GENES, LIFESTYLE OR ENVIRONMENT THE CULPRIT?

PROF. DR. POH BEE KOON

Nutritional Sciences Programme, School of Healthcare Sciences, Faculty of Health Sciences,
Universiti Kebangsaan Malaysia, 50300 Kuala Lumpur.
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The obesity problem is quickly growing to epidemic proportions both globally as well as nationally. Malaysia reportedly has the highest prevalence of obesity among Asian countries. The National Health and Morbidity Survey (NHMS 2015) reported that prevalence of overweight and obesity is 47.7% among adults, while the South East Asian Nutrition Surveys (SEANUTS) reported a prevalence of 21.6% among Malaysian children aged 6 months to 12 years old. Rapid socioeconomic development, urbanization and modernization have affected both dietary habits and physical activity pattern, and consequently the lifestyle and body size of our population. Obesity results from complex interactions of multiple factors. The roles of genetics, lifestyle and the environment are crucial. This presentation will look critically at various unmodifiable factors, including genetics, ethnicity and intrauterine conditions; as well as modifiable factors, such as socio-economy, diet, physical activity and sleep. With the recent rapid rise in obesity and its related non communicable diseases, a deep understanding of the root causes of obesity is of utmost importance; in order that more effective prevention and intervention strategies and policies may be adopted to arrest the rising trend.

HOW TO COMMERCIALIZE RESEARCH

DR. NABISARR MUSTAN
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Research commercialization is vital these days for research institutions and universities to raise fund for their operation and expansion. It is timely for the time and effort spend on research to give returns to the researchers and the universities. It is about identifying the right type of research to be commercialized and also all the different types of business acumen's required beside the technology in successfully developing the technology company. It address cash flow management, marketing, distribution, holding power, how to raise funds and exit plan. Normally it takes about 10 to 15 years to establish a technology company. It also depends whether it is a startup or technology is acquired from elsewhere. If it is acquired, what was the status of the acquired company?

THE IMPACT OF NANOTECHNOLOGY IN TRANSFORMING THE MEDICINE

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Regardless of the administration routes, delivery of small molecule drugs to their target sites of action historically poses one of the biggest challenges due to their homogeneous tissue distribution, renal clearance and lack of target specificity. Nanotherapeutics have evolved as novel drug formulations at dimensions of roughly 1–100 nanometers by virtue of the integration of nanotechnology with medicine for treating and preventing critical human diseases effectively and precisely. The favorable pharmacokinetics with prolonged circulation time, selective endothelial permeability at several target tissues and high specificity for biological targets are the attractive attributes of nanopharmaceuticals driving the pharmaceutical industries to conduct a large number of pre-clinical and clinical trials, with enormous successes seen in the past in getting approval and commercialization of nanotechnology-based medical products. Diversified approaches based on synthetic, recombinant, hybridoma and phage display technologies have been undertaken to fabricate a variety of nanoparticulate and macromolecular carriers and drugs in order to overcome the multi-step extracellular and intracellular barriers and to facilitate development of novel strategies for therapeutic delivery and imaging.

THE ZIKA VIRUS, DENGUE AND THE MOSQUITO – INTERNATIONAL ENVIRONMENTAL HEALTH THREATS

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In an era of widespread international trade and travel it is to be expected that from time to time exotic pest species will find their way from country to country and region to region. In the past, such threats have been controlled by limitations on travel and trade as well as by significant regional climate differences; however, today the position is different – global trade and travel are extensive and global warming is ensuring that the conditions for exotic species to thrive exist in parts of world that lie beyond the natural home of many species. The manner in which Zika, Dengue and Yellow Fever have spread around the world presents some significant challenges to both medical practitioners and environmental health officers operating at ports of entry into countries and beyond. This presentation will examine those challenges and explore how we might better use the International Health Regulations to effect a measure of control.

SEPARATOR 1

THEME:

BODY SYSTEM IN ENVIRONMENTAL HEALTH

SUB THEMES:

- ENVIRONMENTAL HEALTH
- OCCUPATIONAL SAFETY AND HEALTH
- PUBLIC HEALTH

SUB THEME: ENVIRONMENTAL HEALTH

REVIEW ON VENTILATION SYSTEMS PERFORMANCES ON PATHOGENS TRANSMISSION OF HEALTHCARE ISOLATION ROOMS

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The main focus of the healthcare sectors is not only to assist patients' recovery but also to minimize the potential nosocomial infection. An effective and efficient ventilation system will thus ensure that the cross infection will be minimized and shortened the patients stay in the healthcare wards. The objective of this paper is to provide a review of previous simulated and experimental studies on ventilation system inside airborne infection isolation room toward minimizing the potential airborne cross infection in healthcare facilities. We searched major literatures between 2006 and 2016 on the simulated and experimental studies on ventilation performance on negative and positive pressure isolation rooms. The studies show that up to date the current standards on isolation rooms fail in preventing cross contamination. As the results, new types of ventilation system which are different than the current ventilation system need to be developed that will prevent cross infection.

A STUDY ON THE COMPUTATIONAL FLUID DYNAMICS (CFD) MODEL FOR THERMAL COMFORT IN MALAYSIA

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Environmental Management System (EMS) helps organizations to significantly reduce their impact towards the environment and establishing the most efficient way of working in their day to day basis. This study was conducted to identify the issues and challenges in implementing Environmental Management System (EMS) following the ISO 14001 Standards in higher education industry. This cross-sectional study involved 300 respondents who are workers of higher education institution and they were given a modified survey questionnaire and the result was later analyzed by using IBM SPSS Software (Version 23.0) and also Analysis of Moment Structure (AMOS) (Version 23.0). As a result, it is found that (1) there are significant correlation between issues, challenges and implementation on EMS; (2) IPTA have a higher rate of implementation of EMS compared to IPTS; (3) each issues and challenges have significant negative association towards implementation of EMS; (4) respondents in both office and technical working environment are facing the same issues and challenges in implementing EMS. The most common issue that was found is organization resistance to change while the most common challenge is lack of capital.

SCOPING REVIEW ON THE EFFECTS OF AMBIENT AIR POLLUTION AND PREGNANCY OUTCOMES

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Malaysia as a developing country is undergoing rapid industrialization and urbanization which exposes Malaysians to the dangers of air pollution. In addition, the impact of climate change could further deteriorate the air quality. Studies have shown association between air pollution and pregnancy outcomes. However, this area is not studied well in Malaysia as compared to respiratory and cardiovascular diseases. The objectives of this study were to determine the association between ambient air pollution and pregnancy outcomes and identify the methods used. This scoping review study was based on the five stages of Arksey and O'Malley framework. We searched through five on-line bibliographic database i.e PubMed, Scopus, EBSCO Host, Sciencedirect and Google Scholar using pertinent keywords and search strategy. We limited our search to studies from the years 2000-2016, taking only English language articles from academic journal, systematic reviews, primary studies and excluded clinical studies. Inclusion and exclusion criteria were then applied for the selection of relevant studies. There was an extensive amount of literature available favouring the effects of ambient air pollution and pregnancy outcomes. The pollutants studied most often were nitrogen dioxide, sulphur dioxide, particulate matter and carbon monoxide. Majority of the studies were population based cohort studies and the method mostly used was regression analysis to associate the exposure to the pollutant and pregnancy outcomes. Results from this scoping review could be used to justify the need to conduct a study to determine the effect of ambient air pollution and pregnancy outcomes in Malaysia.

USED OIL STORAGE AND DISPOSAL PRACTICE IN AUTOMOBILE REPAIR SHOPS IN HULU LANGAT DISTRICT

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Used oil is a hazardous waste that largely produces in the automobile repair shops where, the compliance in keeping inventory, notification, labeling and disposal practices are main issued. The study investigates the educational level and working experience of the workers, used oil generation, storage and disposal practice of used oil between micro and small automobile repair shops in Hulu Langat District. A cross-sectional study was used and the data was collected using questionnaires, interviews, observation, and checklist at 15 micro and 9 small workshops, involving 97 respondents. Pearson Chi-square was used where the results reveal that there is a significant difference of educational levels between the micro and small workshops [$p = 0.000$] but there is no significant difference on working experience [$p = 0.078$]. Indeed, the significant difference of used oil generation was shown between both workshops [$p = 0.027$] by using Kruskal Wallis test. Furthermore, some of the storage checklist points were found with no significant difference such as ample aisle space [$p = 0.132$] and free of water presence [$p = 0.052$]. Conspicuously, there are significant differences between micro and small workshops especially in inventory date [$p = 0.027$), container label [$p = 0.027$], storage limitation days [$p = 0.028$], leakage free [$p = 0.028$], and disposal practice [$p = 0.011$]. Inspection reveals that the small workshops practice more on the storage and disposal of the used oil rather than the micro workshops. In overall, the policy and information for proper handling of schedule waste in the workshops contributed to the best practice.

CORRELATION STUDIES OF ESTROGENIC ENDOCRINE DISRUPTING CHEMICALS IN MALE VEGETARIANS

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Endocrine disrupting chemicals (EDC) exposure has been suggested to have a negative impact, which eventually might lead to reproductive cancers by disrupting hormone levels. Phytoestrogens are natural EDCs which can be found in plants while BPA is a man-made EDC ubiquitously found in the environment. The purpose of this study was to identify which of the estrogenic EDCs were interacting with endogenous sex hormones. Plasma was sampled from adult males who practised vegetarian diet and non-vegetarians as controls (N = 225). Samples were analysed for phytoestrogens, BPA, estrone, estradiol and testosterone. Spearman's rank correlations were conducted to investigate interaction between exogenous EDCs and endogenous sex hormones in various subject groups such as vegetarian and non-vegetarians, equol and non-equolproducers, ethnic groups, coffee drinkers among vegetarian and non-vegetarian. Positive correlation was found between genistein, formononetin, BPA and testosterone among vegetarians (r_s = 0.24, 0.22, 0.24). Non-vegetarians however had 5 EDCs correlating positively with testosterone. None of the equol producers had positive correlation with testosterone as opposed to non-equolproducerswhich showed positive correlation between daidzein, genistein, formononetin, biochanin A, BPA and testosterone (r_s = 0.38, 0.36, 0.26, 0.31, 0.32). Our results indicate that estrogenic EDCs tend to influence testosterone level in various groups. Vegetarians and equol producers may be beneficial as these groups have less positive correlation between exogenous EDCs and testosterone. We are aware that there are other EDCs which could have also affected the sex hormone levels, however were not measured in this study.

THE IMPACT AND PROJECTION OF FLOODING DUE TO CLIMATE CHANGE ON HEALTHCARE FACILITIES IN SELANGOR AND KUALA LUMPUR, MALAYSIA

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This study aimed to identify healthcare facilities at risk of riverine flooding based on projected climate change. Identification of health facilities at risk of flooding is important to facilitate adaptive management strategies towards planning a resilient health delivery system in Malaysia towards combating climate change. The longitude and latitude of healthcare facilities was determined using the Geographic Positioning System (GPS) and later overlaid with the flood maps produced by NAHRIM. The projection of floods was based on the Intergovernmental Panel on Climate Change Special Report on Emissions Scenario- Fourth Assessment Report. Flood estimation was done using the InsiteProIntermap's cloud-based risk assessment software. A total of 116 Community Health Clinics, 88 Primary Health Clinics and 17 Government Hospitals from Selangor and Federal Territory Kuala Lumpur were included in this study. From the above 116 Community Health Clinics (CHC), 13.8%, 6.9% and 5% CHC's are estimated to have risk of flooding with a 20, 100 and 500 years return period (RTP) respectively. A total of 6.8%, 6.8% and 1.1% of PHC's have a chance of flooding in 20,100 and 500 years RTP respectively. According to the projections only 5.9% of hospitals have an equal risk of flooding at 20,100 and 500 years RTP. The estimated range of flood depths is 0.1-2.9m(CHC), 0.1-3.0m(PHC) and 0.5 – 0.6m(hospitals) in the studied areas. This study has successfully identified the healthcare facilities which are vulnerable to flooding and this should be used by policy makers to prioritize actions needed to ensure undisrupted healthcare services.

ISSUES AND CHALLENGES IN IMPLEMENTING ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) – ISO 14001 STANDARDS IN HIGHER EDUCATION INDUSTRY

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Environmental Management System (EMS) helps organizations to significantly reduce their impact towards the environment and establishing the most efficient way of working in their day to day basis. This study was conducted to identify the issues and challenges in implementing Environmental Management System (EMS) following the ISO 14001 Standards in higher education industry. This cross-sectional study involved 300 respondents who are workers of higher education institution and they were given a modified survey questionnaire and the result was later analyzed by using IBM SPSS Software (Version 23.0) and also Analysis of Moment Structure (AMOS) (Version 23.0). As a result, it is found that (1) there are significant correlation between issues, challenges and implementation on EMS; (2) IPTA have a higher rate of implementation of EMS compared to IPTS; (3) each issues and challenges have significant negative association towards implementation of EMS; (4) respondents in both office and technical working environment are facing the same issues and challenges in implementing EMS. The most common issue that was found is organization resistance to change while the most common challenge is lack of capital.

HEAVY METALS CONCENTRATION IN DRIED SEAFOOD CONSUMED BY FISHING VILLAGERS IN MALACCA

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The expansion of fishery industry in Malaysia increases the production of seafood products. Dried seafood is one of Malaysian popular food products and consumed widely as a delicious complementary dish or used as one of the ingredients in many local delicacies. Nowadays, extensive industrial development might cause the contamination to the marine environment and this food may be contaminated with heavy metals due to water sources contamination or cross contamination during processing. This research was conducted to determine the lead (Pb), arsenic (As) and cadmium (Cd) concentration in selected dried seafood and to assess the health risk of adults in a fishing village in Malacca. A total of 121 respondents were randomly recruited based on inclusion criteria and interviewed to obtain socio-demographic information as well as dried seafood frequency intake by using pre-tested questionnaires. Eight samples which consist of 3 types of dried anchovy, 3 types of dried shrimp and 2 types of dried squid were analysed using Inductively Coupled Plasma Mass Spectrometer (ICP-MS) to determine the heavy metals concentrations. Health risk were calculated for Hazard Quotient (HQ) for non-carcinogenic and Lifetime Cancer Risk (LCR) for carcinogenic health effects. Results showed that heavy metals detected in dried seafood ranged as follow: Cd (25.903 mg/kg) > Pb (3.365 mg/kg) > As (2.374 mg/kg) respectively. Most of the dried seafood samples contain heavy metals which exceeded the Malaysian Food Regulation 1985 permitted level. The calculated health risk due to consumption of selected dried seafood showed that HQ and LCR fall under acceptable risk. Heavy metals were detected in dried seafood in this study which indicates certain levels of contamination to our food sources. Public should be aware for consuming these foods might cause the accumulation of heavy metals in the body and may cause chronic diseases related to them with prolong consumption.

ASSESSMENT ON THE SAFETY OF PLAYGROUNDS AT CHILDREN DAY CARE CENTRES

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Safety and health is an important consideration in all aspects of lives, including playground safety. However, the attention given to playground safety has been rather restricted to public playgrounds rather than those at day care centers. Playgrounds in day care center may not have stringent safety standards as the ones regulated in public playgrounds, yet are more often frequented. This is an important issue to consider. This study was conducted to assess the safety issues that are reported to be prevalent in playground at day care centers. This was done through a risk assessment to determine the safety issue of greatest risk present at selected day care centers. The study made use of HIRARC risk assessment and respondent questionnaire. Findings show that day care center playground exhibited most of the hazards assessed, however at a low to medium risk. It was determined that the safety issue of greatest risk were unprotected playground surfaces under slides ($\bar{x}$= 6.000), insufficient clear zone under slides ($\bar{x}$=4.3846), rusty equipment ($\bar{x}$=3.6154) and uneven playground surfaces ($\bar{x}$= 3.4615). Due to supervision and guidance during playground use these hazards had not caused serious injuries. The questionnaire data revealed that 58.3% of the respondents had received playground safety training. Also a majority of the teachers perceived their playgrounds to have little safety issues. An observational comparison of the risk assessment with the survey conducted however indicated that the teachers perceived these safety issues to be of less prevalent and lesser in degree of severity than that identified and assessed through the HIRARC risk assessment. The implications of the study include the regulation of playgrounds at day care centres and the provision of more extensive training in playground safety for teachers in order for them to identify and thus minimize playground hazards.

CONTAMINATION OF CO, CO_2 AND PM10 AT ENCLOSED AND SEMI-ENCLOSED CAR PARKS IN KAJANG AREA

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The emission from vehicular exhaust that was released to the micro indoor environment of parking such as CO, CO_2, and particulate matter can pose harmful and long lasting effect on human health. Several studies have been conducted on indoor air in enclosed car park yet limited studies conducted on semi-enclosed car parks. This study is to determine the level of contaminants CO, CO_2 and PM10 at enclosed and semi-enclosed basement car parks. The CO and CO_2 level in enclosed and semi-enclosed car parks comply with the Indoor Air Quality guidelines, however PM10 concentration were found higher at some points of the enclosed car park. The CO and CO_2 pollution coupled with insufficient ventilation, as in this study, make them potentially hazardous to users. CO levels and PM10 were measured in selected location using direct-reading instrument and the sampling points was located based on the floor area. Number of cars entering/exiting the car park was recorded every 15 minutes. The correlation between number of cars and CO, CO_2 and PM10 were obtained. The correlations are achieved with the R^2 exceeds 90%, indicates strong association between them. Therefore, total number of cars does affect the increase of CO, CO2 and PM10 level in enclosed and semi-enclosed car parks. From the study it shows that CO, CO2 and PM10 have significant association with number of cars at enclosed and semi-enclosed car parks, with p-value <0.05. The proportion of variation by number of cars toward CO, CO_2 and PM10 at enclosed car park is 0.996, 0.920 and 0.904 respectively. Whereas, the proportion of variation by number of cars towards CO, CO_2 and PM10 at semi-enclosed car park is 0.997, 0.998 and 0.997 respectively. R^2 near 1 indicate there is strong association.

SUB THEME: OCCUPATIONAL SAFETY AND HEALTH

THE INTRODUCTION OF OCCUPATIONAL SAFETY WEBSITE AND LEVEL OF PSYCHOSOCIAL SAFETY CLIMATE (PSC) AMONG MALAYSIAN POLICE

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The prevalence of stress among Malaysian police was high, where 38.8% polices have severe stress related to work resources and workplace environment**.** Workplace psychosocial safety climate is a good indicator to detect such problem at an early stage and effective information dissemination method is vital to increase awareness among workers to avoid such problems. This study aims to determine the effectiveness of an occupational safety website in increasing psychosocial safety (PSC) level among Malaysian police. 105 police officers from nine different departments in PDRM Bukit Aman were randomly selected. Pre-survey was done to determine their PSC levels. The PSC level was assessed by adapting questionnaire from a previous study. Then, an occupational safety website specific for police officers was introduced to the respondents for two weeks. Lastly, post-survey was done to see the difference of PSC before and after the use of occupational safety website. The findings showed that the means before (36.095 ± 5.6202) and after (37.742 ± 4.7069) the introduction of occupational safety website was high. This study showed a significant increase of PSC after the introduction of occupational safety website. Team psychological safety (r=0.381, p=<0.001) and physical safety climate (r=0.657, p=<0.001) were significantly associated with PSC level. This study showed that the existing psychosocial safety climate level among Malaysian police is fairly good and the informative safety website is a promising tool to further improve this PSC.

PREDICTORS OF WORK RELATED MUSCULOSKELETAL DISORDERS OF NECK AND SHOULDERS AMONG FEMALE PUBLIC HOSPITAL NURSES IN THE KLANG VALLEY

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Work related musculoskeletal disorders (WRMSDs) in the neck or shoulders are common occupational health problems among the nursing professionals and have considerable impact, not only on the individuals involved, but also on the organization and society. Therefore, it is important to determine the predictors of these disorders in order to reduce the incidence and impact on the nursing profession and healthcare industry in Malaysia. This study aims to identify potential predictors of WRMSDs in neck and shoulders [workplace condition (psychosocial stressors and physical demands), emotional distress (stress, anxiety and depression) and work engagement (vigour, dedication and absorption)] in Malaysian female nurses in public hospitals in the Klang Valley. A cross-sectional study was conducted among female nurses working in four selected public hospitals in the Klang Valley, Malaysia. Information on the annual prevalence of WRMSDs, demographic, psychosocial stressors, physical demands, emotional distress, and work engagement were collected using a self-administered Malay translated questionnaire survey. Predictors of WRMSDs in the neck and shoulders were identified using multivariate logistic regression analysis. A total of 550 out of 660 nurses returned the questionnaire (response rate: 83.3%). However, the analysis was based on 376 nurses who provided completed questionnaires. 73.1% of nurses suffered of WRMSDs in at least one site in the past 12 months. Of these, 48.9%, 36.9% and 55.6% reported symptoms in the neck alone, shoulders alone and any of these regions respectively. When all significant predictors (p<0.10) were simultaneously included in the final model, the odds of WRMSDs in neck or shoulders was higher among nurses perceiving high physical demand (AOR: 1.18, 95% CI 1.02-1.30)

and high psychological job demand (AOR: 1.08, 95%CI 1.01-1.15). Anxious nursing personnel were at 22.6% greater odds of WRMSDs in neck or shoulders in comparison to the nurse without the symptoms. Married nurses were at higher odds (AOR: 2.12, 95% CI 1.27-3.55) whereas being engaged to work, significantly reduced the risk of WRMSDs in any of the area. The above identified predictive factors accounted for 15.2% of the variance of WRMSDs in region 1. From the results of the Hosmer-Lemeshow test, we can conclude that the goodness-of-fit indicator is satisfactory ($\chi 2=5.53$, df = 8, $p>0.05$). This study indicated that WRMSDs in the neck or shoulders are highly prevalent among female public hospital nurses in the Klang Valley. Psychological job demand, physical demand, anxiety and stress were significant predictors of WRMSDs in the studied anatomical areas. A longitudinal study is needed in the future to validate these findings. Further, the interventional program shall be carried out with a focus to effectively manage the psychological stressors and reduce the burden of physical demand in the hospital environment. In addition, instilling high work engagement at workplace is also crucial for preventing WRMSDs.

THE ASSESSMENT ON THE EFFECTIVENESS OF USING NEEDLE AMONG THE HEALTH CARE WORKERS AT HEALTH FACILITIES CENTRE IN SELANGOR

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The needle-stick injury is a percutaneous piercing wound typically set by a needle point and by other sharp instruments or objects. Needle prick was commonly encountered by people handling needles in the medical field. The injury becomes an occupational hazard towards the medical community. It becomes a major concern because the risk from the injury able to transmit blood-borne diseases through the blood vessel of affected person with Hepatitis B virus (HBV), Hepatitis C virus (HCV), and Human Immunodeficiency Virus (HIV). The study aims was to determine type of occupation and factors that contribute needle prick injuries among health care workers in Health Facilities Centre, Selangor. Data for the needle prick injury incidents has been collected since 2009-2013. Data being analyze by using Correlation Test and Factor Analysis. The results from the correlation test shows that the highest correlation for needle prick injuries was between medical officers and dental officers with correlation of coefficient value 0.999. In Factor Analysis, the result shows that the highest potential factors for needle prick injuries among health care workers was during handling patient and specimen with correlation of determination value more than 0.9. The study demonstrated that education can cause a significant impact towards the reduction of needle prick injuries. There are gaps between the knowledge and practice among the health care workers. Awareness on needle stick injury and safe work practices need to become a part of working culture together with adequate training, education, and information on needle-safe devices.

EFFECTIVE EMERGENCY MANAGEMENT: A MALAYSIAN PUBLIC LISTED OIL AND GAS COMPANY PERSPECTIVE

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Effective emergency management aims to minimize loss during real emergency or disaster. For that reason, Public Listed Oil and Gas (PLONG) companies have conducted numerous emergency response exercise (ERE) to evaluate their capability in handling emergency situations, but challenges in PLONG ERE reports obtained did not clearly identify nor categorized challenges based on emergency management effectiveness namely command structure, planning and information management, communication, situation awareness and finally resources and logistics. With the objective of identifying challenges based on elements of emergency management effectiveness, documents were analyzed towards PLONG ERE reports in 2015. Results were then discussed and validated by experts where it was found that challenges were identified in each element of emergency management and command structure contribute the highest percentage of challenges. The result also indicates the importance of a capable command structure in ensuring effective emergency management. It is believed that more detailed studies could be contributed to understanding and further analyze the role of human factors towards effective emergency management. accounted for 15.2% of the variance of WRMSDs in region 1. From the results of the Hosmer-Lemeshow test, we can conclude that the goodness-of-fit indicator is satisfactory ($\chi 2$=5.53, df = 8, p>0.05). This study indicated that WRMSDs in the neck or shoulders are highly prevalent among female public hospital nurses in the Klang Valley. Psychological job demand, physical demand, anxiety and stress were significant predictors of WRMSDs in the studied anatomical areas. A longitudinal study is needed in the future to validate these findings. Further, the interventional program shall be carried out with a focus to effectively manage the psychological stressors and reduce the burden of physical demand in the hospital environment. In addition, instilling high work engagement at workplace is also crucial for preventing WRMSDs.

THE RISK OF ACUTE MYOCARDIAL INFARCTION IN PHYSICIANS IN TAIWAN

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Taiwanese physicians have heavy workload and stressful workplace which may cause cardiovascular disease. It has been suspected that physicians may have a higher risk of acute myocardial infarction (AMI) consequently. Therefore, we analyzed the data from the National Health Insurance Research Database (NHIRD) to evaluate the possible effect. We identified 28,062 physicians and compared their risk of developing AMI to that of a random sample of 84,186 non-medical staff. We used logistic regressions to make the comparisons and identify the related risk factors, and subgroup analyses by physician specialty, age, gender, comorbidities, area, and hospital level were also conducted. In comparison with references, physicians have higher prevalence of hypertension (23.6% vs. 19.16 %, P < 0.001) and hyperlipidemia (21.4% vs. 12.9%, P < 0.001). However, they had a lower risk of developing AMI (odds ratio [OR]: 0.57; 95% CI: 0.46-0.72) after adjusting for diabetes, hypertension, hyperlipidemia, and area. There was no statistical difference in the AMI risks among subgroups of specialists, age, and area. In comparison with physicians served in local clinics, physicians employed in medical centers had a lower risk (adjusted OR: 0.42; 95% CI: 0.20-0.85). The results suggest that physicians did not have a higher risk of AMI. The higher awareness of disease, better knowledge, and easier access to medical care may be the main reasons why physicians had a lower risk in spite of being more likely to have hypertension and hyperlipidemia.

PERCEPTION OF MALAYSIA CONSTRUCTION WORKERS TOWARDS CONSTRUCTION PERSONNEL ACCREDITATION TRAINING PROGRAM

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As part of occupational safety and health provision in Malaysia, any construction workers are required to register and obtain accreditation of Construction Personnel (CP) before entering any construction sites. The one (1) day training program aims to expose the construction workers with adequate awareness and knowledge, including the legislation on occupational safety and health in Malaysia, but to the researcher's understandings, there are none specific studies made to measure the effectiveness of the training program. With the objectives to identify the effectiveness of the CP accreditation training program, 100 random respondents from several CP accreditation training program class were selected to answer a set of questionnaire based on the training program modules and outcome. Results reveal that majority of the respondents acknowledge the importance and capability of the training program in providing awareness and knowledge on the occupational safety and health issues in the construction industry, hence showing the effectiveness of the CP accreditation training program. However, studies also indicate that improvement of the existing modules is important as the construction industry is dynamically evolving from day to day.

THE IMPORTANCE OF LIQUID CHEMICAL PRESERVATION IN MEDICAL LABORATORY AMONG ASIAN LAB PRACTITIONER: CASE STUDY IN UNIVERSITY MALAYA, MALAYSIA

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Medical laboratory is one of the most important units in the hospital as its function is to identify the cause of the disease that affected by occupied patients in the hospital. Generally, the lab uses various types of chemicals that able to cause harm towards human health if the preservation of these chemical are not following the right process. This study aims to assess the efficiency of chemicals storage, identify the level of knowledge among lab users in managing chemicals storage, and also to determine an effective program that able to improve the knowledge among lab users regarding chemical preservation in the medical laboratory. The study applied questionnaires that have been generated by using a Likert Scale. Sixty respondents have been surveyed among lab users from the Department of Parasitology, Faculty of Medicine, University of Malaya. Result shows that all respondents know that the important of chemical preservation in the lab but not all of them are expert in handling chemical preservation that may lead to unwanted chemical exposure in the lab. Adequate trainings for chemical preservation must be provided in order to solve this issue. Current facility for chemical preservation in the lab also needs to be upgraded and well maintained to prevent unwanted chemical exposure in the medical laboratory.

HEAT EXPOSURE AND PHYSIOLOGICAL CHANGES AMONG COOKS IN KUBANG KERIAN, KELANTAN

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This study aimed to determine the association between area heat exposure levels with the physiological changes (body core temperature, blood pressure and heart rate) among cooks. This cross-sectional study design utilised purposive sampling method and recruited 27 cooks from cafes in Kubang Kerian. For area heat measurement, Wet-bulb Globe Temperature (WBGT) was mounted on a tripod at the height of 1.1 m and was placed near the source of heat for 8 hours. The body core temperature, blood pressure, and heart rate were taken three times per day during pre-shift, mid-shift and post-shift for physiological changes measurement. Respondents' personal information, health history, work description, and symptoms of heat related illness were asked using questionnaire. This study had found that four sampling sites had exceeded the permissible threshold WBGT level of 28.0ºCelsius. There was a significant different in body core temperature ($p=0.016$) and heart rate ($p=0.004$) between pre-shift and post-shift. However no significant correlation ($p>0.05$) was found between WBGT level with body core temperature at pre-shift and mid-shift, but a marginally significant association for post-shift ($p=0.053$). Such increase may be attributed by heat exposure. There was no significant association between body core temperature and blood pressure (systolic and diastolic) and with heart rate ($p>0.05$). For sociodemographic factors, only age showed significant association with the body core temperature. Preventive measures of heat stress at work such as suitable personal clothing and drink more fluid are highly recommended.

WORK-RELATED MUSCULOSKELETAL DISORDERS RISK FACTOR ASSOCIATED WITH MANUAL MATERIAL HANDLING TASK: A REVIEW

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In industrial workplaces, many workers perform processes jobs required manual material handling (MMH) for complete a cycle of their task. This review examined the risk factor related to Work-Related Musculoskeletal Disorders (WMSDs) that occur from MMH. PubMed and Google Scholar database used in searching the systematic review. Combine keyword for work-related musculoskeletal disorder, risk factor, epidemiology, individual, physical, psychosocial and work organization were used in this searching method. Only 60 articles are selected which is related to this review sort out from total 303 articles from screen by tittle and abstract. As finding from this reviews, its identify all the risk factor are related between each other during complete MMH task and required more attention in order to improve productivity of the task. Therefore, this finding of risk factor related to MMH could increase health and comfort of worker at workplace.

SUB THEME: PUBLIC HEALTH

A THERAPEUTIC COMMUNICATION ANALOG AS A MEANS OF ASSESSMENT OF PINK CLOUD SYNDROME AMONG SELECTED ADJUDGED DRUG USERS UNDER DEPARTMENT OF HEALTH – TREATMENT REHABILITATION CENTER (DOH-TRC) IN CAGAYAN DE ORO: A STEP TOWARDS PREVENTION OF RELAPSE

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The widespread prevalence of drug users considerably creates a conflict that concerns public health. About 230 million people, or 5% of the world's adult population were estimated to have used prohibited drugs. In the Philippines, as of the year 2003 there were 6.4 million estimated number of drug users nationwide and only less than 1% of this total number or 7,113 patients have been admitted for treatment and rehabilitation, Philippine Drug Enforcement Agency (PDEA). Pink Cloud Syndrome is defined as a dangerous euphoria, delusional and the inability to accept or meet present circumstances. This phase is a very critical stage for every drug users who has difficulty in staying sober or free from drugs. This study aims to provide assessment and evaluates awareness towards the advance warning sign of Pink Cloud Syndrome to prevent relapse. This study uses a quasi-experimental design which assesses and evaluates awareness towards the advance warning signs of Pink Cloud Syndrome to prevent relapse. The respondents of this study are only those who are adjudged as drug users from year 2011-2015 and those who are 4 to 6 months under rehabilitation or almost completed their rehabilitation. Chosen respondents should be 18-60 years of age. It will be conducted in a drug-treatment rehabilitation center in Puerto, Cagayan De Oro. This study was limited to legally adjudged drug users and males only. The youngest respondents were 18 years old and the oldest was 48 years old. Majority of the respondents are in their 20s and 30s. The scores obtained showed that only 6 of the respondents (20%) obtained scores higher than the middle possible score of 112. A higher rating indicates that the respondent has a greater risk of a relapse than those with lower scores. The mean score of the pre-test is 92 out of 196 while the mean score of the post-test is 54 out of 196. T-test was used in order to determine if there was significant difference between the pretest and posttest after the teachings done. The results showed a significant difference. Thus the said therapeutic communication as a means to prevent relapse is effective.

A CASE STUDY ON THE AVAILABILITY, PRICING AND AFFORDABILITY OF ESSENTIAL MEDICINES IN A PRIVATE GP CLINIC IN MALAYSIA

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This study has been conducted to investigate the availability, pricing and affordability of essential medicines in a private GP clinic in Malaysia. In June 2016 a case study was conducted in an urban private GP clinic in Klang Valley, Malaysia. Quantitatively, fourteen essential medicines on the Global Core List were surveyed, according to the WHO/ HAI (World Health Organisation/Health Action International) guidelines. For each medicine, data were collected for its Originator Brand (OB) and Lowest-Priced Generic (LPG). Medicine prices were compared with their International Reference Price (IRP). Affordability was assessed through calculating the number of days required to be worked by lowest-paid government employees in order to pay for essential medicines. Qualitatively, semi-structured interviews were conducted among four general practitioners in the clinic. The interviews were audio-taped, transcribed, subsequently coded and analysed thematically. Availability of LPGs was higher (42.9%) compared to OBs (21.4%). The median price ratios for 3 OBs and 6 LPGs were 7.43 and 15.47 times higher than the IRPs, respectively. Standard treatment affordability ranged from 0.5 days' wages for adult respiratory infection to 3 days' wages for hypertension. The following five themes were identified: 1) availability of medicines, 2) pricing of medicines, 3) affordability of medicines, 4) views on generic medicines, and 5) suggestions for improvements. Availability, pricing and affordability of essential medicines must be routinely monitored to ensure accessibility to healthcare among the general public, especially in the Malaysian private GP setting.

HAIR MERCURY LEVELS AMONG PRIMARY SCHOOL CHILDREN IN NEGERI SEMBILAN

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Developmental, cognitive and behaviour are not only influenced by social and emotional factors, they can also be influenced by dietary factor. Mercury, a well-established neurotoxicant which easily can be found in food is associated with these three domains. The objective of this cross-sectional study was to determine the hair mercury levels and its association with socio-demographic characteristics, mercury poisoning symptoms and fish consumption pattern among primary school children in Negeri Sembilan. Two hundred and fifteen children aged 11 years old were sampled as respondents. Hair was collected from the children and mercury analysis was carried out using heat vapour-atomic absorption spectrophotometry. Anthropometric data, fish consumption pattern and mercury poisoning symptoms were determined. Mean hair mercury (H-Hg) level among primary school children in Negeri Sembilan was 0.63±0.59µg/g. A total of 31.6% of the respondents had hair mercury levels exceeding 0.5µg/g while 14.4% had H-Hg ≥1µg/g. Most frequent reported mercury poisoning symptoms were headache (54.9%), followed by irritability (39.1%) and fatigue (35.8%). Significant associations ($p<0.05$) were shown between hair mercury levels and fish consumption pattern, household family number, smoking status, as well as salary. Almost half of the respondents (46.0%) possessed hair mercury levels above the mean value for children around the world (0.5µg/g). This study provides an important baseline data regarding the mercury levels and its associated factors among primary school children in Negeri Sembilan.

PRACTICES AND MANAGEMENT OF FATS, OIL AND GREASE IN FOOD SERVICE ESTABLISHMENTS, KAJANG, SELANGOR

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Obstruction by fats, oil and grease (FOG) clogs in sewer pipelines results in high building maintenance costs. FOG in wastewater poses threats to properties and causes pollution of waterways and groundwater. The installment of grease trap between wastewater effluent points and the sewer system can minimize fouling of sewer lines. A survey and kitchen inspection was carried out among 100 selected food service establishments (FSEs) in Kajang town, Malaysia. The study aim to assess the restaurant's management practices in controlling the disposal of FOG from the working grease trap. Grease trap cleaning routine, storm drain design and grease trap design were the causes of FOG accumulation observed in sewer pipes and drains (49%, 32% and 19% respectively). In addition, 62% of FSEs were identified of having 'Poor kitchen management' whilst 55% were observed of not adapting the Best Management Practice of working grease trap. Preventive practices in the management of FOG in restaurant's kitchen waste should be the first line of solutions in mitigating FOG.

BARRIERS TO ADHERENCE TO EXPANDED PROGRAM ON IMMUNIZATION AMONG PARENTS IN LANAO DEL NORTE

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Several vaccine-preventable diseases were identified as the most common cause of infant deaths worldwide (National Institute of Child Health & Human Development, 2008). In fact, it has been reported that an estimated three million or more children worldwide die or are disabled by these diseases each year (WHO, 2013). Nonetheless, this drastic trend can be averted through complete and timely immunization (DOH, 2013). This study aimed to identify and explore the barriers to adherence on Expanded Program on Immunization (EPI) among parents in Lanaodel Norte. A researcher-constructed questionnaire was used after being pilot tested to gather data from 352 respondents. Using frequency counts, percentages, weighted arithmetic mean and ranking the results showed that most of the respondents considered only geographical factors as barrier to adherence to EPI along with social factors. Moreover, it has been found out that respondents lacked knowledge and awareness on the benefits of immunization, the number of vaccines their child need to receive, site and schedule, side-effects, and contraindications. However, with mean above 2.34 indicated that respondents were informed on the appropriate interventions for side-effects of vaccines, as well as their right to refuse vaccination. In addition, the respondents' over-all level of adherence was moderate. The identified barriers geographical, social, personal, beliefs and myths on immunization and respondents' level of knowledge and awareness have influenced respondents' level of adherence to a moderate level only. Based on the results, more intentional follow-up campaign drives in spreading information about Expanded Program on Immunization using media is needed.

PHYSICAL ACTIVITY AMONG BREAST CANCER SURVIVORS IN UKMMC: A PRELIMINARY STUDY

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American Cancer Society Guideline on Nutrition and Physical Activity for Cancer Survivors (2012) recommends 150 minutes of moderate activity a week to cancer survivors. The reason is to help cancer survivors to maintain health and improve their quality of life. The study objective was to determine the level of physical activity among breast cancer survivors and its relationship with sociodemographic, socioeconomic and medical condition. This is a baseline finding of an educational intervention study. A total of 131 female breast cancer survivors were recruited while they went for their appointment at the Oncology clinic in Universiti Kebangsaan Malaysia Medical Centre (UKMMC). Baseline data for physical activity was collected using the International Physical Activity Questionnaire (IPAQ). Descriptive statistics and non-parametric tests were used to determine vigorous, moderate and walking physical activity level according to education, age, income, stage of cancer, years of survival, family history having cancer, supplement intake and working status. There is a significant different in moderate physical activity among breast cancer survivors according to education ($p=0.028$), stage of cancer ($p=0.042$) and supplement intake ($p=0.033$). Breast cancer survivors with secondary education level, stage II cancer and did not take supplement practiced more moderate physical activity in a week, while other characteristics did not show association with moderate physical activity. Physical activity should be encouraged at an early stage of cancer among both low and high education survivors and among supplement users to maintain health and improve their quality of life.

TRENDS IN PEDIATRIC INJURIES AMONG CHILDREN AGES 5 AND 10 ATTENDEES AT THE EMERGENCY AND TRAUMA DEPARTMENT IN THREE MAJOR HOSPITALS IN THE KLANG VALLEY

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Child injuries have become a major global health concern. Every year, hundreds of thousands of children die as a result of some sort of injury which are mostly preventable while millions of others suffer the lifelong consequences of non-fatal injuries. Child injuries do not only affect the life of the child but also the lives of the families and the community directly or indirectly. In Malaysia, injury is the second most common cause of death among Malaysian children. And that 40% of injuries occurred without adult monitoring or supervision. Currently, there is limited scientific evidence and data available on the prevalence of childhood injuries and underlying factors contributing towards these injuries. This paper presents the result from the first phase of a cross-sectional study examining pattern of injuries and underlying contributing factor of pediatric injuries amongst 5 and 10 year old children who attended the Emergency and Trauma Department in three major hospitals in the year 2013. A list of patients (5 and 10 year old) who attended the Emergency and Trauma Department of three hospitals was retrieved from the Health Information System (hospital database). Several indicators such as gender, presenting complaint, types of injuries, place of injuries were extracted from the database. A total of 12,394 records of 5 and 10 year olds attended the Emergency and Trauma Department in three major hospitals were extracted and included in the study. The findings revealed that in general more males (57.9%) presented themselves at the emergency and trauma department compared to females (42.1%) in both age groups. With more 5 year old (67.0%) attendees as compared to 10 year old (33.0%). URTI is the most frequent form of

presentation to the department for combined ages followed by injuries which contributed 13.0% of the overall presentations in both age groups. The most frequent presenting complaints for injuries in both age groups are fall (51.1%) but the second most common presenting complaints are different with both age groups and also different from each hospital. Child abuse and neglect make up only a small percentage (1.54%) of the overall presenting complaints. In terms of most common body parts injured, 5 year old most likely to injury their head, followed by upper limb, which contrast in comparison to the 10 year old age group who were most likely to injure their upper limb. Most common place of injuries in the 5 year old age group was at home whereas the most common place of injuries in the 10 year old age groups was at school. This study clearly shows that patterns of pediatric injuries differ significantly between 5 year old and 10 year old patients. Younger children are mostly injured at home and there is a need to create more awareness towards the parents to ensure that all safety measures are taken and that the home environment is safe. Parents should also need to understand that supervision and monitoring of children at all times are essential in preventing injuries due to neglect. Parents should also be made aware that older children who are more likely to spend most of their time at school should be equipped with proper protective equipment such as knee protector, gloves when playing outdoor sports or helmets when riding a bicycle. School's authority should also play an active role in creating awareness on child safety at school.

KNOWLEDGE, ATTITUDE AND PRACTICES OF PESTICIDE USAGE AND ITS RELATIONSHIP ON NEUROBEHAVIORAL HEALTH EFFECT AMONG PADDY FARMERS IN PERAK

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Epidemiological literature has documented an association between pesticide usage and neurobehavioral performance among workers following long term exposure. However, many of these studies were conducted in the western countries with only a few reports in Malaysia concerning the neurobehavioral health effect from exposure to pesticides. This study is aims to evaluate the levels of knowledge, attitude and practice associated with pesticide usage and impaired neurobehavioral performance. 120 paddy farmers from Felcra Seberang Perak and 70 administrative workers from Pusat Benih Felcra participated in this cross sectional study. A modified questionnaire was used to determine their levels of knowledge, attitude and practice (KAP) of pesticide usage and handling. The neurobehavioral performance of the respondents was measured using a Neurobehavioral Core Test Battery (NCTB) which included test for Digit Symbol, Santa Ana Dominant, Benton Visual, Simple Reaction Time, Trail Making and Pursuit Aiming. The paddy farmers were found to have a low level of knowledge, but had positive attitude and good work practice of pesticide. The neurobehavioral tests showed that the farmers were likely to have deficits in neurobehavioral performance compared to the control group. However, there was no significant association observed between neurobehavioral performance and levels of KAP. Negative correlation in neurologic function was seen among farmers with higher age, low education level and longer duration of pesticide exposure. Further study is recommended to determine if the observed low and negative results can be improved, and how the effective is the training provided by the relevant authority with regards to pesticide usage at their paddy farm.

IMPACT AND OUTCOME EVALUATION OF THE H.E.B.A.T! PROGRAM: A RANDOMIZED CONTROL TRIAL INTERVENTION TO COMBAT CHILDHOOD OBESITY IN NEGERI SEMBILAN

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The prevalence of childhood obesity is increasing throughout the world and significantly associated with health consequences. Thus, obesity prevention and treatment should start early in life and should target modifiable behaviours that influence energy intake and expenditure. The H.E.B.A.T! programme aims to improve weight status, eating habits and physical activity of overweight children aged 10-11 years old in Negeri Sembilan. Two primary schools with the highest rate of overweight and obesity in Seremban were selected and randomly assigned as intervention and control. A total of 43 children (69.7% boys; 30.3% girls) participated in the study. The intervention group underwent two series of 3-day camps, and had regular school-based fun activities to engage in healthy eating and active lifestyle, and participated in a healthy weight competition. Parents of children in intervention group attended a half-day workshop to enable them to create supportive environments at home for their children. Impact and outcome evaluation was assessed based on dietary intake, average step counts, BMI for age z-score, body fat percentage and waist circumference at pre-intervention, post-intervention 1 and post-intervention 2. There was significant reduction in energy (14.8%) and fat (21.9%) intakes ($p<0.05$) at post-intervention 1 in intervention group. Significant intervention effect was found for average step counts, BMI for age z-score and waist circumference. In conclusion, the intervention made an impact on positive behavioural intentions and improves weight status of the children. It is expected that the H.E.B.A.T! Program could be adopted and implemented by the government and private sector as well as policy-makers in formulating childhood obesity intervention.

SEPARATOR 2

THEME:

CLINICAL LABORATORY & BIOMEDICAL SCIENCE

SUB THEMES:

- ANATOMY & PHYSIOLOGY
- BIOCHEMISTRY, GENETICS & MOLECULAR BIOLOGY
- HISTOCHEMISTRY & CELL BIOLOGY
- MICROBIOLOGY
- PHARMACOLOGY & TOXICOLOGY
- IMMUNOLOGY & IMMUNOHEMATOLOGY
- HEMATOLOGY, PATHOLOGY & LABORATORY MEDICINE

SUB THEME: ANATOMY & PHYSIOLOGY

GEOMETRIC MORPHOMETRICS ANALYSIS OF HUMAN MANUBRIUM WITH OPEN-SOURCE SOFTWARE

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The morphology of sternum as a whole with geometric morphometrics (GMM) has been conducted though no study was carried out on the manubrium based on a wide age range and sex previously. The manubrium is a large thick bone which is more likely to survive inhumation which is useful in forensic science. Retrospective analysis was conducted on 660 males and females between ages of 6 days old to 89 years old from the Picture Archiving and Communication System (PACS) database available at the Radiology Department in Universiti Sains Malaysia Hospital. Digital Imaging and Communications in Medicine (DICOM) data from PACS server exported to MITK software showed that only 32% samples could be further utilised for GMM analysis without post-processing. The variation in density of the sternum in general means no default Hounsfield Unit (HU) value could be assigned for each particular sternum and increasing the HU value to compensate the bone loss with MITK resulted in smoothen unusable samples for 3D analysis. MeshLab, IDAVLandmark and MorphoJ were utilised for GMM analysis of these samples. From the 250 available samples, the 14-point landmarks in GMM shows that the manubrium morphology was affected more by age then by sex. It is suggested that better post-processing of DICOM samples in MITK allowing wide HU values before exporting the 3D models is needed for higher accuracy. The difference in the morphology of the manubrium by age is useful tool for Forensic Anthropologists when trying exhuming bones.

RESIBUFOGENIN PREVENTS LEPTIN-INDUCED INCREASES IN BLOOD PRESSURE AND MARKERS OF ENDOTHELIAL ACTIVATION DURING PREGNANCY IN *SPRAGUE DAWLEY* RATS

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Leptin administration has been shown to increase systolic blood pressure (SBP), urinary protein excretion and markers of endothelial activation during pregnancy in rats. Marinobufagenin (MBG) has been implicated in hypertension and proteinuria of pregnancy. The link between leptin-induced increase in blood pressure and marinobufagenin is unknown. It is also unknown if resibufogenin, an MBG antagonist, could prevent these. This study investigated the effect of resibufogenin on leptin-induced raised blood pressure during pregnancy in the rat. Forty-eight female *Sprague-Dawley* rats, aged 12 weeks were randomized into Group 1 (normal saline control), Groups 2, 3 and 4 (given 120µg/kg/day of leptin (LEP), 120µg/kg/day of leptin +30µg/kg/day of resibufogenin (L+RBG) and 30µg/kg/day of resibufogenin (RBG) respectively from Day 1 of pregnancy). SBP, body weight and 24-h urinary protein were measured at Days 0 and 20 of pregnancy. Animals were euthanised on day 21 of pregnancy for estimation of fetal number, fetal weight and placental weight and for serum analysis of VCAM-1, ICAM-1, E-selectin and Endothelin-1. Data were analysed using ANOVA. Compared to the control group, SBP, urinary protein excretion, serum VCAM-1, ICAM-1 and Endothelin-1 were significantly higher whereas fetal weight was significantly lower in LEP ($p<0.05$). No significant differences were evident in these between control and L+RBG groups. No significant differences were evident in the rest of the parameters between the four groups. Resibufogenin prevents leptin-induced increases in SBP, proteinuria,

markers of endothelial activation and decreases in fetal weight implicating the possible involvement of MBG in these.

ANTIHYPERTENSIVE EFFECT OF STANDARDISED AQUEOUS ETHANOLIC EXTRACT OF *FICUS DELTOIDEA TRENGGANUENSIS* IN SPONTANEOUSLY HYPERTENSIVE RATS

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Ficus deltoidea is a plant that has been claimed to have medicinal properties. However, evidence about its antihypertensive activity remains undetermined. This study therefore evaluates the antihypertensive effect of a standardised aqueous-ethanolic extract of *Ficus deltoidea trengganuensis* (FDT) in Spontaneously Hypertensive Rats (SHR). Thirty, male SHR, aged 12 to 14 weeks, with systolic blood pressure (SBP) of more than 150 mmHg were divided into 5 groups (n=6). Each group was treated daily via the oral route for 4 weeks either with 800, 1000 or 1200 mg/kg body weight of standardised aqueous-ethanolic extract of FDT. Controls were given either 10 mg/kg body weight of Losartan or 0.5 ml of distilled water. Blood pressure was measured weekly using tail cuff plethysmography (CODA). Data were analysed using ANOVA.: SBP after 4 weeks of treatment was significantly lower ($p<0.05$) in the 1000 and 1200 mg treated groups when compared to that in the control. SBP in the losartan treated rats was significantly lower at Week 4 when compared to that in the control group ($p<0.001$). No significant differences were evident in body weight, urine total protein concentration and urine output between the groups. There were also no significant differences in urinary calcium, total protein, sodium and potassium excretion. Oral administration of FDT, particularly at doses between 1000 and 1200 mg/kg, significantly lowers blood pressure, but it does not involve changes in electrolyte excretion and might be due to some other yet to be identified mechanism.

SUB THEME: BIOCHEMISTRY, GENETICS & MOLECULAR BIOLOGY

hsa-miR-26a-5p IS UPREGULATED IN CHRONIC MYELOID LEUKAEMIA NON-RESPONSIVE TO IMATINIB THERAPY

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Non-responsive to imatinib therapy occurs in 20-25% of Chronic Myeloid Leukaemia (CML) patients. Patients treated with nilotinib or dasatinib and failed, had more chance of progressing to acute phase or blast phase. To identify microRNA (miRNA) that could be related to progression of CML. CML patients were selected according to European Leukaemia Net recommendations with regards to molecular response. MiRNAs from patients responsive and non-responsive to imatinib therapy and normal control were profiled using Next Generation Sequencing, and 18 miRNAs were selected. These miRNAs were screened in triplicate in non-responsive patients and blood donors using Real-e RT QPCR. Identical threshold settings were used and suitable data were analysed by Gene Globe. Data from 29 non-responsive patients and 28 blood donors were compared. Non-responsive group comprised of 17 Malays, 7 Chinese and 5 Indians (14 males and 15 females) with mean age was 45.1 ± 14.9 years. Blood donors group comprised of 15 Malays, 10 Chinese and 3 Indians (22 males and 6 females) with mean age was 35.8 ± 9.1 years. Four miRNAs were differentially expressed in CML non-responsiveto imatinib therapy in comparison to blood donors samples (p-value<0.05). Two of these were upregulated with hsa-miR-26a-5p was 2.5 times upregulated. Upregulation of hsa-miR-26a-5p could be related to progression of CML. It could be used in monitoring molecular response to tyrosine kinase therapy. Therefore it has potential as a biomarker to predict clinical resistance in CML non-responsiveto imatinib therapy.

BIOCHEMICAL PROFILES OF CITRULLINEMIA TYPE I IN MALAYSIAN PATIENTS

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Citrullinemia type I is an autosomal recessive disorder caused by deficiency of argininosuccinic acid synthetase (ASAS), one of the enzyme in urea cycle. Deficiency of ASAS resulted in hyperammonemia leading to encephalopathy, failure to thrive, mental retardation and subsequent death if not diagnosed and treated early. To determine the biochemical profiles of citrullinemia type I in Malaysian patients in order to distinguish it from other urea cycles disorder. We analysed data from samples received from 1999 to 2015. These samples were sent by clinicians from hospitals all over Malaysia for investigation of inborn error of metabolism (IEM).Their plasma were analysed for amino acids using pre-column derivatization and high performance liquid chromatography (HPLC) with diode-array detector and later it was changed to dedicated amino acids analyser fitted with ion-exchange column. Urine samples were analysed for orotic acid using anion-exchange column and HPLC with ultra-violet detector. A total of 39,621 patients' samples were analysed for amino acids in plasma and urine orotic acid. Eighteen patients were noted to have marked elevation of plasma citrulline ranging from 825 – 4439 umol/l (normal <30). Moderate excretion urine orotic acid was noted ranging from 59.26 - 600 mmol/molcreatinine (normal range < 10). Glutamine was noted to be moderately elevated with hyperammonemia. Argininosucinic acid was not detected in this group of patient. Biochemically, citrullinemia Type I presented with marked elevation of citrulline and moderate elevation of glutamine and orotic acid.

THE APOPTOSIS EFFECT OF PUCUK NENAS HONEY AND GELAM HONEY ON HUMAN CERVICAL CARCINOMA (CASKI)

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There are various type of honey that can be found in Malaysia such as Gelam honey and Pucuk Nenas honey. Pucuk Nenas honey is produced by nectar that collected by honey bees from *Ananas Comosus*. While Gelam honey is obtained from nectar of Gelam tree that belongs to *Myrtacea* family. Both types of honey contain high phenolic compound that possess antioxidant and free radical scavenging activity towards preventing cancer and other disease. This study was done to determine the apoptosis effect of both Gelam and Pucuk Nenas honey on cervical carcinoma Caski cell at different incubation time which is 24 and 48 hours. The IC50 concentration showed for both honey are different for different incubation time (24 hours: IC50 Gelam honey= 8%; IC50 PucukNenas honey= 5% and 48 hour: IC50 Gelam honey=8.5%; IC50 PucukNenas=4.25%). Apoptosis effects were studied through morphological changes and apoptosis cell counting analysis. Morphological changes for apoptosis detection are done using propidium iodide staining observed through fluorescent microscope under 400X magnification. While the apoptosis activity were determined by calculation of apoptotic cell seen for both early and late apoptosis stage in 100 visible CasKi cell using software of Image J. Both honey treated CasKi cell at either 24 hours or 48 hours did increase number of apoptotic cells significantly ($p \leq 0.05$) in both early and late apoptosis stage when compare to the untreated CasKi cells. 29% ($p \leq 0.05$) of early apoptosis stage and 71% ($p \leq 0.05$) of late apoptosis stage was found in 24 hours of incubated CasKi cells with Gelam Honey (24 hours, IC50=8%). Reduce number of early apoptosis stage (15%, $p \leq 0.05$), but increase number of late apoptosis stage (85%, $p \leq 0.05$) was observed in CasKi cells incubated with Gelam honey for 48 hours (IC50=8.5%) when compared to the 24 hours incubation time. Similar pattern of decreasing numbers for early apoptotic CasKi cell and increasing number of late apoptosis CasKi cell were found on CasKi cell treated with Pucuk Nenas honey. The early stage apoptosis CasKi cell incubated with 24 hours of Pucuk Nenas honey (64.67%, $p \leq 0.05$) appeared to be significantly higher than in 48 hours of Pucuk Nenas honey treated CasKi cell (27.33%, $p \leq 0.05$). However, significantly increase of late stage apoptosis CasKi cell were observed in the 48 hours PucukNenas honey incubation (47.33%, $p \leq 0.05$) when compared to 24 hours of Pucuk Nenas honey incubation (14%, $p \leq 0.05$). The proportion of early stage CasKi cell apoptosis activity decrease significantly and the proportion of late stage CasKi cell apoptosis activity increased significantly as the incubation time increases. Thus, it may be conclude that both Gelam and Pucuk Nenas honey has the ability to induce apoptosis in human cervical carcinoma cell line (CasKi) .It's apoptosis inducement activity showed to be in time dependent manner.

HIGH RISK SCREENING OF BIOTINIDASE DEFICIENCY: A RETROSPECTIVE STUDY

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Biotinidase deficiency (BTD) is an autosomal recessively inherited disorder, characterized by developmental delay, seizures, hypotonia, ataxia, skin rash/eczema, alopecia, conjunctivitis/visual problem/optic atrophy and metabolic acidosis. Delayed diagnosis will lead to irreversible neurological damage. The aim of this study is to identify children with clinical symptoms of BTD and to determine presence of mutation in the affected children. This study involved dried blood spot (DBS) samples from government hospitals in Malaysia which sent DBS for high risk screening (HRS). We selected children whom at least had 2 symptoms of BTD, within January 2015 until February 2016. Total of 840 DBS which fulfilled the criteria were analysed for biotinidase activity by fluorimetric assay, using Neonatal Biotinidase Kit from Perkin-Elmer. Further supporting test was done like acylcarnitine profiles in dried blood spots and organic acids analysis while molecular analysis is for confirmation. 17 (2.02%) patients were found to have biotinidase activity < 77 U (cut off value). Out of that, 2 patients (0.2%) were diagnosed with profound biotinidase deficiency and molecular study of these patients revealed that only one child (Patient 1) had heterozygous mutations which are c.98_104delinsTCC p. (Exon 2) and c.839T>C p. [Leu280Pro] (Exon 4) while the other (Patient 2) showed no mutation. 15 patients (1.8%) were diagnosed with partial biotinidase deficiency. High risk screening of BTD is an essential screening to determine definitive enzyme status in symptomatic child. It is highly recommended that patients with absent/low biotinidase activity to be further confirmed by mutation analysis to reduce false positive rate.

A SYSTEMATIC REVIEW ON THE VARIOUS ATTEMPTS TO PROPAGATE HUMAN NOROVIRUS *IN VITRO*

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The human norovirus (HuNoV), a small RNA virus belonging to the *Caliciviridae* family have been recognized as the main cause for acute gastroenteritis outbreak worldwide. Despite their significant impact on global health burden, HuNoV life cycle remains poorly studied due to its incapability of being cultivated *in vitro,* thus hindering any progress towards the development of therapeutics or vaccines. Success of the *in vitro* propagation of HuNoV depends on multiple factors. The objective of this systematic review is to obtain updated publications on HuNoV cultivation method. Comprehensive, structured literature searches were conducted in PubMed, Scopus and Web of Science (WOS) databases. Systematic search strategy was generated based on the focused keywords which are Norovirus, Replication, Culture, and *In vitro.* Articles were selected based on the inclusion and exclusion criteria. Included publications were limited to articles in English language over the period of 10 years from 2006 to 2016. Studies on both non human or animal noroviruses were excluded. Only full text original articles were included while book chapters, books, conference papers and reviews were excluded. Nine eligible articles were identified for this systemic review. The HuNoV replication was reported to be successful in 2D co-culture of B cells with epithelial cells. However, the 3D culture remains unsuccessful despite numerous techniques and different cell types used. Considering all the reported studies so far, it is concluded that the HuNoV cultivation method is still in early developmental stage. Therefore, more research is needed to explore other cultivation techniques that would lead to the successful culture of HuNoV.

DEVELOPMENT OF MITOCHONDRIAL RESPIRATORY CHAIN COMPLEXES ENZYMATIC ASSAY ON HUMAN SKIN FIBROBLAST

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Mitochondrial respiratory chain (MRC) comprises four enzymatic complexes (complexes I–IV) embedded in the inner mitochondrial membrane. Deficiencies in one of these enzymes will lead to mitochondrial disorders which fall under Inborn Errors of Metabolism (IEM). We aimed to develop and evaluate method to measure MRC enzymatic activities of human skin fibroblast. This study involved skin biopsy samples from HKL Genetic Clinic and forensic unit of general hospitals with clinical suspicion of IEM. Ten wild-type strains fibroblasts were successfully cultured and processed into lysate. Methods were adopted from Taylor RW & Turnbull DM (2005) with slight modifications. All assays were performed at 30˚C, pH (7.2-7.4) in 48-well plate, final volume of 1.0 ml containing 20 µg protein lysate. The enzyme activities were calculated in nmol/min/mg of protein. Normal strain fibroblast was used as control. Interassay imprecision using human cell line ATCC was determined for each complex by replicates analyses. Supplementary tests were done to support the diagnosis. Imprecision study of MRC enzymatic activities showed CV of Complexes I–IV were 22%, 9.6%, 21% and 15% respectively. Out of ten patient's samples, 1 showed abnormally low activity of complex III/IV which supported by western blot analysis. The other 9 patient's samples showed normal enzyme activities of all the complexes which were comparable to activities of normal human cell line ($p<0.05$). We have successfully developed a rapid and reliable assay for measuring a full panel of MRC complexes activities in human fibroblast.

UNIVERSAL SAMPLE PREPARATION FOR N-GLYCAN PROFILES BY MASS SPECTROMETRY: APPLICATION TO CULTURED CELLS AND HUMAN SERUM

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We have been interested in developing methods appropriate for isolating and analysing *N*-glycans from cultured cells and human serum. The method needed to be compatible with mass spectrometry for analysis of the released glycans. Mass spectrometry is a well-established approach for studying glycoprotein glycans. A method to assess the diversity of the *N*-linked glycans released from culturd cells and human serum has been developed using filter aided *N*-glycan sample preparation (FANGS) protocol. The samples are boiled in sodium dodecyl sulfate (SDS), as described FANGS protocol the SDS is exchanged for urea , and then for volatile buffer, in which *N*-glycans release using PNGase F treatment is carried out in the upper chamber of a membrane spin filter. The released glycans are recovered in the filtrate following centrifugation subsequently analysed using MALDI TOF/TOF. Authentic standard glycoprotein are used to assess sample processing protocol together with human serum. Non-derivatised *N*-glycans from standard glycoprotein, wild type Chinese Hamster Ovary cells and human serum were analysed using MALDI TOF/TOF MS. Bi and tri-antennary sialylated glycans are observed (*m/z* 2794, 3243, 3605, 3965 $[M+Na]^+$) from standard fetuin for validation of sample processing. We show that the protocol is suitable for *N*-glycan profiling both in cultured cell and human serum. This method was found to work efficiently on different sample matrices and reduces sample preparation time before MALDI-TOF/TOF analysis.

EFFECT OF DREV1 KNOCKDOWN ON LUNG CANCER (A549) ANCHORAGE-INDEPENDENT GROWTH

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Anchorage-independent growth as the cell's ability to proliferate without matrix attachment is one of the hallmarks of oncogenic transformation. Although DREV1 knockdown has been shown to significantly increase cell proliferation, reduce apoptosis and increase cell invasion in monolayer culture, little is known about its effect on lung cancer cell under anchorage-independent culture system. This study demonstrates the effect of DREV1 knockdown towards the anchorage-independent growth of lung cancer cells (A549). A549 cells were transfected with siRNA targeting DREV1 and allowed to grow in three-dimensional culture model by culturing it in polyHEMA-coated plate and soft agar plate. A549 cells with DREV1 knockdown were observed to have less proliferation activity compared to non-transfected cells. MTS assay analysis revealed the significant difference in proliferation activity between silenced (treated) and non-silenced (positive control) A549 cells, in which the activity is reduced in DREV1-silenced cells (0.46 ± 0.02, $p < 0.001$). The growth of A549 cells on soft agar does not correlated with the number of aggregates and proliferation activity in polyHEMA as the colony formation was slow in all groups. These data demonstrated that DREV1 knockdown does not promote anchorage-independent growth in A549 lung cancer cell. It is proposed that the expression of DREV1 may be independent when the cells were forced to grow in suspension cultures compared to monolayer model.

LEPTIN AS A POTENTIAL BIOMARKER FOR PREDICTING CARDIOVASCULAR DISEASES (CVDS) EVENT: A REVIEW

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Cardiovascular diseases (CVDs) account for most NCD deaths. Although hypertension, dyslipidemia, insulin resistance and diabetes are probably key elements in the causal pathway for CVDs, the potential biomarkers are poorly understood. Hence, the objective of this review is to assess the potential utility of leptin as a biomarker to identify high-risk individual for developing CVDs. All the literatures were extracted from three databases (PubMed, CENTRAL and Google scholar) from year 2010 to 2016 with all fields search for any potential human clinical trials using the search terms "leptin" and ("cardiovascular"), crossed with the term "disease". Thirteen articles were selected and divided into two categories: normal and leptin-related disease participants. 70% of the studies found that high levels of leptin was associated with CVDs event, whereas 30% of the studies reported that leptin had varied effect on CVDs. One study found that the ratio of leptin/adiponection (L/A) was most meaningful to predict first CVD event in men than the effect of leptin or adiponection alone. Intriguingly, all the articles reported that most people with high body mass index (BMI) documented high levels of circulating leptin. In conclusion, a positive correlation exists in between high level of leptin and BMI. Although it is still early to conclude that leptin is the biomarker for predicting the onset of CVDs, our preliminary evaluation of recently published human clinical trials offer the possibility that hyperleptinemia in human obesity associated with the increased risk for CVDs.

COMBINATION OF METFORMIN AND HYPOTHERMIA ACTIVATES BAX/BID-DEPENDENT APOPTOSIS IN OSTEOSARCOMA CELLS *IN VITRO*

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Introduction: Both metformin and hypothermia have been shown to influence the normal cell metabolism. However, little is known about their effect on cancer cells that can utilize alternative energy sources. Objective: To investigate the combination of metformin and hypothermia on cell viability, glucose metabolism and the mechanism of apoptotic cell death induced. Osteosarcoma (MG-63) cells were treated with metformin IC5030M for 48 h followed by exposure to moderate (35°C) and severe (27°C) hypothermia for 30 mins, 1 h and 2 h meanwhile 37°C served as control. The glucose metabolism gene GSK3ß and apoptosis pathway genes DR5, Bax, Bid, Bcl-2, AIF, cytochrome c, Apaf1, Caspase -8,- 9 & -3 were measured using real-time PCR. Changes in mRNA level (n=3) were statistically analyzed using the Student's t-test. Results: The combination of metformin and hypothermia downregulated GSK3ß mRNA, which in turn led to a reduction in cell viability particularly in severe hypothermia. The combined effect caused an upregulation of DR5, Bax, Bid found upstream of mitochondrial signalling molecules and a downregulation of antiapoptotic Bcl-2. The intrinsic pathway was not activated as the expression of AIF and cytochrome c was downregulated. Although Apaf-1 upregulated caspase-9, caspase-3 remained downregulated. Conclusion: Therefore, this study suggests that the combination of metformin with hypothermia particularly 27°C, enhances apoptosis via Bax/Bid-dependent pathway. This pathway is either directly p53-mediated or through direct activation of caspase-7.

hsa-miR-486-5p IS DOWNREGULATED IN CHRONIC MYELOID LEUKAEMIA WITH SECOND GENERATION TYROSINE KINASE THERAPY

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Introduction: About half of CML patients on second generation tyrosine kinase inhibitors therapy will have incomplete suppression of the Ph+ cells in bone marrow, although around 90% achieved cytogenetic response at 3-6 months. Mostly no apparent disease progression was observed. Objective: To identify microRNA (miRNA) that has potential in suppressing CML. Methods: CML patients molecularly responsive and non-responsive to imatinib (Glivec®) therapy were chosen according to European Leukaemia Net recommendations. MiRNAs were profiled from patients and normal control using Next Generation Sequencing, whereby 18 miRNAs were chosen. Screening was carried out in triplicate in non-responsive patients and blood donors by Real-Time RT QPCR. The same threshold settings were applied and Gene Globe was used to analyse suitable data. Results: Twenty nine non-responsive patients were receiving mostly nilotinib/Tasigna® (41%), bosutinib/Bosulif® (14%), dasatinib/Sprycel® (3%), hydroxyurea (20%), standard dosage imatinib (10%) and others. hsa-miR-486-5p was differentially expressed (p-value<0.05, 2 times downregulated) in CML non-responsive to imatinib therapy in comparison to 28 blood donors samples. hsa-miR-486-5p was reported under-expressed, targeted ARHGAP5 with inverse correlation in lung tumour tissues and down regulation contributes to tumour progression. It was also downregulated in breast cancer and targeted PIM-1. Overexpression suppressed proliferation *in vitro* and in vivo, induced G0/G1 arrest and promoted apoptosis. Conclusion: hsa-miR-486-5p might play a significant role in suppressing CML from progressing to the subsequent phase and may act as a tumour suppressor. Therefore it has potential as a future therapeutic target in detecting CML non-responsive to imatinib therapy.

EFFECT OF *GARCINIA MANGOSTANA* ETHANOLIC EXTRACT ON MDA TBARS LEVEL AND TESTICULAR SUPEROXIDE DISMUTASE ACTIVITY IN INDUCED DIABETIC RATS

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The purpose of this research was to investigate the effect of *Garcinia Mangostana* ethanolic extract on MDA TBARS level and testicular superoxide dismutase (SOD) activity in induced diabetic rats. Materials and methods: The experiment was performed in 25 male *Sprague Dawley* rats weighed between 150-350 g and divided into 5 groups (5 rats each). Group 1 and 2 consist of non-diabetic rats which were untreated and treated with extract, respectively. Group 3 was a positive control group, administered orally with 5mg/kg of glibenclamide. Group 4 consist of untreated diabetic induced rats whereas group 5 were diabetic rats treated with *G. Mangostana* (250mg/kg). After 3 weeks of treatment with *G. Mangostana*, the testes were harvested and subjected to biochemical analysis to determine the level of lipid peroxidation product, malondialdehyde (MDA) and superoxide dismutase (SOD) activity. The results obtained indicated that *G. Mangostana* extract did not significantly influence the body weight of all treated rats (group 2 and group 5) or induce any mortality to the rats. The decline in blood glucose levels from Group 5 and the insignificant difference of MDA level in Group 5 compared to control groups as seen in testicular tissue reveals the effectiveness of extract treatment. Higher SOD activities were also noted in diabetic rats treated with *G. Mangostana* ethanolic extract. Thus this research proves that dietary supplementation of *G. Mangostana* elicits a protective effect toward oxidative stress in testis upon increasing glucose level by reducing the level of MDA TBARS and increasing superoxide dismutase activity.

ANTIOXIDANT CONTENTS AND ANTIOXIDANT CAPACITIES OF DIFFERENT PARTS OF SELAPUT TUNGGUL (*MIKANIA MICRANTHA* KUNTH)

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Objective: The present study was aimed to determine the antioxidant contents, i.e. total phenolic contents (TPC) and total flavonoid contents (TFC) and antioxidant capacities from the leaves and stems of *Mikania micrantha* extracted using different solvent polarity (hot water, cold water, 70% ethanol, ethyl acetate, and hexane). Methods: TPC and TFC were determined by Folin-Ciocalteu and aluminium chloride colorimetric method, respectively. The antioxidant capacities were determined by 2,2-Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, 2,2'-azinobis-3-ethylbenzothiazoline-6-sulphonic acid (ABTS), ferric reducing antioxidant power (FRAP), phosphomolybdenum antioxidative power (PAP) and ß-carotene bleaching (BCB) assays. Results: The TPC of ethyl acetate stems (141 ± 0.51 mg gallic acid equivalent/g) while TFC of ethyl acetate leaves (70.1 ± 0.92 mg catechin equivalent/g) were markedly highest when compared to the other extracts. In addition, ethyl acetate stems extract exhibited a significantly higher antioxidant capacities when measured by DPPH (EC_{50} = 324 µg/mL), ABTS (0.53 ± 0.01 mmol trolox equivalent/g), FRAP (1.28 ± 0.05 mmol Fe^{2+}/g), PAP (219 ± 7.03 mg ascorbic acid equivalent/g), and BCB (108 ± 2.23% inhibition of bleaching) compared to the other extracts. Pearson correlation analysis between antioxidant contents and antioxidant capacities showed moderate to strong correlation (r = 0.410 – 0.897). Conclusion: The present results demonstrated the ethyl acetate stems extract of *M. micrantha* possess high antioxidant contents and antioxidant capacities. Hence, *M. micrantha* might have a potential as a functional food and pharmaceutical agents.

SUB THEME: HISTOCHEMISTRY & CELL BIOLOGY

THE DEVELOPMENT OF THREE-DIMENSIONAL CELL CULTURE MODEL FOR PERIPHERAL NERVE TISSUE USING COLLAGEN GEL SCAFFOLD

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Two-dimensional cell culture of eukaryotic cells on flats substrates made from glass or polystyrene has been useful in numerous studies. Two-dimensional cell culture fails to accurately recreate the microenvironment of native tissue with respect to the biomechanical and biochemical cues, cell-cell and cell-matrix interactions and the architectural features. While an increasing number of mammalian tissues have been reconstructed using three dimensional techniques, often by combining scaffolds and the co-culture of cells (e.g. skin), little work has been conducted on peripheral nerve. the development of three dimensional *in vitro* peripheral nerve models hold considerable value for a breadth of studies, from a basic understanding of neuronal-glial development through to the design of improved scaffolds for nerve tissue reconstruction following injury. The study aims to develop three-dimensional cell culture model for peripheral nerve by using collagen gel as scaffold. Collagen was extracted from rat tail tendon and later, was purified using dialysis method. Then, extracted collagen was used to establish collagen gel scaffold through neutralization of collagen solution. To establish three-dimensional culture, neutralized collagen solution was set in a mold and dorsal root ganglia (DRG) explants were embedded in the collagen gel before it completely forms gel. After 21 day culture, phalloidin-TRITC stained DRG culture was visualized and axons were observed to extend in random direction from the DRG body in collagen gel. This preliminary study shows that collagen gel scaffold can support axonal growth in DRG explant culture.

SUB THEME: MICROBIOLOGY

EFFICACY OF TOPICAL STIGMASTEROL TREATMENT OF MRSA IN A SUPERFICIAL SKIN WOUND INFECTION RATS

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Methicillin-resistant *Staphylococcus aureus* (MRSA) is an antibiotic-resistant pathogen that causes significant threat to public health. It causes severe skin lesion by secreting toxin compounds that interfering with the wound healing process and creating portal of entry for systemic infections. Furthermore, the pace of resistance exhibited by MRSA has severely narrowed the available treatment options. Thus, this study was aimed to evaluate *in vivo* anti-MRSA efficacy of stigmasterol produced by an endophytic fungus, *Penicilliumminioluteum* ED24. A total of 40 MRSA-infected *Sprague Dawley* rat models were developed. All animal protocols used in this study were approved by the Animal Ethics Committee, UniversitiSains Malaysia. The compound was tested at concentration of 1% and 2% respectively. No animal death or local reaction was observed in connection to the application of stigmasterol during the experimental period. The daily topical treatment was started at 48 hours after the establishment of infection. The diameter of wound decreased with the increase of stigmasterol concentration. The lesions on animal models treated with 2% extract were covered by epithelial tissue and the hair started to grow from the skin. The topical application of the stigmasterol also significantly reduced the bacterial count in the rat models ($p < 0.05$). Besides, the histological analysis of skin sample treated with the stigmasterol also showed presence of hair follicles and sebaceous glands.

HAS BENZIMIDAZOLE RESISTANCE MARKERS DEVELOPED IN *ASCARIS LUMBRICOIDES* ISOLATED FROM ORANG ASLI IN MALAYSIA?

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Albendazole (ABZ), a benzimidazole (BZ) drug is commonly used to treat gastorintestinal parasites (GIP), mainly soil transmitted helminths (STHs) like *Ascaris lumbricoides, Trichuristrichiura* and hookworms. Mass drug admistration (MDA) has been used for the control of these infections but parasite anthelminthic resistance has been reported in human. Single nucleotide polymorphism (SNPs) in the β-tubulin gene at codon positions 167, 198 and 200 is reported to cause resistance in parasitic nematodes. Benzimidazole resistant study by screening β-tubulin gene has not been investigated in Malaysia. Thus, in this study, we investigated the presence of resistance markers at codon 198 and 200 of β-tubulin gene in *Ascaris lumbricoides* before and after 1 and 6 months of albendazoleadministration.This study was conducted at Orang Asli village at Kg.Serendah, Malaysia. Genomic DNA was extracted from individual eggs in fecal samples pre and post albendazole treatment. A simple conventional PCR using high fidelity enzyme was used to amplify β-tubulin gene from *Ascaris lumbricoides*. The PCR products were sequenced using Sanger sequencing method. The sequences obtained were aligned using Vector NTI 9.0 ™.Post 1 month treatment, the cure rate for *Ascaris lumbricoides* was at 87% and post 6 month treatment was 33%. No polymorphisms at either codon 198 or 200 were detected among the isolated *Ascaris lumbricoides* eggs and worms from this study area.It is recommended that periodic molecular screening

for drug resistance developing in target parasites be included in control programmes where MDA with albendazole is used

ANTIMICROBIAL EFFICACY OF *PENICILLIUMAMESTOLKIAE* ELV609 EXTRACT TREATED COTTON FABRIC FOR HEALTHCARE APPLICATIONS

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The National Health and Morbidity Survey revealed that 17.5% of Malaysian adult citizens are estimated to be affected by diabetes in 2015. Diabetes is a major public health concern in Malaysia, where the diabetes care and treatments are estimated to account for 16% of the country healthcare budget. Foot ulceration and wound infection are major forms of disabilities arising from diabetic diseases. Diabetic foot complications resulted in increased hospital bed occupancy and further increase the healthcare cost and resources. This study was aimed to develop a natural antimicrobial finishing on medical grade textile that meets American Association of Textiles Chemists and Colorists (AATCC) standard. The textile samples were finished with the ethanolic extract of *Penicilliumamestolkiae* elv609, an endophytic fungus isolated from *Orthosiphonstamineus*. The antimicrobial efficacy of the ethanolic extract was tested on clinical pathogens isolated from diabetic wound. The extract exhibited significant inhibitory activity against 4 bacteria (*Streptococcus* sp., *Escherichia coli*, *Pseudomonas aeruginosa* and *Bacillus coagulans*) and 1 yeast (*Candida utilis*) with the minimal inhibitory concentration ranged from 6.25 to 12.5 mg/ml. The results indicate different susceptibility levels of the test microorganism to the fungal extract. However, the killing activity of the extract was concentration-dependent. The finished medical textile showed excellent antimicrobial efficacy on AATCC test assays. All the microbial cultures treated with the textile sample displayed a growth reduction of 99.9% on Hoheinstein Challenge Test. The wash durability of the finished textile was found good even after 50 washes with commercial detergent. In conclusion, the developed medical textile showed good antimicrobial efficacy on laboratory tests. This work can be extended to *in vivo* trials for developing healthcare textile products for antimicrobial applications.

EFFECT OF RESPIRATORY SYNCYTIAL VIRUS INFECTION ON HOST TRANSLATIONAL INITIATION FACTOR

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Respiratory Syncytial Virus (RSV) is a leading cause of respiratory infections primarily in children. Presently, there is no effective vaccines able to fight with RSV infection, instead of the treatment is tend to be limited in relieving the sign and symptoms only. The development of RSV antiviral and vaccine is much more focused on viral attachment and RNA transcription and there was still very few information regarding the effect of RSV infection on host translation initiation factor to date. Therefore, this study aimed in investigating the level of translational initiation factors (eIF4A, eIF4E, eIF4G) in RSV-infected cell, in which known to have a major role as translation control target. Human epithelial type-2 cell (Hep2) were optimized and observed for the morphological changes in RSV-infected cells in which involved with the formation of multinucleated cells (syncytia) and disintegration of the cellular membrane. Following these, the time course infections of Hep2 cell with RSV (MOI 0.5) were carried out at 0, 24, 48, 72, 96, 120 hours. In this study, virus titre was determined using TCID50 method. Meanwhile, analysis of the level of proteins was determined by performing immunoprecipitation (Western Blotting). From this study, we found that there were morphological changes of cells with formation of syncycial throughout the infection. However, there were no changes on the level of eIF4G during the RSV infection. This finding suggested that the scaffold protein (eIF4G) might not be cleaved by RSV during infection. Further study on the eIF4G will be conducted to determine requirement of eIF4G during RSV infection. In addition, study on the level of other translation initiation factors; eIF4A and eIF4E during RSV infection will be carried out to analyse the effect of the RSV infection on eIF4E (cap-binding protein) and eIF4A (helicase protein).

MORPHOLOGICAL DIFFERENCES IN PERIPHERAL BLOOD FILM OF PATHOGENIC DENGUE INFECTION FOR ALTERNATIVE EARLY DIAGNOSIS

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Dengue is one of the most widespread mosquito-borne infections in Malaysia. The diagnosis still remains a challenge in area of disease confirmation where it could not be easily differentiated with other febrile illnesses even though the diagnosis of classical dengue fever and dengue haemorrhagic fever can be recognized clinically. The clinical diagnosis also can be difficult where the signs and symptoms presented are easily confused with malaria, leptospirosis and typhoid fever. Therefore, an early and effective evaluation of the peripheral blood can be very helpful in patient management. The objectives of this study are to determine the morphological features in peripheral blood film (PBF) of pathogenic dengue infection. 30 PBF of positive dengue infection in University Malaya Medical Centre (UMMC) had been examined in this study where atypical lymphocytes [n=27, (90%)] and thrombocytopenia [n=22, (73.3%)] were consistently found. Presence of thrombocytopenia and presence of atypical lymphocytes in PBF are important diagnostic clues for early diagnosis of dengue infection, which could be potentially useful parameter in screening dengue. Therefore, PBF can have a significant function in supporting the diagnosis of dengue which can act as complement to the full blood count and serological diagnosis of dengue especially in cases where the clinical manifestation are abnormal.

ANTIBIOTIC SUSCEPTIBILITY PROFILES AND GENOTYPIC CHARACTERISTICS OF TETRACYCLINE–RESISTANCE *STREPTOCOCCUS PYOGENES* ISOLATES FROM TWO TERTIARY HOSPITALS IN MALAYSIA

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Streptococcus pyogenes (group A streptococcus) is the most prevailing human pathogen causing a variety of infectious diseases and immune-related complications. Tetracyclines are one of the alternative drugs used for its therapy. However, there is an increasing evidence of resistance towards these drugs, and clinical failures reported globally. This research was carried out to determine antibiotic susceptibility profiles and genotypic characteristics of tetracycline resistance among *S. pyogenes* isolates. A total of 42 *S. pyogenes* clinical isolates from two tertiary hospitals in Malaysia were obtained from various sites. Disc diffusion technique and E-test were used to determine the antibiotic susceptibility patterns. Polymerase chain reaction (PCR) was done to detect tetracycline resistance genes. All isolates were susceptible to penicillin, erythromycin and linezolid. Thirty isolates (61.9%) were resistant to tetracyclines. Twenty nine of 30 (96.7%) tetracycline-resistant strains harboured the *tet*(M) gene while 20% and 13.3% had *tet*(L) and *tet*(O) genes, respectively. We can conclude that the high rate of tetracycline resistance among local *S. pyogenes* isolates could probably due to the presence of mobile genetic elements such as transposons which are circulating among the bacteria in our local setting.

ANTIBACTERIAL ACTIVITIES OF DIFFERENT EXTRACTION OF *TINOSPORA CRISPA* AGAINST *ENTEROBACTERIACEA*

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Tinospora crispa occupies a very important place in the field of medicinal plants and widely used as traditional medicine. *T. crispa* extracts was proved to have bioactive components that possess antimicrobial properties which contains bitter principle, columbine, alkaloid, picroretine and berberine. Research conducted to determine the antibacterial activity of *T. crispa* leaves and stems of 3 different extraction; distilled water, methanol and chloroform against *Enterobacteriaceae*. Bacteria tested were *Escherichia coli, Salmonella typhi, Shigella sp, Klebsiella pneumoniae* and *Proteus sp*. The antibacterial activity was studied using disc and well diffusion, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) test. From the result, *T.crispa* extracts have shown higher antibacterial activity against *Enterobacteriaceae* by using well diffusion test compared to disc diffusion test. This is because the antibacterial activity was recorded when the zone of inhibition was greater than 6 mm. The extraction was continually tested using MIC and MBC against selected bacteria. The MIC test showed the lowest concentration of extract that inhibit the bacteria, but for this research, the color of extract was affected and required for MBC test. From MBC test, the growth of bacteria was shown to be decreased when tested with *T.crispa* leaves and stems methanol extract against some bacteria of *Enterobacteriaceae.* As a conclusion, both of *T.crispa* leaves and methanol extracts was showed the significant differences towards *Salmonella typhi* and *Shigella sp*.

SUB THEME: PHARMACOLOGY & TOXICOLOGY

VITAMIN E IMPROVES BONE HISTOMORPHOMETRY IN ALCOHOL-INDUCED OSTEOPOROSIS RAT MODEL

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This study was conducted to determine the effects of vitamin E (60 mg/kg) on bone histomorphometric parameters in (3 g/kg) alcohol-induced osteoporosis in rat model. Young adult male *Sprague - Dawley* rats were randomly assigned to six groups with eight rats in each group: baseline control (BC), control (C), alcohol olive oil (AO), alcohol normal saline (AN), alcohol alpha tocopherol (AA), and alcohol palm vitamin E (AE). The treatment was carried out for 3 months which was divided into 2 phases for groups C, AO, AN, AA and AE. During the first phase of 1 month duration, C group received normal saline while AO, AN, AA and AE groups were given alcohol (3 g/kg), 3 days a week, intraperitoneally. The following 2 months normal saline & alcohol were discontinued and oral supplementation of olive oil (C and AO groups), normal saline (AN), alphatocopherol 60 mg/kg (AA) and palm vitamin E 60 mg/kg (AE group) was given 6 days a week. Another group of 8 rats was sacrificed at the beginning without any treatment for the baseline control (BC). Following sacrifice; femurs were processed for bone histomorphometric analysis. Alcohol induced significant bone loss, while vitamin E treatment not only reversed the effects but also stimulated bone formation above control values. However, palm vitamin E was superior to alphatocopherol in all parameters except OV / BV (%). Palm vitamin E, may have therapeutic potential to repair bone damage caused by alcohol.

RR MUTATION AT THE Q/R/N+1 SITES OF THE NMDA RECEPTOR REDUCED THE POTENCIES OF ALZHEIMER'S DISEASE CHANNEL BLOCKERS

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N-methyl-D-aspartate receptors (NMDAR) areionotropic glutamate receptors susceptible to block by Mg^{2+} and are highly permeable to Ca^{2+} hence representing a medically relevant target for Alzheimer's disease caused by excitotoxicity. Previous findings have shown that rat GluN3A and GluN3B subunits containing GR at the Q/R/N+1 positions in the M2 region of the NMDAR results in reduced potency of channel blockers. In human GluN3B, these sites are occupied by RR which could render even higher resistance to channel block. This hypothesis was tested by mutating NN at the Q/R/N+1 sites in GluN2A subunits to RR and characterized with open channel blockers namely Mg^{2+}, memantine, MK-801 and philanthotoxin-343. Also of significant interest is the residue at -8 position, where W in GluN2A subunits were mutated to N as found in both rat GluN3 and human GluN3B subunits. Wild-type and mutated GluN2A were co-expressed with GluN1-1a in *Xenopuslaevis*oocytes and responses to NMDA/glycine were recorded using two-electrode voltage clamp. At -75mV, IC_{50}s for Mg^{2+}, memantine and MK-801 increased 27-, 42- and 325-fold respectively for NMDAR containing the RR mutation compared to wild-type. This suggests that the presence of double R at the Q/R/N+1 sites are likely responsible for the changes in blocking sensitivity and play important roles in ion permeability. W to N mutation at the -8 position did not significantly affect blocking potencies for all channel blockers. Blocking potency for philanthotoxin-343 was not altered in all mutations suggesting that it might have a different mode of action or binding site.

EFFECT OF STANDARDIZED AQUEOUS ETHANOLIC EXTRACT OF *FICUS DELTOIDEA KUNSTLERI* ON BLOOD PRESSURE AND URINARY ELECTROLYTES IN SPONTANEOUSLY HYPERTENSIVE RATS

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Introduction and aim: A preliminary study *in vitro* has shown that *Ficus deltoidea* or "Mas Cotek" might have vasorelaxant properties. However, its effects *in-vivo* has not been investigated. This study investigated the effect of *Ficus deltoidea* var *Kunstleri* (FDK) on blood pressure in spontaneously hypertensive rats (SHR). Methodology: Thirty-six, male SHR aged 12 – 14 weeks, with blood pressure of more than 150/90 mmHg, were divided into a control (I) and five treatment groups (II-VI). Group I received 0.5 ml of distilled water. Groups II-V received FDK at doses of 500, 800, 1000 and 1300 mg/kg body weight, respectively. Group VI received losartan 10 mg/kg body weight. All treatments were given orally, daily for 5 weeks. Blood pressure was measured weekly using tail cuff plethysmography (CODA). 24-hour urine collection was done at weeks 0 and 5. Data were analysed using ANOVA. Results: Systolic and diastolic BP in groups III, IV and V were significantly lower than those in groups I and II, but were not different from those in group VI. Area under the time versus response curve (AUC) for group IV was significantly greater compared to that of groups II, III and V ($p<0.05$) but was not different from that of group VI. There was no significant difference in the urinary excretion of calcium, protein, sodium and potassium between the groups. Conclusion: FDK extract produces maximum antihypertensive effect at a dose of 1000 mg/kg in SHR. This antihypertensive effect is not associated with changes in urinary electrolyte excretion.

COMPARATIVE OSTEOPROTECTIVE EFFECTS OF *LABISIA PUMILA VAR ALATA* ROOTS AND LEAVES IN OVARIECTOMIZED *SPRAGUE-DAWLEY* RATS: A PILOT STUDY

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Labisia pumila var *alata*, the queen of Malaysian herbs, has been reported to protect bone of estrogen-deficient *Sprague-Dawley* rats against osteoporosis and have been suggested to be a potentially safe alternative to estrogen replacement therapy. In the current study, the comparative osteoprotective effects of aqueous leaf and root extracts of *Labisia pumila* at different doses were investigated in ovariectomized rat model. Twenty-seven female rats were divided into nine groups: sham-operated control group (Sham); ovariectomized control group (OVXC); 64.5µg/kg dose estrogen treatment group (ERT); 20mg, 50mg and 100mg/kg *Labisia pumila* leaf extract treatment groups (*LPv20, LPv50* and *LPv100*); and 20mg, 50mg and 100mg/kg *Labisia pumila* root extract treatment groups (*LPr20, LPr50* and *LPr100*). Animals were treated via oral gavages for 8 weeks. Then excised femur bones from sacrificed rats were investigated for bone mineral density (BMD), tissue mineral density (TMD) and morphometric changes in the trabecular and cortical bone using Micro-computed tomographic (µ-CT) technique. Significantly higher values of BMDs were recorded in *LPv20, LPv50 and LPr20* than in OVXC. Trabecular number (Tb.N) and separation (Tb.Sp) values were significantly higher and lower, respectively, in *LPv20* and *LPr20* than OVXC. When compared with Sham and estrogen group, only *LPr20* showed significantly

higher value of bone volume fraction (BV/TV). Significantly higher TMD values were seen in all leaf and root treatment groups when compared with OVXC. *LPv20* and *LPr20* showed significantly higher values of bone medullary area (Ma.Ar) than OVXC. When compared to estrogen treatment group, *LPv20* showed significantly higher values of cortical bone area fraction (Ct.Ar/Tt.Ar) and thickness (Ct.Th). Lower dose of 20 mg/kg of both the root and leaf extracts of *Labisia pumila* were more effective than higher doses of 50 and 100 mg/kg in protecting bones of estrogen-deficient animals from osteoporotic changes. In comparison, the root extract protected against changes in trabecular bone morphometry better than the leaf xtract while, on the cortical bone morphometry, the leaf extract protected better than the root.

PHYTOCHEMICAL CHARACTERIZATION, CYTOTOXICITY AND *IN VITRO* ANTIPLASMODIAL ACTIVITYOF *CARICA PAPAYA* LEAVES EXTRACT

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Carica papaya belongs to the family of *Caricaceae*. Many scientific investigations have been conducted to evaluate the biological activities of various parts of *C. papaya,* including fruits, shoots, leaves, seeds, roots or latex. Use of papaya leaves as an antimalarial remedy has also been reported in India, and some in Latin American and African countries. This study aims to characterize phytochemical profile of *C. papaya* leaves extract followed by evaluation of its antiplasmodial and cytotoxic activities *in vitro*.The characterization of freeze-dried extract was analyzed by Liquid Chromatography OrbitapMass Spectrometry (UHPLC-ESI-Orbitrap-MS/MS) in both modes (negative and positive mode). The extract was evaluated for its growth inhibitory activity *in vitro* against chloroquine resistant strain of *Plasmodium falciparum*, K1 by using P. *falciparum*histidine rich protein-2 (HRP2) ELISA detection assay. Cytotoxic activity of the extract was evaluated *in vitro* on normal cell line by MTT assay. Twenty-four compounds were identified in the extract majorly from alkaloid and flavanol groups. Manghaslin and clitorin were seen most abundance in negative mode whereas carpaine and dehydrocarpaine showed better intensity in positive mode. The leaves extract of *C. papaya* showed inactive antiplasmodial activity against *P. falciparum* (IC_{50}>15.7 µg/ml). However it was not toxic to the normal cell line (VERO) *in vitro* (IC_{50}>50 µg/ml).The phytochemical analysis demonstrated the presence of flavanoids, hydroxycinnamic acids, alkaloids, coumarins, and organic acids in the freeze-dried leaves extract. Although there is no activity against *P. falciparum* been observed *in vitro* for this extract, study on different solvent extracts and isolation of the identified compounds are worth to be investigated.

HUMAN ADULT FIBROBLAST (HAF): SUPPLEMENTATION *IN VITRO* WITH NATURAL EXTRACTS AUGMENTS CELL ACTIVITY DURING SIMULATED WOUND HEALING

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Objective: To investigate the effects of *in vitro* supplementation of Human Adult Fibroblast (HAF) with alpha lipoic acid, emblica, *N*-acetylcysteine, resveratrol and ectoine on tissue remodelling during the wound healing process. Methods: HAF were cultured for 48 hours using a multi-factorial combination with the constituents. Cellular activation and viability were measured via an MTS assay, while LDH assay measured prolonged survival which was indicated by LDH release. Image-based cytometry was used to evaluate the effect of the combination of constituents on the cellular profile by cell cycle and apoptosis assay. Results: All nine combinations showed significant increase in cell viability and no significant difference in LDH release, when compared to healthy cells. Cell cycle analysis indicated six of the combinations shared different cellular profiles to healthy cells, while three combinations produced significant increases in G2/M cell population in comparison. This data correlates with the apoptosis assay where HAF treated with the same three combinations showed higher number of apoptotic cells compared to healthy cells and the other six combinations showed low number of apoptosis compared to healthy cells. The remaining six combinations has a significant influence on the increase of HAF proliferation, produced no cytotoxicity when compared to healthy HAF controls. Conclusions: The combination of alpha lipoic acid, emblica, *N*-acetyl cysteine, resveratrol and ectoine suggests they augment HAF cells when supplemented during the wound healing process.

SUB THEME: PHARMACOLOGY & TOXICOLOGY

ADVANCE IMMUNOHEMATOLOGY: CHALLENGES IN MALAYSIA BLOOD TRANSFUSION LABORATORY SETTING

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Immunohematology problems may be discovered during routine blood screening and cross-matching in blood bank. The correct antibody identification of red cell alloantibodies is important prior blood transfusion. Indeed, due to time consuming and difficulties in result interpretation, we cannot rely on serological techniques in the situation whereby the serology test is not promising. Highly competent technical personnel itself require years of practice to develop skills in resolving complex antibodies case such as in rare antibodies investigation. Moreover, reagent with specific advance serology test; i.e. several type of enzyme such as trypsin, papain, bromelain, dithiotreitol (DTT) is costly despite of their crucial especially in investigation of antibody to a high frequency antigen. Applying monoclonal antibody assay such as monoclonal antibody immobilisation of erythrocyte antigens (MAIEA) may help and it is highly specific towards the suspected red cell membrane protein. However, having well-established of advance immunohematology in daily transfusion practice is crucial to avoid delay of supplying blood to the chronic transfused patients. Discovery of molecular testing provides an effective tool in investigating immunohematology problems. For example, molecular tools ranging from low-throughput PCR-SSP to high-throughput real time PCR are now available for the development of advance immunohematology laboratory. In current situation, the development of advance immunohematology laboratory in Malaysia is developed under the Ministry of Health and the university hospital which the budget is very limited in setting up the laboratory and equipment. Therefore, good collaboration and technology transfer between both institutions will be helpful as for expansion of the service and data publication in the future.

INTERFERON-STIMULATED GENE OF 20 kDa PROTEIN (ISG20) IMPEDING THE REPLICATION OF HEPATITIS B VIRUS

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The innate immune system is essential for controlling viral infection. Hepatitis B virus (HBV) persistently infects human hepatocytes and causes hepatocellular carcinoma. However, the innate immune response to HBV infection in vivo remains unclear. Here we found that transfection of plasmid carrying the Interferon-stimulated gene of 20 kDa protein (ISG20) gene robustly inhibits the HBV replication in various hepatocyte cell lines. Although the transfection of HBV genome or ε-stem of HBV pgRNA (active pgRNA moiety) failed to induce Isg20 expression in the hepatocytes, polyI:C (a viral dsRNA analogue mimic) activated MAVS pathway leading to production of ISG20 and suppression of HBV replication. Northern and southern blotting analysis revealed that ISG20 selectively degrades HBV RNA and blocks replication of infectious HBV particles. The exonuclease domains of ISG20 mainly participated in HBV-RNA decay. In vivo hydrodynamic injection, ISG20 was crucial for suppressing HBV replication without degrading host RNA in the liver. Taken together, ISG20 would be a critical effector for ameliorating chronic HBV infection in the Interferon therapy.

PRIMED NEUTROPHILS FROM CIGARETTE SMOKERS

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Cigarette smoking has been strongly linked to abnormal immune function that consequently contributes to the development of multiple organ disorders. Even though the prevalence of cigarette smoking is reported to decline in industrialized countries, but developing countries including Malaysia recorded an increasing rate. Inflammatory response in tobacco smoking is now designated as the main etiological factor in the pathogenesis of chronic obstructive pulmonary disease, one of the leading causes of death worldwide. This study is intended to assess changes in neutrophil functions among university smokers that could increase the susceptibility to various chronic lung diseases. Neutrophils were isolated from 26 young moderate smokers as classified using Fagerstrom Tolerance Questionnaire and 13 healthy non-smokers. To analyze oxidative stress of neutrophils, chemiluminescence assay was used. The assay consisted of phorbol myristate acetate (PMA) and opsonized zymosan (OZ) as the agonists in stimulating the cells to undergo respiratory burst, an event indicating ability of neutrophils to be functionally activated. Candidacidal assay assessed the ability of neutrophils to phagocytose and eventually kill the organisms, confirming the ultimate outcome of the biological function of neutrophils. Circulating neutrophil counts were elevated in 84.6% of the smokers as compared to that in non-smokers. The production of reactive oxygen species was observed to be higher among moderate smokers as compared to healthy controls, 69.2% with PMA and 61.5% using OZ. The average percentage of dead candida in killing assay was recorded to be 96.7% from the smoker group with reference to the normal individuals. The findings suggested that characteristic features of neutrophilic inflammatory response are within young moderate cigarette smokers. Enhanced neutrophil function, a sign of primed cellular activation signifies the predisposition of chronic obstructive pulmonary disease in these young smokers.

PRESERVATION OF GLYCEROLIZED RED BLOOD CELL IN -80˚C FREEZER: TOOLS FOR EXTENDED RARE ANTIBODY IDENTIFICATION PANEL IN IMMUNOHEMATOLOGY TECHNIQUE

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Introduction: Antibody identification towards rare red blood cell (RBC) antigens is one of the important service offered in blood banking. The crucial antibody specificity determination is to provide cross-match compatible units for the patient. The commercial available antibody identification may lack certain antigen negative typing such as PP_1Pk, Yt^a, In^b, Ch-Rg due to their low incidence. A special treatment for cryopreservation of RBC is used for prolonged storage to maintain their cell viability. Objective: to practice preservation of rare phenotype RBC in glycerol as extended rare antibody identification panel in immunohematology test. Methods: A known antigen negative RBC treated with 33% of glycerol freezing in -80˚c. The RBC to be used are thawed at room temperature, deglycerolized with 12% and 1.6% sodium chloride (NaCl) then washed with 0.9% of NaCl. RBC suspension is prepared and ready to be used as extended rare antibody identification panel. Results: Glycerol used for RBC freezing invades the cell membrane and protect from ice-crystallization and subsequently prevent from membrane damages. Deglycerolized RBC later can be used as an extended panel for antibody identification. Conclusions: Cryopreservation of rare antigen negative RBC can be stored up to 10 years in -80˚c freezer. In conclusion, we are able to identify extremely rare antibody such as anti-PP_1Pk and anti-In^b by using cryopreserved panel. Besides, it is more cost effective as sending to referral laboratories will take time

and involved transportation costs. Furthermore by having extended rare panels, it helps in the patient's clinical management as we are able get faster results and supply the blood accordingly to the patient.

HUMAN BETA DEFENSIN 9 SIGNALING PATHWAYS IN HUMAN CORNEAL EPITHELIAL CELL LINE

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Human β-defensins (HBDs) are an important part of the innate immune host defense at the ocular surface. Unlike other defensins, expression of HBD9 at the ocular surface is reduced during microbial infection, but activation of toll-like receptor 2 (TLR2) in corneal epithelial cells has been shown to up-regulate HBD9. Our purpose was to test the hypothesis that TLR2 has a key role in the signaling pathway(s) involved in the overexpression or underexpression of HBD9, and accordingly, different inhibitors of MAPKinase and NFkB pathways would induce a different expression pattern of HBD9, indirectly highlight the pathways that involved in the expression. The *in vitro* RNAi silencing method and response to various inhibitors of MAPKinase and NFkB pathways were used to determine key molecules involved in signalling pathways of HBD9 in immortalized human corneal epithelial cells. The techniques included cell culture with exposure with Pam3CSK4 and to specific transcription factor inhibitors, RNA extraction and cDNA synthesis, quantitative real-time polymerase chain reaction, and dot blot analysis. This study demonstrates that TLR2 induces HBD9 mRNA and protein expression in a time- and dose-dependent manner. Pam3CK4 plays an important role in HBD9 induction by TLR2. Inhibitors of MAPKinase and NFkB pathways mediated up-regulation of HBD9 mRNA and protein levels in dot blot analysis. In conclusion, TLR2-mediated MKPs and nuclear factor-κB signalling pathways are involved in HBD9 expression. Pam3CSK4 can be potentially targeted to modulate HBD9 expression. Differential expression of HBD9 with different bacteria could be related to differences in pathogen-associated molecular patterns of these organisms.

A COMPARISON STUDY ON QUALITATIVE PERFORMANCE AND FEASIBILITY ASPECT OF PLATELET IMMUNOFLUORESCENCE TEST (PIFT) AND SOLID PHASE RED ADHERENCE ASSAY (SPRCA)

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Refractoriness occurs in many patients receiving multiple platelet transfusion. National Blood Center (NBC) provides compatibility test but on a small scale. In high demand, platelet compatibility studies have been conducted and it is crucial to seek the best methods to reduce immune reaction to platelets. The aim of this study was to compare the performance and suitability of blood cross-match methods, Platelet Immunofluorescence Test (PIFT) Red Cells and Solid Phase Adherence Assay (SRPC) to compare its sensitivity, specificity and cost effectiveness. This study used a known control serum to test the compatibility of individual panel's aphaeresis platelet donors by using PIFT and SPRCA. A total of 200 platelet cross-match were performed. The PIFT method shows 58% (n:116) were positive and 42% (n=84) were negative reaction. Whereas the SPRCA shows 55.5% (n=111) were positive and 44.5% (n=89) were negative reaction. The sensitivity and specificity analysis shows the PIFT is more sensitivity with 98.9% and specificity with 90.4%, however for SPRCA shows the specificity was 98.8% and specificity was 86.8%. Statistical analysis shows strong correlation, p-value <0.0001 between both test results. In additional, the PIFT is more cost effectiveness, more turnaround time with standard report where it is computerize generated as compare to the SPRCA which the report was generated manually.

As a conclusion, the PIFT method was the ideal method for routine platelet compatibility test and furthermore, it is easy to process.

TOTAL SERUM IGE LEVEL AND SHRIMP ALLERGY PATTERN IN YOUNG ADULTS WITH FOOD ALLERGY

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While any food can cause food allergy, one of the most potent one is shellfish. However, the allergens are not well characterized. The aim of this study is to analyze the food allergy pattern in young adults with food allergy and subsequently identify the protein profiles and effects of heating (cooked) on the most popular prawn species consumed in Malaysia, the Giant River Prawn (*Macrobrachium rosernbergii*) and Tiger prawn (*Penaeus monodon*). Data were obtained and analyzed from questionnaires distributed among 91 allergy subjects aged 18-32. Total serum IgE and crab's allergen concentration from 14 subjects with recent symptoms were measured to confirm their allergy. Most of the subjects were allergic to shrimps (74%), followed by crabs (55%) and squids (53%). A significant relationship was found between shrimp allergy subjects and itching symptoms ($p<0.05$). All subjects are confirmed allergy as their IgE concentrations are more than 100 kU/L. Subjects with high (>3.5 kUA/I) level of shrimp allergen are 13% and subjects with moderate level of shrimp allergen (0.7 - <3.5 kUA/I) are also 13%. The sizes of proteins for heated and raw *Penaeus monodon* were compared with *Macrobrachium rosernbergii* by using SDS-PAGE. Distinguishable bands of proteins ranging from 4 to 64 kDa were found in raw *Penaeus monodon* and *Macrobrachium rosernbergii*. Meanwhile, dark band of proteins with less than 64 kDa of size were found in heated *Penaeus monodon* and *Macrobrachium rosernbergii*. As a conclusion, seafood allergy shows the highest frequency in young adults with significant relationship with itching symptoms. Protein profiles of cooked and raw *Penaeus monodon* and *Macrobrachium rosernbergii* exhibit apparent difference in their size. Further investigations are needed to determine whether these proteins contribute to the symptoms of allergy.

SUB THEME: HEMATOLOGY, PATHOLOGY & LABORATORY SCIENCE

FREQUENCY OF PLATELET GLYCOPROTEIN POLYMORPHISM GPIIIA ($PI^{A1/A2}$) IN PATIENT WITH TYPE 2 DIABETES MELLITUS

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Diabetes mellitus (DM) is a major public health concern worldwide, which contribute significantly to the burden of cardiovascular disease. The interindividual differences in platelet responses in patient with type 2 DM may be due to the variety of platelet glycoprotein (GP). GPIIb/IIIa is the final pathway of platelet aggregation. Polymorphism of glycoprotein IIIa $PI^{A1/A2}$ may interfered the platelet function and lead to thrombosis. This study aims at investigating the frequency of GPIIIa polymorphisms in type 2 diabetes mellitus patients. Blood samples were obtained from 36 male patients. DNA was extracted from EDTA blood sample using QIAamp® DNA Blood Mini kit. DNA genotyping was carried out by PCR-Restriction Fragment Length Polymorphism (RFLP) and agarose gel electrophoresis. Current study showed that the GPIIIa $PI^{A1/A2}$ genotypes frequencies in 36 T2DM subjects were 88.9% for $P1^{A1/A1}$ and 11.1% for $PI^{A1/A2}$. None subjects were detected for $PI^{A2/A2}$. The allelic frequencies of Pl^{A1} and Pl^{A2} were 0.94 and 0.04 respectively. The genotype distribution was in accordance with Hardy–Weinberg equilibrium. This study showed that the prevalence of the PlA1 allele is more predominant than the prevalence of the PlA2 allele among the type 2 DM patients. In conclusion, this study has determined the frequency of GPIIIa polymorphism in type 2 DM patients, which provide additional information in individual-tailored therapy for the prevention of cardiovascular disease.

FICUS DELTOIDEA ANGUSTIFOLIA REDUCES BLOOD PRESSURE IN SPONTANEOUSLY HYPERTENSIVE RATS

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Virtually all the anti-hypertensives used today are associated with side effects and hypertension still remains poorly controlled in many instances. This, despite the availability of wide range of antihypertensives. There therefore remains a need to look for better or alternative antihypertensive medications. In this regard, medicinal plants could provide some alternatives for the treatment of hypertension. Objective: To examine the effect of a standardized ethanolic-water extract of *Ficus deltoidea Angustifolia* (FD-A) on blood pressure in male spontaneously hypertensive rats (SHR). Methodology: Eighteen male SHR, aged 12-14 weeks with blood pressure above 150/90 mmHg, were given via oral gavage either 0.5 ml distilled water (control) or 1000 mg/kg FD-A or 10 mg/kg losartan daily for 4 weeks. Blood pressure was measured every week using tail-cuff plethysmography. Bodyweight, blood pressure and urine protein were measured on weeks 0 and 4. Data were analyzed using ANOVA. Results: Bodyweight increased over the 4 weeks in all the groups but was not significantly different between the 3 groups. Systolic and diastolic blood pressures in rats given FD-A and losartan at week 4 were significantly lower than those in the control group ($p<0.01$). Urinary protein excretion at

week 4 was significantly lower in FD-A and losartan treated rats ($p<0.01$). Conclusion: Ethanolic-water extract of *Ficus deltoidea Angustifolia* when given at a dose of 1000 mg/kg daily decreases blood pressure and protein excretion in spontaneously hypertensive rats.

EVALUATION OF THE ANTI-INFLAMMATORY AND ANALGESIC EFFECTS OF AROMATHERAPY WITH LAVENDER ESSENTIAL OIL IN RATS

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Lavender essential oil was reported of having analgesic and anti-inflammation properties. However to date, there is still insufficient of substantial data. The aim of this study was to investigate the anti-inflammatory and analgesic effects of aromatherapy with lavender essential oil in rats using formalin-induced edema in hind paw test. Rats were divided into three groups; control, P (pain induced rats) and PL (pain induced rats treated with lavender oil). Rats in P and PL groups were injected with 50µl of 5% formalin at intraplantar region of rat's left hind paw. Rats in PL group were exposed to lavender oil using whole body exposure chamber. Paw circumference was recorded pre-and post- (one hour) hind paw formalin injection. The pain behaviour was recorded by digital video within one hour and the pain was scored accordingly. At the end of the experiment, blood samples were collected and whole blood samples were analyzed for total white blood cell (WBC) count and differential count. The remaining plasma samples were analyzed for prostaglandin E2 (PGE2) using ELISA kit. The results revealed decreased of hind paw circumferences in PL group ($p<0.01$) as compared to P group. Both WBC count and neutrophil percentage in PL group showed higher ($p>0.05$) count as compared to P group. In contrast PGE2 level in PL group was lower ($p>0.05$) than P group. Although some of these results were insignificant, aromatherapy with lavender oil shows remarkable anti-inflammatory and analgesic effects signifying the potential application of lavender oil in aromatherapy.

EFFECT OF LACTISOLE ON THE BITTERNESS TASTE BASED ON SAMPLES CALCIUM CONCENTRATION

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Lactisole is a well-known food addictive which function to enhance or inhibit the sweetness of its taste. The purpose of this study is to investigate the effectiveness of lactisole on the bitterness taste of calcium in high calcium content food based on the principle done on the inhibition of sweet taste. With determination of each samples calcium concentration by EDTA titration, the sample can be categorized as the high and the low calcium content of sample. The titration used the Eriochrome Black T as an indicator for the endpoint of titration and as well for the calculation of calcium concentration. Both of the end groups will be then presented to the respondents which will add with the food addictive. There were two variables called sample without lactisole and with lactisole which be taste upon male and female respondents. Collected responds were analyzed and the effectiveness of the lactisole on the bitterness taste was indicated. However, there is no significant change of taste with the present of lactisole but instead the taste becoming more bitter as it have no effect at all on the calcium taste but there were different perspectives between male and female sensitivity of taste during the tasting as the female show more obvious reaction and could tell the taste more compared to male. In conclusion, the lactisole did work as the same principles on the calcium but not enough to inhibit the bitterness of food as it does on the sweet taste and female appeared to has a higher sensitivity on taste compared to male respondents.

THE EFFECT OF 2.45 GHz MICROWAVE RADIATION ON LEUKOCYTE PARAMETERS IN RATS

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Microwave radiation is a non-ionizing electromagnetic radiation present in the environment and of potential threat to human health. This study was carried out to investigate the effect of microwave radiation on white blood cells in *Sprague Dawley* rats. The radiation frequency applied in Gigahertz Transverse Electro Magnetic (GTEM) cell was 2.45 GHz with average electromagnetic field strength of 60 Vm^{-1}. Sixteen male *Sprague-Dawley* rats with an average body mass of 250g were divided into groups G1 and G2. Group G1 (control group) comprised of eight unexposed rats and Group G2 comprised of eight rats exposed to microwave radiation in GTEM cell for two months (five days per week, seven hours per day). Peripheral blood samples were taken after two months irradiation. The total number of leukocytes, differential count and neutrophil phagocytic function was assessed using standard lab procedure. The results revealed an insignificant increase of leukocytes count and differential leukocyte count (neutrophils, lymphocytes and monocytes) in the exposed rats compared to unexposed rats ($P>0.05$). There was an insignificant decrease of neutrophil phagocytic function in exposed rats compared to the control group ($P>0.05$). These results showed that microwave radiation may affect the leukocyte parameters of exposed animals.

EFFECT OF MORPHINE EXPOSURE ON ERYTHROCYTE OF NEONATE RAT

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Opioids have been increasingly used for pain control in the neonatal intensive care unit. Pediatric morphine regimens have been reported for neonates with postoperative pain, sickle cell crisis pain, or burns. However, no dose response curve for morphine in neonates has been fully established, yet limited data was reported on the effect of morphine exposure towards blood parameters. Thus, this study was aimed to investigate the effect of morphine exposure on erythrocyte of neonates rat. Twenty-four experimental neonate rats (3 days old) were divided into three groups; 1. control group (without morphine administration), 2. maximum dosage group (administration of morphine at 0.1 mg/kg in every 8 hours for 3 days) and 3. minimum dosage group (administration of morphine at 0.05 mg/kg in every 8 hours for 3 days). Upon the exposure, blood was drawn and subjected to morphology and osmotic fragility analysis. Various size and shape of erythrocyte (anisocytosis and poikilocytosis) was observed both at minimum and maximum dosage group, while erythrocyte at control group remain in normal shape and size. Minimum dosage of exposure revealed the appearance of dacrocyte and echinocyte, while at maximum dosage, stomatocyte, echinocyte and schistocyte was noted. Exposure to morphine increased the osmotic fragility in the neonates erythrocyte in a dose-dependent manner. The degree of hemolysis was greater ($p<0.05$) in the morphine exposure group compared to control group. The percentage of hemolysis was greater in blood samples exposure to maximum dosage of morphine compared to the minimum dosage group ($p<0.05$). In conclusion, administration of morphine at minimal dosage of 0.05 mg/kg does affect the size, shape and membrane stability of the neonates rat erythrocyte.

IN VITRO ANTICOAGULANT ACTIVITY OF *PHALERIA MACROCARPA* (BOERL.) FRUIT EXTRACTS

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Anticoagulants play a pivotal role as agents for the treatment of coronary artery disease and preventing future major cardiovascular events. Anticoagulant agent derived from natural plant extract may potentially minimize the side effects of currently used anticoagulant agents. *Phaleriamacrocarpa* locally known as Mahkotadewa was reported to contain medicinal properties. This study aims to evaluate *in vitro* anticoagulant activity of *P. macrocarpa* aqueous and methanolic fruit extracts at different concentrations. Venous blood from 7 healthy individuals was drawn into 3.2% sodium citrate tubes. Blood samples were centrifuged to obtain platelet–poor–plasma (PPP) and were subsequently pooled to carry out coagulation tests i.e. prothrombin time (PT) and activated partial thromboplastin time (APTT). 1 mL PPP was incubated with 1 mL of 20 mg/mL, 40 mg/mL and 60 mg/mL aqueous and methanolic extracts and tests were conducted accordingly. Data were analysed with SPSS 17. Results were expressed as mean (SD) with $p<0.05$ was considered significant. PT and APTT were markedly prolonged in a concentration–dependent manner for both extracts. However, no significant variation of PT and APTT between aqueous and methanolic extracts was observed. At the lowest concentration of aqueous extract, PT and APTT was 27.7 (1.5) secs and 32.7 (4.2) secs, respectively. Meanwhile, PT and APTT was 17.3 (1.2) secs and 43.3 (0.6) secs, respectively, for methanolic extract–incubated samples. This study confirmed that *P. macrocarpa*fruit extracts affect the intrinsic and extrinsic pathway of the coagulation cascade. Characterization of its anticoagulant bioactive constituents and mechanism of inhibiting coagulation cascade requires further investigation.

SEPARATOR 3

THEME:

NUTRITIONAL IN HEALTHCARE

SUB THEMES:

- CLINICAL NUTRITION
- FOOD SCIENCE & TECHNOLOGY
- NUTRITION IN LIFE CYCLE & NUTRITIONAL SCIENCE

SUB THEME: CLINICAL NUTRITION

PHYSICAL ACTIVITY AND FOOD INTAKE AMONG INDIAN STUDENTS IN UNVERSITI KEBANGSAAN MALAYSIA

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Studies on physical activity and nutritional status among Indian are still limited although the prevalence of obesity and overweight among the minority is quite high. This study was done to determine the physical activity and food intake among Indian students in Universiti Kebangsaan Malaysia (UKM), with participation of 91 Indian students. Physical activity level was determined using pedometer and the *Global Physical Activity Questionnaire* (GPAQ-M). Food intake was recorded using 24-hour diet recall for two weekdays and one day of weekend. The classification for physical activity was based on average step per day recorded by pedometer for three days; two weekdays and a day of weekend. Most of respondents (62%) were classified as moderately active. Only 2% of respondents were classified as active meanwhile 36% were classified as inactive. Through MET score of GPAQ-M, most of respondents (55%) were classified as active, 32% were moderately active and only 13% were classified as inactive. Mean energy intake of respondents is 1424 ±295 kcal/day, achieving only 69% of the Recommended Nutrient Intake (RNI). Only energy intake (13.6%) of protein achieved the recommended intake, whilst energy (51.7%) of carbohydrate intake does not meet the recommendation and 34.7% energy of fat exceeded the recommendation. There was no significant correlation found between energy intake and physical activity level, measured with average steps per day ($r = -0.98$, $p=0.356$) and MET score of GPAQ-M ($r=0.109$, $p=0.303$). As a conclusion, this study showed no significant relation between physical activity and nutritional status among Indian students in UKM.

SUB THEME: FOOD SCIENCE & TECHNOLOGY

POTENTIAL OF TWO SELECTED HYDROCOLLOIDS ON THE TEXTURE AND SENSORIAL PROPERTIES OF LOW FAT ICE CREAM

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This study was conducted to investigate the potential of seaweed (*Kappaphycus alvarezzi*) powder and okra (*Abelmoschus esculentus*) exudate, as fat carbohydrate-based replacers in low-fat ice cream formulation. Six formulations of ice cream were tested with varied percentages of fat replacement at 0%, 22%, 44%, 55%, 88% and 100% to produce Super Premium (18% fat), Premium (14% fat), Regular (10% fat), Economy (8% fat), Low-fat (2% fat) and Zero-fat (0% fat) ice cream respectively. Texture analysis showed that addition of seaweed powder as fat replacer lead to elevated level of hardness especially with 16% and 18%. Okra exudate effects on the texture showed no apparent trend, with 18% okra was found to produce the hardest ice cream. Sensory analysis showed that the addition of seaweed powder altered the sensory attributes of the ice cream produced with Zero-fat ice cream depicting the lowest acceptance score for all attributes evaluated. However, the Super Premium, Premium, Regular and Economy ice cream showed no significant ($p<0.05$) difference in overall consumer acceptability. Sensory properties for ice cream made with okra exudate showed highest overall consumer acceptance with Premium ice cream with 22% fat substitution. Economy ice cream was found to had no significant difference ($p<0.05$) of overall acceptance with Premium ice cream. Although hydrocolloids have been reported to display fat mimetics capabilities, incorporating them into food as fat replacers is not as straightforward and requires a lot more considerations. However, these hydrocolloids showed potentials that can be further explore in the development of low-fat food products.

PROXIMATE ANALYSIS OF *DIOSCOREA PENTAPHYLLA* TUBERS

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The proximate composition of *Dioscoreapentaphylla* tuber was investigated using standard methods by Association of Official Analytical Chemists (AOAC, 1990). The result showed that *D. pentaphylla* tuber has moisture content 81.26%, ash content 0.48%, crude fat content 1.35%, crude protein content 11.77%, crude fiber content 0.10%, carbohydrate content 5.04% and available energy 335.80 kJ/100g. Thus, *D. pentaphylla* tuber can be used as healthy food for controlling the daily diet consumption because it has high water and protein content and low carbohydrate content. It can also serve as an alternative source of high protein flour**.**

PRELIMINARY CHARACTERIZATION ON PHYSICAL PROPERTIES OF MARINE FISH SKINS AS ALTERNATIVE SOURCES OF HALAL GELATIN

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Recently, an alternative gelatin from the fish skins in *halal* market has obtained high demands in many industries. This occurrence has made by-products from the fish such as skins, bones and viscera become valuable and significantly reduced environmental concerns. In this study, there were two types of marine fish used; *Euthynnus affinis* (*Tongkol*) and *Decapterus maruadsi* (*Selayang*) for extracting out gelatin from their skins. The extraction methods were utilized two pre-treatment processes using acidic and alkaline solutions (sulphuric acid, citric acid and sodium hydroxide) to elucidate the quality of obtained gelatin from the different fish skins. There were no significant differences ($p<0.005$) in their pH, melting point and emulsifying capacity at values of 3.25 ± 0.08 and 3.49 ± 0.04 for pH, 24.0 ± 0.0 (^{0}C) and 23.5 ± 0.5 (^{0}C) for melting point and 42.59 ± 1.85% and 35.19 ± 1.85% for emulsifying capacity respectively for the *E. affinis* and *D. maruadsi* gelatins. Significant differences ($p>0.005$) were existed in yield, viscosity and emulsifying stability respectively for the *E. affinis* and *D. maruadsi* gelatin at values of 6.08 ± 1.29% and 1.56 ± 0.86% for yield, 0.0522 ± 0.0029(cP) and 0.0308 ± 0.0001(cP) for viscosity and 42.59±1.85% and 33.33 ± 0.00% for emulsifying stability. Throughout the preliminary results of characterization, *E. affinis* gelatin had showed better physical properties compared to *D. maruadsi* gelatin and can be one of the prospective sources for *halal* gelatin.

NUTRITIONAL COMPOSITION OF FARMED AND WILD SEAWEED (*GRACILARIA CHANGII*)

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Gracilaria changii is Malaysian edible seaweed that is cultivated commercially or found in its natural habitat. However, there is limited information regarding its nutritional composition. In addition, no comparison between farmed and wild *G. changii* in terms of nutritional composition. Furthermore, there is insufficient previous information on mineral content of surface water for farmed (culture pond) and wild *G. changii* (mangrove forest). Proximate composition, mineral, water soluble vitamin, fat soluble vitamin, sugar, fatty acid and amino acid of farmed and wild *G. changii* were determined. Moisture content was found to be 74.47% in farmed *G. changii* and wild *G. changii* (71.12%). Protein, carbohydrate, total dietary fiber and ash were detected in farmed (17.11, 44.88, 32.43 and 32.60 g/ 100 g) and wild *G. changii* (12.30, 42.77, 40.53 and 41.27 g/ 100 g). Atomic absorption spectroscopy of the ashes showed that farmed and wild *G. changii* contained higher amount of potassium (2688.603-5504.927 mg/ 100 g) and sodium (887.168-2680.427 mg/ 100 g) than calcium, zinc, iron and copper. Sodium (341.075-794.243 mg/ 100 g) was the highest mineral detected in culture pond and mangrove forest surface water mineral analysis. Positive correlation between *G. changii* and its surface water was found for zinc, copper and potassium (0.888, 0.972 and 1.000). For water soluble vitamins, vitamin C (0.076-0.337 mg/ 100 g), niacin (0.019-0.078 mg/ 100 g) and pyridoxine (0.004-0.006 mg/ 100 g) were detected. Palmitic acid (0.624-0.687 g/ 100 g) was the highest fatty acid detected and make up more than 80% of the total fatty acid detected. In terms of amino acids, valine (7.33-7.89%) and leucine (7.30-7.84%) were the highest essential amino acid found. Glutamic acid (16.12-16.46%) was the highest non-essential amino acid detected. In summary, *G. changii* can be beneficial to the food industry as a supplement or ingredient due to its attractive nutritional properties such as dietary fiber, minerals, water soluble vitamins and amino acids.

SUB THEME:
NUTRITION IN LIFE CYCLE & NUTRITIONAL SCIENCE

EFFECTS OF PHYSICAL ACTIVITY AND CALCIUM INTAKE ON BONE MINERAL DENSITY IN MALAYSIAN YOUNG ADULTS

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Recent studies reported that increase physical activity (PA) and dietary calcium intake (CI) provide beneficial effects on bone mineral density (BMD). However, the relationship between these factors has yet to be established among Malaysians, particularly young adults. Thus, this study aims to determine the PA and CI among Malaysian young adults and examine the relationship between PA and CI on BMD. A total of 216 subjects aged between 20-30 years old were recruited for the assessment of PA and CI using International Physical Activity Questionnaire (IPAQ) and 24-hour dietary recall respectively. BMD was quantified using Quantitative Ultrasound (QUS). The results showed that Indian group had significantly higher ($p=0.008$) IPAQ scores (2372 ± 1274 MET-minutes/week) compared to Chinese (1704 ± 1289 MET-minutes/week) but no significant effect ($p>0.05$) when compared to Malay group. There was no significant difference ($p>0.05$) in CI between all groups. In addition, the mean CI (335 ± 211 mg/day) is still far less from the recommended daily intake (800 mg/day). However, BMD scores demonstrated that the Indian group had significantly higher ($p=0.045$) BMD T-scores (0.54 ± 1.42) compared to Chinese group but not significant ($p>0.05$) when compared to Malay group. Pearson correlation indicated that PA and CI were significantly correlated ($r=0.158$, $p=0.02$; $r=0.143$, $p<0.05$ respectively) with BMD. These findings showed that PA and CI play a role on BMD among Malaysian young adults. Hence, being active in PA and increase consumption of CI should be emphasized among young adults to sustain a healthy bone during later life.

PROXIMATE ANALYSIS AND MINERAL COMPOSITION OF LEAVES AND STEMS OF *MIKANIA MICRANTHA KUNTH*

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The present study was conducted to analyse the nutritional composition of stems and leaves including proximate and mineral analysis of *Mikania micrantha* plant. The proximate analysis was conducted followed AOAC methods including the test for moisture, ash, crude protein, crude fat, and dietary fibre. Carbohydrate was measured using clogg anthrone methods. Determination of mineral analysis was carried out using microwave digestion technique and determined by atomic absorption spectrophotometer (AAS). Proximate analysis of the leaves and stems of this weed-a-minute called plant revealed the moisture content of 86.33 % and 85.33 %, total ash of 14.74% and 9.54%, protein of 2.53% and 1.17%, fat of 1.23% and 0.28%, dietary fibre of 2.16 g and 4.81g/100g, and carbohydrate of 5.78% and 16.68%, respectively. This plant is found to be rich sources of minerals including micro and macrominerals. Calcium is the highest minerals detected in both leaves and stems of *M. micrantha* followed by magnesium, sodium, potassium, zinc, iron, and manganese. This study is expected to provide additional data on the nutritional composition of the plant.

SEPARATOR 4

THEME:

ENTREPRENEURSHIP IN HEALTHCARE

SUB THEMES:

- MEDICINAL HERBS
- MATERNAL AND CHILDCARE, FAMILY PLANNING & SAFE AND QUALITY CARE
- EDUCATION (TECHNOPRENEURSHIP)

SUB THEME: MEDICINAL HERBS

THE EFFECTS OF GELAM HONEY ON *EX VIVO* CORNEAL RE-EPITHELIALISATION

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The aim of this study is to investigate the effects of Gelam honey (GH) on *ex vivo* corneal re-epithelialisation and to explore its potential as cornea wound healing agent. CEC were isolated from New Zealand white rabbits (n=6) and cultured until passage 1. *Ex vivo* corneal wound was performed using a 4 mm corneal trephine onto the confluent monolayer cultures, subsequently treated in four different media i) basal medium only (BM), ii) BM with 0.0015% GH, iii) cornea medium (CM) and iv) CM with 0.0015% GH. Observation of the wound closure was carried out and analysed at day 0, 3 and 5 post wound creation. Selected genes and proteins associated with corneal re-epithelialisationand differentiation such as cytokeratin-3 (CK3), clusters of differentiation 44 (CD44) and connexin 43 (Cx43) were evaluated using qRT-PCR and immunocytochemistry respectively.CEC cultured inCM supplemented with 0.0015% GH attained 100% wound closure on day 5 post wound creation compared to other groups ($p<0.05$). The gene expressions of CK3, CD44 and Cx43 in all groups were in accordance to the stages of the corneal re-epithelialisation. The immunocytochemistry of the CK3, CD44 and Cx43 were in agreement with the gene expression analysis. This study has demonstrated the accelerative effects of GH onrabbit corneal re-epithelialisation with appropriate phenotypical expressions. The potential of GH as an alternative or adjuvant agent for corneal wound healing especially in the treatment of superficialcorneal abrasion is highly encouraging.

ANTIMICROBIAL ACTIVITY OF CRUDE EXTRACT AND FRACTIONATED CONSTITUENTS OF *PUNICA GRANATUM* LEAF

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The diversity of antibiotic resistance mechanism has faded the effectiveness of the antibiotics available causing difficulties in the treatment of infectious diseases hence, threatening the public health. This study aimed to investigate the potentials of *Punica granatum* leaf as a new source of antimicrobial component. One of the advantages of this study is the resistance towards the natural plant extract is harder to develop as the antimicrobial effect is a result of synergistic action of a few constituents. The dried *P. granatum* leaf was extracted using ethanol. The result from disc diffusion assay showed inhibitory activity on all 10 clinical pathogens isolated previously from diabetic wound including *Methicillin-resistant Staphylococcus aureus* (MRSA) with the size of inhibition zones ranged from 11 to 24 mm. The minimal inhibitory concentration (MIC) was ranged from 8 to 1000 µg/ml, indicates the different susceptibility levels of the test microorganisms to the extract. The extract exhibited fungicidal effect on *Candida albicans* at the concentration of 62.5 µg/ml. The toxicity of the extract was studied by using Brine Shrimp Lethality Assay. The extract did not show acute toxicity effect on *Artemia salina*. A total of 7 spots were observed on silica thin layer chromatography plate by using mobile phase of hexane and ethyl acetate at the ratio of 5:5. The fractions that showed significant antibacterial activity were analyzed with gas chromatography-mass spectrometry.

ANTI-INFLAMMATORY EFFECT OF *RHAPONTICI RADIX* VIA INHIBITION OF NF-κB, MAPK AND INDUCTION OF HO-1

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Objective: *Rhapontici Radix* (RR) has been used in traditional medicine in east-Asia and has been shown to have various beneficial effects. However, its biological properties or mechanism on inflammation-related diseases are unknown. The goal of this study was to determine the anti-inflammatory activity and underlying molecular mechanisms of *Rhapontici Radix* ethanol extract (RRE). Methods: The inhibitory effect of RRE on the production of NO, cytokines, inflammatory-related proteins, and mRNAs in LPS-stimulated macrophages was determined by the Griess assay, ELISA, Western blot analysis, and real-time RT-PCR, respectively. Results: Our results indicate that treatment with RRE significantly inhibited the secretion of NO and inflammatory cytokines in RAW 264.7 cells and mouse peritoneal macrophages without cytotoxicity. We also found that RRE strongly suppressed the expression of iNOS and COX-2 and induced HO-1 expression. It also prevented nuclear translocation of NF-κB by inhibiting the phosphorylation and degradation of IκBα. Furthermore, the phosphorylation of MAPKs in LPS-stimulated RAW 264.7 cells was significantly inhibited by RRE. Conclusions: These findings suggest that RRE may operate as an effective anti-inflammatory agent by inhibiting the activation of NF-κB and MAPK signaling pathways and inducing HO-1 expression in macrophages. Our results suggest that RRE has potential value as candidate to inflammatory therapeutic phytomedicine.

ACUTE AND SUBACUTE HAEMATOLOGY ANALYSIS ON TOXICITY OF ETHANOLIC EXTRACT OF *MARIPOSA CHRISTIA VESPERTILIONIS* LEAVES IN MALE *SPRAGUE DAWLEY* RATS

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The term Butterfly tea refer to decoction of *Mariposa christia vespertilionis* leaves which is widely consumed by cancer patients throughout Malaysia and has gained a huge popularity among Malaysians, not only cancer patients but also researchers to discover the real potential of this plant. Herein, the study is aimed evaluating for the possible toxicity in 14-day acute and 28-day subacute oral toxicity of ethanolic extract *M. christia vespertilionis* in male *Sprague Dawley* rats. The 14-day acute toxicity study was conducted to detect lethal dose 50 (LD_{50}) *M. christia vespertilionis* followed by the 28-day subacute toxicity study to detect the non-observed-adverse-effect level (NOAEL). In acute toxicity study, rats were divided into control, 5% DMSO (vehicle) and 2000 mg/kg groups. The extract was administered orally on day 1 and observed for 14 days. Meanwhile in subacute toxicity study, a total of 30 rats were divided into control, 5% DMSO (vehicle), low dose (75 mg/kg), medium dose (125 mg/kg) and high dose (250 mg/kg) groups. The extract was administered daily from day 1 until day 28. Standard toxicology parameters including mortality, behavioural changes, motor-neuronal abnormalities, body weight and feed-water consumption pattern were measured. The haematological and serum biochemical parameters for the assessment of kidney and liver functions were carried out. Results of acute oral toxicity study showed single dose (2000 mg/kg) of ethanol extract of *M. christia vespertilionis* leaves induced no treatment-related signs of toxicity or mortality in male *Sprague Dawley* rats. The haematological and serum biochemistry results also showed no changes in control and treated groups. Samples for repeated 28-days toxicity study was analysed and also showed no significant changes on the haematological and serum biochemistry parameters. Based on the acute toxicity result, lethal dose 50 (LD_{50}) of *M. christia vespertilionis* is greater than 2000 mg/kg. Meanwhile, subacute study showed non-observed-adverse-effect-level (NOAEL) of *M. christia vespertilionis* is greater than 250 mg/kg.

SUB THEME: MATERNAL AND CHILD CARE, FAMILY PLANNING & SAFE AND QUALITY CARE

ASSISTED REPRODUCTION IN MALAYSIA: CLINICAL ASPECTS OF THE PROCEDURE

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Background: This research work was intended to collate data on the status of ART in Malaysia. Objective: To outline the preliminary findings of this study completed at a private ART clinic in the Klang Valley. Materials and Methods: ART data was to be collected from 4 private and 4 government ART clinics in the Klang valley. This report is for 1 private center only. Individualized data based ART treatment cycles was collected according to the system adopted by the American Registry of ART (CDC, USA. This report includes treatments started between 1st January 2015 and 31st December 2015, and babies born up to September 2016. Material Transfer Agreement (MTA) was provided to all centers. Data obtained was analyzed with the assistance of a Statistician. Result & Discussion: The cycles performed were 100% of ICSI and 0% IVF procedures. At least 96.6% of fertilized eggs cleaved with 84% progressing today 3 stage. In these treatment cycles, 10% of the embryo were transferred to the respective mothers while the remaining embryos were stored frozen for the patients' own use. The implantation rate was 20% for the fresh cycles and 34% for the frozen cycles. Viable pregnancy rate is 25.8% per ET cases for fresh cycles for frozen cycles it is 35.3%. Multiple pregnancy rates were 3%. Pregnancy rate was highest (66.7%) in patients with tubal factor and lowest for PCO (1%) patients. Male factor contributed to 42% infertility that resulted in a 29.4% pregnancy rate after ART. Viable pregnancy rate was highest for <35 age groups and lowest for group age >35 years (16.7%). The study is ongoing. Conclusion: The clinical pregnancy rate was significantly ($p<0.05$) higher for frozen cycles and pregnancies were higher in the <35 age group and in patients with tubal factor compared to low in >36 age groups and PCOS patients.

ANIMUS MANENDI: AN ANALYSIS OF FACTORS AFFECTING COMPLIANCE WITH DIETARY AND FLUID RESTRICTIONS AMONG HEMODIALYSIS PATIENTS IN SELECTED HOSPITALS IN ILIGAN CITY

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According to National Kidney and Transplant Institute (NKTI) kidney diseases, End Stage Renal Disease (ESRD) is the 7th leading cause of death in the country in 2014. The Department of Health states that approximately 23,000 Filipinos underwent dialysis due to kidney failure in 2013, nearly four times higher than the 4,000 cases recorded in 2004 (Dela Cruz, R 2014). Thus, compliance with fluid and dietary instructions is a critically significant factor in the health and well-being of hemodialysis patients; animus manendi or intent to stay with the treatment is critical (Brunner, 2012). This study aimed to analyze the factors affecting compliance with dietary and fluid restrictions among 35 hemodialysis patients in selected hospitals in Iligan City. This research used descriptive-correlational-comparative research design, purposive sampling method, and modified questionnaire based on End Stage Renal Disease Adherence Questionnaire (ESRD-AQ) to assess their compliance with dietary and fluid restrictions. Using Pearson Correlational Coefficient, results revealed that marital status has a strong direct relationship (r: 0.20), educational attainment has a strong inverse relationship (r: -0.20) as well as length of hemodialysis treatment (-0.21) with the respondents' compliance to dietary and fluid restrictions. Hence, the study elucidated that respondents' demographic profile significantly affected their level of compliance with dietary and fluid requirements, highlighted the importance of marital support, and especially among patients with increased educational attainment. In order to provide safe and quality care,

this information could be integrated in planning care for hemodialysis patients, both in the academe and clinical level.

MATERNAL AND CHILD HEALTH AND FAMILY PLANNING BELIEFS AND PRACTICES OF MARANAOS IN ILIGAN CITY

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In health care delivery system, the nurse interacts with people of diverse cultural backgrounds. According to a survey, maternal mortality rate among Filipino Muslims is twice as high as the national average of 162 per 100,000 live births, and they have high unmet needs for family planning with lowest contraceptive prevalence rate (National Health and Demographic Survey, 2008). Therefore, this study was conducted to determine and compare the health beliefs and practices on maternal and child care and family planning of Maranao women from urban and rural barangays of Iligan City. Researcher-structured questionnaire and personal interviews were used after being pilot tested to gather data from 250 respondents. The results of the study showed that most mothers from both barangays lacked access to health care institutions and awareness on the importance of prenatal services. Most of the respondents were aware and informed of Family Planning Program but majority, 64.80% from the urban and 65.60% from the rural respondents do not use contraceptives. Furthermore, their maternal and child health and family planning practices are primarily affected by their religious, cultural perceptions and beliefs resulting to high unmet needs. Lastly, Maranao women from rural barangays have poor compliance and practices than women from urban barangays. Culturally sensitive health care delivery is therefore a critical need and inclusion of Maranao religious leaders in the dissemination of information about Family Planning and maternal and child care is highly recommended for better compliance.

SUB THEME: EDUCATION (TECHNOPRENEURSHIP)

A COMPARATIVE STUDY OF AVIATION AND MEDICAL SCIENCE STUDENTS ATTITUDE TO TECHNOPRENEURSHIP: A REVOLUTION OR REVELATION

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Aviation technology and Healthcare technology sectors are amongst the fastest growing industry internationally and globally. In relation to the challenges encountered by graduates in both fields, the introduction of Technopreneurhip course in Universiti Kuala Lumpur is to spur the growth of inspiring graduates to be employers instead of employees; in turn will elevate the economic wealth of the country. The aim of this study is to compare the aviation and medical science students' attitude towards Technopreneurship course offered. As the key concept of attitude and criteria is studied, the study found that how these key concepts demonstrated their relationship to the course. With such developments in both groups of students, it is found that even though the aviation program scores exceptional academic performance compared to the medical sciences program, both groups of students resembles in the strengths of the attitude and characteristics acquired to become a technological entrepreneur. The relationship in attitude virtue of self-confident with problem solving, creativity and communicative skills is been highlighted in the survey. Therefore it is empirical that the course is worthwhile to explore in depth in grooming these students to diversify the students' interest in venturing into the business environment which is envisaged by the university.

A MANDATORY OR AN ALTERNATIVE OF A TECHNOPRENEURSHIP COURSE FOR UNDERGRADUATE HEALTHCARE STUDENTS: REPERCUSSION OR TRANSFORMATION?

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Globalization, high standard of living and revolutionary changes in technologies, innovation orientation in a modern society is experiencing extensive complexity. Universiti Kuala Lumpur dealt with these complexities systematically by introducing a compulsory Technopreneurship course to be picked up by their Bachelor students. This study is skewed to the Medical Science program offered by Universiti Kuala Lumpur. With the challenges encountered by graduates in the healthcare field currently, Malaysian higher education providers are undertaking the task in preparing students that will not only be of employ-ability to the industry , also to be an employer in providing employ-ability to others in the field. As commented by the public and private sector, Technopreneurship skills or attributes are lacking within the healthcare graduates. The main aim of introducing the course is to equip sets of expertise, attributes or functions in making provisions in preparing the graduates to be effective and efficient not only at the workplace but also as a technopreneur entity. Forth semester students in the bachelor program of Clinical Laboratory Science and Environmental Healthcare were evaluated on the selected attributes to develop viable technopreneur skills. Course registered students achieved well in time management and personal mastery skills when compared to those who yet gone through the course. From the study it is found that students enrolled in Environmental Healthcare program recorded higher scores in the leadership and management skills whilst Clinical Laboratory Science program achieved better scores in communication skills. Students displayed similar weakness in the problem solving and decision –making abilities regardless whether they attended the course or not. As reported by earlier researchers that innovative instructional approach may result in worthwhile outcome in grooming these future competent healthcare practitioners as visualized by the stakeholders.

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