29th Scientific Meeting of the Malaysian Society of Pharmacology and Physiology

Theme
“Biomolecules in Science and Health"

24-25 August 2015

Setia City Convention Centre (SCCC), Setia Alam, Selangor, Malaysia

29TH SCIENTIFIC MEETING OF THE MALAYSIAN SOCIETY OF PHARMACOLOGY AND PHYSIOLOGY (MSPP 2015)

Advisor	Professor Dr Nafeeza Mohd Ismail
Chairperson	Dr Rosfaiizah Siran
Secretary (Speakers and VIP Affairs)	Dr Norasikin Ab Azis Dr Damayanthi Durairajanayagam
Secretary (Participant Affairs)	Dr Noor Azean Anis Abd Aziz
Treasurer	Dr Siti Norashikin Mohd Tambeh
Scientific Committee	Associate Professor Dr Renu Agarwal (Chairperson) Professor Dr Harbindar Jeet Singh Professor Dr Mohd Hamim Rajikin Professor Dr Khatiza Haida Ali Professor Dato Dr Ahmad Pauzi Mohd Yusof Associate Professor Dr Jesmine Khan Associate Professor Dr Igor Iezhitsa Associate Professor Dr Anna Krasilnikova Associate Professor Dr Nor Ashikin Mohamed Noor Khan Dr Syazwana Mohd Zaki
Publicity and Participant affairs	Dr Norhafiza Razali (Chairperson) Dr Nasibah Azme Dr Noor Fahitah Abu Hanipah Dr Siti Nurdiana Shamsulrizal Dr Siti Norsyafika Kamarudin Mdm Fatin Nadzirah Zakaria Mdm Nina Keterina Hashim
Design, Printing and Publications Committee	Dr Yuhaniza Shafinie Kamsani (Chairperson) Dr Nurul Alimah Nasir Mr Mohd Shahril Sharifuddin Mr Dzikri Asmawi Mr Razif Dasiman
Technical and Hospitality	Associate Professor Dr Nuraliza Abdul Satar (Chairperson) Dr Mohd Johari Ibrahim Mr Mohd Shahizan Jamil Mr Mohamad Faizal Othman Mr Mohamad Razif Mohamad Taib
Souvenir, Food and Performance Committee	Associate Professor Dr Narimah Abdul Hamid Hasani (Chairperson) Dr Sharaniza Abd Rahim Dr Mudiana Mohd Saufi Dr Siti Hamimah Sheikh Abdul Kadir

SECRETARIAT

Mohamad Afrizil Zulkarnain
Mohamad Suffian Ahmad
Mohd Shahril Sharifuddin
Suhartiny Md Udin
Zukarmi Mohd Aspar
Mohd Syeth Ahmad
Ahmad Faizal Hawari
Mohammad Fadzil Othman
Mohd Hadi Mohd Ahmad Kamal
Norasidah Haron
Mohamad Azmir Azizan
Norinnon Samat
Siti Aisyah Jasman
Shahrulmazwan Mohd Zahdi
Mohd Shahizan Jamil
Najua Ahmad Najid
Muhamad Azrul Karim
Norhamilia Abdul Hamid
Wan Nurhafizah Wan Abdul Rahman

EXECUTIVE COMMITTEE OF MSPP 2013 -2015

President	Professor Dr Nafeeza Mohd Ismail
Vice-President	Professor Dr Harbindarjeet Singh
Hon Secretary	Associate Professor Dr Nor Ashikin Mohamed Noor Khan
Hon Treasurer	Professor Dr Lam Sau Kuen
Exco Members	Professor Dr Mohd Zaini Asmawi Associate Professor Dr Ivy Chung Dr Siti Khadijah Adam Dr Hoe See Ziau Pn Khairul Niza Abdul Razak
Co-opted Members	Professor Dr Aishah Adam Dr Rosfaiizah Siran

GENERAL INFORMATION

Conference Location

All plenary sessions, together with tea/coffee and lunch, will take place in the Ballroom 1, Setia City Convention Centre (SCCC). Symposia will be held in the Ballroom 1 and Function Room 2.

Conference Arrival and Registration

The Conference Registration Desk is located at the foyer of SCCC. The registration desk will be manned throughout the conference, from 0800hrs on Monday 24August until 1630hrs on Tuesday25 August.

Travel

Information about travel to SCCC and around the Shah Alam city can be found on the conference website. Delegates staying in the recommended hotels are strongly advised to arrange own transportation to the conference venue. Shah Alam is a major city, with inevitable traffic updates, therefore organizing transportation can avoid unexpected challenges and ensure you arrive on time, every time.

Car Parking

Car parks compound are conveniently located for conference delegates, on the side of the conference centre. They do not require crossing of any roads. Drivers should collect a ticket on entry and pay at one of the machines prior to collecting their vehicle. A flat rate of RM 5 is applied at the SCCC helpdesk.

Sessions and Presentations

All seminar rooms have a laptop with a connected data projector. The complete suite of Microsoft Office products as well as pdf readers are available on these laptops. Presenters should bring their presentation on a memory stick and upload it to the general laptop at the registration counter no later than in the break before their session. Laptops can be connected to the projector via a VGA connection; presenters using an Apple laptop must supply their own adaptor to connect to the VGA cable.

First Aid and Emergency Services

Should you require first aid you should go directly to the registration desk for further assistance.SCCC can be called on 03-3359 5252. Outside centre the number for emergencies is 999 which you can dial from any landline or mobile phone without charge.

Printing

Setia City Conference Centre office is able to print/photocopydocuments for delegates. Charges apply. Alternatively, some convenience stores, stationery shops and bookshops located in the Setia City Mall, a building next to SCCC, are also able to provide printing and photocopying services.

Banking

The nearest ATM can be found at Setia City Mall. To reach this, use the shelteredwalkway that connects SCCC building to the mall. Most ATMs accept Mastercard, American Express and Visa.

Telephone dialling code

The international dialling code for Malaysia is +006.

Important note about Malaysia power

Malaysia uses 240v power supply. Electrical sockets (outlets) in Malaysia are the "Type G" British BS-1363 type (refer image below). No provision will be made by conference organisers to supply power converters. If a delegate wishes to bring electrical equipment that operates on a different voltage, he or she must bring their own converter.

Exhibition

Date	:	24-25 August 2015 (10.00am – 5.00pm)
Venue	:	Foyer of SCCC

Conference

Date	:	24-25 August 2015 (8.00am – 5.00pm)
Venue	:	Grand Ballroom &Function Rom 2 of SCCC

Jointly Organized by

The Malaysian Society of Pharmacology and Physiology

Sponsored by

Prima Nexus Sdn Bhd

Admission

Registration counter is located at the foyer area of SCCC. Admission is free upon registration. Pre-registered delegates are required to sign in at the registration counter.

Attire

Business or business casuals areappropriate for this meeting.Since meeting room temperatures and personal comfort levels vary, it is recommended that you dress in layers and bring a sweater or jacket.

Cancellation

Registration includes a RM200.00 nonrefundable registration fee. Should you cancel your registration before June 31, 2015, you will be refunded the entire short course fee less RM200. Sorry no refunds after June 31, 2015.

Official Opening

Date	:	24 August
Time	:	8.30am
Venue	:	Ballroom 1, SCCC

Prayer Room

The prayer room for male is located at Level 2, and female at Level 1, SCCC.

Public Transport Facilities

RapidKL bus U90 is available from the mall. Taxis can be arranged by the SCCC management office. For more information, please visit: http://www.myrapid.com.my/.

Mobile Charging Station

Keys are to be obtained at the management office. Mobile phones can be charged for 2 hrs max. Penalty applies for lost keys.

MESSAGE FROM THE VICE-CHANCELLOR, UNIVERSITI TEKNOLOGI MARA

It is my pleasure to congratulate UiTM's Faculty of Medicine, for the incessant quest to acculturate scholarship and knowledge advancement through discourses and discussions, manifested in events such as **The 29th Scientific Meeting of Malaysian Society of Pharmacology and Physiology 2015 (MSPP 2015)**.

While the faculty is a relatively recent addition to the university's comprehensive set-up, with regards to programmes and disciplines, and while their academics are "new kids on the block", when it comes to research and trekking new horizons in their fields of studies, the faculty and its fraternity have proven to be old hands at enlivening a culture of research.

This is indeed heartening, as it fits in well with our objective and aspiration of contributing towards further development of the nation, by pursuing a path which will subsequently lead UiTM to be in the ranks of research-intensive entities of world standards.

Hence, I am hopeful that **MSPP 2015** will provide the platform from where academics, researchers, practitioners and policy-makers are able to unlearn, relearn and learn from one another with the ultimate goal of enhancing societal wellbeing, and thus making our planet a better place to live. After all, health is wealth. Thus, the theme ***Biomolecules in Science and Health*** is most apt at ensuring that the focus of the meeting will not be lost, and its outcome will translate into deliverables that support the common good of mankind.

I am confident that this year's meeting will offer better opportunities for participants to gain broader access into the field of Pharmacology and Physiology, besides acquiring better insights into the latest discoveries and research findings in the realm of Health and Science. It is hoped that the end of the meeting will also see the beginning of more collaborative efforts with existing partners, and the unfolding of linkages with new ones.

On that note, I wish everyone an enlightening journey that open doors to new knowledge and the sharing of scientific information. To our foreign guests, I wish all of you a memorable experience throughout your stay in our country.

TAN SRI PROF. IR DR SAHOL HAMID ABU BAKAR, FASC.
UNIVERSITI TEKNOLOGI MARA

MESSAGE FROM THE DEPUTY VICE-CHANCELLOR, (RESEARCH AND INNOVATION)

Bismillahirrahmanirrahim

Assalamualaikum wbt.

It gives me great pleasure to congratulate the organizers of this 29th Scientific Meeting of Malaysian Society of Pharmacology and Physiology (MSPP) 2015. I am also happy to note that Faculty of Medicine, UiTM has collaborated with MSPP for this purpose.

The theme for this year is "Biomolecules in Science and health". This meeting has played a major role in encouraging research and innovation in our society. It is a platform where the researchers will meet and share their success and knowledge. Their enthusiasm in research would undoubtedly serve as inspiration to all the young researches.

I hope this conference will meet its objective and the participants will thoroughly benefit from their experience. To all who partake in the Meeting, I would like to wish you 2 days of rewarding intellectual discourse which I hope, will further advance the cause of science and the growth of MSPP.

Last but not least, I thank all the speakers, the presenters, participants from various backgrounds including the students without whose participation this Conference would not have been realized.

Thank you.

PROF. IR DR HJ ABDUL RAHMAN OMAR
DEPUTY VICE-CHANCELLOR (RESEARCH & INOVATION)
UNIVERSITI TEKNOLOGI MARA

MESSAGE FROM THE PRESIDENT OF THE MALAYSIAN SOCIETY OF PHARMACOLOGY AND PHYSIOLOGY

It is indeed my pleasure to welcome you to the 29th Scientific Meeting 2015 of MSPP held here in Setia Alam. The MSPP's annual meeting offers a unique opportunity to gather and network with colleagues from many countries in an exciting educational and scientific environment. The scope and quality of the scientific exchange make Scientific Sessions the premier basic science research.

The goal of this Scientific Meeting is to encourage scientific interchange among basic science researchers in Asia and beyond to further advance knowledge and technology in the field of basic medical sciences and ultimately, the medical field. This meeting brings together sub-specialties and accommodates diverse interests- in various organs and diseases, development and aging, genetics, biochemistry, cell biology and others.

Congratulations to the Organising Chair and the committee for putting together an exciting program. This year's theme is "Biomolecules in Science and Health". The theme was specifically chosen in line with current situation where personlized and precision medicine is an emerging necessity. They have worked tirelessly to make this meeting a success.

The society has held a few activities this year including an event held in University Malaya entitled 'Cardiovascular Physiology Symposium. This event comprises internationally renowned speakers. We also had a refresher course on the Teaching of Physiology and Pharmacology. The teaching course for this year was organised by UPM and focused on cardiovascular. My appreciation to the organisers of these events.

My appeal to members is not to allow your membership to lapse and to those who are not members yet, I would like to extend you an invitation to be a member of MSPP.

PROF DR NAFEEZA MOHD ISMAIL
FACULTY OF MEDICINE
UNIVERSITI TEKNOLOGI MARA, MALAYSIA

MESSAGE FROM THE ORGANIZING CHAIRPERSON

On behalf of the Organizing Committee, I am delighted to welcome all the delegates and their guests to Setia City Convention Centre (SCCC), Selangor, Malaysia, for the 29th Scientific Meeting of the Malaysian Society of Pharmacology and Physiology (MSPP2015) that take place from August 24 to 25, 2015. This is Malaysian Society of Pharmacology and Physiology's largest annual event devoted to the science and practice of pharmacology and physiology, and it will give participants a platform to exchange ideas, discover novel opportunities, reacquaint with colleagues, meet new friends, and broaden their knowledge.

The theme of the MSPP2015 is *"Biomolecules, Health and Science"*; it will broadly cover all disciplines related to health and science from fundamental research to applications, highlight global scientific interactions and collaborations. We are pleased to have Prof Dr Gordon H. Williams (Havard Medical School), Prof Dr N Sreeharan (TranScrip and Kings College) and Prof Dr Zalina Ismail (Universiti Sains Malaysia) as the plenary speakers. Our comprehensive scientific programme will also include series of divisional symposia talks from invited international and national speakers, poster sessions and oral presentations from selected abstracts.

I hope this conference will prove to be an inspiring and truly transformative experience for you. All of the members of the local Organizing Committee from Faculty of Medicine, UiTM wish you a superb conference experience and a memorable stay in Shah Alam, Selangor, Malaysia.

Thank you.

DR. ROSFAIIZAH SIRAN
FACULTY OF MEDICINE,
UNIVERSITI TEKNOLOGI MARA, MALAYSIA

29th SCIENTIFIC MEETING OF THE MALAYSIAN SOCIETY OF PHARMACOLOGY AND PHYSIOLOGY (MSPP)

24-25 August 2015

Setia City Convention Centre (SCCC), Setia Alam, Selangor, Malaysia

SCIENTIFIC PROGRAMME

Day 1: 24/08/15

8.00 AM	**Registration**	
8.30 AM	Opening ceremony by Vice Chancellor, Universiti Teknologi MARA Master of Ceremony : Dr Yuhaniza Shafinie Binti Kamsani	
9.00 AM	**Keynote Lecture (Ballroom 1)**	
	Molecules As The Basis For Precision Medicine.	Speaker : Prof Dr Nafeeza Mohd Ismail, Universiti Teknologi MARA, Malaysia. Chairperson: Prof Dr Aishah Adam
9.45 AM	**Plenary 1 (Ballroom 1)**	
	Personalized Medicine: Merger of Physiology, Pharmacology and Genetics	Speaker : Prof Gordon Williams, Harvard Medical School, USA. Chairperson: Assoc Prof Dr Nor Ashikin Mohamed Noor Khan
10.30 AM	**Tea break and poster viewing and judging (P1-01 – P4-20)**	
11.00 AM	**Plenary 2 (Ballroom 1)**	
	Developing New Medicines in 2020: A look into the future	Speaker : Prof N Sreeharan, TranScrip and King's College London, United Kingdom. Chairperson: Prof Datin Dr Zahurin Mohamed
11.45 AM	**Free oral communication**	
	Chairperson: Prof Debra SM Sim O1-01 – O1-07	Chairperson: Assoc Prof Dr Nor Ashikin Mohamed Noor Khan O1-08 – O1-14
1.00 PM	**Lunch and Poster viewing and judging (P1-01 – P4-20)**	

2.30 PM	**Symposium 1 (Ballroom 1)** **Health and Environment**	**Symposium 2 (Function room 2)** **Molecular targets in advanced therapeutics I**
	Chairperson: Prof Dr Harbindarjeet Singh	Chairperson: Dr Anna Krasilnikova
	Prof Dr Abdul Rashid Abdul Rahman (Cyberjaya, Malaysia): Central Aortic Pressure in Health and Disease	Prof Gan Siew Hua (University Sains Malaysia, Malaysia): Molecular targets in therapeutics: the roles of pharmacogenetics, University Sains Malaysia
	Prof Dr Mustafa Ali Mohd (University Malaya, Malaysia): Endocrine disrupters: Obesity and obesogens	Assoc Prof Dr Igor Iezhitsa (Universiti Teknology MARA, Malaysia): Relationships between magnesium status, oxidative stress and inflammation: links and possible therapeutic targets?"
	Assoc Prof Dr Nor Ashikin Mohamed Noor Khan (Universiti Teknologi MARA, Malaysia): Pre-implantation environment and future health: Huge outcomes from little embryos	Assoc Prof Dr Renu Agarwal (Universiti Teknologi MARA, Malaysia): Current molecular targets in antiglaucoma therapy: Role of adenosine receptor signaling pathways
4.00 PM	**Tea break**	
4.15 PM	**Special Lecture (Ballroom 1)**	
	Animal studies at the bench failed at bedside – Why?	Speaker : Prof Debra SM Sim, University Malaya, Malaysia Chairperson: Prof Dr Khatiza Haida Ali
5.00 PM	**AGM (Ballroom 1)**	
8.00 PM	**Conference dinner (Function room 2)**	

Day 2: 25/08/15

7.45 AM	**Registration**	
8.15 AM	**Plenary 3 (Ballroom 1)**	
	Biomolecules and the brain	Speaker : Prof Dr Zalina Ismail Universiti Sains Malaysia, Malaysia Chairperson: Dr. Rosfaiizah Siran
9.00 AM	**Free oral communication**	
	Chairperson: Assoc Prof. Dr Nuraliza Abdul Satar O2-01 – O2-04	Chairperson : Assoc Prof Dr Anna Krasilnikova O2-05 – O2-08
9.45 AM	**Tea break, poster viewing and judging (P5-01 – P8-17)**	
10.15 AM	**Free oral communication**	
	Chairperson: Assoc Prof Dr Igor Iezhitsa O3-01 – O3-07	Chairperson: Assoc Prof Dr Jesmine Khan O3-08 – O3-14
11.30 AM	**Symposium 3 (Ballroom 1)** **Therapeutic strategies in cardio-renal diseases**	**Symposium 4 (Function room 2)** **Molecular targets for advanced therapeutics II**
	Chairperson: Dr. Hassaan A Rathore,	Chairperson: Assoc Prof Dr Renu Agarwal
	Prof Munavvar Zubaid (University Sains Malaysia, Malaysia): Nervous Kidney	Prof Dr Leif Bertilsson (Karolinska University Hospital, Sweden): Genetics in Drug metabolism
	Asst Prof Dr Hamid Saeed (University of the Punjab, Pakistan): Mesenchymal stem cells in cardiovascular therapeutics – an update	Prof Aishah Adam (University Teknologi MARA, Malaysia): Herbal medicine: the evidence
	Prof Dato Dr Mafauzy Mohamed (University sains Malaysia): Addressing the residual risk for CVD in patients with Type 2 DM	Prof Dr Nor Azizan Abdullah (University Malaya, Malaysia): Targeting signaling pathways in obesity-related disease

1.00 PM	**Lunch, poster viewing and judging (P5-01 – P8-17)**	
2.00 PM	**Free oral communication**	
	Chairperson: Dr. Wang Seok Mui O4-01 – O4-06	Chairperson: Prof Dr Norazlina Mohamed O4-07 – O4-12
3.00 PM	**Panel discussion (Ballroom 1)**	
	Challenges in research and postgraduate training in physiology and pharmacology: Malaysian perspective Chairperson: Prof Ruby Husain	Panelists: Prof Ishwar Parhar, Monash University, Malaysia. Prof Zalina Ismail, University Sains Malaysia, Malaysia. Prof Datin Dr Zahurin Mohamed, University Malaya, Malaysia. Prof Aishah Adam, Universiti Teknologi MARA, Malaysia.
4.30 PM	**Award presentation by Prof Dr Nafeeza Mohd Ismail** **Closing remarks by Chairperson or Organizing committee. (Ballroom 1)**	
5.00 PM	**Tea**	

CONTENTS

FREE ORAL COMMUNICATIONS

Session 1
24/8/2015 (11.45AM – 1.00PM)

	O1-14	Gastroprotective activity of chloroform extract of *Muntingia Calabura* and *Melastoma Malabathricum* leaf extracts ***Zainul Amiruddin Zakaria***	39

Session 2
25/8/15 (9.00 – 9.45 AM)

Ballroom 1	O2-01	Drug patent linkage in India: a case study ***Arun Nanda***	40
	O2-02	The potential for cyclotron and generator-produced radiopharmaceuticals in nuclear imaging: an overview ***Ng Yen***	41
	O2-03	Ursodeoxycholic acid protects cardiomyocytes against hypoxia via ERK and AKT activation ***Noorul Izzati Hanafi***	42
	O2-04	Twenty four hours continuous tympanic temperature recordings in patients with undifferentiated fever - a preliminary observational study ***Pradeepa HD***	43
Function Room 2	O2-05	5-LOX inhibitors from *Canarium Patentinervium* MIQ ***Mogana Sundari Rajagopal***	44
	O2-06	In- vitro antiviral activity of aqueous extracts of *Polygonum Minus* huds leaves against herpes simplex virus 1 ***Sayang Baba***	45
	O2-07	Diffusion-weighted imaging of the brain of children with cerebral palsy: a qualitative analysis ***Md Safwan Samsir***	46
	O2-08	Down regulation of *Cystathione Γ Lyase* and *endothelial nitric oxide synthase* and reduced responsiveness of A_{1A} adrenergic receptors in the kidney of left ventricular hypertrophied *Wistar Kyoto* Rats ***Ashfaq Ahmad***	47

Session 3
25/8/15 (10.15 – 11.30 AM)

Ballroom 1	O3-01	Analgesic effect of zerumbone on a mouse model of chronic constriction injury-induced neuropathic pain ***Nurul Atiqah Zulazmi***	48
	O3-02	Possible mechanism of leptin-induced changes on sperm parameters of Sprague dawley rats ***Fayez Almabhouh***	49
	O3-03	The effects of testosterone deficiency and replacement on inflammatory cytokine levels in rats ***Kok-Yong Chin***	50
	O3-04	Novel copper based compound revamps the apoptotic network, cell cycle arrest and cytoskeletal rearrangement in human colon cancer cells ***Nima Samie***	51

	O3-05	The effect of intravenous N-Acetylcysteine (NAC) on tissue Malondialdehyde (MDA) level and renal function in glycerol-induced rat ***Nurina Hasanatuludhhiyah***	52
	O3-06	*Moringa Oleifera* aqueous leaf extract: role on total leucocyte count & its differentials in cadmium exposed adult Wistar albino rats ***Pratik Kumar Chatterjee***	53
	O3-07	Inhibitory effect of 2,4,6-trihydroxy-3-geranylacetophenone (tHGA) on extracellular matrix deposition in chronic murine model of asthma ***Yu Zhao Lee***	54
Function Room 2	O3-08	Predictors of Anastrozole-induced adverse reactions in postmenopausal breast cancer patients: role of serum estrogen level and duration of anastrozole treatment ***Murtala B. Abubakar***	55
	O3-09	Anti-proliferative and anti-invasion effect of asiatic acid against oral squamous cell carcinoma - *in vitro* and in orthotopic xenograft model studies ***Nuraini Che Aziz***	56
	O3-10	Metabolite changes on blood serum sample of obese rats treated with *Piper betle* leaves extract on ^{1}h NMR-based metabolomics ***Zuleen Delina Fasya Abdul Ghani***	57
	O3-11	Effect of 2, 4, 6-trihydroxy-3-geranylacetophenone (THGA) on human bronchial smooth muscle proliferation in vitro ***Yap Hui Min***	58
	O3-12	Standardised bioactive fraction of *Garcinia Mangostana* ameliorates scopolamine-induced memory in mice ***Liew Wai Lam***	59
	O3-13	Topical *Trans*-Resveratrol increases matrix metalloproteinase 2 via pERK1/2 pathway ***Norhafiza Razali***	60
	O3-14	Antibacterial activity of pterostilbene and standard antibiotics in combination against Methicillin-Resistant *Staphylococcus Aureus* (MRSA) ***Siti Fairuz Ishak***	61

Session 4
25/8/15 (2.00 – 3.00 PM)

Ballroom 1	O4-01	Parental knowledge, attitude and practice regarding antibiotic use ***Giriyappanavar Chandrashekhar***	62
	O4-02	Analytical and biochemical characterization of thymol derived from *Trachyspermum Ammi* exhibits anti-oxidants, anti-microbial and hepatoprotective activity in WRL-68 liver cell line ***S Abel Arul Nathan***	63

POSTER PRESENTATIONS

KEYNOTE LECTURE

MOLECULES AS A BASIS FOR PRECISION MEDICINE

Nafeeza Mohd Ismail, MBBS, PhD

Faculty of Medicine, Universiti Teknologi MARA

Precision medicine is an approach in medicine that takes into consideration differences in patients' biological make up or variability. The medical decisions, practices, and/or products are tailored to suit the individual patient. There have been major advancements in science and technology that have allowed better healthcare decisions to be made. Despite extraordinary advances in medical fields, we have a long way to go in understanding why different individuals experience disease. All along, we have been interested in the disease that the patient has rather than the patient or person with the disease. Precision medicine is defined by the National Academy of Sciences as "the use of genomic, epigenomic, exposure and other data to define of disease, potentially leading to better individual treatment. It is the prescribing skills which is somewhat lost these days and that is to provide the right treatment to the right patient, at the right dose at the right time". However, this is difficult to do as we lack the ability to predict a patient's response to treatment, and most clinicians follow a less than optimal approach based on trial-and-error or one-dose-fits-all. The study of African-American soldiers is a case in point illustrating evidence of genetic variation. They experienced hemolysis in response to primaquine ingestion. Further studies demonstrated that primaquine-induced hemolysis was due to a genetic deficiency of the enzyme glucose-6-phosphate dehydrogenase (G-6-PD). A more common example is clopidogrel. Being a pro-drug, it requires activation or conversion of the drug into its active form. CYP2C19 is an important drug-metabolizing enzyme that catalyzes the biotransformation. Patients who are CYP2C19-poor metabolizers will not be able to convert it into its active metabolite and are at risk of subsequent cardiovascular events. Thus, the importance of 2C19 genotyping in treatment using clopidogrel. Upon determining the safety and efficacy of a drug, the genotyping for pharmacogenomics purposes is driven by two requirements; first, the need to establish an individual's genetic predisposition to a disease state; and second, the patients must be protected against possible adverse drug reactions by identifying poor metabolizers. The use of genotyping in the identification of poor metabolizers is an emerging necessity. Physicians should choose to screen their patients before administering certain drugs.

PLENARY LECTURES

PL-01

PERSONALIZED MEDICINE: MERGER OF PHYSIOLOGY, PHARMACOLOGY AND GENETICS

Gordon H. Williams, MD

Harvard Medical School, United State of America

Clinical and experimental data document a substantial inflammatory component to CV diseases. Observational data support a role for liberal salt intake being associated with CV disease risk. Government and Academic societies strongly recommends salt restriction as national policy. No clinical trial data support this conclusion. McCarron data: average Na intake 155-160 mmol/day over 45 countries and 5 decades. Some clinical trial data suggest that low salt diet may increased CV risk in diabetes and individuals with increased CV risk factors. How to reconcile? Aldosterone's functions and mechanisms of action are different depending on the tissue and the environmental condition. The mineralocorticoid receptor is present in tissues beyond epithelial cells, including the heart and vessels. Furthermore, aldosterone has direct adverse effects by both genomic and rapid/nongenomic actions not only through a nuclear receptor but also through caveolae-mediated intracellular events. Also, multiple environmental-genetic interactions play an important role in salt-sensitive hypertension (SSH) and aldosterone modulation. These findings have reshaped our vision of aldosterone's role in cardiovascular pathophysiology. We will describes new mediators of aldosterone's mechanisms of action: lysine-specific demethylase 1 (LSD1), caveolin 1 (cav-1) and striatin. LSD1, an epigenetic regulator, is involved in the pathogenesis of SSH in both humans and rodents. In addition, cav-1, the main component of caveolae, plays a substantial role in mediating aldosterone pathways of SSH. The mineralocorticoid receptor interacts with cav-1 and is modulated by sodium intake. Finally, striatin, a scaffolding protein, mediates a novel interaction between signaling molecules and mineralocorticoid receptor's rapid effects in the cardiovascular system. Finally, there is a newly discovered relationship between salt intake and autoimmunity that involves one of the key factors that modulates aldosterone’s mechanism of action—SGK1. In summary, substantial progress in aldosterone's functions and mechanisms of action should facilitate the study of cardiovascular diseases and the role of sodium intake in inflammation and aldosterone-induced cardiovascular, renovascular and cerebrovascular damage. This series of presentations will explore and expand on these possibilities and focus on the clinical relevance of the data being generated.

PL-02

DEVELOPING NEW MEDICINES: A LOOK INTO THE FUTURE

Nadarajah Sreeharan MD, PhD, FRCP, FACP

King's College London, United Kingdom

The search for medicines to alleviate disease and human suffering has been punctuated by key events that have influenced the current R&D model. The concept of *rational drug design* has led to breakthrough medicines that have positively impacted clinical practice. The thalidomide tragedy of the 1950s influenced the development of a highly regulated R&D process and the development of the concept of *benefit-risk* of medicines. The current R&D model of protracted drug development, whereby target validated molecules are taken through non clinical and clinical development under intensive regulatory scrutiny and then released to the market followed by post marketing surveillance has been found wanting in more recent times. Declining R&D productivity, the optimal management of benefit-risk and the pricing of medicines linked to "added value" are critical issues that need to be addressed. Rapidly emerging technological advances such as genomics and pharmacogenetics and the emergence of surrogate biomarkers will impact on the management of future drug discovery and development processes. Double blind, controlled clinical trials will have a diminishing role and novel adaptive study designs and use of "big data" in "real world" patients will become more prevalent. Significant shifts in regulatory paradigms will see "breakthrough designations" for medicines in diseases with unmet need resulting in early release of medicines into the market under controlled conditions. Common diseases will be redefined and medicines will target smaller subsets of current disease states as have been seen more recently in therapies for cancer. Development of large molecules such as monoclonal antibodies will introduce an additional complexity to the process. New business models of the Industry and organisational re-design of R&D will emerge, including the utilisation of public-private partnerships and sharing of the risks associated with the R&D process. New stakeholders will have a more active role in the R&D process and will include payers as well as patients as the ultimate consumers of medicines. The use of emerging scientific, medical and information technological advances will fundamentally alter not only the way we discover and develop medicines but also the overall delivery of Healthcare.

PL-03
BIOMOLECULES AND THE BRAIN

Bridging the gap between biomolecules of the brain and cognitive functions of the mind

Zalina Ismail MBBCh, LLB, PhD

Universiti Sains Malaysia, Malaysia

The brain is a dynamic system that interacts with the rest of the body and the external environment. This interaction occurs at three different fundamental levels: (a) the molecular level involves various biomolecules that participate in numerous cellular processes; (b) the neural level involves the translation of biomolecular activity into dynamic patterns of neural activity and (c) the mental consciousness level involves the interpretation of neural activity at the biomolecular level into cognitive processes such as memory, attention, voluntary behaviour and ethical judgment. Taken as a whole, these three levels describe how the biomolecules of the brain translate into neural activity that eventually gets interpreted as the cognitive functions of the mind. The modulation of cognitive and behavioural function occurs through the effect of biomolecules in modulating neural circuitry through processes of neuroplasticity and neurogenesis. However, an explanatory gap remains in the transition between two levels of description: how do molecular mechanisms which determine cellular and tissue functions lead to cognitive functions of the mind? This talk will present three possible mechanisms that link the biomolecular control of ion movements to local neural potentials which generate cognitive patterns of thought and consciousness. In focusing on the explanatory gap, this talk will also explore some of the opportunities that exist in bridging this gap and how in doing so, will provide greater opportunities in understanding how the physiological function of brain biomolecules translates into the cognitive functions of the mind.

SYMPOSIUM 1

Health and Environment

S1-01

CENTRAL AORTIC PRESSURE IN HEALTH AND DISEASE

Abdul Rashid Abdul Rahman MBChB, PhD, FRCPI, FRCP Ed, FNHAM

Consultant Physician and Medical Director, An Nur Specialist Hospital
Visiting Consultant, Clinical Research Center, National Heart Institute
Visiting Professor CUCMS, UIAM, UTM and IJN College

For more than a century, blood pressure measured non- invasively at the brachial artery has been used to measure blood pressure in human. Based on the result of this method, hypertension is diagnosed, patients prognosis estimated and response to treatment determined. While this approach has the backing of hundreds of epidemiological research and clinical trial data, it has to be remembered that blood pressure measured at the brachial artery is a surrogate of blood pressure which matters most , i.e blood pressure at the left ventricular - vascular interface, also known as the central aortic blood pressure. Measuring central aortic blood pressure, until fairly recently, can only be done invasively and hence do not have much practical utility. However over the last few years, several non- invasive techniques have been developed and validated against the gold standard invasive method. The two most popular and well validated methods use a generalised transfer factor method from pulse wave analysis derived by applanation tonometry of the radial artery and the moving point average method also from applanation tonometry of the brachial. In healthy young individuals, the central aortic pressure is typically lower than the brachial arterial pressure, a fact which has important diagnostic implication when assessing a young patient with elevated blood pressure. This is due to the Windkessel effect of pressure augmentation from central to peripheral arteries contributed partly by the elasticity of the aorta and the large arteries. As part of the aging process the aorta and the large vessels losses their elasticity resulting in increased arterial stiffness, increase pulse wave velocity and central aortic pressure augmentation. The central aortic pressure in this situation is reflective of that measured at the periphery. This vascular aging process can occur prematurely in individuals who smoke, has hypertension, diabetes, dyslipidaemia and in patients with chronic renal disease among others. What are the importance of this to researchers and practitioners? To begin with epidemiological studies have shown consistently that central aortic pressure predicts clinical outcome better than peripheral pressure. Secondly intervention trials have shown that antihypertensive drugs have a differential effect on central and peripheral pressure. One sub analysis of an outcome trial (CAFÉ) showed that this differential effect was translated into different clinical outcome, consistent with results from observational studies. If this is replicated in future hypothesis testing outcome trials, measurement of central pressure may be routinely incorporated in assessing patients with cardiovascular risk Central aortic pressure is now no longer only of interest to cardiovascular researchers. With the availability of non-invasive and validated methods of measurement, it has made its way albeit very preliminary to the doctor's office. It is a matter of time before it may be routine clinical practice, pending results from ongoing outcome trials.

S1-02

ENDOCRINE DISRUPTORS: OBESITY AND OBESOGENS

Mustafa Ali Mohd, PhD

Department of Pathology, Faculty of Medicine,
University of Malaya, 50603 Kuala Lumpur, Malaysia

In most cases, problems related to obesity and weight gain were associated with fats, diet and lifestyles, especially sedentary lifestyles and poor diets. Recently, there is an increasingly growing evidence that points to environmental pollutants, specifically, a group of endocrine disruptors, as a cause for obesity and weight gain. These chemicals were specifically grouped as "Obesogens". Obesogens are chemicals or environmental pollutants that may alter the body's metabolism and predispose some individuals to weight gain. Obesogens are known as endocrine disruptors because they interfere with the normal functions of hormonal system by interfering in the chemical messaging of hormones to cells, by turning on, shutting down or modifying the signals, depending on the situation. Some of these obesogens also affects the number and the size of the fat cells. These effects are more prominent if exposures were at the early stage of development, even though it may occur in adults too. Currently, there are many man made chemicals that are used domestically and some are environmental pollutants that possess specific receptor sites that may interact with fat regulating mechanisms and alters their metabolism, resulting in weight gain, fat deposition or reduction in fat degradation. Some of these chemicals are found widely in domestic products and are very highly available in the environment. Some examples of these chemicals are plasticisers (phthalates), flame retardant chemicals found in mattresses, computers, insulators and many other domestic products. They are abundant in the environment and are relatively volatile and can be inhaled through air and also can be introduced into human by food contact and water sources. Polyaromatic hydrocarbons which are emitted from veicle exhaust, house heatings, smoke and cigarettes smoke were some of the common examples of environmental pollutants containing obesogens. Children and women of reproductive age are mostly prone to these effects and are of high concern.

S1-03

PRE-IMPLANTATION ENVIRONMENT AND FUTURE HEALTH: HUGE OUTCOMES FROM LITTLE EMBRYOS

Nor Ashikin Mohamed Noor Khan, PhD

Department of Physiology (Embryology),
Institute of Medical Molecular Biotechnology (IMMB)
Faculty of Medicine, Universiti Teknologi MARA
Selangor, Malaysia

Mammalian pre-implantation development is controlled by a series of well-coordinated molecular events. During this period, embryos are highly sensitive to environmental changes. Alterations in their environment may stimulate signaling events that causes alterations in developmental trajectories leading to risk of adult onset diseases. Plasticity of pre-implantation embryos has been reported in animal models and humans. Evidence of pre-implantation programming is observed from studies *in vivo* as well as *in vitro*. Numerous studies *in vivo* have reported the effect of maternal and paternal nutritional on molecular and metabolic adaptations of the embryo, with repercussion on fertility and postnatal health. The majority of studies *in vitro* on programming focused on Assisted Reproductive Technologies (ART) such as *in vitro* fertilization (IVF) and intracytoplasmic sperm injection (ICSI), for the treatment of infertility. Exposure of pre-implantation embryos to the *in vitro* milieu has been shown to affect growth and metabolism, as well as cause oxidative stress. In human studies, significant health outcomes such as vascular dysfunction and even cardiac remodeling have been reported. Outcomes from these studies suggest that pre-implantation programming is a complex process by which short-term epigenetic, metabolic, and developmental conditions, along with changes in maternal physiology, impose homeostatic changes in gene expression and alters setting of the neuroendocrine axis during later gestation. Although the use of animal models has considerably contributed to our understanding of pre-implantation programming, it is important to note that human embryos may possess different sensitivities. Nevertheless, caution in the handling and manipulation of human embryos and minimizing the duration of culture *in vitro* would likely reduce the potential of adverse consequences.

SYMPOSIUM 2

Molecular targets in advanced therapeutics I

S2-01

MOLECULAR TARGETS IN THERAPEUTICS: THE ROLES OF PHARMACOGENETICS

Siew Hua Gan, PhD

Human Genome Centre
Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

A number of studies in Caucasian populations have shown a relationship between genotype and the extent of the metabolism of CYP2D6 substrate, debrisoquine. Nevertheless, pharmacogenetic testing among the Malaysian populations and in other Asian countries are still in their infancies. The situation is further compounded when variabilities in the "Asian gene" exist when compared to Caucasian genes and most drug dosings in Malaysia are based on Caucasian data. Individuals who are lacking (poor metabolisers, PM) are *almost* always homozygous for null alleles whereas individuals homozygous for *CYP2D6*10* have slower rates of metabolism than individuals homozygous for *CYP2D6* wild type who are not phenotypically PMs. Extensive metabolisers (EMs) are individuals who are homozygous or heterozygous for the wild-type and exhibit normal enzyme activity while ultra-rapid metabolisers (UMs) are carriers of duplicated or multiduplicated active genes. Although prior knowledge of CYP enzyme activity has been suggested as a means to predict optimal dosage and prevent adverse drug reactions from occurring, this prediction has not led to the incorporation of such information into clinical practice. Variations of drug metabolism exist not only between individuals, but also among different ethnic groups. Care must therefore be taken when interpretating results from different ethnic groups. It is hoped that more pharmacogenetic-based studies can be conducted especially in Asia to aid in drug dosings.

S2-02

RELATIONSHIPS BETWEEN MAGNESIUM STATUS, OXIDATIVE STRESS AND INFLAMMATION: LINKS AND POSSIBLE THERAPEUTIC TARGETS?

Igor Iezhitsa, Dr. Sci. Biol, PhD

Department of Pharmacology,
Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia

Magnesium (Mg) deficiency has been reported to be common and may be present in over 10% of hospitalized patients, as well as in the general population. In 183 peer reviewed studies published from 1990 to 2008, Mg deficiency was associated with increased prevalence and risk in 11 major conditions [1]. Similarly, in 68 studies performed over the same period, Mg deficiency was found to predict adverse events and decreased risk of pathology was found upon supplementation or treatment [1]. Clinical presentations of Mg deficiency may vary from vague, non-specific symptoms to causing and/or exacerbating the progression of wide ranging diseases such as cardiovascular pathology, osteoporosis and type II diabetes mellitus [2,3]. Epidemiological and experimental studies have indicated a relationship among dietary Mg, oxidative and inflammatory stresses. Mg deficiency is associated with chronic, low-grade inflammation and activation of cell-mediated immunity. Inverse associations between dietary Mg intake and systemic inflammatory biomarkers including high-sensitivity C-reactive protein (CRP), interleukin-6 (IL-6), and tumor necrosis factor (TNF)α have been reported in both cross-sectional and prospective cohort studies of diverse human populations [2]. It might be accompanied by the activation of cells such as macrophages, neutrophils and endothelial cells. Mg deficiency is similarly accompanied by increased oxidative and nitrosative stress which contribute to disease progression. Intriguingly, Mg supplementation exert significant negative immunoregulatory effects, decreasing the production of pro-inflammatory cytokines, for example, (TNF)α, (IL)-1, (IL)-6 and CRP. It is accompanied by both decreased lipid peroxidation and nitric oxide concentrations. This concept is intriguing because it suggests a fundamentally common mechanism for many pathological conditions accompanied by Mg deficiency. One of the examples is diabetic and age-related cataract. Cataractogenesis is a multifactorial disease, related with various pathogenetic mechanisms that have not been completely clarified. Oxidative stress is one of the main factors contributing to senile cataract. But it is also recognized that inflammation could be an additional pathophysiological factor in senile cataract. This relationship suggests both novel therapeutic and preventative approaches. Our recent finding that magnesium level and oxidative stress plays a role in cataractogenesis might initiate new strategies in the prevention of the disease. Knowledge of connection between magnesium status, oxidative stress and inflammation is undoubtedly a step forward to better comprehension of pathophysiology of cataractogenesis as possible new therapeutic target in cataract treatment.

Reference:

[1] Ismail Y, Ismail AA, Ismail AA. *Clin Chem Lab Med*. 2010;48(3):323-7. doi: 10.1515/CCLM.2010.077.
[2] Magnesium in human health and disease. Editors: Watson, Ronald Ross, Preedy, Victor R., Zibadi, Sherma (Eds.), Humana Press, 2013. pp. 309. doi: 10.1007/978-1-62703-044-1
[3] Spasov AA. [Magnesium in clinical practice (monograph)] Volgograd: Publisher OOO "Otrok". 2000, p. 272.]

S2-03

CURRENT MOLECULAR TARGETS IN ANTIGLAUCOMA THERAPY: ROLE OF ADENOSINE RECEPTOR SIGNALING PATHWAYS

Renu Agarwal, PhD

Department of Pharmacology
Faculty of Medicine, Universiti Teknologi MARA
Selangor, Malaysia

Glaucoma, the leading cause of irreversible blindness, is characterized by progressive loss of Retinal Ganglion Cells resulting in progressively increasing visual field loss. While the precise underlying pathophysiological mechanisms remain debatable, the role of elevated intraocular pressure (IOP) is widely recognized. Current medications used to lower IOP often provide suboptimal control, cause adverse effects and are expensive, resulting in poor patient compliance. Over the past decades several newer targets in aqueous humor outflow pathways have been recognized and adenosine receptors (AR) are one of them. Although, the effects of AR stimulation on IOP are species-specific, generally, stimulation of A3AR increases IOP in any species and that of A1 lowers IOP. A2AR stimulation increases IOP in cat and mouse and decreases in rabbit, while its effects in human remain unclear. A2BAR have poor distribution in ocular tissue. All 4 types of ARs are G-protein coupled. A1 and A3AR are Gi-coupled whereas A2aAR and A2bAR are Gs-coupled receptors. There is substantial evidence that the AR initiate response through cAMP-protein kinase A, phospholipase-inositol triphosphate–diacylglycerol and phosphatidylinositol-3-kinase pathways and through these pathways ARs communicate with MAPK signaling pathways. ARs modulate cAMP formation depending on whether the Gs or Gi proteins are involved. cAMP then modulates extracellular signal regulated kinase (ERK)1/2 activity. ERK1/2 activation through A1 receptors in trabecular cells, which may be phospholipase C dependent or independent, finally culminates into increased matrix metalloproteinase (MMP)-2 production. MMP-2 enhances extracellular matrix (ECM) breakdown in trabecular meshwork and hence reduced IOP. ERK1/2 activation through A2AR increases expression of ECM components and hence increased IOP. A3 receptor activation results in chloride channel activation and increased aqueous humor formation, consequently, increased IOP. Considering such wide-ranging effects of ARs on IOP, molecules targeting AR signaling pathways may soon emerge as a new therapeutic class in the management of glaucoma.

SYMPOSIUM 3

Therapeutic strategies in cardio-renal diseases

S3-01

RENAL NERVE DENERVATION RESTORES THE BAROREFLEX CONTROL OF RENAL SYMPATHETIC NERVE ACTIVITY AND HEART RATE IN CISPLATIN INDUCED RENAL FAILURE RATS

Munavvar Zubaid Abdul Sattar, BPharm, MSc, PhD

Dean, School of Pharmaceutical Sciences, Universiti Sains Malaysia

Sympathetic hyperactivity in various pathological conditions leads to the impairment of the baroreflexes and gradually deteriorates cardiovascular homeostasis. The present study aimed to investigate the effect of cisplatin induced renal failure on the basal and reflexly mediated renal sympathetic nerve activity (RSNA) and heart rate (HR) by the high and low pressure cardiovascular baroreceptors. Renal failure was induced in the male Wistar Kyoto (WKY) rats by i.p. injection of cisplatin (5mg/kg). Renal failure was confirmed by abnormal renal function. Acute unilateral or bilateral denervation was performed and RSNA or HR baroreflex gain curves were generated by i.v. phenylephrine and sodium nitroprusside (50 µg/kg each). All groups of rats treated with cisplatin showed significant ($P<0.05$) reduction in glomerular filtration rate; increased plasma creatinine, fractional excretion of sodium and potassium and kidney index compared to the control. The cisplatin induced renal failure rats showed significant ($P<0.05$) decrease in arterial baroreceptor sensitivity compared to the control. Unilaterally denervated cisplatin treated rats did not show any recovery in the abolished arterial baroreflex sensitivity compared to intact renal nerve renal failure group, but able to restores the blunted cardiopulmonary baroreflex sensitivity. The impaired baroreflex sensitivity was significantly enhanced ($P<0.05$) following bilateral renal denervation. These findings suggest an important role of renal sympathetic nerve in cisplatin-induced renal failure model and that denervation restores the impaired baroreflex control mechanism in this model.

S3-02

MESENCHYMAL STEM CELLS IN CARDIOVASCULAR THERAPEUTICS – FROM BENCH TO BEDSIDE

Hamid Saeed, PhD

Assistant Professor, University College of Pharmacy, University of the Punjab, Allama Iqbal Campus, 54000, Lahore, Pakistan

Cardiovascular disease is amongst the main contributors of mortality and morbidity worldwide. Despite recent advancements in the field of medicine the prognosis for a number of patients with ischemic heart disease, myocardial infarction and heart failure remains poor aimed extensive investigations to come up with new therapeutic tools. In this context, cell based therapies have been introduced to regenerate damaged myocardium and to attenuate ischemic heart injury. However, optimal cell type to achieve prime clinical objectives has not been established yet. Mesenchymal stem cells (MSCs) hold the promise for future cardiac therapies and offer several technical and clinical advantages. MSCs have been shown to improve cardiac function in several ways – differentiation into cardiac lineage, cell-cell fusion, neovascularization and paracrine effects by secreting several of the angiogenic, anti-apoptotic and mitogenic factors. However, despite recent advancements in MSCs biology, there are still un-resolved questions, e.g., therapeutic mechanisms of MSCs, source and route to be used for a particular disease, end-point parameters to establish clinical efficacy, contraindications and uniformly recognized standard protocols for cell expansion, product quality and safety controls. Thus the present talk will cover wide ranging state of the art modalities employed for MSCs based cardiovascular therapeutics – basic to translational research, pertinent clinical trials on ischemic heart disease, myocardial infarction and heart attack, posed challenges and future prospects – en-route transition from experimental bench-side to clinical bedside.

S3-03

ADDRESSING THE RESIDUAL RISK FOR CVD IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Mafauzy Mohamed, MBBS, MMed. Sci, MRCP, FRCP

Health Campus, Universiti Sains Malaysia
Kubang Kerian, Malaysia

Despite efficacy of current standards of care, patients remain exposed to a high residual risk of CVD and micro-vascular complications. Residual vascular risk is particularly important in diabetes management and a large part of medical expenditure is due to CVD and micro-vascular complications of diabetes. CV residual risk is typically higher in type 2 DM without prior CVD and is even greater in those with established CVD. For LDL-C, lowering by 1 mmol/L with statins reduces major coronary events by 23%, leaving an unaddressed CV residual risk of 77% and aggressive lowering of LDL-C with maximal doses of statins does not eliminate CV risk. For blood pressure, about 80% of major cardiovascular events are not prevented by blood pressure lowering treatment. Intensive glycemic control, as shown in CV outcome trials like ACCORD, ADVANCE and VADT, also does not seem to further reduce CV events in patients with type 2 DM. High triglycerides (TG) and low HDL-C are important contributors to CV residual risk and this particular profile is called atherogenic dyslipidemia which is common in patients with type 2 DM, metabolic syndrome and in patients with established CVD. Lifestyle modification with proper diet and adequate exercise is an important step for reducing residual vascular risk in dyslipidemic patients. Omega-3 fatty acids have been shown to reduce CV risk and fibrates lower TG and increase HDL-C. In the FIELD trial, fenofibrate was shown to reduce CV events by 11% overall and by 27% in the subgroup of diabetic patients with atherogenic dyslipidemia. In the ACCORD-Lipid trial, combination of fenofibrate with simvastatin was shown to reduce CV events by 31% in diabetic patients with atherogenic dyslipidemia compared to those on simvastatin alone. In summary, despite efficacy of current standards, including achievement of LDL-C goals, patients remain exposed to a high residual risk of CVD. CVD residual risk is present in both diabetic and non-diabetic but diabetic patients are particularly affected. Atherogenic dyslipidemia is an important factor in CVD residual risk and is common in patients with type 2 diabetes and treatment of atherogenic dyslipidemia has been shown to reduce CVD residual risk.

SYMPOSIUM 4

Molecular targets for advanced therapeutics II

S4-01

GENETICS OF DRUG METABOLISM

Leif Bertilsson and Fazleen Hatta, PhD

Division of Clinical Pharmacology, Department of Laboratory Medicine at Karolinska Institutet, Karolinska University Hospital, Huddinge, Sweden and Faculty of Pharmacy, UiTM, Puncak Alam, Selangor, Malaysia

Many drugs need to be metabolized mainly in the liver before excreted as metabolites in urine.Cytochrome P450 (CYP) is a family of enzymes, where many members e.g.CYP2D6 are polymorphic and show pronounced interethnic differences in allelic variation.In Caucasians the allel CYP2D6*4 encodes no enzyme, while *17 and *10 in Africans and Asians, respectively, encode enzymes with decreased activity (cf review, 1). Subjects with the CYP2D6*4/4* genotype have the poor metabolizer phenotype. In 1985(2), we described a patient treated with the tricyclic antidepressant nortriptyline without any therapeutic response.She was identified as an ultrarapid metabolizer (UM) of nortriptyline and the probe drug debrisoquine (2). Later in 1993 (3), we showed that this patient was UM because she had a duplication of an active CYP2D6 gene. In a Swedish family, we showed that a father, a daughter and a son had 13 active CYP2D6 genes causing extremely high activity of CYP2D6(cf.1).In northern Europe and in Asian countries 1-2% carry a gene duplication or multiduplication, while as many as 29% of Ethiopians are carriers (cf.1). The alleles associated with decreased activity e.g. *10 and *17 together with gene duplication cause a very pronounced variation in CYP2D6 activity in different populations.CYP2D6 metabolises many classes of drugs such as antidepressants and neuroleptics.It has also been associated with personality traits and suicidality and the background for this has been discussed (4). CYP2C19 is also polymorphic with the *2 allele encoding no active protein.It is present in all populations, while the *3 allele is only present in Asians. The allele CYP2C19*17 contains two SNPs and is associated with increased CYP2C19 activity in the catalysis of the metabolism of omeprazole and escitalopram (5). This increase is,however, not considered clinically important. We described a patient with Behcet´s disease (BD), who was an extremely fast metabolizer of the two CYP2C9 substrates phenytoin and losartan (6). Hitherto, we have failed to find a molecular explanation for this ultrahigh activity of CYP2C9 (7), as we did for 2D6 (gene duplication) and 2C19 (two SNPs). The ultrahigh activity of CYP2C9 in the BD patient was not due to the disease, shown together with Prof U Yasar and his group. Turkish BD patients had lower rather than higher CYP2C9 activity compared to healthy controls (Goktas et al, submitted for publication). The lower activity in BD might be a down-regulation of CYP2C9 activity caused by inflammation in this disease. Environmental (comedication, disease, ethnicity etc) as well as genetic factors are important for the regulation of drug metabolism and treatment response (7).

References:

1. Teh HK,Bertilsson L. Drug Metab Pharmacokin 2012;27:55-67.

S4-02

HERBAL MEDICINES: THE EVIDENCE

Nuraini Che Aziz, Mohd Alfazari Mohd Ghazali, Mohd Aidil Azahar Abu Bakar, Mizaton Hazizul Hasan, Aishah Adam

Faculty of Pharmacy University Technology MARA, Bandar Puncak Alam, Selangor, Malaysia.

People are turning to nature for health maintenance. In Asia, systems of traditional medicines are often used alongside conventional, modern medicine. Evidence for effectiveness of traditional medicines is not often forthcoming especially in Malay society where the oral tradition of information transfer is used. We have collected data on effectiveness of several Malaysian herbs for a variety of conditions which are prevalent in Malaysia. Of concern is the prevalence of metabolic syndrome which has reached a high of 43.4%. The risk of diabetes mellitus in a person with metabolic syndrome is increased by 5 folds while cardiovascular disease risk is enhanced by 2 folds. In 2014, cancer has become the number 1 cause of death overtaking deaths due to cardiovascular diseases. Amongst the common herbs taken as food and/or as Malay traditional medicine are *Centella asiatica*, *Polygonum minus and Octomeles sumatrana*. Effects of asiatic acid, a chemical constituent of *C. asiatica* and purified fractions of *P. minus* were investigated using animal models of oral and liver cancer, respectively. Our results showed that treatment of mice with asiatic acid did not prevent tumour growth but reduced tumor invasion in SCID mice model of oral cancer. *P. minus* fraction had antiproliferative effect and was effective at ameliorating liver cancer in SCID mice model of liver cancer xenograph. *O. sumatrana* elicited antihyperglycemic effects in STZ-diabetic animals. Efficacy of each herb was backed by mechanistic effects at molecular level.

S4-03

TARGETTING SIGNALING PATHWAYS IN OBESITY REALTED PATHOLOGIES

Nor Azizan Abdullah, PhD

Department of Pharmacology, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia

Insulin resistance and chronic subacute inflammation are common features in obesity, type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD). Inflammation appears to be the unifying mechanisms behind the pathogenesis of obesity associated diseases. There is a close relationship between nutrient excess and derangements in the molecular mediators of inflammation. Obesity activates IKKβ/NF-κB and JNK pathways in adipocytes, hepatocytes, and associated macrophages. During metabolic dysregulation, ligands such as TNF-α, IL-1, Toll, or AGE and intracellular stresses such as ROS and ER stress activate these pathways. JNK and IKKβ activation can cause insulin resistance through phosphorylation of IRS-1 at serine sites that negatively regulate normal signalling through the insulin receptor/IRS-1 axis. In obesity associated cardiovascular diseases, one of the earliest detectable vascular abnormalities is impaired vascular relaxation. Impaired vascular function has been shown to be predictive of later cardiovascular complications. This early endothelial dysfunction is associated with circulating markers of inflammation. Thus, directly targeting inflammation with pharmacological interventions to treat and/or prevent insulin resistance and T2DM and modulate risk for CVD in obesity may be of great clinical importance. Work in our laboratory has demonstrated that Withaferin A (WA), a steroidal lactone, suppressed inflammation and ameliorated metabolic derangements including insulin resistance in murine models of obesity. In HUVEC, WA significantly inhibited ROS production induced by palmitic acid. Additionally, WA significantly reduced inflammation by suppressing IKKβ/NF-κβ phosphorylation and TNF-α and IL-6 production in these cells was reduced. WA improved insulin resistance by inhibiting ROS- and inflammation-stimulated IRS-1 serine phosphorylation and concomitantly improved the impaired insulin PI3K signalling, thus restored the decreased nitric oxide (NO) production triggered by PA. WA also restored the impaired endothelium-mediated vasodilation in isolated aortic preparation exposed to PA.

SPECIAL LECTURE

SpL-01

ANIMAL MODELS IN TRANSLATIONAL RESEARCH – CHALLENGES AND OPPORTUNITIES

Debra SM Sim, PhD

Department of Pharmacology, Faculty of Medicine,
University of Malaya, 50603 Kuala Lumpur, Malaysia

Animal models have long been used in biomedical research for exploring the underlying pathology, understanding molecular mechanisms of diseases, identifying new drug targets and biomarkers, and evaluating the efficacy of novel therapeutic agents and innovative treatments [1]. Animals are also used to establish pharmacokinetic/pharmacodynamics (PK/PD) relationships, estimate clinical dosing regimens, and determine safety margins and toxicity. Moreover, they may be used to obtain products like vaccines, antibiotics, antivenoms, etc., which can be used in diagnostics and treatments. However, their most significant application is in assessing the therapeutic utility of new chemical entities, where animal models are used at the preclinical stage to validate targets and compounds. As such, they are invaluable in the drug discovery and development process; but it is in this area that their perceived limitations also become the subject of the greatest criticism. Many new potential therapeutic interventions that looked promising in preclinical development have failed to produce the desired improvement in healthcare at the clinical stage. An estimated 85% of research investment is wasted [2]. The main reason for these failures is thought to be a lack of critical evaluation of the face and predictive validity of the animal models used during the non-clinical stages [3]. It is suggested that this wastage may be avoided if preclinical scientists partner early with clinical scientists so that they can begin to envision the pathway forward for their work through clinical trials. Conversely, reverse translation of unsuccessful clinical experience to the preclinical field can be used to refine the models and improve their predictive value. In summary, while total 'Replacement' (one of the 3Rs) of animal models is unlikely, it does well for the scientific community to consider not only the R of 'Reduction' but also the R of 'Refinement' so as to enhance the translational value of these models [4].

References:

1. McGonigle, P. and B. Ruggeri, *Animal models of human disease: Challenges in enabling translation.* Biochemical Pharmacology, 2014. **87**(1): p. 162-171.
2. Macleod, M.R., et al., *Biomedical research: increasing value, reducing waste.* The Lancet, 2014. **383**(9912): p. 101-104.
3. Denayer, T., T. Stöhr, and M. Van Roy, *Animal models in translational medicine: Validation and prediction.* New Horizons in Translational Medicine, 2014. **2**(1): p. 5-11.
4. Groenink, L., G. Folkerts, and H.-J. Schuurman, *European Journal of Pharmacology, Special issue on translational value of animal models: Introduction.* European Journal of Pharmacology, 2015. **759**: p. 1-2.

FREE ORAL COMMUNICATIONS

O1-01

MECHANISM OF ALOE EMODIN INDUCED APOPTOSIS IN ER$^+$-BREAST CANCER CELLS, MCF-7

Indah Binti Mohd Amin[1], Siti Hamimah Sheikh Abdul Kadir[2], Nik Mohd Mazuan Nik Mohd Rosdy[1], Narimah Abdul Hamid Hasani[2]

[1]Faculty of Dentistry, [2]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia

Aloe emodin, an anthraquinone is highly cytotoxic to prostate and cervical cancer cells compared to normal. Accordingly, we found it to selectively inhibit the proliferation of estrogen receptor (ER)-positive cells, MCF-7 (IC_{50} of 80μM); but not ER-negative breast cancer MDA-MB-231 and non-transformed breast MCF-10A cells. In contrary, tamoxifen was cytotoxic to all three cells with IC_{50} of 27μM, 19μM and 42μM, respectively. However, underlying mechanism of aloe emodin-induced ER$^+$-breast cancer cell death remains unclear. Thus, we aim to investigate its cytotoxic action on MCF-7 cells using annexin V-FITC/PI staining and DNA fragmentation assay. Its underlying signalling pathways in the regulation of cell cycle (p53, p21, CDK1, CDK2, Cyclin B1 and Cyclin E1) and apoptosis (Fas receptor, FADD, Caspase-3, Caspase-8, Caspase-9, Bax, Bcl-2, and Cytochrome C) was investigated at gene and protein levels using QuantiGene 2.0 Plex and ELISA assays, respectively. MCF-7 cells were treated with aloe emodin and tamoxifen (positive control) at respective IC_{50} for 72 hours. Data was analysed using One-Way ANOVA with $p<0.05$. Aloe emodin induced early and late apoptosis in MCF-7 cells. Accordingly, DNA fragmentation was observed. In cell cycle signalling, aloe emodin upregulated the expression of p53 and p21 proteins; while downregulating CDK1. Only CDK1 protein is in accordance with gene expression. In intrinsic apoptosis signalling, Bax, Cytochrome C and Caspase-9 proteins were upregulated; while no change in Bcl-2 protein. Except for Caspase-9, these results are in accordance with gene expression. In extrinsic apoptosis, Fas receptor and Caspase-8 were upregulated, contrary to gene expression. These findings indicate that aloe emodin cytotoxic action on MCF-7 cells is through G_2/M arrest; and extrinsic and intrinsic apoptosis pathways. Data obtained suggests (i) aloe emodin has potential as a selective apoptotic inducer in ER$^+$-breast cancer management and (ii) used as basic rationale for *in vivo* study.

O1-02

PREDICTORS OF CORONARY COLLATERAL STATUS IN DIABETICS ON CONSERVATIVE MANAGEMENT FOR CORONARY ARTERY DISEASE

Anish Singhal[1], Sheila Pai[2], Rekha Kini[2], PS Mukund[3], M Chakrapani[4], Padmanabha Kamath[5]

[1]Postgraduate student in Physiology, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India
[2]Faculty of Physiology, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India
[3]Research Scholar Internal Medicine, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India
[4]Faculty of Internal Medicine, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India
[5]Faculty of Cardiology, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India

Oxidative stress over the myocardium and a sheer stress on the blood flow inside it due to Coronary Artery Disease (CAD) leads to arteriogenesis or vasculogenesis; together called as the Coronary Collaterals (CC). CC are often associated with CAD. Diabetes (DM), which is a major risk factor for CAD has controversial association with CC development. Though a few insights about the growth, development and associations of CC in CAD are known but conclusive data regarding their effectiveness in maintaining functional capacity of heart especially in conservatively managed CAD patients with DM is still lacking. The present study was designed to find the predictors of coronary collateral status in diabetics on conservative management for coronary artery disease. This was a Cross sectional Study from Feb 2014- Feb 2015. After the Institutional Ethics Committee approval, 41 patients of either sex (Mean Age 56.56 ± 6.44), from Department of Cardiology, Kasturba Medical College Hospital, Mangalore, Karnataka, India, were selected as per the inclusion and exclusion criterias. 11 of them had CC (Rentrops score >2) whereas 30 were without CC. Presence of CC was confirmed by offline Angiographic visualization. Assessment of severity of CAD was done by calculating the Syntax score. Scores obtained were verified by a blinded Cardiologist. Diagnosis of DM was according to the American Diabetes Association guidelines. Other parameters measured were BMI (kg/m^2), Total Cholesterol (TC), LDL, history of active Smoking & Duration of DM. All the data was computed and analyzed using SPSS Version 20.0, P value <0.05 was considered significant. The results portrayed that Syntax Score >22 (p=0.008) was significantly associated with development of coronary collaterals. Other parameters did not show any significant association. Hence, concluding that Syntax score apart from assessment of severity of CAD might also be used as a predictor of CC status in Diabetics on conservative management.

O1-03

DELETION OF $P2Y_6$ RECEPTOR AGGRAVATES PRESSURE OVERLOAD INDUCED CARDIAC DYSFUNCTION IN MOUSE

Caroline Sunggip[1], Motohiro Nishida[2]

[1]Faculty of Medicine and Health Science, University Malaysia Sabah, Kota Kinabalu, Sabah.
[2]Okazaki Institute for Integrative Bioscience, National Institutes of Natural Sciences, Aichi, Japan

Cardiovascular disease remains to be the main cause of mortality in the developed and developing country. Evidence are emerging on the importance of purinergic receptors as novel therapeutic target for cardiac remodeling and dysfunction. $P2Y_6$ receptor (P2Y6R), a G protein coupled receptor, has been previously reported to play a role in pressure overload-induced cardiac remodeling. Inhibition of $P2Y_6R$-$Ga_{12/13}$ signaling was shown to reduce the expression of fibrotic genes during pressure overload. It was speculated that $P2Y_6$ receptor signaling is the upstream of Angiotensin II (Ang II) and transforming growth factor-b signaling in the development of fibrosis. To further investigate the role of $P2Y_6R$ signaling in the cardiovascular system, $P2Y_6R$ knockout mice were used to clarify the involvement of $P2Y_6$ receptor signaling in tissue remodeling during chronic hemodynamic disturbance. In this study, $P2Y_6R$-deficient mice subjected to transverse aortic constriction (TAC) are susceptible to premature death induced by pressure overload. Chronic pressure overload induces earlier onset of left ventricular dysfunctions in $P2Y_6R$ deficient mice compared to WT, with aggravated hypertrophy and fibrosis at the end of the experimental period. Moreover, we found that chronic pressure overload-induced phosphorylation of Akt was significantly reduced in $P2Y_6R^{(-/-)}$ mice compared to that of WT. Interestingly, $P2Y_6R$ deficient mice subjected to 2 weeks TAC (sub-chronic) shows suppressed fibrosis, suggesting that $P2Y_6R$ may be a key role in pressure overload-induced adaptive cardiac remodeling. Persistence pressure, however, results in deleterious overcompensation, leading to rapid maladaptive hypertrophy. *In vitro* studies using a $P2Y_6R$ in which the integrin-binding domain (RGD) sequence has been mutated, we found that mechanical stretch-induced calcium response were significantly suppressed. We suggest that accumulation of extracellular matrix component (ECM) during pressure overload might increases the interaction between the RGD domain of $P2Y_6R$ to ECM, thus activating a survival signaling in the heart.

O1-04

TOCOTRIENOL SUPPLEMENTATION UPREGULATES SIRT1 GENE EXPRESSION IN AGING MICE OVARY

Saidatul Akhmal Khairuddin[1], Nasibah Azmi[2], Mudiana Muhamad[2], Nuraliza Abdul Satar[2]

[1]Institute of Medical Molecular Biotechnology, [2]Faculty of Medicine, Universiti Teknologi MARA, Jalan Hospital, 47000 Sg. Buloh, Selangor
[2]Faculty of Medicine, Universiti Teknologi MARA, Jalan Hospital, 47000 Sg. Buloh, Selangor

Gradual accumulation of damage by oxidative stress has been considered as one of the mechanism that leads to ovarian aging. Tocotrienol, a constituent of the natural vitamin E has been proven to overcome the adverse effect of oxidative stress in various body systems including female reproductive system. Therefore, this study was designed to investigate the effectiveness of tocotrienol supplementation as an antioxidant at different doses on the expression levels of SIRT1, one of the anti-aging genes in aging mice. Six months old female mice, *Mus musculus* were supplemented with either tocopherol-stripped corn oil (vehicle control) or tocotrienol (TCT) at the doses of 120, 150 and 180 mg/kg body weight (BW) orally per day for 30 days according to their respective groups. Young mice at the age of 6 weeks were used as negative control while aging mice at the age of 7 months were used as positive control. At the end of the TCT supplementation period, mice were sacrificed by cervical dislocation for ovaries collection. Total cellular RNA was isolated from the mice ovaries for gene expression analysis using QuantiGene Plex 2.0 Assay kits. The results showed that the expression level of SIRT1 was higher in the young ($p<0.001$) as compared to the aging group. More importantly, the SIRT1 gene expression was significantly increased in the tocotrienol supplemented groups at the dose of 120 ($p<0.05$), 150 ($p<0.001$) and 180 ($p<0.01$) mg/kg BW as compared to vehicle control group. This finding suggests that tocotrienol supplementation starting at the dose of 120 mg/kg is able to delay ovarian aging and increase the lifespan of female reproductive aging by up regulating the expression of anti-aging gene of aging mice ovaries.

O1-05

EXOGENOUS ADMINISTRATION OF ADIPONECTIN ATTENUATES RENAL EXCRETORY FUNCTION IN DIABETIC AND NON-DIABETIC SPONTANEOUSLY HYPERTENSIVE RAT

Sheryar Afzal[1], Munavvar A Sattar[1], Hassaan A Rathore[1], Mohammed H Abdullah[3], Safia Akhtar[1], Ashfaq Ahmad[1], Sadia Faraz[1,] Fayyaz Hasmi[1], Oh Hui Jin[1] , Mohamed Ibharim Lazhari[1], Nor A Abdullah[2], Edward J Johns[3]

[1]School of Pharmaceutical Sciences, Universiti Sains Malaysia, Minden, 11800 Penang, Malaysia
[2]Department of Pharmacology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia
[3]Department of Physiology, Western Gateway Building, University College Cork, Cork, Ireland

Spontaneously hypertensive rats (SHR) are good model of essential hypertension. Oxidative stress, disturbed glomerular hemodynamics, abnormal renal sodium and water transport with oxidative stress have been proposed in the pathogenesis of essential hypertension. Adiponectin, is a protein hormone, that may act as an arterial vasodilator to decrease blood pressure in experimental hypertension. This study investigates the effects of adiponectin on renal excretory function in diabetic and non-diabetic SHRs. Diabetes was induced with an I.P injection of streptozotocin (40 mg/kg) in control and adiponectin treated rats (STZ-CON, STZ-ADP) and compared with non-diabetic groups (ND-CON, ND-ADP). Adiponectin was administered intraperitoneally at a dose of 2.5µg/kg for one week. A group of WKY rats served as normotensive control. Metabolic data and plasma samples were taken on day 0,8,21 and 29. Plasma and urine samples were analyzed for sodium, potassium, creatinine and adiponectin concentrations. Invasive blood pressure and renal excretory measurements were obtained during the acute study at the end of four weeks treatment. Data, mean±SEM, was analyzed by repeated measure ANOVA followed by Bonferroni *post hoc* test with significance set at 5%. STZ-CON SHR had higher blood pressure, lower plasma and urinary H_2S, creatinine clearance, urine flow rate and urinary sodium excretion as compared to ND-CON SHRs and WKY control groups ($P<0.05$). Treatment with adiponectin for one week starting from day 21 decreased blood pressure and improved renal excretory functions in ND-ADP and STZ-ADP in comparison to ND-CON and STZ-CON SHRs. However, the magnitude of decrease in blood pressure and improvement in renal excretory functions was statistically insignificant between ND-ADP and STZ-ADP. The results suggested that adiponectin significantly decreases the blood pressure and improves the renal excretory function including creatinine clearance, urine flow rate and urinary sodium excretion in ND-ADP and STZ-ADP groups in comparison to ND-CON and STZ-CON SHRs ($P<0.05$).

O1-06

THE NEUROPROTECTIVE EFFECT OF MILD AND MODERATE HYPOTHERMIA IN THE ACUTE MIDDLE CEREBRAL ARTERY OCCLUDED (MCAO) RATS

Nursyazwani Omar[1], Andrean Husin[2], Zalina Ismail[3], Rosfaiizah Siran[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor
[2] Faculty of Dentistry, Universiti Teknologi MARA, Shah Alam, Selangor
[3]BRAINetwork Neurocognitive Centres, Universiti Sains Malaysia, Kubang Kerian, Kelantan

Stroke contributes to high morbidity and mortality rates worldwide. Treatment for acute stroke has been focused on minimizing the degree of brain injury. We determined the effect of systemic hypothermia on the brain injury in rats with the acute ischemic stroke. Thirty male Sprague Dawley rats (12 weeks old, weight of 200g -280g) were divided into 5 groups: normal control (sham operated with normothermia at 37°C), stroke control (MCAO with normothermia at 37°C), mild hypothermia (stroke with temperature of 36°C-34°C), moderate hypothermia (stroke with temperature of 33°C-30°C) and severe hypothermia (stroke with temperature of 29°C-27°C). Acute ischemic stroke was induced by occluding the right middle cerebral artery using the intraluminal technique. One hour after the surgery to induce stroke, the asymmetrical reflex was elicited by the simple tactile extinction test for confirmation of stroke before initiating the induction phase of hypothermia. The induction phase was achieved by alcohol sprays and cooling fans. The body temperature was maintained for three hours. The rats were sacrificed after 2-hour of rewarming phase. The serum was collected by a cardiac puncture for ELISA to estimate neuron specific enolase (NSE) and S100 calcium-binding protein B (S100B). The size of the infarct area was determined by the 2,3,5-triphenyltetrazolium chloride (TTC) staining. There were significant decrements in the NSE levels in the moderate hypothermia treated stroke as compared to the control group. All treatment groups showed significant increments in the S100B levels compared to control group. There were significant reductions in the infarct area of mild ($p=0.001$) and moderate ($p=0.047$) hypothermia treated stroke compared to control group. This study showed the neuroprotective effects of mild and moderate hypothermia against the ischemia induced by middle cerebral artery occlusion in rats.

O1-07

IDENTIFICATION OF ALPHA-GLUCOSIDASE INHIBITORS IN *COSMOS CAUDATUS* LEAVES USING GC-MS BASED METABOLOMICS

Alfi Khatib[1], Neda Javadi[2], Faridah Abas[3], Azizah Abd Hamid[2], Sanimah Simoh[4], Khozirah Shaari[3], Intan Safinar Ismail[3], Ahmed Mediani[2]

[1]Dept. Pharmaceutical Chemistry, Kulliyyah of Pharmacy, International Islamic University Malaysia, Kuantan 25200 Pahang, Malaysia
[2]Dept. of Food Science, Faculty of Food Science and Technology, Univ. Putra Malaysia, 43400, Serdang, Malaysia
[3]Laboratory of Natural Products, Institute of Bioscience, Universiti Putra Malaysia, Serdang 43400, Malaysia
[4]Biotechnology Research Centre, MARDI Headquarters, Serdang, P.O. Box 12301 50744, Kuala Lumpur, Malaysia

Cosmos caudatus, which is known as "Ulam Raja," is a herbal plant used in Malaysia to enhance vitality. This study focused on the evaluation of the α-glucosidase inhibitory activity of different ethanolic extracts of *C. caudatus*. Six series of samples extracted with water, 20%, 40%, 60%, 80%, and 100% ethanol (EtOH) were employed. Gas chromatography-mass spectrometry (GC-MS) and orthogonal partial least-squares (OPLS) analysis was used to correlate bioactivity of different extracts to different metabolite profiles of *C. caudatus*. The obtained OPLS scores indicated a distinct and remarkable separation into 6 clusters, which were indicative of the 6 different ethanol concentrations. GCMS can be integrated with multivariate data analysis to identify compounds that inhibit α-glucosidase activity. In addition, catechin, α-linolenic acid, α-D-glucopyranoside, and vitamin E compounds were identified and indicated the potential α-glucosidase inhibitory activity of this herb.

O1-08

NEGATIVE INOTROPIC AND CHRONOTROPIC EFFECT OF ROSELLE POLYPHENOLS ON ISOLATED RAT HEART

Lim Yi Cheng[1], Siti Balkis Budin[1], Faizah Othman[2], Satirah Zainalabidin [1]

[1]Faculty of Health Sciences, Universiti Kebangsaan Malaysia, 50300 Jalan Raja Muda Abdul Aziz, Kuala Lumpur
[2]Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Center, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur

Polyphenols have been proven as highly effective in preventing cardiovascular diseases. Roselle (*Hibiscus sabdariffa Linn*.), is rich with high antioxidant polyphenols. However, the action of roselle polyphenols on heart function is not fully known yet. The aim of this study was to investigate the direct effect of Roselle Polyphenols (RP) on Langendorff-perfused rat heart. In this study, healthy male *Sprague-Dawley* rat hearts were perfused ex-vivo using Krebs-Henseleit buffer (vehicle) or RP in a constant flow mode (10 ml/min). RP-induced changes in heart mechanical dynamics (perfusion pressure, left ventricle developed pressure (LVDP), maximum and minimum pressure derivatives (±dP/dt) and heart rate) were monitored during pre- and post-perfusion of RP (125, 250, 500, 1000 and 2000 μg/ml) at 10-minute interval. Repeated measures ANOVA was used for statistical analysis and $p<0.05$ was considered as significant. Perfusion with RP lowered the LVDP, ±dP/dt and heart rate significantly ($p<0.05$). This suggests RP's ability to reduce myocardial contractility and heart rate (negative inotropic and chronotropic). In addition, RP increased coronary perfusion pressure ($p<0.001$), indicating an improvement in coronary blood flow. The extract concentration above 1000 μg/ml significantly increased cardiac injury markers, i.e. troponin-T and lactate dehydrogenase (LDH) in coronary effluent. This suggests that the safety dosage range of RP was between 125~500 μg/ml. Pre-treatment with agonists of L-type Ca^{2+} channel (±)-Bay K 8644 (17.3 nM), β_1-adrenergic receptor Isoproterenol (1 nM), ryanodine receptor 4-Chloro-m-cresol (1 μM) and SERCA blocker thapsigargin (1 μM) which increased heart contractile response initially, were then significantly reversed by RP. In conclusion, perfusion of RP showed negative inotropic and chronotropic responses on Langendorff-perfused rat heart, with safety dosage range of 125~500 μg/ml. These effects are probably mediated through inhibitory action of calcium entry and calcium release. Current findings suggest nutraceutical value of roselle-derived polyphenol to prevent cardiovascular diseases such as angina pectoris.

O1-09

EFFECT OF WET CUPPING THERAPY ON BIOCHEMICAL PARAMETERS OF VENOUS BLOOD COLLECTED FROM OBESE MALE INDIVIDUALS

Mohd Anwar Md Yassin[1], Masyitah Mohamad Locman[2], Yusmi Mohd Yunus[3], Aishah Adam[1], Mohamed Mansor Manan[1], Nur Suraya Adina Suratman[1]

[1]Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Puncak Alam, Selangor, Malaysia
[2]Health Centre, Universiti Teknologi MARA (UiTM), Puncak Alam, Selangor, Malaysia
[3]Al-Jawahir Therapy Centre, Shah Alam, Selangor, Malaysia

Cardiovascular Disease (CVD) is a leading health problem caused by several risk factors which include obesity. Obesity is defined as abnormal or excessive fat accumulation that may impair health and is the fifth leading risk for global deaths. Wet cupping therapy (WCT) is a recognized Malay traditional medicine that was shown pre-clinically to be effective against CVD parameters. There was no study to determine effect of WCT on venous blood parameters. This study was conducted to determine effect of WCT on blood of obese male individuals pre and post wet cupping sessions. Obese male participants (n=31) aged 22 to 39 years were recruited with informed consent to receive two WCT sessions. All participants were subjected to venipuncture at baseline (BASE, day=0), before cupping (BWCT, day=21) and after cupping session (AWCT, day=42). Wet cupping sessions were conducted on days 28 and 35. For each WCT session, 3 cupping points were applied on participant's skin. Venous blood and cupping blood were collected and analysed. Paired sample t-test was utilized to determine mean differences at baseline, before and after WCT. Independent sample t-test was used to measure differences between venous and cupping blood samples. Level of significance was set to 5% and data analysis was performed by using Statistical Package for Social Science (SPSS) v.20 Windows version. There were significant changes in alanine transaminase ($p < 0.05$), aspartate transaminase ($p < 0.05$), glucose ($p < 0.05$), total protein ($p < 0.001$) and uric acid ($p < 0.05$) between BWCT and AWCT sessions. No significant changes following WCT were observed in levels of calcium, cholesterol, creatinine, high density lipoprotein, low density lipoprotein, total bilirubin and triglyceride. Two sessions of WCT significantly reduced glucose, total protein and uric acid thus may have a role in management of hyperglycemia and hyperuricemia.

O1-10

EFFECT OF ATENOLOL, A SELECTIVE BETA 1 BLOCKER, ON OVARIECTOMY-INDUCED OBESITY IN ADULT FEMALE ALBINO RATS

Mona Mohamed Ibrahim

Faculty of Medicine, MAHSA University, Kuala Lumpur, Malaysia
Faculty of Medicine, Minia University, El Minia, Egypt

The weight gain associated with ovariectomy (OVX) is found to be ghrelin mediated. Ghrelin is an orixgenic peptide that is secreted mainly from the stomach. The ghrelin secreting cells were found to have adrenergic beta 1 receptors. This work aimed to investigate the effect of atenolol on the treatment of ovariectomy-induced obesity as compared to hormone replacement therapy with estradiol. Twenty eight rats were divided into four groups: control sham operated (C), ovariectomized non-treated (OVX), ovariectomized+estradiol-treated (OVX+E) and ovariectomized + atenolol- treated (OVX+A) groups. Atenolol was given after one week recovery in a dose of 25mg/kg orally once daily for 4 weeks. Food intake, body weight, body mass index (BMI), gastrocolic omentum fat (GCOF), Total cholesterol (TC), Triglycerides (TGs), Low-density lipoprotein cholesterol (LDL-c), High-density lipoprotein cholesterol (HDL-c), insulin level, glucose level and Homeostasis model assessment of insulin resistance (HOMA-IR) were assessed. OVX significantly increased food intake, body weight, BMI, GCOF, serum level of TC, TGs and LDL-c, glucose, insulin and HOMA-IR, as compared with control and significantly increased HDL-c respectively. Estradiol reversed the ovariectomy-induced changes except that of TGs. As compared with OVX, atenolol caused a significant reduction of food intake, body weight, BMI, GCOF, serum level of TC, TG, and LDL-c, serum insulin and HOMA-IR with insignificantly different HDL-c and glucose level. As compared with C, atenolol kept all parameters insignificantly different except body weight, serum level of LDL-c, glucose and HOMA-IR were significantly higher in OVX+A. In conclusion, atenolol was effective in preventing the increase of food intake, BMI and GOF. Although atenolol was effective in reducing cardiovascular risks evidenced by a significantly lower serum level of TC, LDL-c and TG than the OVX group; it worsen the glycemic control evidenced by a significantly higher serum glucose level and HOMA-IR than C.

O1-11

STUDIES ON MITRAGYNINE, THE MAIN ALKALOID OF *MITRAGYNA SPECIOSA* USING BRAIN ENDOTHELIAL *IN VITRO* BLOOD-BRAIN BARRIER MODEL

Mahathir Mohd Uzid[1], Nur Aziah Hanapi[1], Sharif Mahsufi Mansor[1], Siti Rafidah Yusof[1]

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

Mitragynine (MG) is the major indole alkaloid found in leaves of *Mitragyna speciosa*, is traditionally used for its opioid agonistic properties. MG with its stimulant and euphoric effects has gained attention as a potential compound for drug addiction therapy and management of pain. The aim of this study is to investigate the effects of MG on blood-brain barrier (BBB) function and its BBB permeability using *in vitro* BBB model from primary porcine brain endothelial cells (PBECs). The PBECs was isolated and cultured yielding cell monolayer with average transendothelial electrical resistance (TEER) of 425.95 ± 6.56 $\Omega.cm^2$. Prior to permeability assays, we conducted MTT assay to determine PBECs viability at different concentrations of MG from 2.5-20 µM. MG did not affect PBECs viability up to 10 µM. Therefore, MG was tested at 10 µM for subsequent studies. Next we looked at MG effect on BBB tight junction function. MG did not lower PBEC monolayer TEER, indicating the tight junction function was preserved in presence of MG. BBB permeability assays were conducted from apical-to-basal (A-B; blood-to-brain) and basal-to-apical (B-A; brain-to-blood) directions to determine MG BBB permeability mechanisms. L-leucine and digoxin were used as uptake and efflux markers respectively. Sodium flourescein was used as paracellular permeability marker. From the results, MG showed higher A-B permeability compared to B-A with efflux ratio (B-A/ A-B) of 0.42, suggesting net permeability of influx into the brain, with possible carrier-mediated mechanism. The findings on MG BBB permeability mechanism are useful in therapeutic applications particularly in drug addiction.

O1-12

MEDICINAL EFFECTS OF HIBISCUS ROSA SINENSIS (HRS) FLOWER EXTRACTS ON HYPERCHOLESTEROLEMIA INDUCED CHANGES IN LIVER FUNCTIONS OF RODENTS

Urban John Arnold D'Souza[1], Anupam Biswas[2].

[1]Faculty of Medicine & Health Sciences, UMS, 88400, Kota Kinabalu, Sabah
[2]KVG Medical College, Karnataka India

Hyperlipidemia is a major cause of morbidity and mortality worldwide. The use of different plants to cure ailments has been a traditional practice from ancient times. It is emerging as an alternative medicine, health care may be affordable for all with scientifically proven properties of cure. Bunga Raya flowers (*Hibiscus rosa sinensis*; HRS*)* has been reported in the medicinal literature with beneficial effects in health disorders and used for medicinal properties. The cholesterol lowering effect of HRS flower extract and its hepato-protective functions at preclinical level need to be studied since there are less documented studies. Objective of the study was to observe the lipid lowering effects of HRS flower extracts and its hepato-protective effects. Male Wistar rats (180-230gm) were divided into seven groups of six each (n=6). Three doses of HRS extract- 80, 160 & 240 mg/kg body weight were tested. Rats were fed with cholesterol to achieve hypercholesterolemia. Lipid profile from the serum such as triglyceride, total cholesterol, LDL, HDL and VLDL, estimated in groups treated with three doses of HRS. Liver function parameters - SGPT, SGOT, total protein, albumin, globulin, alkaline phosphatase enzyme levels in all the groups were also estimated. Data obtained from the all experiments were analyzed by one way analysis of variance (ANOVA) followed by Bonferoni test (SPSS) version 17, 2007. P value <0.05 was considered as significant. The extract of *Hibiscus rosa sinensis* possess hypocholesterolemic potentiality. Comparing the positive control data with HRS treated groups, it is evident that HRS flower extract has lipid lowering property and enhances liver protection without any harmful side effects.

O1-13

CYTOTOXIC EFFECT OF POTENTIAL SOLVENTS FOR NOVEL 5-PHENYLAMINOURACIL DERIVATIVES IN VERO CELLS

Noor Fahitah Abu Hanipah[1], Noor Farah Omar Ahmad[1], Wang Seok Mui[1] , Meenaketan Tripathy[3], Eleena Gureeva[4] , Mikhail Novikov[4], Nafeeza Mohd Ismail [1], Anna Krasilnikova[1,2]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia
[2]Department of Clinical Pharmacology & Intensive Care, Volgograd State Medical University, Pavshikh Borsov Sq. 1, 40131, Volgograd, Russia
[3]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam Campus, 42300, Puncak Alam, Malaysia
[4]Department of Pharmaceutical & Toxicological Chemistry, Volgograd State Medical University, Pavshikh Borsov Sq. 1, 40131, Volgograd, Russia

The derivatives of 1-substituted 5-(phenylamino) uracil have recently demonstrated positive activity against HIV, Epstein-Barr Virus and Hepatitis C Virus. These compounds have potential use as anti-dengue virus treatment. However, the lipophilic properties of novel 5-(phenylamino) uracil derivatives significantly limit their further *in vitro* and *in vivo* studies. Based on the results of dissolution test L-arginine, sodium benzoate, and dimethyl sulfoxide (DMSO) were selected as potential solvents for 5-(phenylamino) uracil derivatives. However, the cytotoxicity of the selected hydrotropic agents in Vero cell was unknown. This study aimed to evaluate the cytotoxic effect of three potential solvents for novel 5-(phenylamino) uracil derivatives on Vero cells. Vero 76 cells 1×10^4 / well were seeded into 96 well plates and incubated overnight. Tested compounds were added into each well in dose ranged from 6.75 mM to 860 mM for L-arginine, 0.625 mM to 80 mM for sodium benzoate and 32 mM to 500 mM for DMSO. Each concentration was done in triplicates and repeated at least 3 times. The cells were incubated for 72 hrs at 37°C with 5% CO_2. Then MTS assay were performed and the absorbance was read at 490 nm. L-arginine maintained 100% cell viability at concentration ranged from 6.75 mM to 108 mM, however it significantly increased cell proliferation up to 180% at concentration ranged from 215 to 860 mM. Sodium benzoate and DMSO reduced cell viability in a dose dependent manner at concentrations above 10 mM and 160 mM correspondently. Observation of Vero cell morphology showed cell shrinkage, rounding up of the shape, and cellular detachment at concentrations associated with lower than 100% viability. Therefore, we concluded that concentrations of L-arginine, sodium benzoate, and DMSO that demonstrate 100% cell viability and are suitable to dissolve 1-substituted 5-(phenylamino) uracil derivatives are 108 mM, 10 mM, and 160 mM respectively.

O1-14

GASTROPROTECTIVE ACTIVITY OF CHLOROFORM EXTRACT OF *MUNTINGIA CALABURA* AND *MELASTOMA MALABATHRICUM* LEAF EXTRACTS

Zainul Amiruddin Zakaria[1,2,3], Amal Syahirah Nur Zainol[3], Adibah Sahmat[3], Nurul Izzah Salleh[3], Azfar Hizami[3], Nur Diyana Mahmood[3], Nurliana Nasir[3], Farah Hidayah Kamisan[3], Norhafizah Mohtaruddin[1], Siti Farah Md Tohid[1]

[1]Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia
[2]Halal Product Research Institute, Universiti Putra Malaysia, Serdang, Selangor, Malaysia
[3]Integrative Pharmacogenomics Institute, Universiti Teknologi MARA, Bandar Puncak Alam, Selangor, Malaysia

Muntingia calabura L. (Muntingiaceae) and *Melastoma malabathricum* L. (Melastomaceae) are traditionally used to treat ulcer-related diseases. The present study determines the mechanisms of gastroprotective activity of chloroform extract of their respective leaves, labeled as CEMC and CEMM, respectively, using several *in vitro* and *in vivo* assays. Phytochemical screening, HPLC analysis and antioxidant activity of the respective extract were carried out. Gastroprotective activity was determined using the ethanol-induced gastric ulcer assay while the mechanisms of gastroprotection was determined using the pyloric ligation assay. The test solutions (8% Tween-80 (vehicle), 20 mg/kg omeprazole, or the respective extract (50, 250, or 500 mg/kg) were administered orally once daily for 7 consecutive days followed by subjection to the respective assay. CEMC contains tannins, polyphenolics, triterpenes and steroids while CEMM contains only triterpenes and steroids. CEMC, but not CEMM, exerted remarkably strong antioxidant activity in the 2,2-diphenyl-1-picrylhydrazyl (DPPH) - (86% vs. 16%) and superoxide- (73% vs. 36%) radical scavenging assays. Both extracts demonstrated significant ($P<0.05$) gastroprotection with the EC_{50} recorded at 192.3 or 297.7 mg/kg, respectively. In the pylorus ligation assay, CEMC and CEMM significantly ($P<0.05$) reduced the volume and, total and free acidity while increased the pH of gastric juice as well as the gastric wall mucus content in comparison to the vehicle-treated group (Table 1). In conclusion, CEMC and CEMM exert gastroprotection partly via the respective antioxidant and non-antioxidant mechanisms, which were accompanied by their anti-secretory effects, respectively.

O2-01

DRUG PATENT LINKAGE IN INDIA: A CASE STUDY

Arun Nanda

Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak, Haryana, India

Drug Patent Linkage refers to the system or process by which a country links drug marketing approval to the status of the patent(s) corresponding to the originator's product. The concept of Drug Patent Linkage in India has been traced out in this work. In India, immediately after the implementation of Drugs & Cosmetics Act, 1940 and Patents Act, 1970, there was no drug patent linkage for a long time. In a unique judgement in Dec. 2008, Delhi High Court, by its decision, laid down Drug Patent Linkage, in a case of Hetero Pharma vs. BMS on Dasatinib. Upon this, the DCGI, India, also indicated his willingness to "police" drug patents. In another decision in 2008, Delhi High Court initially granted injunction in favour of Drug Patent Linkage (Bayer vs. Cipla – Sorafinib). However, in a series of litigations, Delhi High Court then turned down the concept of Drug Patent Linkage, in the same case, in Feb. 2010, which was supported by the Supreme Court of India, in Feb. 2010. This decision laid down clearly that the Drug Patent Linkage is not acceptable in India. In comparison, several countries, such as European Union, Malaysia, Brunei, Vietnam, The Philippines and Thailand do not have Drug Patent Linkage, while countries like USA, Canada, Japan, China, Australia and Singapore have a strong Drug Patent Linkage. The merits and demerits of Drug Patent Linkage are discussed. This linkage defers / delays the early introduction of cheaper generics in the market, and is heavily tilted towards litigation by innovators against generic companies. It is felt that this system is not friendly to the ultimate consumers, in particular, in poorer countries.

O2-02

THE POTENTIAL FOR CYCLOTRON AND GENERATOR-PRODUCED RADIOPHARMACEUTICALS IN NUCLEAR IMAGING: AN OVERVIEW

Ng Yen

Division of Medical Technology, Malaysian Nuclear Agency, Selangor, Malaysia

Cyclotrons in the energy range 10-30 MeV are widely used for the production of clinically relevant radioisotopes used in clinical nuclear imaging such as Positron Emission Tomography (PET) in disease diagnosis and therapy. Positron Emission Tomography is a powerful imaging tool that produces high quality 3-dimentional images of functional processes of body. The advantage of PET among all other imaging devices is that it allows the study of an impressive array of discrete biochemical and physiologic processes, within a single imaging session. The number of PET scanner increases every year globally due to high clinical demand. However, not all PET centres can afford a cyclotron, due to the expense associated with operation of an in-house cyclotron. Therefore, current research has also focused on the development of parent/daughter generators that can reliably provide PET nuclides. These generators (^{68}Ge/^{68}Ga generator, ^{62}Zn/^{62}Cu, ^{82}Sr/^{82}Rb, etc) can provide even short-lived radionuclides at any time on demand, without the need of an 'in-house cyclotron'. The parent isotope is produced at a cyclotron/reactor facility, and can be shipped to remote clinical sites (regionally/overseas), where the daughter isotope is eluted, a model similar to the ^{99}Mo/^{99m}Tc generator system. The specific aim for this presentation is to briefly describe the potential for both of the cyclotron and generator-produced PET radiopharmaceuticals in biomedical research and clinical imaging.

O2-03

URSODEOXYCHOLIC ACID PROTECTS CARDIOMYOCYTES AGAINST HYPOXIA VIA ERK AND AKT ACTIVATION

Noorul Izzati Hanafi[1], Anis Syamimi Mohamad[1], Nora Julianna Osman[1], Rosfaiizah Siran[1], Julina Md Nor[1], Siti Hamimah Sheikh Abdul Kadir[1]

[1]Faculty of Medicine, UiTM, Sungai Buloh, Selangor, Malaysia

Ursodeoxycholic acid (UDCA) is the most hydrophilic bile acid and widely used to treat liver diseases. Recently, studies have demonstrated the potential of UDCA in heart diseases. However, the action of UDCA in protecting heart against injury such as hypoxia is not well understood. Extracellular signal-regulated kinases (ERK) and Akt are protein kinases are known to be responsible in regulating cell progression and affect myocytes contraction. Therefore, we aims to investigate the effect of UDCA on hypoxia induced injury in cardiomyocytes. Briefly, the primary rat neonatal cardiomyocytes (0-2 days) were isolated and cultured. The cells were chemically induced with hypoxia using $CoCl_2$ (100 µM). Beating assessment were visually calculated and recorded as beat per minutes (bpm). For MTS assay, cells were treated for 24 hours with different doses of UDCA and $CoCl_2$ (0, 50, 100, 200, 300 µM). Then UDCA and $CoCl_2$ treated cells were lysed to assay for ERK and AKT expression by western blot. All data were analysed by Pair T-Test for beating assessment and one-way ANOVA for MTS assay ($p< 0.05$). Our finding shows significant reduction of beating rate by 59% in hypoxic environment (n=5; mean ± SEM; 55 ± 3.37 bpm) compared to control (134 ± 8.76 bpm). Hypoxia cells pre-treated with UDCA significantly increased the cardiomyocytes beating rate (70 ± 4.97 bpm) in comparison to post-treated with UDCA (42 ± 1.50 bpm). There was a significant difference between pre and post-treatment of UDCA with $p<0.05$. Furthermore, survival protein expression of ERK and Akt were up-regulated in hypoxic cardiomyocytes treated with UDCA compared to hypoxic cardiomyocytes only. In conclusion, pre-treatment with UDCA protects cardiomyocytes against hypoxia by regulating ERK and Akt. Furthermore, this study provides an insight into the cardioprotection caused by UDCA agianst hypoxia.

O2-04

TWENTY FOUR HOURS CONTINUOUS TYMPANIC TEMPERATURE RECORDINGS IN PATIENTS WITH UNDIFFERENTIATED FEVER - A PRELIMINARY OBSERVATIONAL STUDY

Pradeepa HD[1], Ganaraja B[2], Gopalkrishna K Bhat[3], Sathish B Rao[4], Pavan MR[4], Chakrapani M[4]

[1]Research scholar in Internal Medicine, Kasturba Medical College and Hospitals, Mangalore. Manipal University, Karnataka, India
[2]Faculty of Physiology, Kasturba Medical College and Hospitals, Mangalore. Manipal University, Karnataka, India
[3]Faculty of Microbiology, Kasturba Medical College and Hospitals, Mangalore. Manipal University, Karnataka, India
[4]Faculty of Internal Medicine, Kasturba Medical College and Hospitals, Mangalore. Manipal University, Karnataka, India

Fever is a presenting symptom of many diseases and an important diagnostic clue to find out the cause of the diseases. However, undifferentiated fever is a major clinical problem and it is very difficult to diagnose. Temperature monitoring has long been practiced in healthcare setups. However, its utility is being limited to check the presence or absence of fever. The Present study was aimed to observe the continuous 24 hours temperature recordings in patients with undifferentiated fever. In this preliminary study, 24 hours continuous tympanic temperatures of 33 healthy volunteers and 19 patients with undifferentiated fever were recorded. Temperature recoded using tympanic probe, which was connected to TherCom device. Fever patterns were classified and compared based on the final diagnosis. Among 19 patients, seven had tuberculosis (TB), four had enteric fever, six had dengue fever and two had inflammatory diseases. In Tuberculosis patients an early evening temperature elevation and a late nocturnal temperature dip was observed, in enteric fever two temperature peaks; one in the evening and another in the early morning period were observed, in dengue fever three temperature peaks were observed and in inflammatory diseases steady temperature elevation with nocturnal dip was observed when compared with temperature pattern in healthy volunteers. Twenty four hours continuous tympanic temperature recordings showed unique patterns for different etiologies of fever. This simple, non-invasive and inexpensive test might be a valuable diagnostic tool in undifferentiated fevers.

O2-05

5-LOX INHIBITORS FROM *CANARIUM PATENTINERVIUM* MIQ

Mogana Sundari Rajagopal[1], Christophe Wiart[2]

[1]Faculty of Pharmaceutical Sciences, No. 1 Jln Menara Gading, UCSI Heights, 56000 Cheras, Kuala Lumpur, Malaysia
[2]School of Pharmacy, Faculty of Science, Center for Natural and Medicinal Products Research, University of Nottingham (Malaysia Campus), Jalan Broga, 43500 Semenyih, Selangor, Malaysia

Canarium patentinervium Miq. is a medicinal timber from the genus *Canarium* L. and family Burseraceae Kunth collected from Bukit Putih Selangor. Bioassay guided fractionation of the ethanol extract of leaves afforded scopoletin, scoparone, (+)-catechin, hyperin and cynaroside while the chloroform extract of barks afforded vomifoliol, lioxin and syringic acid as the bioactive constituents. The anti-inflammatory activity of the pure compounds were assessed through the inhibition of 5-lipoxygenase (5-LOX) enzyme. All isolated compounds displayed significant *in vitro* 5-LOX inhibition compared to positive control NDGA. Both coumarins, scoparone and scopoletin (IC_{50} 0.97 µM and 1.77 µM respectively) had the most potent 5-LOX enzyme inhibition compared to NDGA (IC_{50} 96.53 µM). Given the aforementioned evidence, it is tempting to speculate these coumarins represents an exciting scaffold from which to develop leads for treatment of inflammatory related diseases as asthma, cardiovascular and cancer.

O2-06

IN- VITRO ANTIVIRAL ACTIVITY OF AQUEOUS EXTRACTS OF *POLYGONUM MINUS* HUDS LEAVES AGAINST HERPES SIMPLEX VIRUS 1

Alvin Paul[1], Sayang Baba[1], Saleha Shahar [1], Salehhuddin Hamdan[1]

[1]Department of Biological Science, Faculty of Biosciences and Medical Engineering, Universiti Teknologi Malaysia, UTM Skudai, Johor, 81310, Malaysia

Polygonum minus (*P. minus*) extract was investigated as a potential antiviral agent against herpes simplex virus 1 (HSV-1). Cell survival to assess antiviral activity was detrmined via MTT and crystal violet assays. Initially, cytotoxicity for minimal non-toxic dose was determined prior to MTT assay. The HSV-1 was infected at 1.00 MOI into Vero cells and the cytopathic effect was observed by inverted microscopy. Antiviral treatment was performed based on a time-of-addition routine; simultaneous-treatment, pre-treatment and post-treatment for 24 hours incubation. Aqueous extract was found to be effective in inhibiting HSV-1 in post-treatment, mildly effective in pre-treatment and not effective in simultaneous treatment. In conclusion, aqueous extract of *P. minus* could be a potential candidate for anti-HSV-1 activity. Indeed, further studies are required before a conclusive experimental finding be suggested.

O2-07

DIFFUSION-WEIGHTED IMAGING OF THE BRAIN OF CHILDREN WITH CEREBRAL PALSY: A QUALITATIVE ANALYSIS

Md Safwan Samsir[1], Asma Hayati Ahmad[1], Salmi Abd Razak[1], Mohd Zulkifli Abdul Rahim[2], Chia Shu-Lin[3], Nik Mohammad Faez Nik Osman[1]

[1]School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia
[2]School of Health Sciences, Universiti Sains Malaysia, Kelantan, Malaysia
[3]Taipei Veterans General Hospital

Cerebral palsy is a motor impairment caused by a lesion in the motor region in the brain. The lesion causes disruption not only to the gray matter but also the white matter connecting motor area to other areas in the brain. White matter connectivity in the brain can be traced using diffusion-weighted imaging, utilising the diffusion properties of water molecules along the neuronal axons. In this study, we qualitatively investigated the correspondence between white matter connectivity and motor function among children with cerebral palsy. Six cerebral palsy children aged 8 to 18 diagnosed with hemiplegia and diplegia on follow-up in Hospital Universiti Sains Malaysia were recruited. Their brains were scanned using 3T MRI scanner using diffusion-weighted imaging paradigm. Fiber tracking was then performed using FDT in FSL software, utilizing 5000 streamline samples. The seed mask was placed in the primary motor area and the target mask in the thalamus. The resulting images were analysed qualitatively. Abnormalities in the corticospinal tract were observed in all participants' diffusion tensor images. Reduced diffusivity was found in the tracts that were lesioned which corresponded with the type of cerebral palsy.

O2-08

DOWN REGULATION OF *CYSTATHIONE Γ LYASE* AND *ENDOTHELIAL NITRIC OXIDE SYNTHASE* AND REDUCED RESPONSIVENESS OF A_{1A} ADRENERGIC RECEPTORS IN THE KIDNEY OF LEFT VENTRICULAR HYPERTROPHIED *WISTAR KYOTO RATS*

Ashfaq Ahmad[1], Munavvar Zubaid Abdul Sattar[1], Hassaan Anwer Rathore[1], Safia Akhtar Khan[1], Mohammed Ibrahim Lazhari[1], Sheryar Afzal[1] , Furqan Hashmi[1], Fayyaz Hashmi[1], Sadia Faraz[1], Yen Pei Pei[1], Oh Hui Jin[1], Nor Azizan Abdullah[2], Edward James Johns[3]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, 11800, Malaysia.
[2] Department of Pharmacology, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia.
[3] Department of Physiology, University College Cork, Cork, Ireland

This investigation explored the relationship between the renal expression of *cystathione gamma lyase (CSE)* and *endothelial nitric oxide synthase* (*eNOS*) mRNAs and the responsiveness of α_{1A} adrenergic receptors in the renal vasculature following left ventricular hypertrophy (LVH). LVH was established by administering Isoprenaline (5mg/kg, 5 injections sc, 72 hrs apart) with caffeine, 62mg/L, in the drinking water for 2 weeks. Renal expression of *CSE* mRNAs and *eNOS* mRNAs was estimated using RT-PCR. Renal vasoconstrictor responses were measured using local administration of adrenergic agonists noradrenaline (NA), phenylephrine (PE) and methoxamine (ME) and the selective α_{1A} adrenergic antagonist 5-methyleurapidil (5-MeU). Mean arterial blood pressure (MAP) was higher (144±9 vs 116±4 mmHg) and renal cortical blood perfusion was lower in the LVH (102±5 vs 157±19bpu) compared to the control group (all $P<0.05$). There was a down-regulation of mRNA expression for renal *CSE*, by 68%, and *eNOS*, by 79%, in the LVH compared to the control group (taken as 100%) (all $P<0.05$). The high dose 5 MeU attenuated the vasoconstrictor responses to NA by 33%, PE by 44% and ME by 43% in the LVH compared to the same dose of control WKY group. The reductions in basal renal cortical perfusion and α_{1A} adrenergic receptor vasoconstrictor responses in LVH were associated with the down regulation of renal *cystathione gamma lyase*/hydrogen sulphide and *endothelial nitric oxide synthase*/ nitric oxide pathways. This suggests that removal of pathways generating vasodilator factors may have reduced the ability of adrenergic agonists to induce a vasoconstriction of α_{1A} adrenergic receptors in the renal vasculature of LVH.

O3-01

ANALGESIC EFFECT OF ZERUMBONE ON A MOUSE MODEL OF CHRONIC CONSTRICTION INJURY-INDUCED NEUROPATHIC PAIN

Nurul Atiqah Zulazmi[1], Banulata Gopalsamy[1], Ahmad Akira Omar Farouk[1], Mohd Roslan Sulaiman[1], Hemabarathy Bharatham[2], Enoch Kumar Perimal[1]

[1]Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[2]Biomedical Science Programme, School of Diagnostic and Applied Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia

Neuropathic pain is a chronic condition that is difficult to be treated. Current therapies available are either ineffective or non-specific thus requiring newer treatment approaches. In this study, we investigated the antiallodynic and antihyperalgesic effects of zerumbone, a bioactive sesquiterpene from Zingiber zerumbet in chronic constriction injury (CCI)-induced neuropathic pain animal model. Our findings showed that single and repeated dose of intra-peritoneal administration of zerumbone (5, 10, 50, 100 mg/kg) significantly attenuated the CCI-induced neuropathic pain when evaluated using the electronic von Frey anesthesiometer, cold plate, Randall–Selitto analgesiometer and the Hargreaves plantar test. Zerumbone significantly alleviated tactile and cold allodynia as well as mechanical and thermal hyperalgesia. Our findings are in comparison to the positive control drugs gabapentin (20 mg/kg i.p.) and morphine (1 mg/kg i.p.). Together, these results showed that the systemic administration of zerumbone produced marked antiallodynic and antihyperalgesic effects in the CCI-induced neuropathic pain in mice and may serve as a potential lead compound for further analysis.

O3-02

POSSIBLE MECHANISM OF LEPTIN-INDUCED CHANGES ON SPERM PARAMETERS OF SPRAGUE DAWLEY RATS

Fayez Almabhouh [1], Khairul bin Osman [2], Siti Fatimah Binti Ibrahim[2], Harbindar Jeet Singh[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sg Buloh Campus, 47000 Sg Buloh, Selangor, Malaysia,
[2]Faculty of Allied Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda, Kuala Lumpur, Malaysia

Exogenous leptin administration has been shown to adversely affect sperm count, sperm morphology, sperm DNA integrity and alter its histone: protamine ratio in normal rats, but the mechanisms by which leptin-induces these effects are poorly understood. This study therefore examined the effects of leptin on gene expression profile in rat testis using microarray analysis.
12-week old male Sprague-Dawley rats were randomized into control and leptin-treated groups (n=6). Intra-peritoneal leptin injections (60 µg/kg) were given daily for 42 days whilst the controls received saline. Upon completion of the treatment, the animals were anesthetized and laparotomy was performed and the testes were removed. Total cellular RNA was extracted from the testes for microarray analysis and Real-time-PCR. Data from microarray analysis were analyzed using Affymetrix software. Changes in the gene expression of 2-fold or more were compared to the controls ($p<0.05$). Microarray analysis revealed 5693 genes that were differentially expressed in leptin-treated rat testes. Of these, 1893 genes were up-regulated and 3800 genes were down-regulated in leptin-treated rats when compared to those in controls. These changes included up-regulation of respiratory chain enzyme genes, and down-regulation of anti-oxidant enzyme genes like; CAT, GPX1 and GST. Expressions of TNF-α, AIF, p53, p21, PRM1, HAT and JNK pathway were also up-regulated while the expression of Bcl2-like-1 was down-regulated following leptin-treatment. Real-Time-PCR also revealed significantly higher mRNA expressions of AIF, NDUFAF, p53, p21, TNF-α, HAT and JNK in leptin-treated rats when compared to those in controls. Expression of GPX1 was significantly lower in leptin-treated rats when compared to control. It appears that the adverse effects of leptin involves increases in free radical activity that then induces DNA fragmentation and apoptosis of sperm and seminiferous tubular cells through activation of AIF, TNF-α and JNK pathway.

O3-03

THE EFFECTS OF TESTOSTERONE DEFICIENCY AND REPLACEMENT ON INFLAMMATORY CYTOKINE LEVELS IN RATS

Kok-Yong Chin[1], Soelaiman Ima-Nirwana[1]

[1]Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur, Malaysia

Testosterone deficiency has been linked to low-grade inflammation in humans, but this has not been demonstrated in an animal study. This study aimed to determine the effects of testosterone deficiency and replacement on the circulating inflammatory cytokine levels in orchidectomized male rats. Three-month old Sprague-Dawley male rats (n=18) were randomly divided into three groups. Bilateral orchidectomy was performed on two groups. The sham group was subjected to similar surgical stress, but their testes were not removed. One of the orchidectomized group received intramuscular injection of 7 mg/kg testosterone enanthate suspended in peanut oil weekly and the other two groups received equivolume of peanut oil injection. After 8 weeks, the rats were sacrificed and their blood was collected for the measurement of inflammatory cytokine levels using Procarta multiplex immunoassay. The serum testosterone level was determined using enzyme-linked immunoassay. The untreated orchidectomized group had a significantly lower testosterone level compared to the sham group ($p<0.05$). Testosterone replacement significantly increased the level of testosterone in the orchidectomized rats compared to the sham and untreated orchiderdectomized rats ($p<0.05$). Testosterone deficiency marginally increased the level of interleukin-1 alpha, interleukin-1 beta and tumour necrosis factor alpha ($p>0.05$). Interleukin-6 level was significantly increased in the orchidectomized group compared to the sham group ($p<0.05$). Testosterone replacement at the supraphysiological dose failed to reduce the level of inflammatory cytokines in orchidectomized rats ($p>0.05$). As a conclusion, testosterone deficiency can elicit a state a low-grade inflammation, particularly an increase in interleukin-6 level, but testosterone replacement at supraphysiological dose not suppress the inflammation.

O3-04

NOVEL COPPER BASED COMPOUND REVAMPS THE APOPTOTIC NETWORK, CELL CYCLE ARREST AND CYTOSKELETAL REARRANGEMENT IN HUMAN COLON CANCER CELLS

Nima Samie[1], Batoul Sadat Haerian[1],Sekaran Muniandy[1], MS Kanthimathi[1], Nooshin Mohebali[1], Raja Elina Raja Azudin[2]

[1]Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia
[2]Hospital Kuala Lumpur (HKL), 50586 Kuala Lumpur, Malaysia

Colon cancer is one of the three most prevalent types of cancer worldwide. The broad clinical application of metal based compounds has led to the discovery of potential therapeutic drugs. The aim of this study was to evaluate the cytotoxic action of copper based compound (CBC) against human colon cancer cells. In this line, we determined the potency of CBC in the induction of apoptosis, cell cycle arrest, and cytoskeleton rearrangement. HT-29, WiDr and CCD-18Co cell lines were used to determine the IC_{50} of CBC using MTT assay. Analysis of apoptosis was carried out using immunofluorescence, acridine orange/propidium iodide double staining, Annexin-V-FITC assay, evaluation the translocation of NF-kB, oxygen radical antioxidant capacity, reactive oxygen species, measurement of LDH release, caspase-3/-7, -8 and -9 assay and western blotting. Cell cycle was examined using flow cytometry and gene expression was assed using qPCR. Results showed that CBC displayed a potent suppressive effect on HT-29 and WiDr cells with an IC_{50} value of 2.54±0.54 and 2.13±0.65 µM respectively after 24 h of treatment. Dipping in the mitochondrial membrane potential and increased release of cytochrome c from the mitochondria indicated induction of the intrinsic apoptosis pathway by CBC. Activation of this pathway was further evidenced by significant activation of caspase 9 and 3/7. CBC was also shown to activate extrinsic pathways of apoptosis by activation of caspase-8 which is linked to the suppression of NF-kB translocation to the nucleus. Cell cycle arrest in the G1 phase and up-regulation of glutathione reductase, based on excessive ROS production were also observed. Results of this study suggest that CBC is a potent anti-cancer agent inducing both intrinsic and extrinsic pathways as well as cell cycle arrest in the colon cancer cells.

O3-05

THE EFFECT OF INTRAVENOUS N-ACETYLCYSTEINE (NAC) ON TISSUE MALONDIALDEHYDE (MDA) LEVEL AND RENAL FUNCTION IN GLYCEROL-INDUCED RAT

Nurina Hasanatuludhhiyah[1], Suhartati[1]

[1]Faculty of Medicine, Airlangga University, Surabaya, East Java, Indonesia

Oxidative injury produced via Fenton reaction and myoglobin redox cycle plays crucial role in the pathogenesis of myoglobinuric acute kidney injury. It may damage renal tubules as well as generate lipid peroxidation products with vasoconstrictor properties. *N-acetylcysteine* (NAC) is an antioxidant, which has been proven for the protective effects in many models of renal injury and also the improvement of renal microcirculation. The aim of this study was to scrutinize any protective effect of NAC in glycerol induced rat model by measuring tissue malondialdehyde (MDA) and renal function, and to explore whether the effect was dose-related or not. Male Wistar rats were divided into five groups: 1) saline control group, (2) glycerol (50%, 8mL/kg, i.m) plus saline i.v group, 3) glycerol plus NAC (100 mg/kg)-treated group, 4) glycerol plus NAC (200 mg/kg)-treated group, 5) glycerol plus NAC (400 mg/kg)-treated group. Rats were sacrificed at 24 h after glycerol injection, the cardiac blood was obtained and renal tissues were harvested for MDA measurement by thiobarbituric acid assay. Our study demonstrated that glycerol administration significantly increased renal tissue MDA as well as BUN (blood urea nitrogen) and serum creatinine, however, NAC administration prevented the MDA increment. Intravenous administration of NAC also preserves renal function since there were significant differences in BUN and serum creatinine between glycerol+NAC treated groups and glycerol group. However, there was a significant correlation of the dose of NAC with tissue MDA level and renal function parameters. We concluded that NAC 100 mg/kg attenuates lipid peroxidation and improves renal function in the glycerol induced rat model, nevertheless, the protective effect was diminished in higher doses.

O3-06

MORINGA OLEIFERA AQUEOUS LEAF EXTRACT: ROLE ON TOTAL LEUCOCYTE COUNT & ITS DIFFERENTIALS IN CADMIUM EXPOSED ADULT WISTAR ALBINO RATS

Pratik Kumar Chatterjee[1], Vinodini NA[1], Poulomi Chatterjee[2], Rashmi KS[1], Suman VB[1]

[1]Facultyof Physiology, Kasturba Medical College (KMC), Center for Basic Sciences (CBS), Bejai Campus, Mangalore, Manipal University (MU), Karnataka, India
[2]Dietician - formerly attached to Manipal Ecron Acu-Nova KH Clinical Research Centre, Manipal, Karnataka, India

Cadmium, an environmental metallic toxicant with varying degrees of toxicity, exists in different oxidational or transitional states, causes various blood disorders. *Moringa oleifera* a small, ornamental plant species originally from India has been scientifically assessed for various medicinal applications. The present study was conducted to examine the role of *Moringa oleifera* aqueous leaf extract on total leucocyte count including its differentials (neutrophils & lymphocytes) in cadmium exposed rats. In this experiment, guidelines of Institutional Ethics Committee were followed strictly for all the experimental procedures and animal maintenance. Twenty-four adult male *Wistar Albino* rats, weighing between (180-200) g were broadly divided into four groups, six animals in each group, with group I being the control. The results portrayed that pre-treatment with *Moringa* leaf extract, 100 mg/kg body weight, prior to the administration of cadmium showed a significant increase ($p \leq 0.001$) in the total leucocyte count including its differentials as compared to the cadmium alone treated group. Therefore, our study suggests that aqueous leaf extract of *Moringa oleifera* enhances the immune mechanisms to fight back foreign substances when exposed to cadmium toxicity.

O3-07

INHIBITORY EFFECT OF 2,4,6-TRIHYDROXY-3-GERANYLACETOPHENONE (tHGA) ON EXTRACELLULAR MATRIX DEPOSITION IN CHRONIC MURINE MODEL OF ASTHMA

Yu Zhao Lee[1], Mohd Roslan Sulaiman[1], Chau Ling Tham[1], Khozirah Shaari[2], Daud Ahmad Israf Ali[1]

[1]Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
[2]Institute of Bioscience, Universiti Putra Malaysia

Asthma, a chronic inflammatory disease of lung is a worldwide pandemic that affects over 300 million of people today. Current treatment of asthma includes inhalation of corticosteroids and bronchodilators that manages the symptoms. However up to 10% of patients does not response to steroids treatment. It is also reported that the current treatment does not curb airway structural remodeling of chronic asthma which include increased extracellular matrix (ECM) deposition and increased airway smooth muscle (ASM) cells. It was understood that myofibroblast that emerges from airway epithelial cells through epithelial-mesenchymal transition contributed the majority of ECM deposition and the hyperplasia of ASM. The present study was to investigate the therapeutic effect of an orally administered non-steroidal LOX-2 inhibitor, 2,4,6-trihydroxy-3-geranylacetophenone (tHGA), on the attenuation of myofibroblast number and activity in a chronic murine model of asthma. BALB/C mice were sensitized and challenged with ovalbumin (OVA) and treated with several oral doses (80, 40, 20 mg/kg) of tHGA prior to each OVA challenge. Lung tissues were homogenized and underwent western blot and PCR analysis to examine the expression level of extracellular matrix protein fibronectin and tenascin-C. Mesenchymal cell marker vimentin was also evaluated. tHGA demonstrated supression of the synthesis of fibronectin and tenascin-C. Dose-dependent reduction after tHGA treatment of vimentin was demonstrated indicating a reduction of myofibroblast in lungs. These preliminary data showed that tHGA, when given orally, is able to suppress airway remodeling in a chronic model of asthma. Thus, tHGA may posses new therapeutic potential of an oral formulation for the treatment of bronchial asthma.

O3-08

PREDICTORS OF ANASTROZOLE-INDUCED ADVERSE REACTIONS IN POSTMENOPAUSAL BREAST CANCER PATIENTS: ROLE OF SERUM ESTROGEN LEVEL AND DURATION OF ANASTROZOLE TREATMENT

Murtala B Abubakar[1, 2], Venkata Murali Krishna Bhavaraju[3], Siew Hua Gan[1]

[1]Human Genome Centre, [3] Department of Nuclear Medicine, Radiotherapy and Oncology, School of Medical Sciences, Universiti Sains Malaysia 16150 Malaysia.
[2]Department of Physiology, College of Health Sciences, Usmanu Dan Fodiyo University PMB 2254 Sokoto, Nigeria.

Anastrozole (Anas) plays a key role in the management of endocrine sensitive post-menopausal (PM) breast cancer (BC) patients. However, there is great variability in both its efficacy and tolerability. Anas-associated musculoskeletal symptoms (MS) and other adverse reactions such as hot flashes (HF) and vaginal dryness/dyspareunia (VDD) are common and can contribute to withdrawal from treatment. In this study, a cross sectional study on estrogen receptor (ER) positive PM women (n = 92) with stages I to III BC who received anas (1 mg/d) was conducted to examine the factors associated with anas adverse effects using multivariate analyses. The mean concentration of serum follicle stimulating hormone level was 61.24 IU/L. Although serum estradiol concentration was undetectable (< 36.7 pmol/L) in 68.1% of the subjects, it was however within normal range (>36.7-88.1 pmol/L) in the remaining 31.9% of the patients who had lower odds of overall adverse effects (OAE) when compared to those with undetectable levels [adjusted odds ratio (AOR) 0.12, 95% confidence interval (CI) 0.02 to 0.64, p = 0.013]. Patients who received anas treatment for more than one year had higher odds of having OAE (AOR 28.43, CI 1.80 to 451.33, p = 0.013) and VDD (AOR 27.90, CI 2.21 to 351.84, p = 0.002). Those with grades II and III tumour and with family history of BC had higher odds of OAE (grade II-AOR 12.22, CI 1.48 to 100.80, p = 0.020, grade III-AOR 12.95, CI 1.25 to 134.33, p = 0.032) and VDD (AOR 5.99, CI 1.30 to 27.52, p = 0.021) respectively. Advanced age also contributed to lower odds of HF (AOR 0.90, CI 0.83 to 1.00, p = 0.049). Overall, the study suggests that patient's hormonal environment and duration of treatment with anas play a key role in developing anas-induced adverse effects.

O3-09

ANTI-PROLIFERATIVE AND ANTI-INVASION EFFECT OF ASIATIC ACID AGAINST ORAL SQUAMOUS CELL CARCINOMA - *IN VITRO* AND IN ORTHOTOPIC XENOGRAFT MODEL STUDIES

Nuraini Che Aziz[1], Fahima Khan[2] , Javed Mahmood[2], Aishah Adam[1]

[1]Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Bandar Puncak Alam, Selangor, Malaysia
[2]School of Medicine, University of Maryland, Baltimore

Oral cancer is among the most common cancers in South East Asia with a survival rate of 50% for the past thirty years due to poor prognosis. Squamous cell carcinoma (SCC) is the most common histological subtype of oral cancer. This study was aimed at evaluating the anti-proliferative effect of asiatic acid (AA), a pentacyclic triterpene against OSCC *in vitro* and its protective effect in orthotopic xenograft model of oral cancer. Anti-proliferative activity was determined by MTS assay. Expression of genes that account for cell proliferation namely Bax and Bcl-2 were determined by quantitative RT-PCR with AA (30 and 40 μM). To determine protective effect of AA against OSCC *in vivo*, AA (1, 5 and 10 mg/kg, *i.p.*) and normal saline were given daily for three weeks prior tumor inoculation to tongue of severely compromised immunodeficiency (SCID) mice. Treatment continued for four weeks following tumor inoculation. IC_{50} for AA in OSCC at 24, 48 and 72 h were 36 ± 4, 38 ± 1.7 and 12 ± 3.5 μM, respectively. AA significantly ($p < 0.05$) initiated apoptosis by down regulation of Bcl-2 gene by 59% and 68% and upregulation of Bax gene by 2.37 and 2.06 folds when treated with 30 and 40 μM, respectively. Eventhough AA did not affect tumor formation, the tumors that were formed were smaller in their area of invasion. In conclusion, AA showed promise as an anti-proliferative agent against oral squamous cell carcinoma *in vitro* and prevented invasion of tumor *in vivo*.

O3-10

METABOLITE CHANGES ON BLOOD SERUM SAMPLE OF OBESE RATS TREATED WITH *PIPER BETLE* LEAVES EXTRACT ON ^{1}H NMR-BASED METABOLOMICS

Zuleen Delina Fasya Abdul Ghani[1,2], Juani Mazmin Husin[2], Ahmad Hazri Ab Rashid[2], Khozirah Shaari[3], Zamri Chik[1]

[1]Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur
[2]Industrial Biotechnology Research Centre, Sirim Berhad, 40700 Shah Alam
[3]Institute of Bioscience, Universiti Putra Malaysia, 43400 Serdang

Piper betle (PB) belongs to the *Piperaceae* family. The presence of a fairly large quantity of diastase in the *betle* leaf is deemed to likely play an important part in starch digestion and calls for the study of weight loss activities and metabolite profile from *Piper betle* leaf extracts using metabolomics approach to be performed. 70% ethanolic PB extracts were subjected to animal studies involving five groups of rats fed with high fat and standard diet. The animal groups were then fed with the extracts in two doses and compared with a positive control group given Phentermine and a negative control group given water according to then study protocol. The body weights and food intakes were monitored every week. At the end of the study, blood serum of the experimental animal was analysed to determine the biochemical and metabolite changes. High Fat Diet (HFD) animals treated with Phentermine gave a significant decrease in food intake and body weight from the Week 1 until the end of the studies. PB treated group demonstrated inhibition of body weight gain without showing an effect on the food intake. In serum bioassay the PB treated group showed a decrease in LDL level and increase in HDL level when compared with HFD group and decrease in LDH compared to drugs control group. For metabolite analysis, the PCA model showed that HFD group was characterized by high-level of the taurine, glycine and glucose. Reduction in the glycine and lactate level was evident in the PB treated group. Administering PB extracts leads to reduction of the glucose metabolism while also maintaining the body weight and without giving an effect on the appetite even though HFD was continuously consumed by the animals until the end of the studies.

O3-11

EFFECT OF 2, 4, 6-TRIHYDROXY-3-GERANYLACETOPHENONE (THGA) ON HUMAN BRONCHIAL SMOOTH MUSCLE PROLIFERATION IN VITRO

Yap Hui Min[1], Daud Ahmad Israf[1], Khozirah Shaari[2], Tham Chau Ling[1], Manraj Singh Cheema[1]

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

Asthma is a chronic inflammatory airway disease, which can be characterized by airway hyperresponsiveness (AHR) and airway remodeling. Increased airway smooth muscle (ASM) mass appeared to be the prominent hallmark of airway remodeling in asthma. A large number of mitogenic factors released during the inflammatory process in asthma, which includes growth factors, contractile agents and pro-inflammatory cytokines, promote the increase in ASM mass. The increase in ASM mass could be due to the increased rate of proliferation, decreased rate of apoptosis or migration of ASM. Current asthma treatment, which utilizes the combination of corticosteroid and beta$_2$-agonists, have little or no effect on airway remodeling. Previous studies had shown that 2,4,6-trihydroxy-3-geranlyacetophenone (tHGA), a non-steroidal synthetic compound, attenuated airway remodeling in a chronic murine model of asthma. In this study, human bronchial smooth muscle cells (HBSMC) were serum-starved overnight before induced in growth medium and co-treated with tHGA for 48 hours. Cytotoxicity of tHGA upon HBSMC was determined through lactate dehydrogenase (LDH) assay. Effects of tHGA upon HBSMC proliferation were examined using BrdU proliferation assay and also the mRNA expression of Ki-67, a proliferation marker. Cell cycle analysis was carried out to further examine the anti-proliferative effect of tHGA on HBSMC. Our findings demonstrated tHGA to be of significant value in inhibiting the proliferation of growth factor-stimulated HBSMC. The growth inhibitory effect of tHGA was further demonstrated through significant reduction of Ki-67 expression. Furthermore, tHGA was also shown to promote cell cycle arrest at the G1 phase. In conclusion, the anti-proliferative effect of tHGA upon HBSMC proliferation highlights the anti-remodeling potential of this compound in chronic lung disease. Further investigations are underway to examine the mechanism of action of tHGA in inhibiting ASM proliferation.

O3-12

STANDARDISED BIOACTIVE FRACTION OF *GARCINIA MANGOSTANA* AMELIORATES SCOPOLAMINE-INDUCED MEMORY IN MICE

Liew Wai Lam[1], Vikneswaran Murugaiyah[1], Zurina Hassan[2,] Chan Kit Lam[1]

[1]School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, 11800 Malaysia
[2]Center for Drug Research, Universiti Sains Malaysia, Penang, 11800 Malaysia

Alzheimer's disease (AD) is associated with neurodegenerative loss and dysfunction of the cholinergic neuronal system, leading to cognitive decline and memory loss. Currently, cholinesterase inhibitors developed based on the cholinergic hypothesis serves as the best available treatment for AD patients. The potent cholinesterases inhibitory activity of *Garcinia mangostana* (GM) methanolic extract and its bioactive fraction has been reported previously. The present study investigated the cognitive enhancing effects of the standardised GM bioactive fraction at two doses (10 mg/kg and 20 mg/kg) on memory impairment induced in mice by scopolamine (1 mg/kg), whereby physostigmine (0.3 mg/kg) was used as the positive control. The learning and memory behavioural tasks were assessed using the step-through passive avoidance set-up and Morris water maze. The standardised bioactive fraction contains 58.8 ± 2.2 % of α-mangostin, the major compound of GM. The bioactive fraction at both doses (10 and 20 mg/kg) reversed the scopolamine-induced memory deficit in the passive avoidance test ($P<0.05$). In the Morris water maze test, both doses reduced escape latencies in training trials and prolonged swimming duration within the targeted quadrant during the probe trial ($P<0.05$). In conclusion, the results showed the cognitive enhancing effects of the GM bioactive fraction may be in part through cholinesterases inhibition and thus possess some potential therapeutic relevance.

O3-13

TOPICAL *TRANS*-RESVERATROL INCREASES MATRIX METALLOPROTEINASE-2 SECRETION VIA pERK1/2 PATHWAY

Norhafiza Razali[1,2], Renu Agarwal[2], Puneet Agarwal[3], Minaketan Tripathy[4], Gabriele AR Froemming[1,2], Nafeeza M. Ismail[2].

[1]Institute of Medical Molecular Biotechnology (IMMB), Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, Selangor, Malaysia
[2]Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, Selangor, Malaysia
[3]Department of Ophthalmology, IMU Clinical School, International Medical University, Seremban, Malaysia
[4]Faculty of Pharmacy, Universiti Teknologi MARA, UiTM Puncak Alam, Selangor, Malaysia

Raised intraocular pressure (IOP) is a well-recognized risk factor for the development and progression of glaucoma. Our previous studies have shown that single drop application of *trans*-resveratrol (TR) produced significant reduction of IOP in steroid-induced ocular hypertensive (SIOH) rats and the maximum IOP reduction is achieved at 1.5-hour post-instillation. Based on previous studies, we hypothesized that the TR-induced oculohypotension involves increased matrix metalloproteinase-2 (MMP-2) secretion by trabecular meshwork. Hence we carried out in vivo and in vitro studies to investigate if TR instillation is associated with increased the aqueous humor (AH) total MMP-2 concentration. We also investigated if increased MMP2 secretion involves phosphorylation of extracellular signal-regulated kinases 1/2 (pERK1/2). For in-vivo study, SIOH rats were treated with single drop of either TR 0.2% or vehicle. 1.5-hour post-instillation, rats were sacrificed and AH was collected. For in-vitro study, primary human trabecular meshwork cells (HTMC) were treated with 25microM of TR or vehicle. Media and cells were collected at 30, 60, 90 and 120 minutes post-treatment. Total MMP-2 concentration in AH and media as well as pERK1/2 levels in AH and cells were quantified using ELISA kits. Significant elevation of total MMP2 in AH was observed in TR-treated SIOH rats compared to those given vehicle. This finding correlated with significant increase in total MMP-2 level in culture media from TR-treated TM cells compared to vehicle-treated cells. Increase in MMP2 levels in media was significant at 0.5-hour and peaked at 1.5-hour. No significant changes were seen in AH pERK1/2 level in TR-treated SIOH rats versus vehicle at 1.5-hour. Cellular pERK1/2 showed significant increment at 1-hour post treatment but not at 1.5-hour. Resveratrol-induced oculohypotension is associated with increased aqueous humor MMP2 levels. The increase in MMP2 is preceded by significant increase in cellular pERK1/2 level.

O3-14

ANTIBACTERIAL ACTIVITY OF PTEROSTILBENE AND STANDARD ANTIBIOTICS IN COMBINATION AGAINST METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA)

Siti Fairuz Ishak[1], Dayang Fredalina Basri[1], Noraziah Mohamad Zin[1], Ahmad Rohi Ghazali[1]

[1]School of Diagnostic & Applied Health Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia

Methicillin-resistant Staphylococcus aureus (MRSA) is a deadly pathogen that initially was limited to hospital and healthcare facilities but has gradually became a growing problem in healthy children and adults. Pterostilbene belongs to the phenylpropanoid phytoalexin which is involved in plant response to various pathogen and herbivores attack. The aim of this study is to evaluate the anti-MRSA action of pterostilbene in combination with selected antibiotics, vancomycin, linezolid and oxacillin against ATCC 43300 and ATCC 33591. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values of individual antimicrobial agents were determined using microbroth dilution technique whereas the microdilution checkerboard (MDC) assay was employed to verify the type of interaction of the combined agents from the fractional inhibitory concentration (FIC) index values. The MIC and MBC of pterostilbene against ATCC 33591 was 31.25µg/ml and 62.50µg/ml, respectively. While for ATCC 43300, the MBC value was also twice (62.50 µg/ml) its MIC value of 31.25µg/ml. This indicated that pterotilbene was bacteriostatic against both MRSA strains. Our MIC/MBC study also showed that linezolid exhibited bacteriostatic action but, oxacillin and vancomycin were bactericidal. MDC study showed that pterostilbene-oxacillin combination exhibited lowest FIC value (0.56) for both MRSA strains which indicated partial synergistic interaction. On the other hand, pterostilbene was additive (FIC 1.00) in combination with vancomycin whereas pterostilbene-linezolid combination displayed indifference with FIC of 1.25 against both MRSA ATCC 33591 and MRSA ATCC 43300. It conclusion, pterostilbene in combination with oxacillin partially enhanced anti-MRSA activity by acting at different target at the bacterial cell wall from that of oxacillin.

O4-01

PARENTAL KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING ANTIBIOTIC USE

Giriyappanavar Chandrashekhar[1], Ida Yasmin[2]

[1]Faculty of Medicine, Universiti Kuala Lumpur, Royal College of Medicine, Perak, Ipoh
[2]4th Year Medical student, Universiti Kuala Lumpur, Royal College of Medicine, Perak, Ipoh

Upper respiratory tract infections (URTI) are common in children. Antibiotics are often used for the treatment of URTI, even though viruses cause most of these illnesses. Antibiotic misuse in URTI in children is an important factor accountable for the development of antibiotic resistance. Factors leading to antimicrobial overuse in children are complex but possibly both doctor and parents contribute to it. The objective of the study is to assess the level of knowledge, attitude and practice of parents' about antibiotic use for URTI in their children. A cross-sectional survey involving 200 parents was conducted using a validated questionnaire at an outpatient department in health centre, Ipoh. All data were analysed using SPSS program and the influence of demographic characteristics on knowledge and attitude was tested by Chi-Square test. Majority of the respondents were females (64.5%) and Malays (76.5%). Among the respondents 48% had secondary schooling and 36.5% had college education. Almost 70.5% of respondents had good knowledge of antibiotic except 91% said antibiotics were effective in viral infections. With regard to attitude 47.3 % believed that antibiotics to be prescribed for common cold and 33% seek antibiotics if doctors did not prescribe. Statistical significance was seen with higher educational level with antimicrobial resistance and completion of antibiotic course. In connection with practice 70% did not keep the left over antibiotics for future use. Much of the information (49%) got from the health professional. Enhancing the trust of a doctor and educational awareness has to be created regarding the prudent use of antibiotic by public.

O4-02

ANALYTICAL AND BIOCHEMICAL CHARACTERIZATION OF THYMOL DERIVED FROM *TRACHYSPERMUM AMMI* EXHIBITS ANTI-OXIDANTS, ANTI-MICROBIAL AND HEPATOPROTECTIVE ACTIVITY IN WRL-68 LIVER CELL LINE

S Abel Arul Nathan, M Bhakyalakshmi, SB Anand

Department of Genetic Engineering, School of Biotechnology, Madurai Kamaraj University, Madurai – 625021. India

According to WHO, 80% of the world population is dependent on traditional medicine to fulfill their primary health care needs and 85% of the traditional medicine involves the use of plant products. India has rich sources of medicinal herbs and aromatic spices with high potential abilities which need to be studied chemically and pharmacologically for their potential medicinal value. Thymol has been reported as the major constituent of *Trachyspermum ammi.* This molecule has a broad range of activities includes antiseptic, antitussive, expectorant and antispasmdic. To the best of our knowledge, there is only few reports have been published in the purification and characterization of thymol from the methanol extract of *T.ammi* seeds and no reports to show *in vitro* studies of cytotoxic and hepatoprotective activities of thymol. Hence, the present study was designed to purify and characterize the thymol compound from the seeds of *T.ammi* and evaluate its therapeutic efficacy. Thymol from *Trachyspermum ammi* were purified and characterized using silica Gel column chromatography, TLC and GC-MS. Other analytical techniques were employed to confirm the same were HPLC, UV-VISIBLE spectroscopy and FT-IR spectroscopy. The antimicrobial activity of isolated thymol against different bacterial strains shows a clear zone of inhibition in disc diffusion method. The antioxidant potential of thymol against DPPH and H_2O_2 shows the free radical scavenging increases with increasing in the concentration of thymol. Thus, the natural antioxidants may preferably be used for food preservation and securing health effects, as they are equally good in strength to synthetic ones. *In-vitro* analysis of hepatoprotective activity of thymol offered maximum protection against paracetamol induced hepatoxicity on normal WRL-68 normal liver cells. *In vitro* analysis of cytotoxic activity of thymol shows toxicity on AGS and HepG2 cancerous cell lines at different concentrations.

O4-03

IMPACT OF 1800 MHZ GSM-LIKE FREQUENCY ASSOCIATED WITH OXIDATIVE STRESS ON MICRONUCLEI FORMATION IN RATS' OVARIAN TISSUE

Ali SH Alchalabi[1], Erkihun Aklilu[1], Abd Rahman Aziz[1], F Malek[2], SH Ronald[2], Mohd Azam Khan[1]

[1]Faculty of Veterinary Medicine, Universiti Malaysia Kelantan
[2]School of Electrical System Engineering, Universiti Malaysia Perlis (UniMAP)

Exposure to electromagnetic fields from mobile communications has been increasing during the past 10 years. A lot of concerns have been raised due to the introduction of new mobile communication technologies without the provisions of adequate public information about the potential health consequences. The aim of this study was to investigate the bioeffects of 1800 MHz radiofrequency electromagnetic fields from cellular phones on ovarian histopathological changes associated with oxidative stress. Thirty Sprague-Dawley rats were distributed into a control and two experimental groups. Whole body irradiation was done for 30 and 60 days respectively at an average 2h/day exposure and specific absorption rate level of 0.048 W/Kg by using a GSM signal generator. After the last exposure, rats were sacrificed and serum and ovaries were collected for biochemical and histological investigations. Biochemical analysis showed that melatonin levels were significantly lower in experimental groups ($p < 0.006$) compared to the control group. Glutathione peroxidase activity was reduced significantly in the exposed animals ($p< 0.004$) while Malondialdehyde levels were raised significantly in exposure groups compared to the control ($p< 0.004$). The histopathological changes in the experimental groups were prominent and vacuolation in the granulosa, ooplasm and luteal cells were evident. Other observed histopathological changes were separation of granulosa cells, disorientation of corona radiata and disruption and thinning of the zona pellucida. Micronuclei formation in oocyte nucleus and in some luteal cells indicating nuclear changes similar to DNA fragmentation were also seen. This latter finding may indicate the start of apoptosis and the degeneration process at Graffian follicles and corpus luteum. We suggest that the potential alteration of antioxidant capacity associated with serious histopathological changes may contribute to female infertility. As such, enhancing public awareness on usage of mobile communications and comprehensive risk analysis on their usage are recommended.

O4-04

CO-ADMINISTRATION OF CONJUGATED LINOLEIC ACID AND ROSIGLITAZONE AFFECT ISOPRENALINE-INDUCED VASODILATION IN ISOLATED AORTIC RINGS OF NORMAL RATS FED HIGH FAT DIET

Chai Boon Kheng[1], Lau Yeh Siang[2], Loong Bi Juin[1], Mohd Rais Mustafa[2], Ting Kang Nee[1], Dharamani Devi Murugan[2], Suresh Kumar Mohankumar[1]

[1]Faculty of Science, University of Nottingham Malaysia Campus, Semenyih, Selangor, Malaysia
[2]Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

Current therapeutics for Type 2 diabetes mellitus (T2DM) is hindered by non-negligible adverse effects, rendering the search for safe alternatives necessary. Conjugated linoleic acids (CLA), a class of polyunsaturated fatty acids abundant in dairy and ruminant products, have garnered interest for their health benefit in metabolic syndrome and T2DM. Previous studies have shown that *cis*-9, *trans*-11 (c9,t11) and *trans*-10, *cis*-12 (t10,c12)-CLA are agonists of peroxisome proliferator activated receptors (PPARs) and possibly mimic conventional PPAR agonists to modulate lipid and glucose metabolism. However, it is unclear whether CLA boost or battle the effects of drugs targeting PPARs, thus the study on the effects of CLA in combination with rosiglitazone. Six weeks old male Sprague-Dawley (SD) rats were fed high fat diet (55% energy from fat) for 12 weeks and subsequently treated with or without CLA, either alone or together with rosiglitazone for 4 weeks. Following treatments, animals were sacrificed; blood and fat pads were collected. The concentration response curve to isoprenaline was examined using isolated aortic preparations. High fat diet fed rats exhibited a modest increase in body weight but a significant increase in fat pads. Administration of CLA (1:1 mixture of c9,t11 and t10,c12) either alone or with rosiglitazone has no major changes on surrogate markers including blood glucose, serum insulin, low density lipoprotein levels and oral glucose tolerance compared to control. Interestingly, animals received both CLA and rosiglitazone had significant reduction in vasodilation among endothelium denuded aortas, with a significant decrease in maximum relaxation and an increase in EC50, compared to identically treated endothelium intact aortas. This alteration of vascular function may precede changes in surrogate markers. We propose that preserving endothelial function is critical to combat adverse effects of conventional PPAR agonists as CLA and rosiglitazone may alter vascular function directly or through other endothelium-dependent mediators.

O4-05

ASSOCIATION BETWEEN PULSE WAVE VELOCITY AND FINGER PHOTOPLETHYSMOGRAPHY FITNESS ON YOUNG WOMEN WITH CARDIOVASCULAR DISEASE RISK FACTORS

Musilawati Muhajir[1], Amilia Aminudin[1], Zaiton Zakaria[1], Norizam Salamt[1], Azmir Ahmad[1], Muhammad Firdaus Azmi[1], Kalaivani Chellappan[2], Hanita Othman[1] Nor Anita Megat Mohd Nordin[1]

[1]Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latiff, Cheras, Kuala Lumpur, Malaysia
[2]Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

Pulse wave velocity (PWV) is a marker of arterial stiffness and has been to predict the risk of future cardiovascular disease (CVD). A new vascular marker using finger photoplethysmography (PPG) which capture the blood volume change has been developed and is known as PPG Fitness (PPGF). Both measurements have the advantage of being non-invasive. However, the study of those biomarkers on Malaysian women is still limited. This study is to determine the potential of PWV and PPGF in young women with CVD risk factors and their association with other CVD risk factors. We recruited 149 young women aged 20-40 years old. They were divided into healthy group (HG, n=71) and CVD risk group (RG, n=78). RG defined as having one or more CVD risk factors such as abdominal obesity, hypertension, dyslipidemia, smoker and family history of premature CVD. Measurements included age, height, waist circumference (WC), body mass index (BMI), blood pressure (BP), fasting lipid profile (FSL), fasting blood sugar (FBS), PWV and PPGF. The mean age for all subjects was 30.03$\pm$5.30 years old. There was significant difference in RG versus HG in PWV (7.04$\pm$1.00 vs 6.64$\pm$0.73, $p<0.006$) whereas PPGF showed no difference. PWV had more number of correlations to CVD risk factors compared to PPGF. Both biomarkers were correlated ($r=-0.313$, $p<0.001$) with each other. Diastolic blood pressure (DBP) ($\beta=0.419$), age ($\beta=0.182$) and PPGF ($\beta=-0.161$) were independent factors for PWV. The correlation was $R= 0.562$, SEE=0.765 and $R^2=0.316$. PWV ($\beta=-0.312$) and height ($\beta=0.178$) were independent factors for PPGF ($p< 0.001$ for all). The correlation was $R=0.358$, SEE=8.416 and $R^2=0.218$. In conclusion, PWV may be the early CVD marker for young women with the CVD risk. There is independent association between PWV and PPGF, and PPGF may be a potential marker of arterial stiffness which needs further investigation.

O4-06

ADIPONECTIN BUT NOT LEPTIN INCREASES THE MARKERS OF INFLAMMATION IN HUMAN CORONARY ARTERY ENDOTHELIAL CELLS *IN VITRO*

Noor Aiwa Rosman[1], Gabriele Ruth Anisah Froemming[1], Effat Omar[1], Hapizah Mohd Nawawi[1], Harbindar Jeet Singh[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai. Buloh, Selangor, Malaysia

Obesity and obesity-related complications are increasingly linked to adipocyte derived factors even though much still remains to be elucidated about their role in endothelial activation and inflammation. Both pro-inflammatory and anti-inflammatory adipokines are secreted by the adipocytes. Although in obese individuals serum levels of leptin are higher while adiponectin levels are lower, their effects on endothelial cell function and markers of inflammation remain uncertain. This study therefore investigated the effect of leptin and adiponectin on markers of inflammation in human coronary artery endothelial cells (HCAEC) *in vitro*. HCAEC at the seventh passage were divided into four groups and incubated for 24 hours at 37° C and 5% CO_2 as follows: Control, leptin-treated (100 ng/ml leptin), leptin-adiponectin-treated (100 ng/ml leptin + 30 µg/ml adiponectin) and adiponectin-treated (30 µg/ml adiponectin) groups. Supernatants were analysed for COX-2 and IL-6 using ELISA. RT-PCR was used to analyse gene expression of COX-2, IL-6, NFkBp50 and NFkBp65. Data were analysed using one-way ANOVA and Bonferonni post-hoc analysis. COX-2 and IL-6 mRNA expressions were significantly higher in adiponectin-treated groups ($P<0.001$) although COX-2 protein levels in the supernatants were not significantly different. IL-6 concentration was significantly higher in supernatants from adiponectin treated cells than that in the controls, leptin treated and leptin-adiponectin treated cells ($P<0.001$) individually. Expressions of NFkBp50 and NFkBp65 mRNA were significantly higher in adiponectin treated cells when compared to that in controls. Leptin on its own has little effect on the expression of markers of inflammation by HCAEC. However, adiponectin by itself or together with leptin increases the expression of these inflammatory markers from HCAEC in culture. The role of adiponectin in inflammation needs further study, particularly when it is often referred to as the "good' adipokine" or anti-inflammatory adipokine.

O4-07

RECOMBINANT SOLUBLE FORM OF HEPARIN-BINDING EPIDERMAL GROWTH FACTOR-LIKE GROWTH FACTOR PROTEIN (rsHB-EGFp) ON ACETAMINOPHEN INDUCED NECROSIS AND FAS-INDUCED APOPTOSIS OF LIVER

Ngin Cin Khai[1,2], Kouichi Sakamoto[2], Ken-ichiro Kosai[2]

[1] School of Science, Monash University, Subang Jaya, Selangor, Malaysia
[2] Faculty of Medicine, Kagoshima University Graduate School of Medical and Dental Sciences, Kagoshima, Japan

It was reported that HB-EGF is rapidly increased after partial hepatectomy and suggested that it is a hepatotropic factor. In the liver, Fas stimulation caused hepatocytes apoptosis and acetaminophen (APAP) induced necrosis. In this study we investigated the effects of rsHB-EGF on both apoptosis and necrosis of liver. 5- to 6-week-old male C57BL/6J mice (n=8 per group) were administered 3 intraperitoneal injections of 100 μg/mouse rsHB-EGFp at 6 and 0.5 hours before and 3 hours after intraperitoneal injection of 4 μg/ mouse of an agonistic anti-Fas antibody (4Fas-ip) or APAP 300 mg/kg after overnight fasting for 15-16 hours. Twenty-four hours after administering of anti-Fas antibody, the serum alanine aminotransferase (ALT), aspartate aminotransferase (AST) levels were remarkably increased in the control mice (2853±814 and 1817±469 respectively) , but were drastically attenuated to normal levels in the rsHB-EGFp-treated mice (ALT, 21±5; AST, 28±4;). Moreover, immunoblotting showed reduced expression of pro-apototic protein Bax. But remarkably high liver enzyme levels were seen in both treatment and control groups of APAP injection. Accordingly, all of the control mice had histopathological liver injury, including apoptosis, while none of the rsHB-EGFp treated mice had histopathological findings of liver injury in Fas-treated group. In APAP injected mice, both control and rsHB-EGFp treated groups showed massive centrilobular necrosis. Although rsHB-EGFp attenuated Fas-induced apoptosis, it had no effect on APAP-induced necrosis in liver.

O4-08

PLACENTAL EXPRESSION OF EPHRIN-B1, EPHRIN-B2 AND EPHB4 MIGHT NOT BE INVOLVED IN LEPTIN-INDUCED HYPERTENSION DURING PREGNANCY IN SPRAGUE DAWLEY RATS

Norizan Kamal Basah[1], Gupalo Sergey[1], Methil Kannan Kutty[1], Marina Yurievna Kapitonova[1], Harbindar Jeet Singh[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.

Leptin has been shown to increase blood pressure during pregnancy in the rat. It is however unclear if this involves changes in the expression of ephrins that might play a role in targeting the migration of cytotrophoblast during endometrial invasion. This study examines the effect of leptin on the pattern of expression of EPHB4, Ephrin-B1 and Ephrin-B2 in the utero-placental during normal pregnancy. Twelve weeks old normotensive *Sprague-Dawley* rats, without proteinuria, were housed in individual metabolic cages with access *ad libitum* to food and water**.** After confirmation of pro-estrous through a vaginal smear, each female was individually housed overnight with a male. Mating was confirmed upon a sperm positive vaginal smear the following morning. Animals were divided into two groups; control group and leptin-treated group. These groups were further randomised into 10 subgroups (n=6 per group). The uteri from a group of non-pregnant rats in proestrus served as control. The leptin-treated group received daily 60 μg/kg/BW of leptin subcutaneously from two weeks prior to mating and until the day they were euthanized. Rats were euthanized every 2 days from day 5 of pregnancy and the placentae with the attached uterine wall were collected for RT-PCR. Data were analysed using two-way ANOVA and expressed as mean ± SEM. Ephrin-B1, Ephrin-B2 and EPHB4 expression decreased significantly over the course of pregnancy in both control and leptin-treated rats. No significant difference was evident between the leptin-treated groups and the controls in any of these except for ephrin-B1 expression, which was significantly higher on day 21 of pregnancy in leptin-treated group when compared to that in the matched control. It appears that Ephrin-B1, Ephrin-B2 and EPHB4 might not be involved in the lepin-induced hypertension during pregnancy in the rat.

O4-09

BODY FAT DISTRIBUTION INFLUENCES CARDIOVASCULAR REACTIONS TO MENTAL STRESS: A PRELIMINARY STUDY ON MALE MEDICAL STUDENTS IN MALAYSIA

Sarmishtha Ghosh[1], Aung Ko Ko Min[2]

[1]Faculty of Medicine, MAHSA University, Kuala Lumpur Malaysia
[2]Faculty of Medicine, MAHSA University, Kuala Lumpur Malaysia

Medical students are exposed to frequent mental stress. They are also deprived of physical activity due to excessive academic load. Cardiovascular reactivity has been shown to be influenced by level of fat in body. The aim of the present study was to examine the association of adiposity and magnitude of cardiovascular reaction to mental stress in young adults. Blood pressure and heart rate were measured at rest and upon being subjected to a mental stress through reading and presenting a short paragraph within a stipulated time period. Height, weight, waist-hip ratio, regional fat levels and visceral fat were assessed in apparently healthy young adults using a body composition analyzer. Heart rate and blood pressure were recorded with a Polar heart rate monitor and a sphygmomanometer respectively to indicate autonomic status of the subjects. Results showed that systolic blood pressure [SBP] change upon application of stress was positively correlated to waist-hip ratio [WHR] [r=0.65] while the diastolic blood pressure [DBP] showed no correlation. Trunk fat was found to be correlated with SBP pre and post mental stress but of lesser magnitude as compared to the WHR. Visceral fat showed better correlation [r= 0.8] with blood pressure changes with mental stress, indicating involvement of sympathetic nervous system. Heart rate changes were found to be similarly correlated with both WHR and visceral fat but poorly correlated with trunk fat, leg fat and arm fat. The study indicated that regional fat distribution in body has no effect on the parasympathetic status of the body while WHR, visceral and trunk fat have an important impact on the altered cardiovascular changes upon application of mental stress. This highlighted that visceral and trunk fat influenced the cardiovascular reactivity, thus hinting at probable involvement of autonomic nervous system in cardiovascular changes happening in overweight individuals under mental stress.

O4-10

THE PAINS OF LOVE

Sofina Tamam[1], Wan Ahmad Kamil[1], Mohd Ezane Aziz[1], Wan Nor Azlen[2], Asma Hayati Ahmad[3]

[1]Department of Radiology, Universiti Sains Malaysia, Kubang Kerian, Kelantan, 16150, Malaysia
[2]Department of Neurosciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, 16150, Malaysia
[3]Department of Physiology, Universiti Sains Malaysia, Kubang Kerian, Kelantan, 16150, Malaysia

The perception of pain can be modulated by emotion, resulting in either a decrease or increase in pain sensation. This study investigated the changes in pain threshold due to laser stimulation given in solitude and in the presence of a loved one. Seventeen right handed female volunteers (mean age: 20.59; SD: 2.85) were recruited for a within subjects study design involving two conditions: alone and in the presence of a loved one. All volunteers were given two sets of questionnaires (1) Experiences Close Relationship - Relationship Structure (ECR-RS) to assess their attachment types (secure, dismissing, fearful and preoccupied) with respect to 4 candidates (parents, partner, others and best friend); and (2) Personality Inventory (USMaP-i). Only candidates with 'preoccupied' attachment type were asked to accompany the volunteers during the experiment. Pain threshold was determined by giving volunteers pain stimuli over the dorsum of the right hand using Th:YAG laser with the energies gradually increased until they felt pain. Ten out of seventeen volunteers showed decreased pain threshold while the rest displayed higher pain threshold when in the presence of a loved one. This showed that there exist variations in the modulation of pain by having a loved one nearby compared to experiencing the pain alone.

O4-11

EVOLUTION OF PHYSIOLOGY: FROM PHILOSOPHY TO PHYSICS

Ravi Shankar Savanna[1], Ram Reddy Barra[2]

[1]Faculty of Medicine, Universiti Kuala Lumpur, Royal College of Medicine Perak, Ipoh, Perak, Malaysia
[2]Faculty of Medicine, NTR University of Health Sciences, Apollo Institute of Medical Sciences and Research Hyderabad, Telangana. India

Physiology has its roots in Philosophy. Over the ages, the study of biological phenomenon has shifted from teleological reasoning to the more robust mechanistic answers which are scientifically more valid, being supported by experimental evidence. Traditionally and especially in our present age of reductionism, we attempt to retrace the development of the process to its roots, at the molecular levels. Though these methods have generated a wealth of information albeit in a confined cellular space the grand challenge is to assemble all the pieces together to create an integrated holistic view of whole cell transactions and their interactions with each other and the environment. Cells develop, function and evolve in stochastic regimes. Biological processes occur at diverse temporal and spatial scales. Hence, quantitative methods are indispensable for rationalizing and understanding these systems. Logically, the behaviour of these biological systems must pass the litmus test of the physical laws laid down by the fundamental sciences as the same laws govern nature as well. Physiologists still do not understand the fundamental laws of biology, which can test the "standard model of biology" comprising the model of DNA and amino acids and proteins and a genetic code. Discovery of the Higgs boson particle has triggered speculation that we may be a step closer to a fundamental discovery in biology, as well. Interdisciplinary research at the interface between biology, physics and mathematics is the need of the hour to answer fundamental questions about how living systems tolerate or utilize fluctuations, noise, or heterogeneity as well as to uncover emergent phenomena and design principles. Apt use of mathematical modelling and computer simulation techniques could provide valuable insights into the working and general principles of organization of biological systems and help answer the age old questions troubling ancient Greeks to the modern systems biologist.

O4-12

ANTIMITOTIC EFFECT OF ALKALOID FRACTION ACHYRANTHES ASPERA LINN ON MYELOMA CELL

Wurlina[1], Sunarni Zakaria[2], Dewa Ketut Meles[1], Dewa Putu Anom Adnyana[3]

[1]Faculty of Veterinary Medicine Universitas Airlangga
[2]Faculty of Medicine Universitas Airlangga
[3]Faculty of Veterinary Medicine Universitas Brawijaya

Alkaloid fraction of Achyranthes aspera linn in used these research contain 97,73% to expended the necrotic and apoptotic mechanism to caused cell death, to stop on growth and developmend cells in cancer. The purpose these research to prove necrotic and apoptotic induction of alkaloid fraction in vitro to used cells culture of myeloma with akridine orange and ethidium bromide staining and lethal concentration 50% of myeloma cells (LC50%) from the viability cells myeloma. These research yield to expected Achyranthes aspera linn to used for anticancer drug in traditional and modern medicine, cheap, safety and healthy. Alkaloid fraction of Achyranthes aspera linn to prepare with Pharmacope Indonesian methode. Invitro the effect of alkaloid to prove on myeloma cell devided into 3 groups : the first group as treatment groups myeloma cell as given alkaloid fraction in concentration 1 ppm, 10 ppm, 100 ppm and 1000 ppm. The second group as negatif control as given RPMI and DMSO media only. The third groups as positif control is given colchicin in concentration 100 ppm. Severally groups represented with 4 microwell plate hole. Severally group represented 4 hole in 24 hole microwell plate. The result of the research are alkaloid fraction of Achyranthes aspera linn in dose 100 ppm in vitro to caused viability of myeloma cell 9,45 $\pm$ 5,96% lower than positif control 13,18 $\pm$ 3,67%, to caused apoptotic 13,66 $\pm$ 3,67% higher than positif control 9,62 $\pm$ 5,96%. Alkaloid fraction of Achyranthes aspera linn in dose 1000 ppm to caused cleavage of myeloma cell to stop in metaphase stage > 50% that is 77 $\pm$ 1,83% and lethal concentration is 0,719 ppm.

POSTER PRESENTATIONS

P1-01

GENE EXPRESSION STUDY ON THE OXIDATIVE STRESS-INDUCED DNA DAMAGE IN FEMALE REPRODUCTIVE SYSTEM: A SYSTEMATIC REVIEW

Muhammad Zaid Wan Ahmad Rosli[1], Nasibah Azme[2], Mudiana Muhamad[2], Nuraliza Abdul Satar[2]

[1]Institute of Medical Molecular Biotechnology (IMMB), Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia
[2]Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia

Reproductive failure is a significant public health concern. Although relatively little is known about factors affecting fertility and early pregnancy loss, a growing body of literature suggests that environmental and lifestyle factors play an important role which can trigger oxidative stress. It has been reported that in cell culture, oxidative stress is involved in causing retardation of embryonic development that is attributed to induced DNA damage. The objective of this review was to examine the association between oxidative stress, DNA damage and gene expression in female reproductive system based on published literatures. A comprehensive search was conducted in Google Scholar and Medline for related studies publish between the years 2005 to present. The main inclusion criteria were research articles published in English, and studies had to report on the gene expression of oxidative stress-induced DNA damage in female reproductive system. The literature search identified 14 potentially relevant articles, whereby 3 articles met the inclusion criteria**.** The research reported on the potential molecular technique to detect the expression of genes involved in protecting and repairing the oxidative stress-induced DNA damage in female reproductive organ were Quantitative Reverse Transcriptase Polymerase Chain Reaction (qRT-PCR), Terminal Deoxynucleotidyl Transferase-Mediated dUTP Nick-End Labeling (TUNEL) Assay and Enzyme-Linked Immunosorbent Assay (ELISA). More research needs to be conducted to explore the accurate technique to detect the gene expression of oxidative stress-induced DNA damage in order to elucidate the protective role of antioxidant vitamins for primary prevention of oxidative stress-induced pathologies.

P1-02

PRELIMINARY PHYTOCHEMICAL SCREENING AND EVALUATION OF ANTIOXIDANT PROPERTIES OF FLORAL EXTRACTS OF *MELICOPE PTELEFOLIA*

Nur Sarah Saleh[1], Siti Nasihah Harif[1], Ismin Izwani Zanol Abidin[1], Imtiaz Khalid Mohammed[1]

[1]Faculty of Pharmacy, Cyberjaya University College of Medical Sciences (CUCMS), Cyberjaya, Selangor, Malaysia

Medicinal plants are the sources of natural antioxidant which composed of natural plant substance which can treat and prevent illnesses due to excessive free radical or infection. Excessive free radicals develop a variety of diseases including cardiovascular disease and many types of cancers. Therefore, interest has increased considerably in finding natural antioxidants from the medicinal herbs. *Melicope Ptelefolia* is one of medicinal plants which is used for different human health benefits. Among the Malaysian community, it is known as 'Tenggek Burung' and is usually consumed as salads. The objectives of the present study were to carry out the preliminary phytochemical screening and to relate the presence of phytochemicals with antioxidant properties of floral extracts of *M. ptelefolia* in different solvents. The solvents used were methanol, ethanol and acetone. Result of preliminary phytochemical screening of *M. ptelefolia* floral extract show the presence of carbohydrate, protein, saponins, fixed oil, phenolic compounds, terpenoids, steroids and phlobatannins. The antioxidant properties of extracts were further investigated by free radical scavenging of 2,2-diphenyhyl-1-picryll-hydrazil (DPPH), Total Phenolic Content (TPC) and Ferric Reducing Antioxidant Power (FRAP) assay. In DDPH and TPC assay, acetone extract has highest 89.42% of radical scavenging activity and highest 25.4 mg GAE/100 g phenolic content. While in FRAP assay, methanol extract exhibited the highest antioxidant activity with 0.4914 FRAP value. The preliminary phytochemical screening provide evidence that some of phytochemicals such as phenolic compounds that present in the floral extract contribute to its antioxidant activities. From the results of the present investigation, it could be concluded that *M. ptelefolia* floral extract is a rich source of natural antioxidant which can be an alternative to synthetic antioxidants.

P1-03

PREVENTIVE ROLE OF VITAMIN E & VITAMIN C IN COMBINATION ON CADMIUM INDUCED OXIDATIVE STRESS ON RAT TESTIS

Rekha D Kini

Faculty of Physiology, Kasturba Medical College, Manipal University, Mangalore, Karnataka, India

Cadmium is an environmental and industrial pollutant and exposure to cadmium metal is known to induce the formation of reactive oxygen species (ROS). The purpose of present study was to investigate the protective role of combined therapy of vitamin E & vitamin C on cadmium induced testicular damage. The present study was conducted following approval from Institutional Bioethical Committee and strict internationally accepted guidelines, for the usage of animals. Rats were divided into Group I, II, III and IV. The normal control group (Gr. I) rats were administered with the single dose of normal saline. Group II received Vitamin E (100mg/kg bw) & Vitamin C(30mg/kg bw) orally for 30days. Group III received a single dose of 1mg/kg bw cadmium chloride and Group IV received vitamin E and vitamin C for 30 days orally prior to 1mg/kg bw cadmium administration. After the desired protocol, rats were sacrificed & both the testes were removed for biochemical & histological evaluation. The levels of lipid peroxides (LPO) and glutathione (GSH) & superoxide dismutase (SOD) were detected in the tissue homogenates. In the present study, the level of lipid peroxidation (LPO) was significantly high (P<,0.001) & GSH & SOD were low in cadmium treated rats compared to normal control. Pre-treatment with vitamin E & C in combination showed a protective effect by decreasing LPO ($p<0.001$) & increasing GSH ($P<0.001$) & SOD ($P<0.001$) level. Present study showed the morphological changes like atrophy of tubules, edema and decreased spermatogenesis in the testis of rats exposed to cadmium chloride. But pre-treatment with antioxidant showed the normal architecture of the testis by protecting the rat testis from cadmium induced testicular damage. Thus, present study showed that pre-treatment with vitamin E & C was beneficial in protecting the testis from cadmium induced toxicity.

P1-04

EFFICACY OF TOPICAL TAZOCIN IN THE TREATMENT OF *P. AERUGINOSA*-INDUCED KERATITIS IN RABBITS

Renu Agarwal[1], Lwin Lwin Nyein[1], Robin Ngu Soon Tat[2], Sushil Vasudevan[1], Marina Kapitonova[1], Visvaraja Subrayan[2]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Selangor, Malaysia
[2]Faculty of Medicine, University Malaya, Kuala Lumpur

Pseudomonas aeruginosa-induced bacterial keratitis is a potentially sight-threatening ocular pathology. Aminoglycosides and fluoroquinolones are currently used in clinical practice for this infection; however, there are increasing reports of emergence of drug resistance strains. Tazocin has been used as anti-pseudomonas antibiotic for the treatment of systemic infections, but has not been evaluated for efficacy of topical treatment for keratitis. In the current study, we used a *Pseudomonas aeruginosa*-induced keratitis rabbit model to observe the clinical and histopathological response to treatment with topical tazocin. We also studied the effect of this treatment on corneal bacterial load and level of inflammatory cytokines including IL-1β, IL-8 and TNF-α. A comparison was also made with moxifloxacin 0.5%. Topical treatment with tazocin 10% resulted in significant clinical and histopathological improvement compared to vehicle treated group. This improvement was associated with significant reduction in corneal bacterial load and inflammatory cytokines. When compared to moxifloxacin 0.5%, the tazocin group showed significantly greater clinical response and reduction in corneal bacterial load. Histopathologically, tazocin group showed significantly lesser inflammatory infiltration and moxifloxacin group showed better epithelialization. This difference could be attributed to difference in the corneal cytokine profile between two groups. Thus, topical tazocin seems a potential option to treat microbial keratitis and solve the threat of drug resistant strains of *Pseudomonus aeroginosa*.

P1-05

ANTIMICROBIAL AND ANTIOXIDANT SCREENING OF *PERESKIA GRANDIFOLIA* AND *PERESKIA BLEO* USING THREE DIFFERENT SOLVENT

Yeo Yoong Hwa[1], Mahani Mahadi[1], Zauyah Yusuf[1], Fauziah Otthman[2]

[1]Department of Pharmaceutical Sciences, Faculty of Pharmacy, Cyberjaya University College of Medical Sciences, Malaysia
[2]Department of Human anatomy, Faculty of Medicine and Health Sciences, University Putra Malaysia, Malaysia

Pereskia grandifolia and *Pereskia bleo* have been commonly used in the local community for its medicinal properties against various illnesses such as hypertension, renal disease, diabetes mellitus, cancer, inflammation and rheumatism, swellings, ulcer and gastric pain. However, the method of preparation is solely based on concoction or consumed as in raw form. Hence, the present study was conducted to determine antimicrobial and antioxidant properties of *Pereskia grandifolia* and *Pereskia bleo* using three different solvent. Leaves of both plants were extracted using three different solvent which are acetone, methanol and distilled water. The antimicrobial properties was screened at the concentration of 100mg/ml using Kirby-Bauer disc diffusion method against 3 microorganisms which are *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida albicans*. Antioxidant properties and total phenolic content were determined using DPPH radical scavenging activity assay and Folin-Ciocalteu Reagent method. None of the leaves crude extractds showed positive results towards the tested microorganisms. Acetone extracts of *Pereskia grandifolia* showed highest radical scavenging activity of 82.26% while methanolic extracts of *Pereskia bleo* showed highest radical scavenging activity of 85.86%. Acetone extracts of both plants showed highest total phenolic content. As for the correlation between antioxidant properties and total phenolic content, there is a positive correlation for *Pereskia grandifolia* only. The antimicrobial properties of *Pereskia grandifolia* and *Pereskia bleo* are not promising. However, the antioxidant properties should be focused due to the present of high phenolic contents and phenolic compounds.

P1-06

REDUCED INFLAMMATION AND OXIDATIVE DAMAGE IN EXCISION WOUND MODEL USING SELENIUM ADDED UNRIPE PAPAYA EXTRACT

Nafiu Bidemi Abdulrazaq[1], Mohammad Tariqur Rahman [2]

[1] Faculty of Basic Medical Science, University of Ilorin, Ilorin, Nigeria
[2] Faculty of Science, International Islamic University Malaya, Kuantan, Malaysia

Wounds due to injury or accident have become a major public health concern. Delayed wound healing is a major burden. In recent times, researchers have explored the use of plant extracts in combination with synthetic drugs or pure chemicals to expedite wound healing. Unripe *Carica papaya* Linn (papaya) is widely used in developing countries as an effective and readily available treatment for various wounds, particularly burns and chronic ulcers. Therefore, Se an antioxidant co-factor and Zn a component of signalling pathway for cellular proliferation were added to papaya extracts to analyze their potential in wound healing. In an attempt to analyze the rate wound closure after treatment, Se^{2+} (0.5 μg) and Zn^{2+} (100 mM) are separately combined with papaya PBS extract (PE) and water extract (WE). Full thickness excision wound induced on mice were treated with PE or WE in combination with or without the selected concentrations (Zn^{2+} 100 mM and Se^{2+} 0.5 μg) of the elements. Positive control group (PC) was treated with solcoseryl and negative control (NC) was treated with deionised water. Wound area was monitored by a digital camera and wound size measured using the software Adobe® CS3 Photoshop software (Extended version 12.0.4 × 32 Adobe Inc., Adobe Systems Incorporated, San Jose, CA). Se^{2+} added PE at 0.5 μg took ~ 9 days while control groups took 14 days and other treatment groups took at least 10 days for the complete wound closure. The calculated wound healing efficiency was significantly ($p < 0.05$) higher for Se^{2+} (0.5 μg) added PE compared to other groups. Physical examination, histochemical evaluations, biochemical analysis and immunohistochemical techniques were performed on wound tissues excised at early (day 4) and later (day 10) phase of wound healing. Wound healing was found to be accelerated initially by suppression of oxidative damage mediated through increased activities of endogenous antioxidants, followed by reduced inflammation via modulation of COX-2 enzyme activity and arginine metabolic pathway and induced up regulation of pro-fibrotic (TGF-β) and angiogenic (VEGFA) proteins expression which triggers angiogenesis and fibrogenesis in the early proliferation phase of wound healing. These mechanisms were more pronounced in Se^{2+} added PE treatment.

P2-01

THE CENTRAL VASCULAR MARKERS AMONG YOUNG MEN WITH CARDIOVASCULAR DISEASE (CVD) RISK FACTORS AND THEIR ASSOCIATIONS WITH LONG TERM CVD RISK.

Amilia Aminuddin[1], Zaiton Zakaria[1], Kalaivani Chellappan[2], Nor Anita Megat Mohd Nordin[1]

[1]Hospital Canselor Tuanku Mukhriz, Pusat Perubatan Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras Kuala Lumpur, Malaysia
[2]Fakulti Kejuruteraan dan Alam Bina, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor Malaysia

The assessment of central vascular markers such as carotid intima media thickness (CIMT), pulse wave velocity (PWV) and augmentation index (AI) may give additional information on the degree of vascular damage among those with cardiovascular disease (CVD) risk factors. The current study aims to determine the associations among these three markers and with long term CVD risk (30-year full CVD risk) among the young men with CVD risk factors. Two hundred and eighteen young men were recruited. They were healthy or may have CVD risk factors such as hypertension, dyslipidemia, smoking, abdominal obesity or had family history of premature CVD. AI and PWV were measured by Vicorder and CIMT were measured by ultrasound. 30-year full CVD risk was assessed by calculating the points that incorporates the age, sex, total cholesterol (TC), high density lipoprotein (HDL), smoker status, systolic blood pressure (SBP), the presence of diabetes mellitus (DM) and antihypertensive medication of each individual. Data were analyzed via SPSS version 16. The mean age of the subjects was 27.09±5.30 years old and the 30-year full CVD risk was 12.25±8.65%. There were no correlations between PWV and AI (r=0.03, P>0.05), AI and CIMT (r=0.04, P>0.05) and PWV and CIMT (r=0.06, P>0.05) after adjustment for the age. Both AI and CIMT were significantly associated with long term CVD risk, with AI having the strongest association (β=0.55 and β=0.22 respectively). No associations between CIMT, PWV and AI may signify that they represent different entity of vascular markers, whereby PWV and AI reflected vascular function while CIMT reflected vascular structure. Among the three markers, AI maybe the best marker to predict future CVD risks among young men.

P2-02

EFFECT OF EXERCISE ON OXYGEN SATURATION AND HEART RATE IN HEALTHY YOUNG ADULTS OF DIFFERENT BODY MASS INDEX

Anupama Noojibail

Faculty of Physiology, Kasturba Medical College, Manipal University, Mangalore, India

Physical exercise enhances physical fitness and overall health. Reports show that sedentary people with low level of physical activity are at higher risk of heart disease than the active people. Hence this study was done with an objective to find the effect of exercise on oxygen saturation and heart rate in healthy young adults of different body mass index. In this cross-sectional study 136 medical students of age group 17-25 years were included. 56 subjects who were doing minimum 30 minute of exercise per day for 3 days a week were taken as exercising (control) group and another 80 subjects who did not do any type of regular exercise were selected as non-exercising (case) group. A standard informed consent was taken from all the subjects following approval from the college ethics committee. Based on the body mass index the subjects were divided into three groups normal (BMI18.5-25), low (BMI ≤18.5) and high (BMI 25-30). The 6-min. walk test was conducted according to a standardized protocol. Oxygen saturation and pulse rate were assessed at the start and end of the 6-min walk test using Pulse Oximetry. A statistical package SPSS Version 17.0 was used. The data was expressed as mean ± SD. Student unpaired 't' test was used to do the analysis. $P \leq 0.05$ was considered as significant. The oxygen saturation of normal BMI non-exercising subjects (97.52±1.82) were low compared to exercising subjects (98.17±0.44) and it was statistically significant ($P < 0.05$). The pulse rate of normal BMI non-exercising subjects were high compared to exercising subjects but without any statistical significance. Physical exercise done only three to four times a week in young adults improves oxygen saturation and heart rate. This proves physical exercise improves cardiac functioning thus may prevent the occurrence of cardiac diseases in adults and middle aged individuals.

P2-03

THE EFFECT OF LEPTIN ADMINISTRATION ON RENAL TGF-β1, SMAD AND BMP7 IN SPONTANEOUSLY HYPERTENSIVE RATS (SHR)

Azdayanti Muslim[1], Brinnell Caszo[2], Effat Omar[1], Effendi Ibrahim[1], Harbindarjeet Singh[1,3,4]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Faculty of Medicine and Defence Health, National Defence University of Malaysia, Kuala Lumpur
[3]IMMB, Faculty of Medicine, UiTM, Sg Buloh, Selangor
[4]I-PPerForm, UiTM, Campus Selayang, Selayang, Selangor

Elevated levels of leptin may be responsible directly for progression and severity of renal disease in obesity and hypertension. It may exert its effects by promoting fibrosis through the actions of TGF-β1 and the SMAD pathway. This study was designed to determine the effect of leptin administration on some responses involved in renal fibrosis in non-obese spontaneously hypertensive rats (SHR). Male SHR, aged 12-14 weeks, were injected with either leptin (60 µg/kg/day) or saline (for the control group) subcutaneously daily for 42 days. On day 43, animals were euthanized and their kidneys were removed. The right kidney was harvested and stored at -80˚ C for the determination of TGF-β1, SMAD 2, SMAD 3 pathway expression using RT-PCR and Bone Morphogenic Protein 7(BMP). The left kidneys were stored in neutral buffered 10% formalin until they were processed and stained with hematoxylin and eosin. Prepared slides were examined under light microscopy. Thirty consecutive glomeruli were examined for the cell counts based on the number of nuclei seen and the total area of glomeruli. Results revealed that at the dose administered, leptin did not affect renal function adversely. Cellularity and area of glomeruli were also not affected by leptin administration. However, it altered the expression of TGF β1 mediated SMAD levels, elevating TGF-β1 and SMAD 2, while leptin might have led to increased BMP 7 expression, which could inhibit the effects of TGF-β1. In conclusion, it appears that leptin administration increases renal TGF-β1 and SMAD 2 levels but with little morphological changes in the kidney. Whether the elevated BMP 7 expression was responsible for the lack of effect of leptin on renal morphological changes remains unclear.

P2-04

THE SPATIOTEMPORAL PROFILING OF THE BLOOD-BRAIN BARRIER PERMEABILITY IN RAT MODEL OF BILATERAL CAROTID ARTERY STENOSIS

Hema Sekaran[1], Zurina Hassan[1], Siti Rafidah Yusof[1]

[1]Centre for Drug Research, Universiti Sains Malaysia, Penang, Malaysia

Cerebral hypoperfusion is a condition where there is a reduced blood supply thus oxygen and essential nutrients to the brain. During ischemic insult, the brain's first line of defense, the blood-brain barrier (BBB), is breached thus causing leakage of blood-borne substances into the brain parenchyma. To our best knowledge, the complete spatiotemporal profiling of the disruption of the BBB during cerebral hypoperfusion is limited. To address this knowledge gap, we established a rat model of bilateral carotid artery stenosis (BCAS) to study the spatiotemporal profiling of the BBB permeability during cerebral hypoperfusion. To study the changes in the BBB permeability, fluorescence of high molecular weight (Evans blue dye [EBD]) and low molecular weight (sodium fluorescein [NaF]) exogenous tracers were measured at predetermined time points (t= 3 hr, 1, 3, 7, 14 and 30 days) and in different regions of the brain (frontal cortex [Fc], striatum [Str], posterior cortex [Pc], hippocampus [Hip], thalamus and midbrain [Th-Mb] and cerebellum [Cer]). In the BCAS rat model, we observed leakage of the BBB to both EBD and NaF as early as day 1 in several brain regions with Fc showing the most significant leakage. However, leakage of the EBD disappeared with time, but leakage of the NaF was still detected in Fc, Str and Hip. From the results, we found that during early cerebral hypoperfusion, the BBB was leaky to macromolecules such as protein as observed with EBD leakage and had a prolonged leakage to small solutes and ions as observed with NaF leakage. The regions of the brain that are most negatively affected during cerebral hypoperfusion are Fc, Str and Hip. This knowledge on the pattern of the BBB leakage during cerebral hypoperfusion will greatly enable further investigation at the cellular and molecular levels.

P2-05

A STUDY OF BLOOD PRESSURE AND HEART RATE ON SMOKELESS TOBACCO USERS

Nasrin Habib[1], Mamunur Rashid [2], Farzana Afzal F[3], Dilruba Akther[4], Tanbira Alam[5] , Lubna Shirin[6],

[1]Physiology Unit, Faculty of Medicine, AIMST University, Semeling, 08100 Bedong, Kedah, Malaysia
[2]Medicine Unit, Faculty of Medicine, AIMST University, Semeling, 08100 Bedong, Kedah, Malaysia
[3]National Institute of Ophthalmology & Hospital, Dhaka, Bangladesh
[4]Holy Family Red Crescent Medical College, Dhaka, Bangladesh
[5]Physiology Unit, Faculty of Medicine, AIMST University, Semeling, 08100 Bedong, Kedah, Malaysia
[6]Faculty of Medicine, AIMST University, Semeling, 08100 Bedong, Kedah, Malaysia

Tobacco has close association with blood pressure and heart rate which is very common phenomenon. Tobacco consumption is mainly done in two forms, namely smoked tobacco products and smokeless tobacco. However, the relationship between smokeless tobacco uses on blood pressure and heart rate remains unknown, particularly in tertiary level hospitals. Smokeless tobacco might have different influence on systolic or diastolic blood pressure and heart rate. This paper, which is a cross-sectional study, was carried out to assess changes in blood pressure and heart rate among adult male smokeless tobacco (ST) users. 120 male respondents were randomly participated in this study those were selected from Medicine outdoor of Dhaka Medical College & Hospital, Bangladesh. Heart rate and blood pressure was measured and ST use behaviour was assessed using self-reports. The mean (± SD) of age was 61.70±16.379 years among the smokeless tobacco users whereas mean per day use of smokeless tobacco was 4.8125±1.64190 SD. All respondents were regular users, among them, 56.7% used gul and remaining used shada. The mean (±SD) of pulse rate was 84.07±11.011beat/min while the mean (SD) of systolic blood pressure was 154.50 (SD26.79) mm of Hg and the mean (SD) of diastolic blood pressure was 96.67 (SD10.93) mm of Hg in smokeless tobacco users. Mean systolic and diastolic blood pressures were higher in smokeless tobacco users in the tertiary level hospital; however, mean heart rate was within the normal range. Though there were few limitations in this study, nevertheless, it would unlock further frontiers for prospective researchers in this area.

P2-06

RENAL IMPAIRMENT IN INTERMITTENT CHRONIC LOW DOSE ORGANOPHOSPHATE EXPOSURE: BIOCHEMICAL EVIDENCE

Sanda Aung[1], Nor Zamzila Abdullah[2], Norlelawati A. Talib[3], Noriah Mohd Noor[4], Zamzuria Mat Zainone[5], Tariq Abdul Razak[6]

[1,4]Kulliyyah of Pharmacy, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[2,3,6]Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[5]Sultanah Nur Zahirah Hospital, KualanTerengganu

Organophosphates (OPs) pesticides are widely used in agriculture as pest control. Many people are exposed to chronic low dose of OPs through these activities. However, most of the studies on OPs mainly focused on its acute toxic effects rather than its chronic low dose effects. Limited epidemiology data and animal study found that there was evidence of nephrotoxicity in chronic low dose OPs exposure but the study lack of biochemical support. The aim of this study was to study the effect of chronic low dose OPs exposure on selected biochemical parameters of renal function in a rat model. 24 males Sprague-Dawley rats were randomly divided into 3 groups of 6 with Group 1 as a Control group. Group 2 and Group 3 received subcutaneous vehicle (3% dimethyl sulphoxide + 97% v/v soy oil) and 18.0 mg/kg BW chlorpyrifos (CPF) respectively every other day for 180 days. The intermittent dosing regimen is used to provide a model for the types of exposure that might be experienced by agricultural workers. Blood was analysed for urea, creatinine, glucose and advanced glycation end-products (AGEs). Urea and creatinine were significantly higher in OPs exposed group with significant correlation between urea and creatinine. OPs exposed group showed higher glucose and AGEs level than that of the control groups with significant correlation between glucose and AGEs. Significant correlations were also noted between both urea and creatinine with glucose but not with AGEs. Chronic intermittent low dose CPF exposure induces renal impairment with possible contribution from the effect of hyperglycaemia but not AGEs. Further study need to be done to explain the relevant mechanism.

P3-01

METABOLITE PROFILING AND CYTOTOXICITY STUDY OF *ACANTHUS EBRACTEATUS* EXTRACTS ON HUMAN HEPATOCELLULAR CARCINOMA (HEPG2) CELL LINE

Abdullah Hakim Mohd Lokman[1], Ismin Izwani Zainol Abidin[1], Waheedah Abdul Hakeem[1], Noraznawati Ismail[2], Tengku Sifzizul Tengku Muhammad[2]

[1]Faculty of Pharmacy, Cyberjaya University College of Medical Sciences, Cyberjaya, Selangor, Malaysia
[2]Institute of Marine Biotechnology, Universiti Malaysia Terengganu, Kuala Terengganu, Terengganu, Malaysia

Cancer is a global disease without a standard treatment. Presently, different types of cancer require treatment that uses different protocols and drugs, which have different side effects and efficacies. Pharmaceutical companies are increasingly turning to natural products used in folk medicine in finding novel compounds to combat cancer including from vegetation. One of the vegetations that grows in the undergrowth of mangroves is *Acanthus ebracteatus* or locally known as "Jeruju Hitam" which has been used traditionally to treat various diseases. Therefore, the objectives of this study were to determine the metabolite profiles and cytotoxicity effects of *Acanthus ebracteatus* on human hepatocellular carcinoma liver, HepG2 cell line. Stems and leaves of *Acanthus ebracteatus* were extracted with 70% (v/v) methanol overnight. Higher yield in the methanol extract was produced in leaves than to that of stems. Thin Layer Chromatography (TLC) was used to evaluate the metabolite profiles, where alkaloids, double bonds linkage compounds and aromatic compounds were found to be present in both extracts. Subsequently, various concentrations of both methanol extracts were used to treat HepG2 cell line. After 72 hours treatment, the cytotoxic effect was determined using MTS assay. The effective concentrations of extract required to inhibit fifty percent of cell population (EC_{50}) for both stems and leaves extracts were above 100 µg/ml. In conclusion, the *Acanthus ebracteatus* extracts from leaves and stems did not show any cytotoxic effects towards HepG2 cell line. Thus, the extracts may be used as potential candidates for other therapeutic interventions without the possibility of having any cytotoxicity effects.

P3-02

POTENTIAL MICRORNAS AS BIOMARKERS IN CHRONIC MYELOID LEUKAEMIA PATIENT RECEIVING SECOND-GENERATION TYROSINE KINASE INHIBITOR TREATMENT

Aliza Mohd Yacob[1], Chang Kian Meng[2], Nor Asiah Muhamad[1], Rosline Hassan[3], Zubaidah Zakaria[1]

[1]. Institute for Medical Research, Kuala Lumpur, Malaysia
[2]. Hospital Ampang, Selangor, Malaysia
[3]. School of Medical Sciences, Hospital Universiti Sains Malaysia, Kelantan, Malaysia

About half of CML patients that were imatinib-resistant have kinase domain mutations. Among these mutations, 87% were caused by 16 commonly mutated amino acids. Therefore new biomarkers are needed to further characterize disease status in CML patients receiving second-generation TKIs. This study will identify microRNAs in CML patient that have potential to be used as biomarkers in relation to disease progression. Patient was a 22-year-old Malay male, diagnosed with CML in 2012 and was given 400 mg Imatinib Mesylate (IM) for 10 months before escalated to 600 mg for 8 months. BCR-ABL1 fusion transcript detected was 15% reduced and Philadelphia chromosome present was reduced to 18 cells. Aberrant lymphocytes or blasts were not detected and ABL kinase domain mutation (L387F) was detected. Imatinib was then replaced by nilotinib. Normal control was a 46-year-old Malay male blood donor and written informed consent was obtained from participants prior to blood collection (NMRR-12-926-13248). MicroRNAs that have potential as biomarkers were selected from NGS profile from Miseq, illumina and were screened in triplicate by real-time QPCR using LC480, Roche. Compared to normal control, 2 microRNAs were 3 to 3.5 fold over-expressed and 8 microRNAs were 3.6 to 21.4 fold under-expressed, all with p-value less than 0.05. Single Tm peak was seen in these miRNAs indicating specific products. L387F is a mutation in the A-loop that promotes resistance. In conclusion, 10 microRNAs were identified as potential biomarkers in CML patient receiving second-generation tyrosine kinase inhibitor treatment.

P3-03

QUERCETIN REGULATES EXPRESSIONS OF CYSTIC FIBROSIS TRANSMEMBRANE REGULATOR AND CHLORIDE-BICARBONATE EXCHANGER IN THE UTERI OF OVARIECTOMISED RATS

Huma Shahzad[1], Nelli Giribabu[1], Normadiah M Kassim[2], Praveen Kumar Korla[3], Naguib Salleh[1]

[1]Dept of Physiology & [2]Dept of Anatomy, Faculty of Medicine, University of Malaya, 50603 Lembah Pantai, Kuala Lumpur, Malaysia
[3]Dept of Biomedical Informatics, Asia University, Taichung 41354, Taiwan

We hypothesized that quercetin affects expression of HCO_3^-- transporters in the uterus, thus could interfere with uterine fluid pH. This study investigated quercetin effect on uterine CFTR and Cl^-/HCO_3^- exchanger (SLC26A6) expressions as they are involved in uterine fluid pH regulation. Uteri of ovariectomised, non-steroid-treated and steroid-treated rats receiving seven days treatment with 10, 50 and 100mg/kg/day quercetin and estrogen (1µg/kg/day) were harvested and changes in CFTR and SLC26A6 mRNA and protein expression were analyzed by Real-time PCR and immunofluorescence respectively. AC expression was analyzed by immunofluorescence while cAMP level was determined by EIA. Computational molecular docking study was used to identify interactions between quercetin and AC or CFTR. Administration of quercetin resulted in a dose-dependent increase in CFTR, AC and SLC26A6 expression and cAMP levels however the levels were markedly lower as compared to estrogen treatment. Molecular docking revealed interaction between quercetin with AC and CFTR. Reduce expression of CFTR, AC and SLC26A6 and cAMP level following 10mg/kg/day quercetin treatment could result in the reduction of uterine fluid pH with lesser effects seen with increasing doses of quercetin. This effect could interfere with uterine fluid pH regulation that might have adverse consequences of fertility.

P3-04

SELECTION OF SUITABLE ENDOGENOUS REFERENCE GENES IN RAT KIDNEY AND HYPOTHALAMUS UNDER THE INFLUENCE OF TESTOSTERONE FOR qPCR

Loh Su Yi[1], Khadijeh Gholami[1], Hoe See Ziau[1], Naguib Salleh[1], Lam Sau Kuen[1]

Faculty of Medicine, University Malaya, Kuala Lumpur Malaysia

Real-time quantitative PCR (qPCR) is the most reliable and accurate technique for gene expression. Endogenous reference genes are being used to normalize qPCR data even though their expression may vary under different conditions and in different tissues. Nonetheless, verification of expression of reference genes in the selected tissue of study is very essential in order to accurately assess the level of expression of target genes in question. Thus, this investigation examined six different commonly used reference genes in order to identify the most constant ones under the influence of testosterone in two tissues ie the kidney and hypothalamus for qPCR analysis. The reference genes are glyceraldehyde-3-phosphate dehydrogenase (GAPDH), actin beta (ACTB), beta-2 microglobuli (B2m), hypoxanthine phosphoribosyltransferase 1 (HPRT), peptidylprolyl isomerase A (Pipa) and hydroxymethylbilane synthase (Hmbs). The cycle threshold (Ct) value for each gene was determined and data obtained were analysed using the software programs normFinder, geNorm, bestKeeper and rank aggregation. Results show that the genes Hmbs and HPRT have been identified as being the most stable and most variable respectively in the hypothalamus. Meanwhile, in the kidney, Hmbs and GAPDH appear to be the most constant genes with B2m being the least stable. In conclusion, variations in reference genes occur in different tissues even under the same experimental conditions. This calls for verification of optimal reference genes in each and every individual tissue to be established before the commencement of any such studies.

P3-05

QUANTIFICATION OF DNA METHYLATION FOR COMT, RELN AND HTR2C IN SCHIZOPHRENIA USING METHYLIGHT ASSAY

Nour El Huda Abd Rahim[1], Mohd Nabil Fikri Rahim[1], Norsidah Ku Zaifah[1], Norlelawati A Talib[1]

[1]Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang, Malaysia

Epigenetic is an interaction between the environment and gene and has been attributed with pathogenesis of many complex diseases such as Schizophrenia (Sz) and also has been debated for future pharmacotherapeutic approach. The purpose of this study is to optimize the MethyLight assay method for quantification of DNA methylation for Catechol-O-methyltransferase COMT, Reelin RELN and 5-hydroxytryptamine (serotonin) 2C receptor HTR2C genes and assessing 2 reference genes, (β-actin) ACTB and ALU for its use. To assess the efficiency of MethyLight assay at different percentage of DNA methylation, DNA of universal human methylated and unmethylated samples were made into serial methylation percentage and subjected to bisulfite treatment. The primers and probes of the genes were designed to cover CpG rich sites while reference genes based on suggested literature. To assess the sensitivity of the assay at different DNA concentration, the universal human methylated DNA was diluted into 1:3 serial dilutions. Both assessments were subjected to real-time PCR assay. Amplification curves for target and reference genes were plotted at acceptable Cq values. However, the assay for HTR2C, ALU and ACTB were unable to differentiate the Cq values based on the percentage of DNA methylation, whilst the amplification assay and Cq values of RELN and COMT were proportionate and able to differentiate the percentage of DNA methylation. Serial dilution of the samples showed an acceptable standard curves with R^2 range from 0.80 to 1.00. In conclusion, ALU and ACTB can be used for reference genes as both assays showed no differences of Cq values against various percentage of DNA methylation. However ALU was more preferable as the dilution series showed a better assay efficiency especially at lower concentration of DNA. The assay for COMT and RELN were sensitive and specific for detection and quantification of DNA methylation.

P3-06

ANTIPROLIFERATIVE ACTIVITY OF *MYRMECODIA PLATYTYREA* METHANOLIC TUBER EXTRACT ON SEVERAL CANCER CELL LINES

Nurhafizah Ibrahim[1], Mizaton Hazizul Hasan[1], Masdiana Abdul Samad[1], Aisyah Hasyila Jahidin[1], Aishah Adam[1]

[1]Faculty of Pharmacy, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor Darul Ehsan

Myrmecodia (Rubiaceae) from Papua, Eastern Indonesia are well known for their tuber that are inhabited by ants. The ants are nesting in the inner part of its hypocotyls thus is why the plant is called 'sarang semut' by local Malaysian. Myrmecodia spp. can be found scattered from Peninsular Malaysia to the Asia Pacific region. Local people in the West Papua use Myrmecodia spp. as part of decoction herbal preparations for mild diseases such as backaches, ulcer, nosebleed, allergy, haemorrhoid, uric acid disorder to a much severe diseases such as tuberculosis, coronary heart disease, stroke, tumour and cancer. However, not many studies was conducted on *Myrmecodia platytyrea* which is locally known as 'sarang semut daging merah'. In this current study, *M. platytyrea* methanolic tuber extract was studied for its antiproliferative activities against several tumour and normal cell lines using MTS assay. To further confirm the mode of cell death of *M. platytyrea* methanolic tuber extract, apoptosis analysis was conducted by fluorescent microscopy (Acridine Orange/ Propidium Iodide staining). The extract was found to be most potent in inhibiting the growth of liver cancer cell line compared to other cancerous cells. *M. platytyrea* methanolic tuber extract was shown to be cytotoxic against HepG2 cell at IC_{50} value of 7.49 µg/mL and HSC-4 cell at IC_{50} value of 107.03 µg/mL while, normal liver cell line (Chang cells) demonstrated low cytotoxicity activity (IC_{50}= 282.9 µg/mL). HepG2 cells treated with *M. platytyrea* methanolic tuber extract was found to produce typical apoptotic characteristic when observed under fluorescent microscope at 400x magnification at a dose-dependent manner. *M. platytyrea* methanolic tuber extract inhibited the proliferation of HepG2 cells and HSC-4 cell without affecting normal cells, showing high selectivity. In conclusion, the extract possess potential antiproliferative activity that may be developed for management of cancer.

P3-07

GENERATION AND CHARACTERIZATION OF MONOCLONAL ANTIBODY AGAINST LMTK3 AND INVESTIGATION THEIR ROLE IN PROLIFERATION IN CANCER

Eng Sue Ping[1], Lit Lei Cheng[1], Cheah Swee Hung[1]

[1]Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia

Lemur tyrosine kinase 3 (LMTK3) is a transmembrane tyrosine kinase that belongs to the family of serine-threonine-tyrosine kinases and recent studies show that LMTK3 may be a reliable new biomarker in breast cancer, lung cancer, gastric cancer and colorectal cancer. In this study, 3 different clones of monoclonal antibodies (mAbs) were raised against synthetic peptide that corresponds to the 3 different part of sequence LMTK3. The main criteria for their choice were the location of the kinase domain, antigenicity, and their hydrophilicity. All the mAbs showed binding activity against the LMTK3 when analysed by ELISA and western blot. Only one of the mAbs showed binding activity with LMTK3 in MCF-7 overexpressing LMTK3 cells, analyzed by immunofluorescence. Two mAbs were found to be potent inhibitors of LMTK3 activity in vitro leading the cell to programmed death in p53 dependent manner. Further studies are needed to show the mechanism of the LMTK3 in role of cell proliferation and cell programmed death. These mAbs are useful for the development of diagnostic or research tools and may be beneficial for developing therapeutic strategy against cancer cells that express LMTK3.

P3-08

HDL3 INDUCES HIGHER CHOLESTEROL EFFLUX FROM THP-1 DERIVED MACROPHAGES THAN HDL2 AND TOTAL HDL

Roslina Ali[1], Mohd Yusri Idorus[1], Nawawi MH[2], Froemming GRA[3]

[1]Institute of Medical Molecular Biotechnology (IMMB), Faculty of Medicine, UiTM Sungai Buloh Campus, 47000 Sungai Buloh.
[2]Institute of Forensic Sciences,UiTM, Selayang Campus, 47000 Selayang
[3]Faculty of Medicine, UiTM Sungai Buloh Campus, 47000 Sungai Buloh

Cholesterol efflux from macrophages and the vascular wall is the initial step of the cardiovascular protective reverse cholesterol transport (RCT) process. Objective of this study was to test the capabilities of total HDL and its subpopulations HDL2 and HDL3 to remove cholesterol from THP-1 derived macrophages. THP-1, monocytic cells were treated with different concentrations of phorbol 12-myristate 13-acetate (PMA) and observed for 24, 48 and 72h. After the cells showed macrophage features, they were loaded with fluorescence-labelled cholesterol for 24h, followed by an equilibrium process, in which cells were incubated in serum-free medium to equilibrate the labelled cholesterol among all intracellular cholesterol pools. After that, the cells were incubated with extracellular cholesterol acceptors and the movement of labelled cholesterol from cells to the acceptor was quantified. The capability of total HDL, HDL2 and HDL3 (20µg/ml) to take up labelled cholesterol was determined after 2, 4 and 24h of incubation. ApoA-1 (10µg/ml) was used as a positive control. The intensity of fluorescence-labelled cholesterol was measured at 535nm excitation and 460nm emission. The ApoA1 content of each HDL population was determined using Western Blotting.The percentage of cholesterol efflux from THP-1-derived macrophages to total HDL, HDL2 and HDL3 increased between 2 and 4h but was reduced after 24h. Among the HDL groups, HDL3 showed the highest percent of cholesterol efflux followed by HDL2 and total HDL. ApoA1 content was the highest in HDL2 followed by HDL3 and total HDL. HDL3 has the highest capability to remove cholesterol from normal macrophages independent of ApoA-1 content. Therefore it seems that HDL3 is more atheroprotective than total HDL and HDL2.

P3-09

INVESTIGATING LAPATINIB-INDUCED DIARRHOEA IN A TUMOUR-BEARING RAT MODEL

WNI Wan Mohamad Zain[1,2], J. Bowen[3], E Bateman[2], D Keefe[2,4]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]School of Medicine, Faculty of Health Sciences, University of Adelaide, Adelaide, SA, Australia
[3]School of Medical Sciences, Faculty of Health Sciences, University of Adelaide, Adelaide, SA, Australia
[4]Cancer Centre, Royal Adelaide Hospital, Adelaide, SA, Australia

Lapatinib, an ErbB1/ErbB2 tyrosine kinase inhibitor is effective in breast cancer treatment but is associated with diarrhoea. ErbB1 inhibition by lapatinib may interfere with the normal functioning in the intestines. This study aimed to identify histological changes in intestines following lapatinib treatment and to determine the mechanism of diarrhoea related to the treatment. Female albino Wistar rats were injected subcutaneously with Walker 256 breast tumour cells. When the tumour reached 0.01% of body weight, rats were divided into three groups: control, lapatinib 240mg/kg once daily gavaged (L240 1x) and lapatinib 200mg/kg twice daily gavaged (L200 2x). Rats were assessed for indicators of intestinal injury. Upon necropsy, jejunum and colon were collected for histological assessment via H&E staining. Expression of ErbB1, ErbB2 and markers for apoptosis (caspase-3) and proliferation (ki-67) were detected via immunohistochemistry. From the results, diarrhoea was seen in L200 2x group but not in other groups. However, both L240 1x and L200 2x showed significant changes in the intestines compared to controls such as villus blunting in jejunum (L240 1x $p<0.01$, L200 2x $p<0.0001$) and increased apoptosis in colon (L240 1x $p<0.01$, L200 2x $p<0.001$). ErbB2 expression in jejunal crypt was significantly lower than controls in both L240 1x ($p<0.05$) and L200 2x ($p<0.05$). Interestingly, there were no changes in ErbB1 expression. In conclusion, lapatinib twice daily administration caused diarrhoea. However, it was not related to ErbB1 expression as was expected. As such, a mechanism unrelated to growth factor receptor suppression may be more important in the pathogenesis of diarrhoea.

P3-10

ANTIOXIDATIVE AND ANTIPROLIFERATIVE EVALUATION OF *CYMBOPOGEN CITRATUS* MICROWAVE EXTRACTED ESSENTIAL OIL ON HTB43 AND MCF-7 CELL LINES

Daryl Jesus Arapoc[1], Mohamed Zaffar Ali Bin Mohamed Amiroudine[1], Ng Yen[1], Zainah Adam[1], Shafii Khamis[1]

[1]Bahagian Teknologi Perubatan, Agensi Nuklear Malaysia, Bangi, Selangor

Cymbopogon citratus, (Lemon grass) is a widely used herb in tropical countries, especially in Southeast Asia. *Cymbopogon* is a genus of about 55 species, which are indigenous in tropical and semi-tropical areas of Asia and are cultivated in South and Central America, Africa and other tropical countries. *Cymbopogon citratus* essential oil was obtained by placing samples into microwave reactor without any solvent or water. The microwave extracted essential oil was studied for its *in vitro* cytotoxicity and apoptotic effects against two human cancer cell lines (HTB43 and MCF-7). The antioxidant activities of the essential oil were also studied using Total Phenolic Content (TPC), Total Flavanoid Content (TFC) and 1,1-diphenyl-2-picrylhydrazyl assay (DPPH). In HTB43 (head and neck cancer) and MCF-7 (breast cancer) cell lines, the essential oil showed cytotoxicity effects with IC_{50} value of 11.98 ± 1.78 and 63.32 ± 1.05 µg/ml respectively. The cytotoxicity studies showed dose-dependent effects against both cell lines. In addition, the essential oil has found inducing apoptotic effects within HTB43 (25.71 ± 1.43 %) and MCF-7 (27.68 ± 5.18 %) cell lines. The phenolic content (TPC) of the oil was 1.01 ± 0.006 mg/ (GAE)/0.1 gml^{-1} extract and the flavanoid content (TFC) was 0.806 ± 0.001 mg (QE)/0.1gml^{-1} extract. TPC and TFC results correlated positively with scavenging activity IC_{50} (DPPH) with 1.241 ± 0.21µg/ml. Our results indicate that the oil has promising anticancer activity and causes loss in cancer cell viability by activating the apoptotic process. Besides that, these data also suggested that the oil possessed antioxidative properties which may contribute towards the anticancer activities.

P4-01

THE EFFECTS OF ORAL ADMINISTRATION OF EURYCOMA LONGIFOLIA EXTRACT ON BODY WEIGHT AND BLOOD PRESSURE IN SPRAGUE DAWLEY RATS FED HIGH-FAT DIET

Al-Joufi Fakhria[1], Anil Kumar Saxena[1], Imad Matloub AL-Ani[1], Talib A Norlelawati[1], Mokhtar Rafidah Hanim[2] , Ku-Zaifah Norsidah[1]

[1]Department of Pharmacology, Faculty of Medicine, International Islamic University Malaysia
[2]Faculty of Medicine, Universiti Sains Islam Malaysia

Hypertension is one of the most important risk factors for cardiovascular events. It has become a significant socioeconomic burden in many countries. Eurycoma longifolia (EL), *Simaroubaceae*, is a herb that has been used since ancient times to combat many health problems. Its effects are attributed to its bioactive constituents. This study focused on the effects of EL on blood pressure (BP) and body weight (BW) in rats fed high-fat (HF). Healthy male SD rats were randomly divided into 4 groups (n=6) and were orally fed the following diets: 1) Normal diet alone (ND); 2) Normal diet plus EL [15 mg/kg] (ND+EL); High-Fat diet (53%) alone (HFD); High-Fat diet (53%) plus EL [15 mg/kg] (HFD+EL). EL extract was orally administered for 12 weeks. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured at week 0, 6 and 12 by using CODA® tail-cuff BP system while the BW was measured weekly. Statistical significance was determined by repeated measure (ANOVA) and one-way (ANOVA). P values < 0.05 were considered significant. Administration of EL led to less increment in BW (ND (34%) vs. NDEL (21%) and HFD (37%) vs. HFDEL (25%)) but did not achieve significant level. No changes in SBP and DBP were demonstrated among the experimental groups at week 0. In addition, ND and NDEL groups did not show any significant difference in SBP and DBP ($p > 0.05$) over the period of the study. Although, the SBP and DBP were significantly increased in HFD and HFDEL compared to ND ($p<0.05$), the SBP and DPB were significantly reduced in HFDEL as compared with HFD ($p= 0.001$) over the period of study. This study showed that the potential BW reduction effect of EL and its anti-hypertensive property by providing a significant reduction in SBP and DBP.

P4-02

MOLECULAR MODELLING STUDIES OF NATURAL PRODUCTS DERIVED FROM *PUNICA GRANATUM* AS POTENT ANTIDIABETIC AGENTS

Azza Mohammed Ghazali[1], Mohamad Haizal Lajis[1], Mahani Mahadi[1], Imtiaz Khalid Mohammed[1]

[1]Faculty of Pharmacy, Cyberjaya University College of Medical Sciences (CUCMS), Cyberjaya, Selangor, Malaysia

Diabetes Mellitus is a global epidemic that is characterized by an alarmingly high blood glucose level causing a lot of complications including neuropathy, retinopathy, and gangrene among other conditions. The emergence of treatment of this disease has lowered the risk of developing these worrying complications. However, these antidiabetic agents have unfavourable side effects such as weight gain. The search of new oral hypoglycaemic has been on the rise to minimize the side effects. Therefore, this study aims to search for antidiabetic properties of the 92 chemical constituents found in *Punica granatum* plant against three antidiabetic targets namely aldose reductase, α-amylase, and α-glucosidase. This study incorporated molecular modelling techniques by using Autodock 4.2 software for molecular docking simulations and Amber11 software for molecular dynamic simulations to achieve results. The molecular docking studies suggested 4 lead compounds with promising dock scores. For aldose reductase, the lead compounds are cholesterol and camesterol with free energy of binding values of -10.09 Kcal/mol and -9.98 Kcal/mol, and inhibition constant of 40.31 nM and 48.01 nM respectively. Meanwhile, α-amylase has the lead compounds, camesterol and β-sitosterol with free energy of binding values of -8.87 Kcal/mol and -8.83 Kcal/mol, and inhibition constant of 313.13 nM and 336.37 nM respectively. Lastly for α-glucosidase, the lead compounds are serotonin and β-sitosterol with free energy of binding values of -9.12 Kcal/mol and -8.97 Kcal/mol, and inhibition constant of 208.11 nM and 267.58 nM respectively. In molecular dynamic study, 4 systems were chosen which are aldose reductase – cholesterol, aldose reductase – camesterol, α-amylase - β-sitosterol, and α-amylase – camesterol which were subjected for RMSD and RMSF analysis. The RMSD and RMSF analyses show significant deviations of these selected natural compounds with the proteins and the fluctuations of the specific amino acids in the proteins are less than 3Å for these four complexes.

P4-03

HEPATOPROTECTIVE EFFECT OF METHANOLIC EXTRACT OF *PUNICA GRANATUM* ON PARACETAMOL-INDUCED HEPATOTOXICITY

Chiang Chun Yee[1], Waheedah Abdul Hakeem[1], Shamima Abdul Rahman[1]

[1]Department of Pharmaceutical Sciences, Faculty of Pharmacy, Cyberjaya University College of Medical Sciences, Selangor, Malaysia

Recently, natural resources which possess medicinal property have become an objective for current treatment. Phytochemical studies have revealed presence of antioxidants in *Punica granatum*, mainly comprised of flavonoids and tannins. Hepatotoxicity is potentially lethal and it is one of the most undesirable side effects of paracetamol (PCM) overdose. Paracetamol is known to cause hepatotoxicity via accumulation of its toxic metabolite, N-acetyl-p-benzoquinone imine (NAPQI) in the liver, thereby inducing oxidative stress. Thus, the aim of present study is to evaluate the hepatoprotective effect of *Punica granatum* (PG) against hepatotoxicity caused by acute paracetamol (PCM) overdose. Thirty-five Sprague-Dawley rats were divided into seven groups which were silymarin and PCM, normal saline, PCM only, 250mg PG peel and PCM, 500mg PG peel and PCM, 250mg PG pulp with PCM and 500mg PG pulp along with PCM. Based on studies conducted beforehand, the animals were dosed with PCM (7g/kg) prior to administration of treatment. Hepatoprotective effect was evaluated by macroscopic analysis of liver, weight of liver, liver enzymes Alanine aminotransferase (AST) and aspartate aminotransferase (ALT) as well as antioxidant level. From the findings, it was noted that both macroscopic scoring and weight of liver in treated group yielded significant results which supported hepatoprotective potential of PG. Both ALT and AST showed reduction for the treatment group but it is not significant when compared to control group. As for antioxidant assays, both FRAP and DPPH indicated the antioxidant level of treated groups is significantly higher compared to control group. In conclusion, the results obtained suggested that peel and pulp extracts of *punica granatum* may exhibit hepatoprotective effect against PCM-induced hepatotoxicity due to its antioxidant property.

P4-04

TOXICITY SCREENING AND PROTECTIVE EFFECTS OF *PHYLLANTHUS GOMPHOCARPUS* HOOK. F. ROOTS (PGR) ON WISTAR ALBINO RATS.

Ebby-Anuar Bahari[1], Mohd Azrul Hisham Ismail[1], Razif Dasiman[1], Norhisham Haron[1] , Zulkhairi Amom[1]

[1]Faculty of Health Sciences, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia.

Phyllanthus gomphocarpus Hook. F (Cermela Hutan) is a plant from *Phyllanthaceae* family and widely distributed in Malaysian tropical rainforest. The decoction water from its root was traditionally used as a supplement by local traditional practitioners and Orang Asli community to give positive impact towards human health. This study was carried out to determine its toxicity and protective effects on health, especially in liver and kidney. Acute oral toxicity (AOT) was used to assess the toxicity effects of PGR. Ten rats (5 males and 5 females) were administered orally with the highest dose of 2000 mg/kg of PGR aqueous extract and any changes or fatality on rats were observed and recorded within 7 days. In a different test, 24 male rats were randomly divided into 4 groups (n=6). Except to one group acted as a negative control, the other three groups were toxify with 200 mg/kg of BPA. Two groups were concomitantly supplemented with 50 mg/kg and 800 mg/kg PGR respectively. Body weights were recorded whereas nephrotoxicity and hepatotoxicity were assessed by liver function test and renal function test analysis. AOT result clearly showed that no fatality or any clinical symptoms of highest concentration of PGR extracts on both, male and female rats. Meanwhile, nephrotoxicity and hepatotoxicity screening also suggested that PGR does not affect the liver and kidney demonstrated with normal level of LFT and renal parameters. On the other hand, PGR extract possessed hepatoprotective and nephroprotective effects against the BPA. PGR was found to be not toxic in rat model and possesses beneficial effects on the liver and kidney. Further investigation need to be carried out to elucidate more about the effectiveness of PGR towards human health.

P4-05

MOLECULAR MODELLING STUDIES OF NATURAL PRODUCTS DERIVED FROM *MELICOPE PTELEFOLIA* AS POTENT ANTIHYPERCHOLESTEROLEMIA AGENTS

Fashli Syafiq Abd Razak[1], Nur Syafiqah Bakhtiar[1], Ismin Izwani Zainol Abidin[1], Imtiaz Khalid Mohammed[1]

[1]Faculty of Pharmacy, Cyberjaya University College of Medical Sciences (CUCMS), Cyberjaya, Selangor, Malaysia

Hypercholesterolemia is a type of condition where the blood carries out a high level of cholesterol, which may lead to the risk of developing cardiovascular disease. Today, the conventional lipid lowering medication is widely used. It is very effective in controlling the disease, however, they also posses many undesirable side effects. Alternative medicine such as using the medicinal plant that contains anti-cholesterolemic principles is a reliable method to control the disease. *Melicope ptelefolia*, which is also known as 'tenggek burung' among the Malaysian community, has been used as medicinal plant. The different parts of *M. ptelefolia* offer various kind of natural remedy for over the past centuries for various diseases. 82 natural products from *M. ptelefolia* were screened against various anti-cholesterolemic targets. In this study, three targets that involve in the cholesterol biosynthetic pathway has been choosen, which is squalene synthase, lanosterol synthase, and HMG-CoA synthase. The study involved two types of molecular modelling studies. Firstly screened the natural products by molecular docking simulation using Autodock 4.2 and continued with molecular dynamics simulation study using AMBER 11. The top two lead compounds were selected from each target based on the lowest free energy of binding and inhibition constant of the compound. β-sitosterol (FSH026) with free energy of binding of -9.40 Kcal/Mol and inhibition constant of 127.89 nM was found to be the lead compound for every selected target. Other potential lead compounds were Melicobisquinolinone B (FSH021) for squalene synthase, 2,4,6-trihydroxy-3-farnesylacetophenone (FSH035) for lanosterol synthase, and paraensidimerine D (FSH022) for HMG-CoA synthase. Two lead compounds, beta-sitosterol (FSH026) and Melicobisquinolinone B (FSH021) were then further studied using the molecular dynamics simulation method. The preliminary analysis of molecular dynamics simulation data has shown these compounds to be potential lead compounds.

P4-06

THE NOMENCLATURE OF *PANDANUS* ALKALOIDS

Hannis Fadzillah Mohsin[1], Ibtisam Abdul Wahab[1], Ummu Amirah Armayni[1]

[1]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia

From the literature, only one percent of the total *Pandanus* species (Pandanaceae family) were analysed in the studies related to their secondary metabolites. Scientific publications offered neither a recent record of all *Pandanus* alkaloids, nor the suggestion of any classification of these biomolecules. Therefore, this abstract is aimed to propose the unprecedented nomenclature of *Pandanus* alkaloids, following the inventory of their 23 natural alkaloids. From the examination, these specific compounds have a basic C_9-N-C_9 molecular framework. For an example, in the arrangement of carbon atoms of Pandanamine, the first carbon (C-1) is counted at the heteroatom of oxygen and the second carbon is attached with the ketone group. The C-1 to C-9 was assigned with one lactone skeleton. In the meantime, C-11 to C-19 showed the second lactone moiety. Furthermore, this nomenclature is determined based on its amine group. Pandanamine, being a symmetrical secondary amine, is hypothetically a biogenetic precursor of the *Pandanus* alkaloids. It has a straight chain of anime group that undergoes intramolecular cyclisation to form heterocyclic amines such as pyrrolidine (five-membered ring), piperidine (six-membered ring) and indolizidine (five- and six-membered rings). Thus, the compound that consists of piperidine alkaloid was named as pandamarilactone. Meanwhile, the molecules having pyrrolidine alkaloid was referred as pandamarilactonine. Pandanamine has two lactone rings and this might be observed in all alkaloids that were isolated from *Pandanus* species. The proposed systematic classification of the above alkaloid was utilised as well, in order to characterise two novel alkaloids, Pygmauesamine A and B, which were purified from the dichloromethane extract of *Pandanus pygmaeus*. Such compounds owning the indolizidine ring might possess biological activities such as antibacterial, fungicidal and insecticidal properties. It is anticipated that this nomenclature could be applied indefinitely, due to the relatively small number of *Pandanus'* alkaloidal structures.

P4-07

EFFECTS OF METHANOLIC EXTRACT OF *MYRMECODIA PLATYTYREA* TUBER ON STZ-INDUCED RATS

Hasbullani Zakaria[1], Mizaton Hazizul Hasan[1], Ibtisam Abdul Wahab[1], Aishah Adam[1]

[1]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia

Myrmecodia platytyrea (Rubiaceace) has been traditionally used as a remedy throughout Southeast Asia in the management of cancer, coronary heart diseases and many ailments related to inflammation. Inflammation has been linked to the activation of the immune system that leads to the pathogenesis of obesity-related insulin resistance and type 2 diabetes mellitus (T2DM). Thus, there is potential for this plant to treat diabetes, a metabolic disorder resulting from defects in tissue sensitivity to insulin. In 2014 the global prevalence of diabetes was estimated to be 9% among adults aged above 18 years. Therefore, the aim of this study was to investigate the effect of *M. platytyrea* methanolic tuber extract (MPMTE) on streptozotocin (STZ)-induced diabetic rats. MPMTE (100-400 mg/kg, p.o.) was administered daily to STZ-induced diabetic rats for 14 days. Blood was collected on day 1 and day 15 to measure fasting blood glucose and their lipid profile. The results showed STZ-induced diabetic rats given normal saline (p.o., control group) exhibited high levels of fasting glucose (219.5±3.4 mg/dL), total cholesterol (163.7±0.2 mg/dL), triglycerides (152.1±0.2 mg/dL) and low-density lipoprotein (LDL) (63.7±0.1 mg/dL), and low in levels of high-density lipoprotein (HDL) (37.0±0.3 mg/dl) compared to the normal rats (non-STZ-induced rats). The STZ-induced diabetic rats given MPMTE 200 and 400 mg/kg showed significant decreased (p<0.05) in fasting glucose (91.0±0.2 and 98.7±0.5 mg/dL, respectively), total cholesterol (88.8±0.1 and 75.7±0.2 mg/dL, respectively), triglycerides (116.1±0.1 and 97.7±0.2 mg/dL, respectively) and LDL (25.7±0.1 and 20.4±0.1 mg/dL, respectively) levels compared to control. However, the HDL levels (52.1±0.1 and 50.2±0.3 mg/dL, respectively) were not significant compared to control. In conclusion, MPMTE is potent in reducing blood glucose levels and lowering the cholesterol and triglyceride levels of STZ-induced diabetic rats. These findings supported the folkloric claims of this plant and can be further developed into an adjuvant therapy for diabetic patients.

P4-08

THE BIOMOLECULES FROM *PANDANUS PYGMAUES*

Ibtisam Abdul Wahab[1], Hannis Fadzillah Mohsin[1], Mizaton Hazizul Hasan[1], Sadia Sultan[1], Ummu Amirah Armayni[1], Nuruljannah Md Yusof[1], Mohd Sharil Ahmad[1]

[1]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia

The *Pandanus* of Pandanaceae family are Asia Pacific screwpines that are used by indigenous people in their traditional practices. From the literatures, these plants contain biomolecules, which are valuable for medicinal purposes. Therefore, they are investigated to identify the constituents that could contribute to these properties. A phytochemical work was conducted on *P. pygmaeus*, which has been rarely studied before. It is a dwarf species and possesses non-fragrant leaves, unlike *P. amaryllifolius* (the scented screwpine). It was reported that *P. pygmaeus* originates from Madagascar, thus, similar to *P. baptistii*. The aim of this research is to identify the active compounds that would exhibit antioxidant activity. The leaves were extracted in different polarities of organic solvents, to broaden the nature of isolated compounds. A series of chromatographic techniques were performed for the fractionation and purification, including silica gel column chromatography, centrifugal radial thin layer chromatography and preparative thin layer chromatography. In addition, the extract profiling was also performed by high performance liquid chromatography. As for the structural identification of pure compounds, Nuclear Magnetic Resonance spectroscopy and mass spectrometry were utilised. This *Pandanu*s work also comprises of four antioxidant tests such as 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity, Total Phenolic Content (TPC), Total Flavonoid Content (TFC) and Ferrous Ion Chelating (FIC) assays. The methanol crude extract was recorded to have the antioxidant activity, whereby, mixtures of beta-sitosterol and stigmasterol were separated. Meanwhile, a known indolizidine alkaloid, called as Pygmauesamine A, and its novel isomer, Pygmauesamine B were discovered from dichloromethane extract. In addition, Pygmauesamine A and beta-sitosterol were also purified from the hexanoic extract, along with a tirucallane-type triterpene and triglycerides from linoleic and stearic acids, respectively. Finally, the characterisations of the secondary metabolites from *P. pygmaeus* were completed.

P4-09

EFFECTS OF *GYNURA PROCUMBENS* LEAVES AQUEOUS EXTRACTS ON LIPID PROFILES AND LIVER FUNCTION TEST OF NEW ZEALAND WHITE RABBITS INDUCED WITH HIGH CHOLESTEROL DIETS

Mohd Azrul Hisham Ismail[1], Farrah Shafeera Ibrahim[1], Razif Dasiman[1], Ebby Anuar Bahari[2], Zulkhairi Amom[1]

[1]Universiti Teknologi MARA Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor

Gynura procumbens is also known as Sambung Nyawa in Malay contains active chemical constituents such as flavonoids, saponins, tannins, terpenoids and sterol glycosides and have been used traditionally in treating eruptive fever, rash, kidney disease, migraines, constipation, hypertension, diabetis mellitus, and cancer. Thirty six (36) males New Zealand White rabbits were divided into 6 groups as normal diet (ND), high cholesterol diet (HCD), simvastation group (SG) and treatment groups (TGA, TGB and TGC). TGA, TGB and TGC were given *Gynura procumbens* leaves aqueous extract at 100mg/kg, 200mg/kg and 400mg/kg per day. All groups except for ND were given 0.5% cholesterol diet to induce hypercholesterol. The effects of *Gynura procumbens* extract towards hypercholesterolemic induced rabbits were determined by measuring the body weight lipid profiles (Total Cholesterol, Triglycerides, HDl, LDL) where the serum samples were analysed by CPDRL, UiTM Sungai Buloh. Total cholesterol at week 10 was 1.163±0.186mmol/L, 40.153±3.958mmol/L, 9.830±mmol/L, 4.303±0.856mmol/L, 16.750±4.304mmol/L and 22.668±2.833mmol/L respectively. Triglycerides at week 10 were 0.790±0.092mmol/L, 1.945±0.355mmol/L, 0.563±0.071mmol/L, 0.453±0.061, 0.527±0.090 and 0.610±0.125mmol/L respectively. HDL level for ND, HCD, SG, TGA, TGB and TGC for week 10 were 0.505±0.089mmol/L, 2.840±0.433mmol/L, 1.777±0.276mmol/L, 1.544±0.235mmol/L, 1.899±0.315mmol/L and 2.510±0.391mmol/L respectively. LDL for ND, HCD, SG, TGA, TGB and TGC on week 10 were 0.233±0.020, 32.917±5.956mmol/L, 9.249±0.702, 8.162±0.065mmol/L, 16.240±4.366mmol/L and 32.063±7.184mmol/L respectively. Supplement of *Gynura procumbens* extracts (TGA, TGB and TGC) shows positive effects as compare to HCD. Body weights at week 10 for all groups were increased as compared to week 0. Consumption of *Gynura procumbens* leaves aqueous extract for a long term give beneficial effects in lipid profiles as it can work against high cholesterol.

P4-10

ANTIDIABETIC PROPERTIES OF LOCAL *Punica granatum* PEEL EXTRACT IN STREPTOZOTOCIN-INDUCED DIABETIC RATS

Muhammad Amirul Naqiuddin bin M. Azmi[1], Waheedah Abdul Hakeem[1], Mahani binti Mahadi[1]

[1]Faculty of Pharmacy, Cyberjaya University College of Medical Sciences (CUCMS), Cyberjaya, Selangor, Malaysia

Punica granatum or more commonly known as pomegranate is a plant with many proven medicinal benefits. It has a rich history of traditional uses in medicine and has been used to treat various diseases such as diabetes, hypertension, cancer, and dyslipidemia. The aim of this study is to determine the antidiabetic properties of local *Punica granatum* peel extract (PGPE) in rats. Local *Punica granatum* peel was made into extract by using methanol as the solvent. The antidiabetic properties of local PGPE extract were tested on three groups with three different doses: 50 mg/kg (Group 4), 100 mg/kg (Group 5), and 250 mg/kg (Group 6). The fasting blood glucose level of each rat was taken to determine its blood glucose lowering activity. The results shows that PGPE extract possess significant blood glucose lowering activity in streptozotocin-induced diabetic rats. In short, PGPE 250 mg/kg is more effective in reducing fasting blood glucose after two weeks of oral administration compared to PGPE 50 mg/kg and PGPE 100 mg/kg. While, PGPE 50 mg/kg and PGPE 100 mg/kg is more effective compared to PGPE 250 mg/kg in reducing fasting blood glucose after four weeks of oral administration. In conclusion, this study was able to identify that *Punica granatum* peel extract (PGPE) does indeed possess antidiabetic properties in streptozotocin-induced diabetic rats.

P4-11

ANTIULCER PROPERTY OF COMMERCIAL OLIVE OIL AGAINST WATER IMMERSION INDUCED STRESS IN RATS

Noorazwaniza binti Ahmad Khairi[1], Zauyah Yusuf[1], Shamima Abdul Rahman[1]

[1]Department of Pharmaceutical Sciences, Faculty of Pharmacy, Cyberjaya University College of Medical Sciences, 63000 Cyberjaya, Selangor, Malaysia

Olive is a rich source of valuable nutrients and bioactives of medicinal and therapeutic interest. Studies have stated that most therapeutic potential of virgin olive oil is attributed to its antioxidant compounds. In animal systems, olive oil phenolics showed their antioxidant activities in vivo. Therefore, this study has been conducted to evaluate the anti-ulcerogenic effect of commercial extra virgin olive oil. A total of 48 male Sprague Dawley rats were used in this present study and were divided into 6 groups with different pre-treatment; Group 1 (Normal Saline), Group 2 (Stress), Group 3 (Omeprazole 20 mg/kg), Group 4 (Palestine Extra Virgin Olive Oil), Group 5 (Minsyam Extra Virgin Olive Oil), and Group 6 (Colavita Extra Virgin Olive Oil). Ulcer was induced by using water immersion stress method by forcing the rats to swim for 4 hours. Then, the rats were sacrified with ketamil and xylazil. The stomach was then removed and cut along the greater curvature. Macroscopic analysis in the scoring of ulcer, weight of stomach of rats, protein concentration estimation and biochemical analysis including catalase, FRAP and DPPH were done to evaluate the antiulcer properties of the respective treatments. With the administration of extra virgin olive oil, the ulcer score decreases with decrease of weight of stomach together with increasing protein concentration and the antioxidant enzyme catalase. Pre-treatment with extra virgin olive oil also exhibit increasing FRAP value and DPPH free radical scavenging activity. As a conclusion, extra virgin olive oil regardless of any brand provides gastroprotection in water-immersion stress induced ulcer.

P4-12

ISOLATION OF CLITORIN AND MANGHASLIN FROM *CARICA PAPAYA* L. LEAVES BY CPC AND ITS QUANTITAIVE ANALYSIS BY QNMR

Norazlan Mohmad Misnan[1], Maizatul Hasyima Omar[1], Mohd Isa Wasiman[1]

[1]Herbal Medicine Research Centre, Institute for Medical Research, Kuala Lumpur, Malaysia

Carica papaya L. is a tree that mainly cultivated for its fruits in many tropical regions including Malaysia. Beside fruits, its leaves been traditionally used for treating diseases, which also reported to possess anti-cancer and anti- malaria properties. It's leaves have been reported to consist of various chemical compounds such as alkaloids, flavonoids and phenolics (Adlin *et al.,* 2012). Clitorin and manghaslin are among major flavonoids present. Thus, the aim of this study was to quantify the purity of these isolated compounds (clitorin and manghsalin) by using quantitative Nuclear Magnetic Resonance (qNMR) analysis. Fresh *C. papaya* leaves were used for juice extraction procedure and subsequently was freeze-dried to obtain a dark green powdered form of extract prior to Centrifugal Partition Chromatography (CPC) separation. The CPC experiments were performed using a two-phase solvent system comprising ethyl acetate/butanol/water (1:4:5, v/v/v/v) solvent. Fraction 6 and fraction 8 has been identified as clitorin (m/z 739.21 $[M-H]^-$) and manghaslin (m/z 755.21 $[M-H]^-$) respectively based on LCMS data and full analysis of NMR. The ^{1}H-qNMR measurements were carried out using a 400 MHz NMR spectrometer and deuterated methanol was used as a solvent. Quantification was performed using the AQARI method (Accurate Quantitative NMR) with deuterated 1,4-Bis(trimethylsilyl)benzene (BTMSB) as an internal reference substances. Regions containing the two downfield signals from aromatic part (6.00–6.89 ppm), and the singlet signal, (18H) arising from BTMSB (0.63-1.05ppm) were selected for integration. The purity of clitorin and manghaslin were calculated to be 52.22% and 43.36% respectively. Further purification is needed in order to increase its purity. This finding has demonstrated the use of qNMR for quality control and standardization of various plant extracts, which can be applied for NMR fingerprinting of other plant-based products with good reproducibility and in the case where commercial standards is not readily available.

P4-13

ANTIDIABETIC EFFECT OF *MELICOPE PTELEIFOLIA* LEAVES EXTRACT ON STREPTOZOTOCIN-INDUCED DIABETIC RATS

Nur Aqilah Azmi[1], Waheedah Abdul Hakeem[1], Mahani Mahadi[1]

[1]Faculty of Pharmacy, Cyberjaya Universiti College of Medical Sciences, Cyberjaya, Selangor, Malaysia

Melicope pteleifolia is known for its traditional use. Its reputation is growing vastly due to its medicinal values. This study report the antidiabetic effect of *Melicope pteleifolia* (MP) leaves ethanolic extracts on streptozotocin-induced diabetic rats. 30 male Sprague-Dawley rats consisted of 24 diabetic rats and six normal rats were used in this study. Diabetes was induced by intraperitoneal injection of streptozotocin (60mg/kg). Group 1 is a control group (0.9%normal saline), meanwhile diabetic rats were divided into 4 experimental groups, Group 2 (metformin 100mg/kg), group 3 (0.9% normal saline),Group 4 (200mg/kg of MP extract) and group 5 (400mg/kg of MP extract). All treatments were given via oral gavage for 15 days. Fasting blood glucose of all groups was measured to determine the efficacy of treatments. Group 4 lowered blood glucose level from 21.00mmol/L to 20.22mmol/L while group 5 significantly reduced the blood glucose level from 20.56mmol/L to 7.78mmol/L ($p<0.05$). Treatment with an antidiabetic drug, metformin in group 2, lowered blood glucose level from 20.56mmol/L to 11.26mmol/L. Significant reduction in body weight was also observed in both groups treated with MP leaves extract, while the groups treated with metformin gained a total weight of 26.214 ± 5.25g. The results showed ethanolic extract of MP exhibited dose dependent anti-diabetic property. 400mg/kg of MP extract was found to be more effective compare to 200mg/kg MP extract. Furthermore, the effect of 400mg/kg MP leaves extract was also found to be greater than metformin 100mg/kg. *Melicope pteleifolia* leaves extract has the potential as an antidiabetic agent and may useful in treating diabetes mellitus.

P4-14

WOUND HEALING PROPERTIES OF *MELICOPE PTELEFOLIA* (TENGGEK BURUNG) USING CREAM FORMULATION

Sharifah Nor Fadlina Syed Hassan[1], Waheedah Abdul Hakeem[1], Afendi Dahlan[1], Adnan Sulong[1]

[1]Faculty of Pharmacy, Cyberjaya University College of Medical Sciences, Cyberjaya, Selangor, Malaysia

Melicope ptelefolia (*M. ptelefolia*) or *tenggek burung* is a local herb that is widely used for various purposes such as treatment of wound infections, itches and also as an anti-inflammatory agent. The aim of this study is to formulate *M. ptelefolia* into cream and determine its wound healing properties. Extraction of *M. ptelefolia* leaves was done in Cyberjaya University College of Medical Sciences (CUCMS) utilizing methanol as the solvent. The methanolic extract of *M. ptelefolia* leaves was formulated into cream with different concentrations; 0%, 2%, 4% and 6% and were then evaluated for its wound healing properties by excisional wound method to mice. The evaluation of wound healing properties of *M. ptelefolia* creams were done to 6 groups of mice with each group consisting of 6 mice. Group 1 was the negative control group and was not given any treatment. Group 2 as the positive control was treated with commercially marketed product, Solcoseryl® Jelly 10%. Meanwhile, group 3 to group 6 were treated with different concentrations of *M. ptelefolia* extract cream. Treatment was given to respective group once daily for 7 days. The effect produced by the 6% of *M. ptelefolia* extract cream in terms of wound contraction ability was significant with $p<0.05$ when compared to the negative control group and group treated with 0% of *M. ptelefolia* extract cream. Therefore, the creams containing *M. ptelefolia* extract in this study are comparable with the marketed product, Solcoseryl® which contains 10% of active ingredients. As a conclusion, *M. ptelefolia* has the potential to be formulated as cream for wound healing purposes.

P4-15

ANTIOXIDANT, ANTIDIABETIC AND CYTOTOXIC ACTIVITY OF *BOUEA MACROPHYLLA* GRIFF SEED EXTRACTS

Zainah Adam[1], Mohamed Zaffar Ali bin Mohamed Amiroudine[1], Daryl bin Jesus Arapoc[1]and Shafii Khamis[1]

[1]Medical Technology Division, Malaysian Nuclear Agency, Selangor, Malaysia

Bouea macrophylla Griff or locally known as 'Kundang' is one of the common plant available in Malaysia. This plant from Anacardiaceae family is native to Southeast Asia particularly in Malaysia, Thailand and Indonesia. The medicinal values of this plant is not yet been explored. In the present study, total phenolic and flavonoids content of aqueous, methanolic, chloroform and hexane extracts of *B. macrophylla* seed extracts were determined. Antioxidant, *in vitro* antidiabetic and cytotoxic activities of these extracts were also determined. Results showed that aqueous, methanolic and chloroform extracts contain high concentrations of total phenolic, 689.17±37.50, 838.54±16.04 and 686.04±40.21 mg GAEs/g extract, respectively. However, all extracts showed low concentration of flavonoids suggesting that most of the phenolic compounds in *B. macrophylla* seed extracts were non-flavonoids. Antioxidant assay showed that aqueous, methanolic and chloroform extracts possess strong ferric reducing and DPPH radical scavenging activity (IC_{50}: 4.73±0.51, 6.02±0.67 and 4.34±0.74 µg/ml). These activities were almost comparable to that of vitamin C. Potent activities of such extracts might be attributed to the amount of phenolic compounds presence in such extracts. Antidiabetic study showed that aqueous, methanolic and chloroform extracts inhibited rat's intestine α-glucosidase activity with the IC_{50} values of 0.55±0.04, 0.33±0.02 and 0.26±0.01 mg/ml, suggesting the ability of the plant to delay glucose absorption from small intestine, hence reduces hyperglycemia. Cytotoxic evaluation showed that aqueous, methanolic and chloroform extracts exhibited promising cytotoxic activity against HTB43 cells with the IC_{50} values were 29.32±5.80, 18.65±2.94 and 21.14±6.97 µg/ml, respectively. Meanwhile, the hexane extract exhibited modest inhibition against MDA-MB-231 proliferation (IC_{50}: 123.35±28.65 µg/ml). In conclusion, *B. macrophylla* seed extracts possess strong antioxidant activity, promising antidiabetic and cytotoxic activities. These results indicate that *B. macrophylla* might have the potential to be developed as new pharmacological agent targeting on diabetes mellitus and cancer management.

P4-16

EFFECT OF A BIOACTIVE FRACTION OF *TYPHA CAPENSIS* RHIZOME EXTRACT ON LNCAP AND PWR-1E PROSTATE CELLS

Abdulkarem Ilfergane[1], Keenau Pearce[1], Ralf Henkel[1]

[1]Faculty of Science, University of the Western Cape, Bellville, South Africa

Typha capensis (bulrush) is a medicinal plant in wet lands of Southern Africa the rhizomes are used to treat numerous ailments including venereal diseases and fertility problems in women and men. Reportedly, *T. capensis* is also boosting testosterone secretion. Yet, its effect on the prostate remains elusive. Therefore, this study aimed at investigating its effects on LNCaP prostate cancer and PWR-1E prostate epithelial cells. Rhizomes of the plant were harvested in the four seasons, extracted with hot water and fractionated using HPLC. LNCaP and PWR-1E cells were incubated with different fractions (F1 to F4) of the extract under standard conditions at different concentrations (0.01, 0.02, 0.1, 1, 10, 100 µg/ml) for 24 and 96 hours, respectively. Viability, cell morphology, early apoptosis, and DNA fragmentation were determined. HPLC fingerprinting was carried out. Exposure of LNCaP cells resulted in a significant decrease in cell viability at high concentrations (10, 100 µg/ml). Signs of early apoptosis and DNA damage were obvious in the treated cells. For PWR-1E cells, the extract showed no significant effect on cell viability. Only at the highest concentration (100µg/ml) cellular stress was obvious with no indication of early apoptosis and DNA damage. HPLC data showed that the most effective fraction was the F1 fraction from the summer harvest. *Typha capensis* rhizome extract, particularly the F1 fraction of the summer harvest, has distinct cytotoxic effects and increased the level of apoptosis in LNCaP, but not in PWR-1E cells. Thus, this study opens perspectives on the use of *T. capensis* preparations in the treatment of prostate cancer in patients with aging male symptoms.

P4-17

IN VITRO ANTIOXIDANT AND ANTIPROLIFERATIVE ACTIVITIES OF *BOUEA MACROPHYLLA* EXTRACTS

Mohamed Zaffar Ali Mohamed Amiroudine[1], Daryl Jesus Arapoc[1], Zainah Adam[1]

[1]Agensi Nuklear Malaysia, Bangi, 43000 kajang, Selangor Darul Ehsan, Malaysia

Bouea macrophylla or commonly known as kundang fruit in Malaysia is a tropical fruit tree native to Southeast Asia. This plant belongs to the family *Anacardiaceae* which are cultivated for their edible fruits, seeds and medicinal compounds. The present study was conducted to evaluate the in vitro antioxidant and antiproliferation activities of *n*-hexane extracts from the mesocarp and endocarp of *B. macrophylla*. Antioxidant activity was measured via total phenolics (TPC) and total flavonoids (TFC) content and 2,2-diphenyl-1-picrylhydrazyl (DPPH). The extracts were screened on human squamous cell carcinoma (HTB-43) and breast cancer (MCF7) cell lines by using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Most effective concentration were screened for apoptosis induction in both cells using Hoeshst stain. Results show that the total phenolics in the mesocarp were (103.54±19.38) µg/mL gallic acid equivalents (GAE) while it was (58.96±16.46) µg/mL GAE in the endocarp. The flavonoid content was 36.85±0.45 mg (QE)/0.1gml-1 and 14.97±0.18 mg (QE)/0.1gml-1 extract for mesocarp and endocarp extracts respectively. TPC and TFC results correlated positively with scavenging activity (DPPH), 347.00 µg/mL for mesocarp and 1455.00 µg/mL in the endocarp extracts. Our present study has shown that both extracts strongly inhibited proliferation of HTB-43 and MCF7 cell lines. IC_{50} for the mesocarp and endocarp extracts on HTB-43 were 16.89 µg/mL and 21.50 µg/mL, while IC_{50} against the MCF7 cell lines were 12.50 and 15.30 µg/mL respectively. The characterization of antiproliferative effect demonstrated that this extract was an apoptosis inducer in both cell lines tested. These findings suggest that *B. macrophylla* may have novel therapeutic applications for the treatment of different cancer types.

P4-18

GASTROPROTECTIVE ACTIVITY OF VARIOUS PARTITIONS OF METHANOLIC EXTRACT OF *MELASTOMA MALABATHRICUM* AGAINST ETHANOL-INDUCED GASTRIC ULCER IN RATS: THE ROLE OF ANTIOXIDANT AND CYTOPROTECTIVE STUDY

Noor Wahida Ismail Suhaimy[1], Zainul Amiruddin Zakaria[1,2], Norhafizah Mohtaruddin[1], Manraj Singh Cheema[1]

[1]Faculty of Medicine, Universiti Putra Malaysia, Serdang, Selangor, Malaysia
[2]Institute for Halal Product Research, Universiti Putra Malaysia, Serdang, Selangor, Malaysia

Melastoma malabathricum L. (Melastomaceae), a plant that originate from the tropic and subtropic regions including Malaysia, has been traditionally used to treat various ailments including gastric ulcer. Its methanol extract has been proven to exert antiulcer activity against ethanol-induced gastric ulcer model. In the present study, the methanol extract of *M. malabathricum* leaves (MEMM) was semi-purified into petroleum ether (PEMM), ethyl acetate (EAMM) and aqueous (AQMM) extracts/fractions followed by subjection of each extract to the ethanol-nduced assay. Each fraction was also tested for their *in vitro* antioxidant and anti-inflammatory potentials. Tissue of the stomach of rats pre-treated with the most effective partition was also subjected to the antioxidant enzymes evaluation to determine the partition's cytoprotective potentials. From the antiulcer results obtained, EAMM exerted the most effective activity supported by the macroscopic and microscopic observations. Furthermore, EAMM significantly ($p < 0.05$) increased the superoxide dismutase (SOD), catalase (CAT), glutathione (GSH), prostaglandin E2 (PGE_2) value and decreased the level of lipid production (MDA) in gastric tissue. Additionally, the antiulcer activity of EAMM was modulated in the presence of nitric oxide, but not sulfhydryl compounds. In conclusion, EAMM exerts the antiulcer potentials plausibly via its antioxidant and cytoprotective activities that warrant further in-depth studies.

P4-19

HEPATOPROTECTIVE EFFECT OF *MORINDA CITRIFOLIA* ETHANOLIC LEAF EXTRACT SUPPLEMENTATION ON THE LIVER OF POSTMENOPAUSAL RATS FED WITH THERMOXIDIZED PALM OIL DIET

Gloria Chong Chui Lin[1], Farida Hussan, Faizah Othman[1]

[1]Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur, Malaysia

Menopause is associated with the development of obesity, dyslipidemia and non-alcoholic fatty liver disease (NALFD). *Morinda citrifolia* is an edible plant which has wide medicinal properties. This study was aimed to investigate the effects of *Morinda citrifolia* ethanolic leaf extract on the liver of postmenopausal rats fed with thermoxidized palm oil diet. Thirty-eight adult female Sprague-Dawley rats were divided into 5 groups; Sham Control (SH), Ovariectomized (OVX), Ovariectomized with Simvastatin 10 mg/kg (OVX+ST), Ovariectomized plus low dose *Morinda citrifolia* 500 mg/kg (OVX+MCLD) and Ovariectomized plus high dose *Morinda citrifolia* 1000 mg/kg (OVX+MCHD). All ovariectomized groups were fed with thermoxidized palm oil diet whereas the sham group was fed with normal diet. All groups were sacrificed after 1 month of treatment. Serum was obtained for liver function test and liver tissues were collected for histological study under light microscope. In the untreated group there were fat globules, inflammatory cells, hepatocyte ballooning, fibrosis, congestion and distortion of sinusoids. Supplementation with the leaf extract prevented the hepatic steatosis and inflammation. It also maintained the normal function of the liver. Adverse hepatic effects secondary to ovariectomy and thermoxidized palm oil diet were mitigated through the leaf extract supplementation. *Morinda citrifolia* leaf extract has hepatoprotective effect against NAFLD.

P4-20

BERBERINE AND GENISTEIN REVERSE METHYLGLYOXAL INDUCED CELL DEATH, DNA DAMAGE AND CYTOSKELETAL CHANGES IN OSTEOBLAST CELLS

Nurhafizah Md Shaari[1], Alyaa R AL-Khateeb[2], Suhaila Abd Muid[2], Aletza Mohd Ismail[2], Hapizah Mohd Nawawi[2,3], Gabriele Ruth Anisah Froemming[1,2,3]

[1]Institute of Medical Molecular of Biotechnology, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Faculty of Medicine, Universiti Teknologi MARA, Jalan Hospital, Sungai Buloh, Selangor, Malaysia
[3]I-PPerForM, Universiti Teknologi MARA, Selayang, Selangor, Malaysia

Methylglyoxal is a highly reactive *α,β*-dicarbonyl that is significantly increased during hyperglycemia and a known precursor for advanced glycation end-products (AGEs). AGEs on the other hand are associated with diabetic complications like retinopathy, neuropathy, cardiomyopathy, bone fragility, osteoporosis and others. The objectives of this study were to evaluate the effect of methylglyoxal on cell viability and cytoskeleton structure of osteoblastic hFOB 1.19 cells. hFOB1.19 cells were incubated with various concentrations of methylglyoxal, metformin, berberine, genistein, metformin and berberine, and metformin and genistein. The IC_{50} of methylglyoxal and cell viability rate was measured using Tryphan Blue. The mode of cell death and cytoskeleton changes was observed using Annexin-V-FLOUS Staining Kit and Phalloidin 635 with monoclonal anti-α-tubulin. Independent Samples *t*-test was used for the statistical analysis. Osteoblast cell viability was 50% reduced after treatment with 150 µM methylglyoxal (IC_{50}) when compared to control, $P<0.01$. Treatment with 10ug/ml metformin, 10ug/ml berberine, 10ug/ml genistein, 10ug/ml metformin and 10ug/ml berberine, and 10ug/ml metformin and 10ug/ml genistein each reversed the cytotoxic effect of methylglyoxal by 28.45%, 14.91%, 28.72%, 6.90%, 17.40% in hFOB 1.19 cells and therefore increased the cell viability when compared to methylglyoxal. Methylglyoxal (150 µM) caused DNA damage to the hFOB 1.19 cells while an incubation of methylglyoxal with natural compounds reversed the apoptotic effect of methylgloxal. Meanwhile, the cytoskeleton test showed that methylglyoxal depolymerised actin and tubulin fibers in hFOB 1.19 cells when compared to control. In contrast, incubation of methylglyoxal with metformin and natural compounds restored actin and tubulin fibers when compared to 150 µM methylglyoxal alone. These data support the idea that high methylglyoxal concentrations have detrimental effects on osteoblast cell viability, causing DNA damage and depolymerisation of actin and tubulin fibers. Berberine and genistein are potential anti-diabetic drugs.

P5-01

THE ROLE OF MICROGLIA IN PATHOPHYSIOLOGY OF ACUTE ISCHEMIC STROKE IN FIRST 3 HOURS THROUGH ATP RECEPTOR

Arni Kusuma Dewi[1], Tedy Apriawan[1], Chairul Anwar[2]

[1] Faculty of Medicine, Airlangga University, Surabaya, Indonesia
[2] Faculty of Veterinary Medicine, Airlangga University, Surabaya, Indonesia

Stroke is one of the cardiovascular diseases that needs attention in the world because, according to WHO, every year 15 million people worldwide suffer from stroke. Initial Handling of stroke further determines the quality of life of patients which depends on time, type and location of the stroke and the treatment given. It is associated with the pathophysiology of neuronal cell damage and inflammatory process. Here is a study on the role of microglia in inflammation, in first 3 hours of acute ischemic stroke through ATP receptors. 12 male Wistar rats, healthy with no motor abnormalities were used. Procedures for implementing the study were approved by the Research Ethics Committee Faculty of Veterinary Medicine Airlangga University. Rats were divided into 3 groups: first group with 1 hour of stroke, the second group with 2 hours of stroke and the third group with 3 hours of stroke. Induction of stroke was done by ligating common carotid artery dextra at different time points. Rat cerebrum was subjected to immunohistochemistry stain with primary rabbit anti ATP antibody. The mean number of microglia cells with ATP receptor expression in cerebral cortex of first group was higher than second group and no expression was found in third group. Between first and second group there was no statistically significant difference ($p > 0.05$). But from the description of histopathology first, second and the third groups showed qualitative differences regarding the dilatation of blood vessels, dilatation of perineural space, the type of neuronal death, and the distribution of inflammatory cells. Based on the data, microglia activated by ATP receptors were one of the cells involved in inflammation in acute ischemia stroke in first 3 hours.

P5-02

INFLUENCE OF ANTHROPOMETRY AND OBESITY INDICES ON ULNAR NERVE MOTOR CONDUCTION VELOCITY

KM Padmavathy[1], RK Marya[1], Rukhsana HM[1], Alam Sher Malik[1], Rohith Sharan Sankaran[2]

[1]Quest International University Perak, Malaysia
[2]YSMU, Armenia

Nerve conduction studies (NCS) are accomplished to diagnose the type of peripheral nervous system disorders causing demyelination and/or axonal degeneration and to locate site of lesion. The purpose of this study was to investigate the relationship of anthropometric and obesity indices with motor nerve conduction velocity (MNCV) of ulnar nerve among asymptomatic healthy young adults in Malaysia. In this study 30 medical students of Quest International University Perak (QIUP) aged between 19-21 years were participated. The parameters of compound muscle action potential (CMAP) of ulnar nerve were recorded using computerized equipment - Power Lab with standard techniques of supramaximal percutaneous stimulation by means of constant current and surface electrodes. The anthropometric measurements and CMAP parameters such as latency, peak amplitude, differences in latency and MNCV of ulnar nerve on both sides were recorded. Obesity indices BMI and waist-hip ratio were calculated. Pearson correlation revealed that the conduction velocity had significant correlation ($p< 0.05$) with height, BMI and waist-hip ratio; weight, BMI and hip circumference correlated significantly ($p< 0.05$) with peak amplitude at wrist on right side. The conduction velocity correlated significantly ($p< 0.05$) with latency and peak amplitude at wrist; also with latency at elbow on right side. The difference in latencies between wrist and elbow correlated positively only with height on both sides. Tukey-Krammer multiple comparisons revealed no significant differences on latency at wrist, latency at elbow, peak amplitude at wrist, peak amplitude at elbow and conduction velocity between both sides. Hence it was concluded that anthropometric parameters and obesity indices influence ulnar nerve CMAP parameters on both sides.

P5-03

EFFECT OF PROPOLIS ON TNF-α CONCENTRATION AND EXPRESSION IN KAINIC ACID INDUCED EXCITOTOXIC RAT BRAIN

Mummedy Swamy, Dian Suhaili, KNS Sirajudeen, Zulkarnain Mustapha, Chandran Govindasamy

Department of Chemical Pathology , School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

Glutamate receptor-mediated excitotoxicity is considered to be an important mechanism involved in various neurodegenerative diseases. Oxidative stress, neuronal inflammation and apoptosis have been proposed to be involved in excitotoxicity, which plays a part in many neurodegenerative diseases. Excitotoxicity is commonly induced in experimental animals by Kainic Acid (KA), which is 30-fold potent neurotoxic than glutamate. Honey bee propolis has been proposed to be protective in neurodegenerative disorders. To understand the neuro-protective effects of propolis, TNF-α expression and concentration were studied in cerebral cortex, cerebellum and brain stem of rats supplemented with propolis and administered with KA. Male *Sprague-Dawley* rats were divided into control group, KA group, propolis group and propolis + KA group with six rats in each group. Propolis and KA+propolis groups were orally administered with propolis (150mg/kg body weight), five times every 12 hours. Control group received vehicle. KA and KA+ propolis groups were given subcutaneous injection of KA (15mg/kg body weight) and were sacrificed after 2 hrs along with other groups. The brain regions were separated, homogenized and used for estimation of TNF-α by a commercial kit. RNA was extracted from the brain regions and converted to cDNA and in that TNF-α gene expression was estimated by RT-PCR. Results were analyzed by one-way ANOVA and reported as mean $\pm$ standard deviation and $p<0.05$ considered statistically significant. The TNF-α expression and concentration were significantly increased in all the three brain regions tested in KA group compared to control, but the increase of TNF-α expression and concentration by KA was prevented by prior supplementation of propolis. Results of this study clearly demonstrated that the propolis supplementation attenuated the inflammatory marker TNF-α expression and concentration in rats with KA mediated excitotoxicity. Hence, the propolis can be a potential candidate as protective agent against excitotoxicity and neurodegenerative diseases.

P5-04

HISTOLOGICAL ASSESSMENT OF PROTECTIVE EFFECT OF TUALANG HONEY AGAINST KAINIC ACID-INDUCED NEURONAL DEGENERATION IN RAT CEREBRAL CORTEX

Nur Shafika Mohd Sairazi[1], KNS Sirajudeen[1], Mohd Asnizam Asari[2], Mummedy Swamy[1], Siti Amrah Sulaiman[3], Muzaimi Mustapha[4]

[1]Department of Chemical Pathology, [2]Department of Anatomy, [3]Department of Pharmacology, [4]Department of Neurosciences, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian 16150 Kota Bahru, Kelantan, Malaysia

In recent decades, there is an emerging trend to search for natural resources to combat neurodegenerative diseases. Honey with its high nutritional content possesses various therapeutic properties including antioxidant and anti-inflammatory effects. Therefore, this study histologically evaluated the potential protective effect of Malaysian Tualang Honey (TH) against KA-induced neuronal degeneration in rat cerebral cortex by Fluoro Jade C staining. Male *Sprague-Dawley* rats were divided into five groups (n=6) as Control, KA-treated, TH + KA-treated, Aspirin (ASP- anti-inflammatory agent) + KA-treated and Topiramate (TPM – antiepileptic agent) + KA-treated groups. Control and KA-treated groups were administered orally with drinking water, whereas TH + KA-treated, ASP + KA-treated and TPM + KA-treated groups were orally administered with TH (1.0g/kg BW), ASP (7.5mg/kg BW) and TPM (40mg/kg BW), respectively, five times at 12 hours intervals. KA (15mg/kg BW) was injected subcutaneously 30 min after last treatment to all groups except the control group (normal saline). Animals were sacrificed 48 hours after KA administration. Then the cerebral cortex was separated, processed, sectioned and stained with Fluoro Jade C. The slides were then histologically evaluated for neurodegeneration. Histological evaluation revealed that numerous Fluoro jade-positive cells were present in the cerebral cortex region of KA- treated group which indicates neuronal degeneration, in comparison to the control. Fluoro jade-positive cells were not detected in the control group. Pretreatment with TH helped to reduce the KA-induced neuronal degeneration with less Fluoro jade-positive cells in the cerebral cortex and it showed more protective effect than TPM + KA-treated group. But no change was found between KA and ASP + KA-treated groups. This study suggested that Tualang honey provides some protective effect against neuronal degeneration induced by KA in rat cerebral cortex.

P5-05

ASSESSMENT OF REACTIVE OXYGEN SPECIES STATUS AND NEUROPROTECTION BY VITAMIN E IN CHRONIC CEREBRAL HYPOPERFUSION-INDUCED NEURODEGENERATION IN RATS

Sayyada Sayeed[1], Anil Kumar Saxena[1], Norlelawati Binti A.Talib[1], Marwan Saad Azzubaidi[2]

[1]Kulliyyah of Medicine; International Islamic University Malaysia, Kuantan Campus, 25200 Kuantan, Pahang, Malaysia
[2]Kulliyyah of Pharmacy; International Islamic University Malaysia, Kuantan Campus, 25200 Kuantan, Pahang, Malaysia

A persistent reduction in regional cerebral blood flow (CBF) compromises memory and cognitive functions in the elderly leading to neurological illnesses. To unravel the neuropathological consequences of a reduced CBF a similar condition has been created in rats by common carotid artery occlusion (2 vessel occlusion, 2VO). Since oxidative stress, leading to neuronal death, is a major risk factor in neurodegenerative disorders, the present study was designed to assess the neuroprotective role of Vitamin E (Vit E) in chronic cerebral hypoperfusion induced-neurodegeneration. After acclimatization, twenty four Sprague Dawley rats weighing 200-250 g were equally divided into three groups. Group A – sham control, Group B–2VO, and Group C–2VO-E (treated daily with Vit E, 100 mg/kg, orally following 2VO). On the 8th week, all the rats were euthanized and the hippocampi were isolated. Viable neuronal cell count in the hippocampal CA-1 region was estimated. The Isoprostane F2 (Iso-F2) levels were also measured in the brain homogenates to quantify the oxidative stress levels. There was significant difference in neuronal cell death in 2VO group as compared to sham group. In 2VO-E rats, the viable neuronal cell count of the hippocampal CA-1 region was significantly higher ($p<0.05$) as compared to the 2VO group. Moreover, Iso-F2 levels in 2VO group was significantly higher ($p<0.05$) as compared to 2VO-E group, implying high oxidative stress in 2VO group and reduction of oxidative stress levels in 2VO-E group. This study clearly demonstrates the effectiveness of Vit E as a neuroprotective and antioxidant agent in chronic cerebral hypoperfusion induced-neurodegeneration in rats.

P5-06

VAGAL NERVE FUNCTION IN CANCER PATIENTS COMPARED TO HEALTHY AND SUBJECTS WITH TYPE 2 DIABETES MELLITUS

Subbalakshmi Narasajjana Krishnadasa[1], Shilpa N Bijoor[1]

[1]Faculty of Physiology, Kasturba Medical College, Mangalore, Manipal University, Mangalore, Karnataka, India

Research in cancer is probing into association between vagal nerve dysfunction and progression of cancer. But, a suitable indicator for assessment of vagal activity in clinical setup is not explored adequately. We assessed the E:I ratio a marker of vagal activity in cancer patients compared to healthy and subjects with diabetes. 101 cancer patients, 179 healthy and 207 subjects with type 2 diabetes matched for age and sex of study subjects were included. E:I ratio was obtained from lead II electrocardiogram during deep breathing at 6 respiratory cycles per minute. Impaired E:I ratio was defined based on the age related normal values. Study group was divided in to group A (with abnormal E:I ratio, n = 30) and group B (with normal E:I ratio n = 71). Comparison of E:I ratio among the three groups was done by Kruskal-Wallis /ANOVA followed by multiple comparison tests. Frequency of cancer subjects with advanced stages and early stages in group A and group B was compared using Chi-square test. $p < 0.05$ was taken as significant. E:I ratio was lower in cancer subjects compared to healthy and subjects with type 2 diabetes ($p < 0.001$). E:I Ratio was impaired in 29.75% of cancer patients. In group A, number of cancer patients with advanced stages were higher compared to cancer patients with early stages ($p < 0.001$). In group B, there was no significant difference in number of patients with early and advanced stages of cancer. Vagal activity in cancer patients is reduced compared to healthy and subjects with type 2 diabetes mellitus. Severity of cancer influences E:I ratio.

P5-07

THE TIME-DEPENDENT EFFECTS OF HYPOTHERMIA ON THE L-GLUTAMATE INDUCED INJURY OF THE ASTROCYTES

Fatin Nur Asyiqin Abd Talib[1], Maizatulikhma Mat Zain[2], Andrean Husin[3], Noor Azean Anis Abdul Aziz[1], Rosfaiizah Siran[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Institute of Science, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia
[3]Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia

Glutamate excitotoxicity is involved in the pathophysiology of ischemic stroke injury due to release of massive amount of glutamate from the neurons into the extracellular space. The degree of the injury can be minimized by active intake of glutamate by the astrocytes. Hypothermia promotes neuronal survival against ischemic injury and represses pathological responses in glial cells including astrocytes. The aim of this study was to investigate the time-dependent effects of hypothermia on L-glutamate induced injury in astrocytes *in vitro*. The primary astrocytes were cultured and subjected to normothermia (37°C), mild hypothermia (33°C) and moderate hypothermia (29°C) for 6 hour, 12 hour and 24 hour after L-glutamate induced injury. Cell viability was evaluated by the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay. The astrocytes were shrunk after exposure to L-glutamate. MTT analysis of L-glutamate-treated cells at 37°C showed that the cell viability was reduced when compared to the control. Furthermore, primary cortical astrocytes showed the increment in the cell survival rates after 6 hour treatment at 33°C but the viability was gradually decreased after prolonged treatment for 12 and 24 hours. Furthermore, the 29°C significantly increased the viability of astrocytes at first 6 hour treatment and prolonged treatment for 12 and 24 hours. In conclusion, mild hypothermia was neuroprotective when given for shorter duration, while moderate hypothermia was effective when given for a longer duration.

P5-08

PILOT STUDY: THE EFFECT OF MILD HYPOTHERMIA ON GLUTAMATE TOXICITY IN HUMAN NEUROBLASTOMA SH-SY5Y CELLS.

Fatin Nur Asyiqin Abd Talib[1], Maizatulikhma Mat Zain[2], Andrean Husin[3], Noor Azean Anis Abdul Aziz[1], Rosfaiizah Siran[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Institute of Science, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia
[3]Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia

Glutamate toxicity is related to several neurodegenerative disorders. Hypothermia advances the survival and represses the pathological responses in neurons but the exact temperature needed is poorly defined. The aim of this study is to investigate the effect of mild hypothermia on glutamate toxicity in human neuroblastoma SH-SY5Y cells. SH-SY5Y cells were seeded at a cell density of 5x103 cell per well and incubated overnight at 37°C and 5% of CO2. After an overnight incubation, the glutamate toxicity was induced by exposing the SH-SY5Y cells with excess amount of L-glutamate in the culture medium at 37ºC for 15 minutes. The plate was incubated in mild hypothermia (33°C) or normothermia (37°C) for 24 hours. The plate without L-glutamate under normothermia (37°C) for 24 hours acted as the control. The MTT assay was carried out to evaluate the viability of SH-SY5Y cells. After 15 minutes exposure to the L-glutamate, the SH-SY5Y cells showed significant reduction in the cell viability (69 ± 0.006%) as compared to cells that did not receive glutamate toxicity. Mild hypothermia has no effect on the survival rate (56 ± 0.03%) when compared to normothermia against glutamate-induced cell toxicity. In conclusion, mild hypothermia for 24 hours has no effect on the viability of cultured neuroblastoma SH-SY5Y cells against glutamate-induced toxicity.

P5-09

THE EFFECTS OF 1 μM AND 100 μM (S)-3,5-DHPG ON NEUROBEHAVIOURS AND DREAM PROTEIN LEVELS OF MIDDLE CEREBRAL ARTERY OCCLUDED RATS

Nik Ramli NN[1], Omar N[1], Husin A[2], Ismail Z[3], Siran R[1]

[1]Faculty of Medicine, [2]Faculty of Dentistry, Universiti Teknologi MARA, Selangor, Malaysia
[3]Brain Research and Information Network, Universiti Sains Malaysia, Kelantan, Malaysia

Downstream Regulatory Antagonist Modulator (DREAM) is a multifunctional protein, which belongs to the neuronal calcium sensor family. Previous study showed that pre-treatment with group I mGluR agonist, (S)-3,5-dihydroxyphenylglycine ((S)-3,5-DHPG) induces neuroprotection against ischemia by regulating the DREAM protein expression. The objective of this study was to investigate the neuroprotective effect of DREAM protein in (S)-3,5-DHPG pre-treated rats with acute ischemic stroke. 1 or 100 μM of (S)-3,5-DHPG was administered intrathecally between L4-L5 of normal Sprague Dawley rats, 2 hours prior to the middle cerebral artery occlusion. The neurological deficits of the ischemic rats were assessed after 24 hours. The ischemic rats were sacrificed after 24 hours while the normal rats were sacrificed after 2 or 24 hours of (S)-3,5-DHPG administration. The brain tissues were extracted for TTC staining and protein extraction. The DREAM protein levels were quantitated using western blot analysis. There was significant increase in nuclear but not cytoplasmic DREAM protein after 2 hours of 1 μM and 100 μM(S)-3,5-DHPG. There were significant increase of cytoplasmic DREAM protein in 100 μM (S)-3,5-DHPG pre-treated and control ischemic rats where both of these groups showed significant neurological impairment and brain damages compared to 1 μM (S)-3,5-DHPG pre-treated ischemic rats. Pre-treatment with 1 μM of (S)-3,5-DHPG promotes increment in nuclear DREAM protein, therefore, may prevent DREAM from exerting apoptotic effect in cytoplasmic region during ischemia. On the other hand, 100 μM of (S)-3,5-DHPG increased the cytoplasmic DREAM which exacerbates ischemic injury.

P5-10

DEVELOPMENT OF BDNF INCORPORATED PLGA NANOPARTICLES AND EVALUATION OF ITS ABILITY TO CROSS BLOOD-BRAIN BARRIER USING AN *IN VITRO* MODEL

Siti Norsyafika Kamarudin[1], Minaketan Tripathy[2], Gabriele Ruth Anisah Froemming[1, 3], Igor Iezhitsa[1], Renad Alyautdin, Nafeeza Mohd Ismail[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia
[3]IPPerForm, Universiti Teknologi MARA, Selayang, Selangor, Malaysia

Brain derived neurotrophic factor (BDNF) was found to be neuroprotective following delayed intravenous administration in either regional or global brain ischemia. However, the therapeutic proteins with higher molecular weight, BDNF cannot be transported easily across the blood-brain barrier (BBB). The purpose of this study was to design BDNF incorporated PLGA nanoparticles (NPs) and to evaluate its ability to cross BBB using an in vitro model of the BBB employing human brain microvascular endothelial cells (HBMEC). In the present study, BDNF containing PLGA nanoparticles were synthesized using water/oil/water double emulsion solvent evaporation method with modification. The nanoparticles were characterized for particle size (PS) and zeta potential (ZP) using a dynamic light scattering (DLS) technique. The percentage entrapment efficiency (% EE) was calculated. Morphology of NPs has been studied using transmission electron microscopy (TEM) and scanning electron microscopy (SEM). Ability to cross BBB was studied using an *in vitro* model employing human brain microvascular endothelial cells (HBMEC). In our study the PS and ZP of nanoparticles were found to be ~27.8 nm and -5.7 mV respectively. Incorporation of BDNF resulted in increased PS with the average size of ~565 nm, though NPs remained in the nanometer-sized range with a marginal change in ZP of -20.8mV. One-month stability study showed good physical stability with size distribution of ~215.1 nm and zeta potential of -15.2mV. Data from DLS and SEM/TEM analysis complimented each other well. In our study BDNF loading efficiency was found to be 93%. Confocal laser scanning microscopy (CLSM) confirmed penetration and distribution of fluorescent NPs into HBMEC, however individual NPs could not be visualized as their size was below the resolution limit of the confocal microscope. In conclusion, findings tend to indicate that BDNF incorporated PLGA nanoparticles (NPs) could be of benefit in enhancing BDNF transport across BBB.

We acknowledge financial support from grant 600-RMI/ERGS 5/3 (36/2013) by MOE, Malaysia.

P5-11

EFFECT OF MAGNESIUM ACETYLTAURINATE AGAINST NMDA INDUCED EXCITOTOXICITY ON RETINAL GANGLION CELLS (RGCs)

Azliana Jusnida Ahmad Jafri[1], Lidawani Lambuk[1], Natasha Najwa Nor Arfuzir[1], Ahmad Pauzi Md. Yusof[1], Igor Iezhitsa[1], Renu Agarwal[1], Khairul Nizam Rozali[1], Puneet Agarwal[2], Nor Salmah Bakar[1], Methil Kannan Kutty[1], Anna Krasilnikova[1], Alexander Spasov[3], Nafeeza Mohd Ismail[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Malaysia
[2]Faculty of Medicine, International Medical University, Malaysia
[3]Volgograd State Medical University, Russia

Prolonged stimulation of NMDA receptors causes calcium dependent excitotoxicity on retinal ganglion cells (RGCs). RGCs are located at the innermost layer of retina where the first insult of excitotoxicity occurs. A number of substances have been proposed to reverse this effect. In the current study, Magnesium Acetyltaurinate is being investigated as possible therapeutic agent against NMDA induced excitotoxic injury to RGCs. We examined the effect of Magnesium Acetyltaurinate against NMDA induced excitotoxicity on RGCs by retinal morphometric measurements in 5 groups of 150g-250g Sprague Dawley rats. Rats were divided into 5 groups of 6 rats each and were given intravitreal injections. Group 1 was injected with vehicle; group 2 was injected with NMDA while groups 3, 4 and 5 were injected with NMDA, 24 hours before, in combination or 24 hours after Magnesium Acetyltaurinate in equimolar doses (160nm). 7 days post-injection, the rats were sacrificed and their eyes were enucleated, fixed and processed for histopathological studies. Morphometric measurements were performed by estimating the thickness, area and length of retinal layer and ganglion cell layer (GCL) and the number of cells in each was counted. The morphometry showed that GCL thickness (μm)(%) was reduced by 1.35, 1.05, 1.26 and 1.16 folds in groups 2, 3, 4 and 5 respectively compared to group 1. Linear cell density in the GCL showed 1.85, 1.45, 1.79 and 1.45 folds reduction in groups 2, 3, 4 and 5 compared to group 1. Numeric density of ganglion cell in GCL was 1.59, 1.14, 1.42 and 1.15 folds lower in groups 2, 3, 4 and 5 compared to group 1. Numeric density of ganglion cells in inner retina for groups 2, 3, 4 and 5 was 1.63, 1.10, 1.4 and 1.2 folds lower than group 1. In conclusion, pretreatment and co-treatment with Magnesium Acetyltaurinate prevents NMDA-induced RGC death.

We acknowledge financial support from grant 600-RMI/RAGS 5/3 (103/2013) and grant 600-RMI/FRGS 5/3 (104/2013) by MOE, Malaysia

P5-12

DOSE-RELATED EFFECTS OF MAGNESIUM ACETYLTAURINATE AGAINST ENDOTHELIN-INDUCED RETINAL GANGLION CELL DEATH

Natasha Najwa Nor Arfuzir[1], Lidawani Lambuk[1], Azliana Jusnida Ahmad Jafri[1], Renu Agarwal[1], Igor Iezhitsa[1,3], Sabril Hakim Sidek[1], Puneet Agarwal[2], Methil Kannan Kutty[1], Ahmad Pauzi Md. Yusof[1], Anna Krasilnikova[1,4], Alexander Spasov[3], Alexander Ozerov[3] Nafeeza Mohd Ismail[1]

[1]Faculty of Medicine, Universiti Teknologi MARA Sungai Buloh Campus, Selangor, Malaysia
[2]Faculty of Medicine, International Medical University, IMU Clinical School, Seremban, Malaysia
[3]Volgograd State Medical University, Research Institute of Pharmacology, Volgograd, Russia
[4]Department of Clinical Pharmacology & Intensive Care, Volgograd State Medical University, Pavshikh Borsov Sq. 1, 40131, Volgograd, Russia

Retinal ganglion cell (RGC) apoptosis in glaucoma is associated with increased vitreous levels of endothelin-1 (ET-1), a potent vasoconstrictor. Considering the vasodilating effects of magnesium and antioxidant effects of taurine, we studied the dose-related effects of magnesium acetyltaurinate (MgT) against ET-1-induced retinal morphological changes. Among the six groups of rats (n=6), groups 1 and 2 were intravitreally administered with vehicle or ET-1 (2.5 nm), respectively. Groups 3, 4, 5 and 6 were similarly treated with ET-1 2.5 nm along with MgT 80, 160, 320 and 640 nmol, respectively. Seven days post-injection, rats were sacrificed and retina was examined histopathologically. The fraction of ganglion cell layer (GCL) thickness within inner-retina (IR) (%) was 2.12 folds lower in group 2 compared to group 1 ($p<0.05$). The same in groups 4, 5 and 6 was 1.46, 1.11 and 1.05 folds lower than group 1 with significant difference from group 2 ($p<0.05$). The number of nuclei/100 μm length of GCL was 4.01 times lower in group 2 compared to group 1. The same was significantly higher ($p<0.05$) in groups 4, 5 and 6 compared to group 2, however, the mean values remained 2.36, 1.55 and 1.49 folds lower than group 1. The number of nuclei/100 μm² area of GCL were 2.85, 1.69, 1.59, 1.19, and 1.32 folds lower in groups 2, 3, 4, 5 and 6, respectively, compared to group 1. Groups 4, 5 and 6 showed significantly higher values than group 2 ($p<0.05$). Similar observation was made for number of nuclei/100 μm² area of IR. Group 3 did not show significant difference from group 2 for any of the 4 parameters. Additionally, all 4 parameters were significantly greater in groups 5 and 6 compared to group 4 ($p<0.05$). In conclusion, intravitreal MgT protects against ET-1-induced retinal morphological changes in a dose-dependent manner.

We acknowledge financial support under grant no. 600-RMI/RAGS 5/3 (40/2014) by MOE, Malaysia

P5-13

EFFECT OF MAGNESIUM ACETYLTAURINATE ON RETINAL GANGLION CELLS DEATH INDUCED BY N-METHYL-*D*-ASPARTATE: POSITIVE TUNEL STAINING STUDY

Lidawani Lambuk[1], Natasha Najwa Nor Arfuzir[1], Azliana Jusnida Ahmad Jafri[1], Igor Iezhitsa[1], Renu Agarwal[1], Khairul Nizam Rozali[1], Puneet Agarwal[2], Nor Salmah Bakar[1], Methil Kannan Kutty[1], Ahmad Pauzi Md. Yusof[1], Anna Krasilnikova[1], Alexander Spasov[3], Alexander Ozerov[3], Nafeeza Mohd Ismail[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Malaysia
[2]Faculty of Medicine, International Medical University, Malaysia
[3]Volgograd State Medical University, Research Institute of Pharmacology, Volgograd, Russia

Glutamate excitoxicity plays a major role in the loss of retinal ganglion cells (RGCs) in glaucoma. The toxic effects of glutamate on RGCs are mediated by the overstimulation of N-methyl-*d*-aspartate (NMDA) receptors. Magnesium (Mg) exhibits neuroprotective effect by blocking NMDA receptor-related calcium influx. Taurine has been shown to possess antioxidant properties. In this study, we examined the effect of Mg acetyltaurinate (MgAT) on RGC death induced by NMDA. Sprague Dawley rats (180-200g) were divided into 5 groups. Group 1 and 2 were intravitreally injected with vehicle (PBS) or NMDA; group 3 and 4 were intravitreally injected with MgAT 24 hours before or after NMDA injection (MgT pre-treatment and MgT post-treatment groups); group 5 was intravitreally co-administered with both NMDA and MgAT (MgT co-treatment group). NMDA and MgAT were injected in PBS at eqimolar doses (160 nmol). Seven days after injection, rats were sacrificed; eyes were enucleated, fixed and processed for TUNEL staining. The result was expressed as the number of apoptotic cells per 100 μm^2 of ganglion cell layer. In our study intravitreal NMDA injection caused severe degenerative changes accompanied with 3.85 folds increase in number of apoptotic cells compared to control group ($p<0.001$). Pre-treatment with MgAT completely abolished apoptotic response to NMDA with decrease in number of apoptotic cells by 2.37 times compared to NMDA-treated group ($p<0.001$). There was no significant difference in the number of apoptotic cells between control group and MgT pretreatment group. Co-treatment with MgT significantly but not completely prevented NMDA-induced neuronal cell death with decrease in the number of apoptotic cells by 1.54 times compared to NMDA-treated group ($p< 0.01$). There was no significant difference in the number of apoptotic cells between NMDA-treated group and MgT post-treatment group. The results suggest that both pre-treatment and co-treatment with MgAT abolish neurotoxic effect of NMDA on RGCs.

We acknowledge financial support from grant 600-RMI/RAGS 5/3 (103/2013) by MOE.

P5-14

DOSE-RELATED EFFECTS OF AMYLOID BETA$_{1-40}$ ON RETINAL MORPHOLOGY AND RGC SURVIVAL

Mohd Aizuddin Mohd Lazaldin[1], Igor Iezhitsa[1], Renu Agarwal[1], Puneet Agarwal[2], Methil Kannan Kutty[1], Anna Krasilnikova[1], Nafeeza Mohd Ismail[1]

[1]*Faculty of Medicine, Universiti Teknologi MARA, Malaysia,*
[2]*Faculty of Medicine, International Medical University, Malaysia*

Amyloid beta (Aβ) deposition takes places in many neurodegenerative diseases including glaucoma. Intravitreal Aβ injections in varying doses are often used to study molecular mechanisms of retinal ganglion cell (RGC) death and neuroprotection. However, the dose-related effects of amyloid beta on retinal morphological changes remain unclear. The purpose of this study is to evaluate the dose-dependent neurotoxic effects of amyloid beta 1-40 (Aβ 1-40) on RGCs using morphometric measurements. Female Sprague Dawley rats (200-250g) were divided into 5 groups. Groups 1 was intravitreally administered with vehicle (PBS), group 2, 3, 4 and 5 were intravitreally administered with Aβ 1-40 in doses of 1 nmol, 2.5 nmol, 5 nmol and 10 nmol respectively. Seven days after injection, rats were sacrificed, eyes were enucleated, fixed and processed for hematoxylin and eosin staining. The thickness, area and length of the inner retinal layer (IRL), ganglion cell layer (GCL) were measured and the number of cells counted. Subsequently, morphometric analyses were performed. In our study, GCL thickness within inner-retina (IR) (%) was 1.25 folds lower in group 2 compared to group 1 ($p<0.05$). The same in groups 3, 4 and 5 were 1.63, 1.65 and 1.63 folds lower than group 1 ($p<0.05$) with significant differences from group 2 ($p<0.05$). There were no differences between groups 3, 4 and 5. The number of nuclei/100 µm² area of GCL were 2.92, 2.82, 2.70, and 3.25 folds lower in groups 2, 3, 4, and 5, respectively, compared to group 1 ($p<0.05$). Groups 5 demonstrated significantly higher mean values than groups 2, 3 and 4 ($p<0.05$). There were no differences between groups 2, 3 and 4. Similar observation was made for number of nuclei/100 µm² area of IR. In conclusion, intravitreally injected Aβ 1-40 affects retinal morphology and reduces RGC survival in a dose -dependent manner.

We acknowledge financial support from grant 600-RMI/FRGS 5/3 (111/2014) by MOE.

P6-01

REDUCED EXPRESSION OF CLAUDIN 4 IN THE INTESTINAL VILLI AND PEYER'S PATCHES OF RATS FED HIGH FAT DIET

Auni Aqilah Zainal Abidin, Effat Omar, Mohammed Nasimul Islam, Jesmine Khan

Faculty of Medicine, Sungai Buloh Campus, Universiti Teknologi MARA (UiTM), Selangor, Malaysia

Prevalence of obesity has increased worldwide. One of the factors leading to obesity is consumption of high fat diet (HFD). HFD causes many harmful effects within the body. Before causing its effect in different organs, HFD might have effects on the gastrointestinal (GI) mucosa first. Unfortunately, the effect of HFD on the GI mucosa has received minimal attention. Intestinal tight junction protein claudin 4, situated in between the enterocytes of villi and Peyer's patches (PP), regulates the permeability through intestinal mucosa. Reduced Claudin 4 is responsible for increased paracellular transport of antigenic materials. Objective of this study was to investigate the expression of claudin 4 in the PP and villi of male Wistar rats fed HFD. Four weeks old, twenty male Wistar rats were divided into chow (n=10) and HFD (n=10) groups. After 6 weeks of the respective diets, small intestinal segments containing PP were collected after laparotomy. Tissues were processed, sectioned into 3 micrometer thickness and taken on poly-L-lysine coated glass slides. Immunohistochemical staining was performed by anti-claudin 4 antibody. Stained sections were scored under light microscope to calculate the number of claudin 4 in the PP and villi of both groups. Statistical analysis was done by chi-square test. Data were presented as mean ± SD. Expression of claudin 4 in the PP was significantly decreased in HFD rats compared to the control (1.6 ± 0.669 vs 2.1 ± 0.583, $p = 0.018$). Expression of claudin 4 in the villi in HFD rats was significantly decreased (1.55 ± 0.597 vs 1.975 ± 0.670, $p = 0.015$) compared to the control. HFD consumption for 6 weeks reduced the expression of claudin 4 in the intestinal Peyer's patches and villi of male Wistar rats, which might be responsible for the higher transport of harmful GI luminal substances to the systemic circulation.

P6-02

ASSOCIATION BETWEEN BODY MASS INDEX (BMI) AND CHOLESTEROL LEVEL

Noorzaid Muhamad, Resni Mona, Norain Ab Latif and Nadea Annur Desa

Universiti Kuala Lumpur, Royal College of Medicine Perak, Malaysia

Earlier study has demonstrated the significant correlation between BMI with other cardiovascular risk factors, leisure-time, physical activity, and diet (Schroder, H. et al., 2003). In addition, obesity in young adults has also been suggested to lead to a higher risk of developing hypercholesterolemia. Acknowledging the bad effect that high cholesterol may cause, this study therefore aims to determine the association between cholesterol level and different categories of BMI. The study population consists of 165 individuals (age 18 to 60) from different state who were invited to participate in a health screening programme. Body weight and height were measured using the Karada scan machine. Random blood cholesterol were measured by using strips method. Hypercholesterolaemia is defined as the blood cholesterol level >5.2mmol/L. Our study showed that 77.8% of underweight subjects with a body mass index <18.5kg/m2 have hypercholesterolaemia. Excess body weight and elevated blood cholesterol are strongly interrelated. Results show that 79.4% of obese subjects have hypercholesterolaemia. Excess body weight should receive increased attention in this population. Weight reduction and normal BMI are strongly recommended to younger people to prevent hypercholesterolaemia. As BMI rises above 25, cholesterol level will increase with increased risk of developing various heart disease.

P6-03

ADIPOQ POLYMORPHISMS IN OBESITY AND HYPERINSULINEMIA AMONG MALAYSIAN ADOLESCENTS POPULATION

Nor Hanisah Muhamad[1], Nur Lisa Zaharan[1], Fatin Fauzi[1], and Zahurin Mohamed[1]

[1]Department of Pharmacology, Faculty of Medicine, University of Malaya, Kuala Lumpur

Hyperinsulinaemia is thought to be the earliest marker of metabolic dysfunctions and is more common in obese individuals. Single nucleotide polymorphisms (SNPs) in the adiponectin (ADIPOQ) gene were shown to be associated with both obesity and hyperinsulinaemia in various population. We aim to examine the relationship between selected ADIPOQ polymorphisms (rs3774261, rs17366568, rs2241766 and rs266729) with obesity related parameters as well as hyperinsulinaemia in Malaysian adolescents. This cross sectional study recruited 696 adolescents (13-year olds, 28% boys, 74% Malay, 15% Chinese and 10% Indian) from 23 randomly selected secondary schools across Kuala Lumpur, Malaysia. Anthropometric measures included body mass index (BMI), waist (WC) and hip circumference and waist and hip ratio (WHR). Percentage of body fat (BF %) was assessed using portable bioelectrical impedance analysis. Hyperinsulinemia was defined as fasting insulin level of >20 uU/mL. Obesity was defined as BMI $\geq 95^{th}$ centile. Genotyping was performed using sequenom MassARRAY. Association of allele was performed using binary logistic regression adjusting for gender, ethnicity and puberty stages. One way ANOVA test was conducted for comparison of means between alleles. The mean and standard deviations for obesity parameters in the adolescents were as follows: BMI 20.6±5.1, WC 68.9±12.2cm, WHR 0.8±0.3 and BF% 29.6%±10.7% with fasting insulin of 14.7±12.4uU/mL. Of those, 14% students were obese (44% boys, 77% Malays). A significant association was found between ADIPOQ rs17366568 with BMI ($p<0.0001$), BF% ($p=0.02$) and fasting insulin ($p<0.05$). Those with AA gentotype of rs17366568 were associated with higher BMI and BF% ($p<0.05$) compared to those with GG and GA genotypes. No significant association was observed between other ADIPOQ SNPs and obesity or hyperinsulinaemia. In conclusion, ADIPOQ rs17366568 was associated with increased risk of obesity and hyperinsulinemia in Malaysian adolescent population.

P6-04

HDL AND ITS SUBPOPULATIONS REDUCE INFLAMMATION AND ACTIVATE ABCA1 CHOLESTEROL TRANSPORTER VIA PPARδ PATHWAY IN STIMULATED ADIPOCYTES

Suhaila Abd Muid S[1, 3], Remee Awang Jalil[1], Hapizah Nawawi [1, 2], Gabriele Ruth Froemming GRA[1, 3]

[1]Faculty of Medicine, Universiti Teknologi MARA (UiTM), 47000, Sungai Buloh, Selangor, Malaysia
[2]IPPerform, Universiti Teknologi MARA, 47000, Selayang, Selangor, Malaysia
[3] Health & Wellbeing Core, Universiti Teknologi MARA (UiTM), 40450, Shah Alam, Selangor

It has been suggested that the activation of peroxisome proliferator activated receptor gamma (PPARγ) and peroxisome proliferator activated receptor delta (PPARδ) leads to increased ABCA1 expression by adipocytes. ATP-binding cassette transporter (ABCA1) is a key transporter of cholesterol from within cells onto high density lipoprotein (HDL). Therefore, increasing both ABCA1 and HDL is important in promoting cholesterol efflux. However, not much data on the effects of HDL and especially its subpopulations on tumour necrosis factor alpha (TNF-α) stimulated adipocytes have been reported. The objective of this study is to investigate the effects of tHDL, HDL2 and HDL3 on the expression of ABCA1, PPARδ, PPARγ, interleukin-6 (IL-6) and visfatin in TNF-α stimulated 3T3-L1 adipocytes. Mature 3T3-L1 adipocytes were incubated with 10 ng/ml TNF-α and HDL (tHDL, HDL2 or HDL3) 20, 60 and 100 µg/ml for 24 hours. Protein expression of IL-6, ABCA1 and visfatin were measured using ELISA while mRNA expression of IL-6, ABCA1, PPARδ, PPARγ and visfatin were determined by QuantiGene Plex. tHDL, HDL2 and HDL3 significantly increased ABCA1 protein expression in a dose dependant manner and showed an increasing trend in gene expression. All HDL subpopulations increased PPARδ gene expression but showed no beneficial effects on PPARγ gene expression. HDL and its subpopulations significantly reduced IL-6 protein and gene expression in a concentration dependant manner while decreasing visfatin protein expression only. HDL and its subpopulations increased expression of ABCA1 via PPARδ and not PPARγ pathway leading to reduced inflammation in stimulated 3T3-L1 adipocytes. This suggests that increasing HDL concentrations in obese patients will be beneficial by preventing chronic inflammation related diseases such as atherosclerosis.

P6-05

THE EFFECT OF ALKALOID FRACTION OF BITTER MELON (*Momordica charantia Linn)* ON THE BLOOD GLUCOSE LEVEL IN DIABETIC RATS

Sunarni Zakaria[1], Dewa Ketut Meles[2], Wurlina[2], Niluh Suwasanti[3]

[1]Faculty of Medicine Universitas Airlangga
[2]Faculty of Veterinary Medicine Universitas Airlangga
[3]PPDS Pathologic clinic Universitas Airlangga

The study was conducted to evaluate the dose-dependent effect of the alkaloid fraction of bitter melon on blood glucose level in aloxan-induced male diabetic rats. We used 60 male Wistar diabetic rats of 2-3 month age with 200-250 gram body weight. The rat was randomized in 6 groups; each group consisted of 10 rats. Six groups of animals were treated orally with glibenclaid, CMC, alkaloid fraction at the dose of 3.78 mg/200 gBW, 7.56 mg/200 gBW and 11.34 mg/200 gBW, respectively. The treatments were givens once daily for 21 days. Blood glucose level was measured at 0 hour, 2 hour, 4 hour, 6 hour, 8 hour, and subsequently at 7 days, 14 days and 21 days. The result of blood glucose level (mg/dl) was analyzed by 2 way ANOVA using SPSS version 13.00. The conclution of the study showed that pare fruit alkaloid fraction 11.34 mg/ 200gBW can decrease blood glucose level male diabetic rats.

P7-01

EFFECT OF ORAL SUPPLEMENTATION OF PALM OIL TOCOTRIENOL-RICH-FRACTION (TRF) ON OVARIES AND OOCYTE COUNTS IN RAT MODELS

Mastura Abd Malek[1], Razif Dasiman[2,3], Junaidi Abd Halim[2], Mohd Fareez Faisal Saad @ Asri[2], Norziela Sulaiman[2], Noor Arshikin Talib[2], Fakhrur Razi Jamal[2], Nik Nur Syamimi Nik Mat[2], Mimi Sophia Sarbandi[1], Nor Shahida Abdul Rahman[1], Nor Ashikin Mohamed Noor Khan[1,3]

[1]Institute of Medical Molecular Biotechnology (IMMB), Faculty of Medicine, Universiti Teknologi MARA, 47000 Sungai Buloh, Selangor, Malaysia
[2]Faculty of Health Sciences, Universiti Teknologi MARA Puncak Alam, 42300 Bandar Puncak Alam, Selangor, Selangor, Malaysia
[3]Maternofetal and Embryo (MatE) Research Group, Health and Wellbeing CoRe, Universiti Teknologi MARA, 40450 Shah Alam

Over the past two decades, the reported prevalence of infertility has increased markedly. Forty to fifty percent of reported cases are related to female infertility. This is due to multifactorial factors such as ovulatory failure, tubular damage, endometriosis, poor oocyte quality, and even unexplained infertility cases. Assisted reproductive techniques (ART) such as *in vitro* fertilization (IVF) and intracytoplasmic sperm injection (ICSI) have been used extensively as treatment to overcome this problem. Female patients use antioxidant supplements in preparation for ART, and some patients rely on supplement alone in their effort to improve fertility. Oil palm tocotrienol-rich-fraction (TRF) has been reported to possess antioxidant, anticancer, neuroprotective and antihyperthensive properties. Herein, the main aim of this study was to evaluate the effect of TRF oral supplementation on female reproductive parameters and oocyte counts in rat models. A total of 30 adult female Wistar rats were divided into 5 groups (n=6). All rats were subjected to oral gavage. Negative control group (G1) was given distilled water and positive control group (G2) was given corn oil (vehicle of palm oil TRF). Treatment groups were given palm oil TRF at concentrations of 30 mg/kg (G3), 60 mg/kg (G4) and 90 mg/kg (G5) for 7 consecutive days. Following 7 days of treatment, histological examination of ovaries and oocyte counts were performed. Histological evaluation on ovaries showed that 60 mg/kg (G4) and 90 mg/kg (G5) groups had significantly different ovarian surface epithelium (OSE) height compared to the other groups. TRF administration, especially in the 60 mg/kg (G4) treatment group showed an increase in total oocyte count compared to control groups. Our results suggest that oral supplementation of TRF improves ovarian structure and oocyte quality in rats.

P7-02

EFFECT OF REGULAR EXERCISE ON PREMENSTRUAL SYNDROME, COGNITIVE FUNCTIONS AND SERUM LIPID PROFILE IN PREMENOPAUSAL WOMEN

Nayanatara AK

Faculty of Physiology, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India

The modern way of living promotes comfort and well-being in a less energy-demanding environment. Women's weight gain and increase in adiposity occurs through a number of mechanisms, including lowered physical activity and resting metabolic rate**.** However, previously published randomized controlled trials investigating the effects of exercise have shown less than overwhelming results. The present study was conducted to examine the impact of an aerobic exercise program at different intensities on premenstrual symptoms, cognitive functions and metabolic control in premenopausal group. A total of 100 healthy premenopausal women were divided into two groups which included the exercising group and the non exercising group. The exercising group included 50 women who were selected from the health and fitness centers. The control group included 50 healthy non exercising women selected from the general population. Cognitive function was evaluated by ADDENBROOKE'S COGNITIVE EXAMINATION-ACE-R. Serum lipid profile was analyzed using Roche/ Hitachi auto analyzer. Premenstrual Distress Questionnaire was used to assess the premenstrual symptoms. The prevalence of premenstrual symptoms was significantly ($P<0.001$) higher in the non exercising group. Cognitive function parameters such as Mini Mental Scale examination (MMS-E), Orientation, Attention, Memory was significantly decreased ($P<0.001$) in the non exercising group. Further, total cholesterol ($P<0.001$), triglycerides ($P<0.001$), low density cholesterol ($P<0.001$) showed a significant increase in the non exercising group. The present study indicates that regular exercise as a part of life style modification is a preventive approach to relieve premenstrual symptoms, improve cognitive functions and proper metabolic control. It is highly recommended for the health professionals to educate and guide the pre-menopausal women on the importance and value of regular exercise.

P7-03

TIMED PREGNANCY IN RATS: A SIMPLE AND RELIABLE APPROACH IN DETERMINING THE STAGE OF OESTROUS FOR NON-HISTOLOGISTS

Niferiti Aminuddin[1], Tariq Abdul Razak[2], Muhammad Hakimi Mohd Rashid[1], Noriah Mohd Noor[1]
[1]Kulliyyah of Pharmacy, International Islamic University Malaysia, Kuantan,Pahang, Malaysia
[2]Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan,Pahang, Malaysia

There are a few approaches that enable us to time the pregnancy. Recent techniques have shown that observation of unstained smear is more practical than stained smear. However, with simple modifications, methylene blue dye staining technique can be a practical and reliable approach for non-histologists. 10 healthy fertile male and 30 female Sprague Dawley rats, aged 10 weeks, were acclimatized. At 12 weeks of age, the oestrous cycle of the female rats were determined. Two to three drops of normal saline (NaCl 0.90%) was flushed into the vagina for three times. One to two drops of the cells suspension was placed on the slide .The slide was dried with a hot plate. The cells suspension was treated with 0.1% methylene blue dye for 20 to 30 seconds. The surplus was removed from the slide by dipping in a container filled with slowly running tap water for three times. The slide can be immediately examined under the light microscope at 40x and 100x magnification. The four oestrous cycle stages namely proestrous, estrous, metestrous and diestrous were clearly identified with the methylene blue dye staining method. All 30 female rats were successfully impregnated. The methylene blue dye treatment can be done within 20-30 seconds, as compared to 45 minutes in previous study. The smear can be accurately observed by the beginners directly under the light microscope without the aid of histologists. The methylene blue dye stained smear is easy to interpret as the characteristics of the cells are well discernible, relatively inexpensive and doesn't require complex preparation.

P7-04

TOCOTRIENOL IMPROVES THE FERTILIZING CAPACITY OF EPIDIDYMAL SPERM OF CORTICOSTERONE-TREATED RATS

Noor Azean Anis Abd Aziz[1], Damayanthi Durairajanayagam[1]
[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor

Excess corticosterone (CORT) increases reactive oxygen species levels, leading to a state of oxidative stress. This impairs steroidogenesis, induces lipid peroxidation and Leydig cell apoptosis. Tocotrienol, a major chain-breaking antioxidant has been shown to inhibit lipid peroxidation and reduce oxidative damage. This study aims to assess the effects of tocotrienol-rich fraction (TRF) on pregnancy outcome from CORT-treated male rats. Epididymides of fertile male rats were surgically-separated at the testis-caput junction. Twenty-four hours post-surgery, the animals received the following treatment daily for seven consecutive days: Tocopherol-stripped corn oil (control), CORT 25 mg/kg sc (CORT), CORT 25 mg/kg sc+TRF 50 mg/kg orally (CORT+TRF50) or CORT 25 mg/kg sc+TRF 100 mg/kg orally (CORT+TRF100). On day 8, experimental rats were co-habitated with cyclic proestrus females. Sperm-positive vaginal smear was considered as day 1 of pregnancy (p.c.). Pregnant females were laparotomized on day 8 p.c. to determine the number of blastocyst implantation. They were then sutured back and left until term. At parturition, the number of pups delivered was compared with the number of blastocyst implantation and fetal birth weight was determined. Results showed that females mated with CORT-treated rats had a lower number of blastocyst implantation ($p=0.039$), live fetuses ($p=0.002$), and fetal birth weight ($p=0.004$), compared to that of control. Administration of TRF (100 mg/kg) to CORT-treated rats increased the number of blastocyst implantation ($p=0.044$), live fetuses ($p=0.009$) and fetal birth weight ($p=0.011$). In conclusion, exogenous CORT (25 mg/kg/day) given for 7 consecutive days attenuated the fertilizing capacity of rat epididymal sperm. However, 100 mg/kg/day TRF supplementation reversed the oxidative stress-induced effects of CORT and restored the fertilizing capacity of epididymal sperm resulting in improved pregnancy outcome. TRF supplementation is able to prevent oxidative stress-induced damage on male reproductive parameters and exerts beneficial effects on male fertility, which is currently a major clinical concern.

P7-05

EFFECTS OF HIGH AND LOW MATERNAL DIETARY SODIUM INTAKE DURING PREGNANCY ON THE OFFSPRINGS' GLOMERULAR NUMBER IN RATS

Nurul Adilah Alias[1], Wan Shamimi Amni Wan Aziz[1], Che Anuar Che Mohamad[1], Rosazra Roslan[1], Niferiti Aminuddin[1], Muhammad Hakimi Mohd Rashid[1], Noriah Mohd Noor[1]

[1]Department of Basic Medical Sciences, Kulliyyah of Pharmacy, International Islamic University Malaysia, Kuantan, Malaysia

The blood pressure of the offspring of dams fed on low or high salt diet during pregnancy and lactation are higher than that of normal sodium dams. The mechanism of the programmed hypertension in the offspring has not been identified. The experiment aims at studying the effects of high and low maternal dietary sodium on their offsprings' glomerular number in rats. Normotensive female rats were subjected to timed pregnancy. Pregnant rats were randomly divided into three groups and were fed either low-sodium diet (0.145% NaCl), normal diet (1.0%) or high-sodium diet (3.0% NaCl) during pregnancy. The newborn pups were sacrificed on day 1 postnatal. The kidneys were fixed in 4% paraformaldehyde and then processed to be embedded into paraffin wax**.** The kidneys were cut into 6µm and 10% of each kidney section was stained with Haematoxylin and Eosin. The antero-posterior (AP) thickness of the kidney was determined by multiplying the total number of sections of each kidney by the thickness of the section. The imaged of the sections were captured using LEICA DM750 microscope at X4 magnification. The glomeruli were counted using the point selection tool of LEICA LAS software. Our preliminary data showed a significant reduction in AP thickness and glomerular number of the offspring of dams receiving low and high salt diet as compared to normal salt diet as early as day 1 post-natal. There is also evidence of focal glomerular tuft retraction in the offspring of dam fed on high salt diet and haemorrhage were seen in the glomerular tuft and interstitium in the offspring of dam fed on high and low salt diet. There were no focal glomerular tuft retraction haemorrhage were seen in the offspring of dam fed on the normal salt diet. This suggests that dietary sodium intake affects nephrogenesis.

P7-06

MITOCHONDRIAL FUNCTION AND DEVELOPMENTAL DISPARITIES IN EARLY- AND LATE- CLEAVING EMBRYOS

M Sophia Sarbandi[1], Nor-Shahida AR[1], Wan Hafizah WJ[1], Zolkapli E[2], Salina O[1], Tuan Muhd Hafiidz TK[1], Froemming GRA[1], Nor-Ashikin MNK[1,3]

[1]Institute of Medical Molecular Biotechnology (IMMB), Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia,
[2]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia,
[3]Maternofetal and Embryo (MatE) Research Group, Health and Wellbeing CoRe, Universiti Teknologi MARA, 40450 Shah Alam

Studies have shown that the timing of the first zygotic cleavage is an accurate predictor of embryo quality. Early-cleaving embryos show higher pre-implantation viability compared to late-cleaving embryos. Cleavage is affected by cellular metabolic processes performed by mitochondria during embryonic development. It is therefore hypothesized that the timing of the first zygotic cleavage may be related to the number and intensity of mitochondria within the embryos, which correlates with the developing stages. This study compares mitochondrial distributions of early- and late-cleaving embryos at the 2-cell and 4-cell stage, using confocal microscopy. A total of 50 mouse embryos were obtained from 6 to 8-week-old female ICR mice superovulated with Pregnant Mare Serum Gonadotrophin (PMSG), followed by human Chorionic Gonadotrophin (hCG), 48 hours apart. The females were then mated with fertile males, at a ratio of 1:1. At 28-30 hours post hCG, females were euthanized for embryo collection. Two-cell embryos were categorized as early-cleaving (EC) embryos, while zygotes with the second polar body and two pronuclei present were categorized as late-cleaving (LC) embryos. The embryos were cultured *in vitro* until the 2- and 4-cell stages. To assess mitochondrial membrane potential, embryos were stained with MitoTracker Red® CMXRos fluorescent dye, after fixation with 4% paraformaldehyde. The fluorescent images were obtained using a laser-scanning confocal microscope with excitation at 543 nm and emission at 560 nm.
Early-cleaving embryos showed significantly higher mean of mitochondrial fluorescence intensities compared to late-cleaving embryos at 2-cell stage ($113.7 \times 10^5 + 3.5 \times 10^5$ versus $59.9 \times 10^5 + 2.3 \times 10^5$), respectively. Our data suggest that pre-implantation developmental lag observed in late-cleaving embryos is attributed to reduced mitochondrial function.

P7-07

DELTA-TOCOTRIENOL INTERVENTION NEGATES THE ADVERSE EFFECTS OF LEPTIN ON RAT SPERM MORPHOLOGY

Nor-Shahida AR[1], Abu-Thalhah AA[1], Mohd-Akmal K[1], FA Almabhouh[2], Tuan Muhd Hafiidz TK[1], M Sophia Sarbandi[1], Mastura AM[1], APM. Yusof[1,2], Nor-Ashikin MNK[1,2,3]

[1]Institute of Medical Molecular Biotechnology (IMMB), Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia.
[3]Maternofetal and Embryo (MatE) Research Group, Health and Wellbeing CoRe, Universiti Teknologi MARA, 40450 Shah Alam, Malaysia

Leptin is a protein derived from adipose tissue which plays an important role in energy homeostasis and metabolism, and in neuroendocrine and reproductive systems. Leptin has been reported to increase oxidative stress and abnormal sperm production in leptin-treated rats. On the other hand, tocotrienol is a subgroup of the vitamin E family derived from plant sources. It is a potent antioxidant capable of reducing lipid peroxidation and has huge potential in the regulation of reproductive processes such as spermatogenesis. This study aims to evaluate whether the effects of leptin on sperm parameters in rats can be negated by tocotrienol intervention. Thirty 12-week-old male Sprague-Dawley rats were divided into five groups of six rats each; leptin treatment, delta-tocotrienol treatment, leptin with delta-tocotrienol treatment, saline negative control and corn oil positive control. Leptin was administered daily at a dose of 60 mg/kg body weight via intraperitoneal injections, for 42 days. Delta-tocotrienol treatments and positive control corn oil were given by oral gavage. Rats in the negative and positive control groups were given 0.1 ml 0.9% saline and 0.1 ml corn oil respectively. On Day-43, rats were weighed before euthanization. Epididymal spermatozoa were then collected. Sperm count and morphological observations were made using a Makler counting chamber. The number of normal and abnormal spermatozoa was recorded. No differences in body weight were observed between treatment groups and their controls. Although the total sperm count was highest in the leptin-treated group, the percentage of spermatozoa with abnormal morphology was also higher in leptin-treated rats compared to the other groups. Intervention of delta-tocotrienol was shown to decrease the percentage of spermatozoa with abnormal morphology in leptin-treated rats. Leptin administration adversely affects sperm morphology. The adverse effects may be negated by delta-tocotrienol intervention.

P7-08

POTENTIAL BIOMARKERS IN MOLAR PREGNANCY

Othman Syahirah Fatin[2, 3], Thanikachalam@Thanikasalam Kahitresan[1], Wang Seok Mui[1]

[1] Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Selangor, Malaysia.
[2] Institute of Medical Molecular Biotechnology, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Selangor, Malaysia.
[3] Faculty of Biosciences and Medical Engineering, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

A Molar pregnancy (Hydatidiform mole) is a benign tumor that develops in the uterus. There are two types of molar pregnancy: "complete" and "partial", which differ on the basis of chromosomal pattern, gross and microscopic histopathology, clinical presentation, and outcome. Molar pregnancy is usually benign but can become malignant, and is diagnosed by high hCG level, ultrasound, and histopathological examination. The prognosis and treatment depends on how soon the tumor is diagnosed after the pregnancy begins. Hence, an early diagnosis of molar pregnancy aids physician in better management of the disease. This study aims to review on the scientific evidences of potential biomarkers in molar pregnancy. Search engine of google, google scholar, science direct, and pubmed were used to search articles by the keywords molar pregnancy, biomarkers, and Gestational Trophoblastic Disease (GTD) from the year 2002 to 2015. Results from the literature search were limited; the potential biomarkers for molar pregnancy include hCG, isoforms of hCG, alpha-fetoprotein (AFP), Carbohydrate Antigen 19-9 (CA19-9), placenta growth hormone (hGH-V), Chloride intracellular channel protein 1 (CLIC1), Sialic acid immunoglobulin-like lectin (Siglec-6), and Cytokeratin 20(CK20). Literature findings showed that the commonly used diagnostic marker for molar pregnancy is based on the measurement of hCG level by ELISA. High hCG level above the normal range indicate molar pregnancy. The ratios of isoforms hCGβ/hcG+hCGβ and hCGα/hCGβ can also be used for distinction between a hydatidiform mole and normal pregnancy. Low AFP levels and increased CA19-9 in serum indicate molar pregnancies. Meanwhile, hGH-V can be detected in all entities of GTD. CLIC1 is used to detect molar pregnancies that undergo malignant transformation. CK20 and Singlec-6 was a useful marker for diagnosing complete molar pregnancies. However, the clinical utility of AFP, CA19-9, hGH-V, CLIC1, Siglec-6, and CK20 in diagnosis of molar pregnancy needs to be determined in further studies.

P7-09

CORRELATION BETWEEN LEVELS OF ESTRADIOL AND QUALITY OF EMBRYOS FROM AGING MOUSE: A PILOT STUDY

Norerlyda Hamdan[1], Nasibah Azme[2], Fathimah Mohamad[2], Nuraliza Abdul Satar[2]

[1]Institute of Medical Molecular Biotechnology, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2] Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia

Female reproductive aging caused a decline in the level of estradiol as well as quantity and quality of embryo. These oxidative stress-induced aging consequences will eventually leads to a reduction in fertility rates in female. Therefore, aim of the present study was to investigate the correlation between levels of estradiol, quality and development of preimplantation embryos derived from aging mice. Female *Mus musculus* mice were divided into two groups consisting of young mice (6 six weeks old) and aging mice (8 months old). The mice were superovulated and mated with proven fertile male mice. After 48 hours, mice were sacrificed and the embryos were collected for evaluation of its quality and then observed for its *in vitro* development. Normal embryos were cultured from 2-cell until blastocyst stage. Estradiol levels in the plasma were analysed using enzyme-like immunosorbent assay (ELISA). The percentage of normal embryos in aging group was significantly lower ($p<0.001$) as compared to the young group. Similarly, when compared to the young group, the number of normal embryo that developed until morula ($p<0.01$) and blastocyst ($p<0.05$) stage were significantly lower. However, there was no significant difference in the plasma estradiol levels between young and aging group. These results confirmed that aging process caused a detrimental effect on the quality and development of embryos in mouse. Nevertheless, there was no positive correlation found in this study between the levels of estradiol and quality and development of embryos in 8 months old-aging mice. Thus, further study needs to be conducted in order to understand the mechanism leading to female reproductive aging.

P8-01

EFFECT OF LONG-TERM TOPICAL TREATMENT WITH INHIBITORS OF RENIN-ANGIOTENSIN SYSTEM ON TRABECULAR MESHWORK TISSUE REMODELING IN STEROID-INDUCED OCULAR HYPERTENSIVE RATS

Anna Krasilnikova[1,2], Renu Agarwal[1], Tajul 'Atiqah Zulkafali[1], Siti Nur Laili Mohamed[1], Nor Salmah Bakar[1], Methil Kannan Kutty[1], Nurul Raudzah Adib Ridzuan[1], Nafeeza Mohd Ismail[1].

[1] Faculty of Medicine, Universiti Teknologi MARA, Jalan Hospital, 47000, Sungai Buloh, Selangor, Malaysia
[2] Department of Clinical Pharmacology & Intensive Care, Volgograd State Medical University, Pavshikh Borsov Sq. 1, 40131, Volgograd, Russia

Inhibitors of renin angiotensin system (RAS) such as angiotensin converting enzyme inhibitors (ACEIs) and angiotensin II type 1 receptor blockers (ARBs) have been shown to reduce intraocular pressure (IOP) in animals and human subjects. They also have been proven to attenuate cardiovascular remodeling. Anti-remodeling effect of inhibitors of RAS could be extrapolated to have similar effect on trabecular meshwork (TM). This study was done to determine the effect of topical enalaprilat dehydrate and losartan potassium on TM remodeling in chronic ocular hypertensive rats. Ocular hypertensive model was developed using *Sprague Dawley* rats by topical application of dexamethasone 0.1% twice daily for 36 days. Steroid induced oculohypertensive (SIOH) rats were divided into 3 groups (n=6). Following baseline IOP estimation, the animals in group 1 and 2 were treated topically and bilaterally with 10µl of enalaprilat dehydrate 1% and losartan potassium 2%, respectively, twice daily for 21 days. The rats in group 3 received vehicle (HPMC 1%) also twice daily for 21 days. The ocular normotensive rats (group 4; n=6) were used as a control. The IOP was measured twice a week for 21 days. On day 21 rats were sacrificed and eye balls were enucleated and subjected for hematoxylin & eosin staining to assess the morphology of TM tissue. Statistical comparison among 4 groups was done. Topical treatment with inhibitors of RAS caused significant ($p<0.001$) IOP reduction ranging from 20.2-26.6% (enalaprilat) and 14.73-21.39% (losartan) compared to baseline. TM thicknesses and cellularity in SIOH group was significantly ($p<0.01$) higher compare to that in normotensive group. Both enalaprilat and losartan showed the ability to restore the thickness and cellularity of TM close to that in ocular normotensive group. Based on this study we conclude that inhibitors of RAS produce significant ocular hypotensive effect that could be attributed to attenuation of TM remodeling.

P8-02

A STUDY ON SLEEP PATTERN AND FACTORS AFFECTING MBBS STUDENTS

Basanta Kumar Mohanty[1], Charmaine Anne Augustine[1], Shivanya Asokan[1], Thaanver Singh[1], Thivvahsh Sugumararan[1]

[1]Faculty of Medicine, University Kuala Lumpur Royal College of Medicine Perak (UniKL RCMP), Ipoh, Malaysia

Continuous academic demands in medical students bring about poor sleep quality and sleep problems. Present study investigates the sleep pattern among medical students in University Kuala Lumpur Royal College of Medicine, Perak. The contributing factors of poor sleep are still not clear, therefore, several factors are taken into account in our study. This cross sectional study was conducted in June-October 2013 period and the study population included Year 1 and Year 2 MBBS students of University Kuala Lumpur Royal College of Medicine, Perak. A set of questionnaires was distributed to each of 180 students. All the questions in the questionnaire were then computed as the variables of this study. Analysis was done in Microsoft excel using appropriate proportions. 85% of the respondents suffered from sleep deprivation, 12.8% had optimum sleep while the remaining 2.2% reported excessive sleep. Relationship between the sleeping pattern and the factors affecting it were closely analysed. The overall prevalence sleeping pattern among medical students is less than 7 hours. Our study shows that most of the medical students suffer from sleep deprivation. Students who have optimum sleep have the highest concentration in class. Lack of adequate sleep and excess sleep produce negative effect to the concentration and alertness level.

P8-03

READINESS FOR VIRTUAL LEARNING – STUDENT'S PERSPECTIVE

Faezah Sabirin[1], Nurhaslina Hasan[1], Vivi Noryati Ahmad[1]

[1]Faculty of Dentistry, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Virtual teaching is a component of E-learning. By definition, E-learning is facilitated learning with utilisation of information and communication technologies such as the usage of internet, computer and videos. In the implementation of E-learning as part of the blended learning material, virtual teaching will be introduced to the students. The virtual teaching was not meant to replace the traditional teaching but to complement and provide interaction beyond classroom setting. The virtual teaching materials would be made available on i-Learn for student's reference and self-revision. This study focused on the student's perspective and was designed to evaluate the readiness of Year One, Bachelor of Dentistry students for virtual teaching in Physiology based on their acceptance, intention and attitudinal beliefs towards virtual teaching as part of E-learning. All year one students who enrolled for DFS401 course (n=70) were included. The students were provided with a consent form and a one page questionnaire. The data collected were then analysed. The results showed that all students own at least one mobile device. However, only 40% of them subscribed for personal data packages for uninterrupted internet access while the rest were dependent on the availability of local wireless internet access. The perceived ease of use had a significant influence on perceived usefulness of virtual teaching ($p<0.05$). Both ease of use and usefulness perceptions significantly correlated ($p<0.05$) with positive attitudes as well as favoured intention towards virtual learning. In conclusion, the students are ready as they have the suitable device and have accepted the idea of virtual teaching as one of the teaching methods. They also have favoured intention and the right attitude towards virtual teaching. Provision of better wireless internet service and coverage by the institution will be a great aid to accommodate the implementation of virtual teaching style.

P8-04

STUDY OF THE KNOWLEDGE, ATTITUDE AND PRACTICES ON ANTIMICROBIAL RESISTANCE AND USAGE AMONG MEDICAL STUDENTS IN A MALAYSIAN MEDICAL UNIVERSITY

Heethal Jaiprakash[1], Ameeta Patil[1], Sunil Kale[1], Pallavi R Shidhaye[2]

[1]Faculty of Medicine, MAHSA University, Kuala Lumpur, Malaysia
[2]Faculty of Medicine, LNMCRC & JK Hospital, Bhopal, India

Drug resistance is a fast mounting crisis. Many factors like inappropriate use of antimicrobials by prescribing physician, unregulated sale of drugs and self-medication have been attributed to the increase in the incidence of antimicrobial resistance. Health care professionals are a major determinant in this regard. Their in-depth knowledge is essential for rationale antimicrobial usage. The objective of this study is to analyse the knowledge, attitude, and practice of antimicrobial usage and resistance among different years of medical students. This is a cross sectional questionnaire based study which was conducted among year 1 to year 5 students. A validated Questionnaire was obtained. The questionnaire assesses the students on their attitude, practice and knowledge on antimicrobial resistance and usage. The data was analyzed using descriptive statistics. A total of 543 students participated in the study. Antimicrobial resistance was recognized as an important and serious public health issue in today's era by 92.16% year 5 respondents, which was highest among all the years (Year 1-5). The awareness regarding the aetiology of cold and flu was observed to be the highest among year 4 respondents (65.74%). Only 2.8% of the total respondents strongly agreed that skipping one or two doses of antimicrobials does not lead to development of resistance. 49.02% of the year 5 respondents always consulted a physician before starting an antimicrobial, indicating a good practice. However, when it came to checking the expiry date of antimicrobials prior to taking it, the year 1 respondents (53.95%) were more particular. The study revealed that some aspects of knowledge regarding antimicrobial resistance and usage were found to be significantly higher among the respondents in the clinical years. The said knowledge was well-reflected in some, but not all of the facets of the respondent's attitude and practice.

P8-05

BODY COMPOSITION AND ANTHROPOMETRIC CHARACTERIZATION OF YOUNG TRIATHLETES IN MALAYSIA

Mohamad Hanapi Johari[1], Brinnell Caszo[1], Ananthan Subramaniam[2], Steve Lumley[3], Victor Feizal[1], Justin Gnanou[1]

[1]Faculty of Medicine and Defence Health, Universiti Pertahanan Nasional Malaysia, Kem Sungai Besi, Kuala Lumpur, Malaysia
[2]Faculty of Defence Studies & Management, Universiti Pertahanan Nasional Malaysia, Kem Sungai Besi, Kuala Lumpur, Malaysia
[3]Chief Coach, Team TIME triathlon team, Kuala Lumpur, Malaysia

Determination of anthropometric characteristics of athletes is important for performance enhancement and for implementation of individual specific training and recovery recommendations. Triathlon is an endurance sport involving these three disciplines – running, cycling and swimming and thus a triathlete is in an unique position with respect to the relationship between anthropometry and performance. However, limited data is available on anthropometric characterization of triathletes. Hence the aim of this study was to characterize anthropometry parameters in competitive triathletes from Malaysia. Sixteen competitive triathletes (nine male and seven female) with an average age of 17.2 ± 3.73 volunteered to take part in this study. Body composition measurements were carried out using a bio-impedence segmental body composition analyser (N2O U.Healthcare System, Korea). The subjects complete body composition profile including body water (Kg), Protein (Kg), Minerals (Kg), Muscle Mass (Kg), Fat Free Mass (Kg), Skeletal Muscle Mass (Kg), Right Arm, Left Arm, trunk, Right Leg, Left Leg, and % body fat of the was measured. Descriptive statistical analysis was performed using SPSS version 21. The anthropometric measurements revealed that the male triathletes were significantly taller than the female triathletes and had significantly more protein and skeletal muscle mass. The female triathletes however had significantly higher percent body fat when compared to the male triathletes. This resulted in comparable body weight between the male and female triathletes and this reflected in no difference in BMI between the male and female triathletes. We also observed that the female triathletes had a significantly lower body mineral content when compared to the male triathletes. Anthropometry is directly linked to lung function and ventillatory threshold of triathlete and which is in turn is related to the performance of the triathlete. Hence anthropometric characterization provides valuable information for developing individual specific training modules.

P8-06

2D GEL ELECTROPHORESIS REVEALS DISTINCT DIFFERENT PROTEIN PATTERN OF HDL2 AND HDL3 PARTICLES ISOLATED BY DENSITY GRADIENT ULTRACENTRIFUGATION

Mohd Yusri I[1], Nura'zimaturrahmah J[1], Abdul Muid S[2], Abdul Rahman T[2, 3, 4], Nawawi H[2, 4], Froemming G.R.A[2, 3, 4]

[1] Institute of Molecular Medicine and Biotechnology (IMMB), Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh Campus, Selangor, Malaysia
[2] Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh , Selangor, Malaysia
[3] Health & Wellbeing, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia
[4] IPPerform, Universiti Teknologi MARA (UiTM), Selayang Campus, Selangor, Malaysia

High Density Lipoprotein (HDL) is a lipoprotein and plays an important role in reverse cholesterol transport and protection against cardiovascular diseases (CVD). Until recently little attention was paid to the diversity of HDL particles and their different capabilities of preventing CVD. Proteomics studies have identified more than 100 different proteins to be associated with total HDL whereby Apolipoprotein A1 (Apo A1) was the major protein component of HDL. Little is known about the number and distribution of proteins associated with the HDL subpopulations: HDL2 and HDL3. Total HDL, HDL2 and HDL3 were isolated using a three-step density gradient ultracentrifugation. To minimize the potential losses of HDL-associated proteins during isolation alcohol precipitation technique was applied. The protein content of each fraction was separated by 2D gel electrophoresis with IEF and SDS gel electrophoresis.). The number and density of protein spots in the gels were analyzed using PDQuest 2D imaging software (Bio-Rad). The Apo A1 content of each HDL fraction was determined with Western blotting after 1D gel electrophoretic separation. Western blotting showed that Apo A1 was most prevalent in total HDL extract followed by HDL2 and HDL3. 2D gel electrophoresis showed different protein pattern in HDL2 and HDL3and the number of proteins detected confirmed that number and density of proteins varied significantly between HDL2 and HDL3; 92 spots detected in HDL2 gel and 104 spots in HDL3. The two subpopulations shared 50 identical proteins while 34 proteins were down-regulated in HDL3 compared to HDL2 and 15 spots were up regulated compared to HDL2. HDL2 and HDL3 contain distinctive different proteins which may contribute to the differences observed in the biological behavior and their effectiveness against the development of atherosclerosis. This study is a preliminary step in identifying protein difference between HDL2 and HDL3 and their functions.

P8-07

IMPACT OF BODY MASS INDEX AND BLOOD PRESSURE ON PERCEIVED STRESS AND PROFESSIONAL LIFE STRESS IN INFORMATION TECHNOLOGY WORKERS IN MANGALORE

Ramesh Bhat

Professor , Department of Physiology, Center for Basic Sciences, Kasturba Medical College, Bejai, Mangalore, Manipal University, Karnataka, India

Work place stress is one of the most important problems experienced by all professionals irrespective of their nature of work. Software industry is affected greatly by the challenges and professionals serving these organizations are often observed under huge stress. This might lead to various health hazards. The present study investigates the impact of body mass index and blood pressure on perceived stress and professional life stress in information technology workers among software professionals in Mangalore city. A total of 100 software employees were included in this study. Based on the body mass index, the subjects were grouped into normal group (n=50) and obese groups (n=50). In the obese group a significant increase ($P<0.001$) was observed in perceived stress and professional stress score. Further, a significant ($P<0.001$) increase in the systolic and non-significant increase in the diastolic blood pressure was observed in the obese group. Programs designed to prevent hypertension in the workplace should therefore focus not only on the working environment but also on the way individuals perceive and cope with stress insofar as this influences behaviors directly predisposing to hypertension. Regular health education programs are necessary in software professionals to create the awareness of regular physical activity and body weight control.

P8-08

AWARENESS OF THE IMPORTANCE OF PHARMACOLOGY AMONG BDS STUDENT IN UITM-BASED SURVEY

Siti Zaleha Suki[1], Vivi Noryati Ahmad[1], Indah Mohd Amin[1], Norhayati Liaqat Ali Khan[1]

[1]Faculty of Dentistry, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

The science of drug action on biological system or Pharmacology is a compulsory subject for Dental students before they enter their clinical years. This study was designed to assess awareness: knowledge, attitude, preference and practice among undergraduate dental student (BDS) with respect to Pharmacology subject. A cross-sectional study was conducted in June 2015 in two selected batches of BDS students: year 1 and 2. A self-administered questionnaire was implemented to 124 participants based on uncontrolled quota sampling to retrieve information; 97 consented to participate. It comprises of socio-demographic characteristics, knowledge, attitude, preference and methods towards learning Pharmacology. Data were analysed using SPSS Ver.2.1. 67% (±0.1) of respondent are aware that Pharmacology is one of the compulsory subjects during PreClinical phase. Majority of them selected Haematopoietic & Lymphoid (26±0.80%) and Cardiovascular System (22%±0.68) as their favourite topics, meanwhile, 54% (±0.64) confessed that they dislike General Module due to highest number of principle lectures of Pharmacology. In view of learning method, majority (72% ±0.16) chose lecture notes from the lecturers as compared to the other sources. And as expected, they prefer the lecture to be conducted in the morning session (74%±0.23). 77% (±0.32) disclosed that Pharmacology lecturer assigned, conducted the class in a knowledgeable and enjoyable manner. Most of the participants feels that Pharmacology is a relatively tough (84%±0.54) subject and it is difficult to score in the examination (86%±0.57). This study revealed that BDS students are aware that learning Pharmacology is compulsory in dental field. However, they were too dependent ("spoon-feeding") in learning. Pharmacology is a tough subject and difficult to score thus it may sometimes bring down the whole performance of the student even though they did well in other subjects. This matter is a concern to all Pharmacologists as we must work hand-in-hand to seek the most effective methods in both teaching and learning.

P8-09

EARLY DETECTION OF HEMATOLOGICAL PARAMETERS IN ALCOHOLICS IN SOUTH INDIAN POPULATION

Sneha Shetty[1], Balachandra Shetty[2]

[1]Faculty of Physiology, Kasturba Medical College, Manipal University, Mangalore, Karnataka, India
[2]Faculty of Medicine, A.J.Institute of Medical Sciences, Mangalore, Karnataka, India

Alcohol consumption is known for morbidity and mortality, being a serious health hazard of the world. The present study was aimed to describe incidence and type of anemia in alcoholics. The present prospective cross sectional study included about 500 individuals comprising of 185 habitual consumers of alcohol and 315 non-consumers that served as controls. All the subjects were administered questionnaire to determine the amount of alcohol they consume daily and the duration after which their blood samples were taken. Consumers of at least 4 bottles (of both beer and local gins)/day for a period of at least 5 years were designated consumers and strictly non-alcoholic drinks consumers were designated as control. All subjects were apparently healthy without any form of disease and their age ranged within 19-50 years. About 5.0 mL blood samples were collected into K_3 EDTA anticoagulant bottles and were analyzed automatically for packed Cell Volume (PCV), haemoglobin estimation, red cell count, total white cell count (WBC), platelet count, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) using an autoanalyser (Sysmex KN-21N). In the present study, the mean haemoglobin was 10.46 gm% among alcoholics and 12.31 gm% among non alcoholics. 75% of the alcoholics had pallor. The peripheral blood smear showed all types of anaemia. Normocytic normchromic anaemia was present in 34% of patients followed by macrocytic hypochromic anaemia (26%). Microcytic aneamia was present in 15% patients. Dimorphic anaemia was present in 17%. However, even in non-alcoholics 7% of patients also showed normocytic normchromic anaemia. 12% of non-alcoholics showed microcytic hypochromic anaemia. The present study showed that heavy consumption has deleterious effects such as severe infections to consequences of bone marrow malfunctioning. Early detection of hematological changes in alcoholics and treating them can prevent further complications and help in reducing the mortality.

P8-10

PREVALENCE AND AWARENESS OF COLOUR VISION DEFICIENCY (CVD) AMONG DENTAL DEGREE (BDS) FIRST YEAR STUDENTS IN UITM-BASED SURVEY

Vivi Noryati Ahmad[1], Indah Mohd Amin[1], Zatilfarihiah Rasdi[1], Norhayati Liaqat Ali Khan[1], Siti Zaleha Suki[1], Faezah Sabirin[1], Nurhaslina Hasan[1]

[1]Faculty of Dentistry, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

Colour vision deficiency (CVD) is defined as the inability to differentiate certain colours and can be divided into congenital and acquired forms. This study was designed to assess prevalence and awareness: knowledge and attitude among dental degree (BDS) first year student with respect to CVD. A cross-sectional study was conducted from May 2015 until June 2015. A self-administered questionnaire was implemented to 70 participants based on uncontrolled quota sampling to retrieve information. It comprises of socio-demographic characteristics, knowledge, attitude and practice towards prevalence and awareness of CVD. Data were analysed by using SPSS version 21. Current study indicated that 66% (±0.67) of respondent have vision defect, with hyperopia 86% (±0.96) and astigmatism 63% (±0.96). Based on CVD test via Ishihara Plate, none of them suffered from CVD. 62% (±0.32) correctly defined protanopia as a reduced sensitivity to red light; 53% (±0.62) described deuteranopia is a reduced sensitivity to green light and only 17% (±0.39) correctly explained that tritanopia as reduced sensitivity to blue light. 84% (±0.06) claimed CVD is inherited. 59% (±0.42) agreed that CVD can also be caused by other factors. 57% (±0.97) answered that CVD is most common in males. Only 17% (±0.39) believed that people with CVD are permitted to drive and have driving licence. 15% (±0.94) accepted that VCD can be treated. 65% (±0.22) were not aware of what Ishihara chart is. None of the respondents knew the existence of "Valspar glass" used to overcome certain VCD problem. This study revealed that no VCD problem was found among first year BDS students but they lacked awareness about the disorder. Thus, this matter is of concern to all preclinical sciences lecturers who could contribute to enhance awareness of CVD among students.

P8-11

IN VITRO ANTIPLASMODIAL AND CHLOROQUINE RESISTANCE REVERSAL EFFECTS OF β-CARBOLIN ALKALOIDS

Zaid Osama Ibraheem[1], Roslaini Abd Majid[1], Sabariah Mohd Noor[1], Hasidah Mohd. Sidek[2], Siti Khadijah Adam[1], Rusliza Basir[1]

[1]Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor
[2]Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600, UKM-Bangi, Selangor, Malaysia

Malaria endemicity in affected regions around the world has increased due to the widespread drug resistance and tolerance among different strains of *Plasmodium falciparum* against the available chemotherapeutic agents. Emergence of chloroquine (CQ) resistance has worsened the calamity as CQ is still considered as the most efficient, safe and cost effective drug among other antimalarials. This urged the scientists to search for other alternatives or sensitizers that may be able to augment CQ action and reverse its resistance. In this study, three β-carbolin derivatives, namely; harmalin, harmol and harmalol were tested for their anti-plasmodial and CQ resistance reversal effects against *Plasmodium falciparum 3D7* and *K1*. SYBR Green-1 based drug sensitivity assay and isobologram analysis were used to screen the mentioned effects respectively. All of them showed moderate anti-plasmodium effect and harmalin was the most effective in reversing CQ resistance and tolerance. Overall conclusion suggest that the abovementioned phytochemicals are not ideal to be used as conventional anti-malarials and only harmalin can be suggested to reverse CQ resistance in *Plasmodium falciparum* K1.

P8-12

AWARENESS OF NUTRITION INTAKE AND HEALTHY LIFE STYLE AMONG BDS FIRST YEAR STUDENTS IN UITM- BASED SURVEY

Zatilfarihiah Rasdi[1], Vivi Noryati Ahmad[1], Indah Mohd Amin[1]

[1]Faculty of Dentistry, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

A healthy diet and life style are very important part for maintaining and optimising prolonged health status. This study was designed to assess awareness: knowledge, attitude and practise among first year dental degree students (BDS) with respect to nutritional intake and healthy life style. A cross-sectional study was conducted from May 2015 until June 2015. A self-administered questionnaire was implemented to 70 participants based on uncontrolled quota sampling to retrieve information. It comprises of socio-demographic characteristics, knowledge, attitude, and practice towards nutritional intake and healthy life style. Data were analysed by using SPSS version 21. Current study indicated that means age of the respondents is 20 years (±0. 2) with most of them with ideal weight, 64% (±0.2). None of them were smoker. 74% (±0.62) confessed that they did exercise but the duration was less than an hour per week. 91% (±0.04) were aware of the presence of food pyramid but only 7% (±0.46) admitted that they practice the benefits of food pyramid. 50% (±0.75) claimed that they eat two times per day and only 26% of respondents took breakfast daily. 31% (±0.34) answered that they have routine of eating schedule. Most of the respondents consume high salt content of crisps 56% (±0.72) as their snacks between meals. 77% (±0.61) answered that sometimes they order fast food as main dish. 46% (±0.27) of them consumed supplements and only 1% (±0.49) got proper consultation from nutritionist. This study suggested that the first year BDS students were aware of the knowlegde of eating for healthy life. However, they did not practice good habits of eating and exercise. Thus, this matter is a concern to all especially the students themselves, parents, lecturers and institutes to encourage practising a healthy life style.

P8-13

SKELETAL CHANGES IN RABBIT ON LONG TERM INGESTION OF HIGH LEVEL OF FLUORIDE

Ghosh Sumitabha

Faculty of Medicine, Quest International University Perak (QIUP), Ipoh, Perak, Malaysia

Fluoride is present in all natural waters, but long term ingestion of drinking water containing high level of fluoride leads to crippling disorders of skeletal fluorosis. The deleterious effects of fluoride on bone maturation are not well understood. Therefore, the present study was conducted to evaluate the effect of high level of fluoride consumption on the bone formation in rabbits. Inbred weanling Belgian rabbits of either sex were given 500 ppm fluoride with drinking water. The animals were sacrificed after 8 – 12 weeks (period of rapid growth), 16 – 18 weeks (period of fusion of epiphyseal cartilage) and 24 weeks (following cessation of longitudinal growth of long bones) of fluoride consumption. The long bones were separated, cleaned, epiphyseal and metaphyseal portion were removed to obtain hollow diaphyseal cylinders. Collagen was extracted from bone samples with sodium chloride, acetic acid and guanidine hydrochloride solutions sequentially and the fractions obtained were subjected to polyacrylamide gel electrophoresis. Fluoride, calcium and phosphorous were estimated from the bone ashes. Fluoride administration caused an increase in the outer diameter of the diaphysis, widening of medullary cavities, increase in skeletal weight and an increase of water content of bones. The organic phase of bone showed an increase in immature form and a decrease the more mature forms of collagen. Mineral analysis showed a marked increase in fluoride concentrations which were proportional to the amount of fluoride intake. A lower calcium concentration and a lower Ca/PO_4 ratio was observed after 24 weeks of fluoride intake. However, the total amount of calcium and phosphorous in pooled diaphyseal bones per 100 g body weight of animals were considerably higher in fluoride fed animals. High level of fluoride in bone interferes with the maturation of collagen matrix and affects the normal mineral composition.

P8-14

EVALUATION OF CYTOTOXIC EFFECT OF 5-(PHENYLAMINO) URACIL DERIVATES ON VERO 76 CELL CULTURE AS POTENTIAL ANTI-CHIKUNGUNYA ANTIVIRAL DRUGS

Noor Farah Omar Ahmad[1], Noor Fahitah Abu Hanipah[1], Eleena Gureeva[2], Mikhail Novikov[2], Anna Krasilnikova[1,3], Wang Seok Mui[1]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]Department of Clinical Pharmacology & Intensive Care, Volgograd State Medical University, Pavshikh Borsov Sq. 1, 40131, Volgograd, Russia
[3]Department of Pharmaceutical & Toxicological Chemistry, Volgograd State Medical University, Pavshikh Borsov Sq. 1, 40131, Volgograd, Russia

Recent studies showed that novel 5-(phenylamino)uracil derivates exhibit inhibitory effects against HIV and Hepatitis C virus. The similarities in genome sequences of Hepatitis C and Chikungunya (CHIKV) viruses suggest the presence of anti-Chikungunya virus effect of 5-(phenylamino)uracil derivates. This study aimed to evaluate the cytotoxic effect of five 1-substituted 5-(phenylamino)uracil derivates on Vero 76 cells. Tested compounds were dissolved in 1% dimethyl sulfoxide (DMSO). Vero 76 cells (1×10^4 cells/ well) were seeded into 96 well-plates and incubated overnight in 37ºC supplemented with 5% CO_2. Tested 5-(phenylamino)uracil derivates were added into respective wells in concentrations ranged from 0.39 µM to 200 µM. The greater concentrations were not been tested because of poor solubility of the compounds. The plates were incubated for 24 and 48 hours. Each concentration of the tested compounds was done in triplicates and repeated at least 4 times. Then percentage of cell viability was determined by using CellTiter 96® AQueous Non-Radioactive Cell Proliferation Assay (Promega, USA) in accordance to the manufacturer's protocols. The results of cytotoxicity test showed that CC_{50} for all tested compounds was $\geq$ 200µM for both 24 and 48 hours. However, cell viability was slightly increased at 48 hours of incubation compared to what at 24 hours. This may be explained by the loss of the inhibitory effect of the compounds due to their degradation. The exact CC_{50} for each of the tested 5-(phenylamino)uracil derivates could not be detected due to limitations of the compound solubility. We concluded that concentrations of the tested 5-(phenylamino)uracil derivates $\leq$ 200µM were safe to be used for further studies of anti-Chikungunya virus effects.

P8-15

SURVEY ON ETHNOBOTANICAL USES OF ENDEMIC AND ENDANGERED PLANT SPECIES IN SABARIMALA HILLS, SOUTHERN WESTERN GHATS, KERALA, INDIA

Erulappan Marimuthu[1], Krishnaswamy Muthuchelian[1]

[1]Department of Bioenergy, School of Energy, Environment and Natural Resources, Madurai Kamaraj University Madurai – 625 021

Medicinal plant species play a vital role towards the healthcare of local tribal people in Kerala. A number of medicinal plant species are being used for curing a wide range of ailments. The names of the plants and Red List Data category were gathered from International Union for Conservation of Nature (IUCN) annual reports and standard research articles. Traditional remedies are part of the cultural and spiritual life of these people. Sabarimala is located on a hill at an altitude of 3000 feet in the district of Pathanamthitta in Kerala in southern Western Ghats. The major objective of the present study is to evaluate the diversity and role of endemic and endangered plant species with ethnomedicine values in the Sabarimala hills. The results of the study reveal that among the 203 plant species, 55 are endangered, which form 27% of total flora. We found that one medicinal plant species such as, *Cinnamomum sulphuratum* are considered as "almost got extinct". The other enumerated plants are categorized into endemic and endangered species, which include *Acacia caesia, Actinodaphne campanulata, Bauhinia acuminate, Elaeocarpus venustus, Homonoia riparia, Humboldtia bourdillonii, Hydnocarpus macrocarpa, Hydroctyle javanica, Litsea travancorica, Phyllodium pulchellum*, etc. These plants are used for the treatment of various health problems. The present investigation has brought out some important medicinal plant species traditionally used by the local tribal peoples towards the treatment of minor ailments such as, boils, cuts, wounds, diarrhea, headache, jaundice, skin infection, major ailments leprosy, AIDS, tuberculosis and cancer. Therefore, it is suggested that the above mentioned Red List Data medicinal plant species are required to be adopted for proper conservation and management measures prior to their complete extinction.

P8-16

PRE-TREATMENT WITH RESERPINE DOES NOT SHORTEN THE DURATION OF MNNG-INDUCED STOMACH ADENOCARCINOMA

Faizatul Isyraqiah Ahmad Muhammad[1], Methil Kannan Kutty[1], Sergey Gupalo[1], Norizan Kamal Basah[1], Harbindar Jeet Singh [1,2,3]

[1]Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
[2]IMMB, Faculty of Medicine, Universiti Teknologi MARA
[3]I-PPerFORM, Universiti Teknologi MARA

N-methyl-N′-nitro-N-nitrosoguanidine (MNNG) is a carcinogen used to induce well-differentiated type of adenocarcinoma in the stomach of rats. It is usually administered together with sodium chloride in drinking water to induce adenocarcinoma and takes about 40 weeks to develop. It is however unknown if the duration for the development of MNNG-induced adenocarcinoma could be shortened by pre-treatment with reserpine, an agent used to induce peptic ulceration. This study therefore examined the effects of MNNG-induced tumourigenesis in female Sprague-Dawley rats pre-treated with a single dose of reserpine. Sixteen, 6-week old female rats were divided into 2 groups, consisting of 8 rats per group. Group 1, which was pre-treated with a stat dose of 20 mg/kg of reserpine given via the intraperitoneal route served as a control. Group 2 was given a stat dose of 20 mg/kg of reserpine via the intraperitoneal route followed by daily administration of MNNG at a dose of 100 μg/ml in drinking water. Body weight and water intake were measured weekly throughout the study. The rats were euthanized after 40 weeks and the stomachs were collected, and histo-pathological examination on the stomach was performed. Data on bodyweight and water intake were analysed using 2-way ANOVA. There was no difference in body weight and water intake between the two groups. Histological examination showed intact gastric mucosa and regular stomach layers in the control rats. Stomachs of rats exposed to MNNG for 40 weeks showed no tumoural tubes and no tumour invasion in the stomach layers. Pre-treatment of rats with reserpine to induce acute ulceration in the stomach prior to MNNG exposure does not increase the ability of MNNG to form well-differentiated stomach adenocarcinoma.

P8-17

EFFECTS OF RAMADAN FASTING ON STRESS LEVELS BASED ON SALIVARY CORTISOL LEVELS IN HEALTHY ADULT MALES

Hakimi Zainudin[1], Brinnell Caszo[2], Shahidah Abdullah[2], Victor Feizal[2], Justin Gnanou[2]

[1]Pusat Pengurusan Penyelidikan dan Inovasi, Universiti Pertahanan Nasional Malaysia, Kem Sungai Besi, Kuala Lumpur, Malaysia
[2]Faculty of Medicine and Defence Health, Universiti Pertahanan Nasional Malaysia, Kem Sungai Besi, Kuala Lumpur, Malaysia

Ramadan fasting practice not only involves abstention from or restriction of food and water but also inculcates self-discipline and self-restraint. However the nature of this practice may be associated with disturbed sleep and feeding patterns which could increase body stress levels. Thus the aim of this study was to assess the effect of Ramadan fasting on the body stress levels using salivary cortisol as a stress marker in healthy male Malaysian subjects. Nineteen healthy male (19-23 years) Muslim subjects were followed up during the fasting month of Ramadan. Anthropometry and unstimulated salivary samples were taken one week before (Phase 1) and during the fourth week of fasting (Phase 2). In order to maintain the same duration of fasting (eight hours) in both phase 1 and 2, salivary samples were collected at one pm. During phase 1, subjects were asked to complete their morning meal by 5 am and fast until 1 pm. In this manner, both phase 1 and 2 samples were collected 8 hours after the morning meal. Salivary cortisol was estimated using enzyme linked immunosorbant assay. The difference between the two groups was analysed using paired sample t-test using SPSS version 21. A p value of <0.05 was considered significant. Subjects experienced a significant decrease in body weight and body mass index ($p < 0.01$). There was also a decrease in salivary cortisol levels, however this decrease was not statistically significant ($p=0.2$). These results indicate that Ramadan fasting in young healthy individuals has a positive impact on health. There was statistically significant lowering of body weight as well as body mass index. Despite the change in sleep and dietary patterns, we observed a decrease in stress levels during the course of the Ramadan month.

Author Index
Plenary, Symposium and special lecture

Author Index
Free Oral Communications

Farah Hidayah Kamisan	O1-14
Faridah Abas	O1-07
Fayez Almabhouh	O3-02
Fayyaz Hashmi	O1-05,O2-08
Furqan Hashmi	O2-08
Gabriele Ruth Anisah Froemming	O3-13,O4-06
Ganaraja B	O2-04
Giriyappanavar Chandrashekhar	O4-01
Gopalkrishna K Bhat	O2-04
Gupalo Sergey	O4-08
Hanita Othman	O4-05
Hapizah Mohd Nawawi	O4-06
Harbindar Jeet Singh	O3-02, O4-06, O4-08
Hassaan A Rathore	O1-05
Hassaan Anwer Rathore	O2-08
Hemabarathy Bharatham	O3-01
Ida Yasmin	O4-01
Indah Binti Mohd Amin	O1-01
Intan Safinar Ismail	O1-07
Javed Mahmood	O3-09
Juani Mazmin Husin	O3-10
Julina Md Nor	O2-03
Kalaivani Chellappan	O4-05
Ken-ichiro Kosai	O4-07
Khairul bin Osman	O3-02
Khozirah Shaari	O1-07, O3-07, O3-10, O3-11
Kok-Yong Chin	O3-03
Kouichi Sakamoto	O4-07
Lau Yeh Siang	O4-04
Liew Wai Lam	O3-12
Lim Yi Cheng	O1-08
Loong Bi Juin	O4-04
M Bhakyalakshmi	O4-02
M Chakrapani	O1-02
Mahathir Mohd Uzid	O1-11
Manraj Singh Cheema	O3-11
Marina Yurievna Kapitonova	O4-08
Masyitah Mohamad Locman	O1-09
Md Safwan Samsir	O2-07
Meenaketan Tripathy	O1-13
Methil Kannan Kutty	O4-08
Mikhail Novikov	O1-13
Minaketan Tripathy	O3-13
Mogana Sundari Rajagopal	O2-05
Mohamed Ibharim Lazhari	O1-05
Mohamed Mansor Manan	O1-09
Mohammed H Abdullah	O1-05
Mohammed Ibrahim Lazhari	O2-08
Mohd Anwar Md Yassin	O1-09
Mohd Azam Khan	O4-03

Author Index
Poster Presentations

ACKNOWLEDGEMENT
&
SPONSORS

TEGUH PHARMA

PowerLab
Data with integrity

ADINSTRUMENTS
making science easier

Building Integrated Systems for Speciality Lab:

• Anti-Doping Lab • Pharmacy (Pharmaceutical) Lab • Genetic and Genomic Lab

Specializing in Solid Dosage Manufacturing Equipment

Teguh Pharma (M) Sdn Bhd
38-2, Jalan USJ1/1B, Regalia Business Centre, 47620 Subang Jaya
(T) 03-8023 6304 / (F) 03-8023 6307
www.teguhpharma.com.my / info@teguhpharma.com.my

MEDIC IMAGING

MEDICAL SOLUTIONS

With best compliments.

I-Medic Imaging Sdn Bhd (681560-K)
GST Reg. No.: 000839647232
57-2, Block D, Jaya One, No 72A, Jalan Universiti
46200 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: 603-7957 7958, 7957 9486, 7956 3216 Fax: 603-7955 1817
Website: www.imedicimaging.com

Authorised dealer for:

PHILIPS

NeuroLogica

Uscom

pharmaniaga
enriching life together
(A member of Boustead Group)

Make the RITE DECISION

Respect, Integrity, Teamwork and **Excellence** – values that make it **RITE** for Pharmaniaga to deliver growth that would define our performance as an industry player. Winner of "Malaysia's 100 Leading Graduate Employers Awards 2012 and 2014" in Pharmaceutical Industry category and "HR Asia's Best Companies to work for in Asia 2014", Pharmaniaga is dedicated to encouraging responsibility, nurturing leadership and fostering the career growth of its employees in such diverse positions in pharmacy, pharmaceutical manufacturing, process engineering, supply chain and warehouse management, sales and marketing as well as other management support services. Learn how to make it **RITE** for you. To find out how you can be part of Pharmaniaga, take on new responsibilities and seek new challenges, please send in your resume via **www.pharmaniaga.com/careers.htm**

Visit our website
www.pharmaniaga.com/careers.htm
for latest vacancy list and send your application to
recruitment@pharmaniaga.com
& application for internship to
pharma_training@pharmaniaga.com

HR Asia™
BEST COMPANIES TO WORK FOR IN ASIA 2014

WINNER
PHARMACEUTICAL
2012
MALAYSIA'S 100 leading graduate EMPLOYERS
gti media

WINNER
PHARMACEUTICAL
2014
MALAYSIA'S 100 leading graduate EMPLOYERS
gti media

Pharmaniaga Berhad
(467709-M)

No. 7, Lorong Keluli 1B, Kawasan Perindustrian Bukit Raja Selatan,
Seksyen 7, 40000 Shah Alam, Selangor Darul Ehsan
Tel : 03 - 3342 9999 Fax : 03 - 3344 5626 www.pharmaniaga.com

HCM-2014-041(05)A4

GE Healthcare

Full prescribing information available at this stand/meeting.

Adverse events should be reported. Please provide the AE reporting forms either to your local distributors or directly to GE Healthcare Central Safety Units at Dss-oslo@ge.com; DrugSafetyPrinceton@ge.com.

GE Healthcare Limited, Amersham Place, Little Chalfont, Buckinghamshire, England HP7 9NA
www.gehealthcare.com
11-2014 JB26021SG INT'L ENGLISH

A strong commitment to patient care

ISOSMOLAR VISIPAQUE™ (IODIXANOL)

At all available iodine concentrations, the only isosmolar X-ray contrast agent for intravascular use[1]

OMNIPAQUE™ IOHEXOL

A constant in the world of radiology with over 360 million procedures to date[2]

+PLUSPAK™ (polymer bottle)

A plus in the department. A plus for the planet.[3,4,5]

NON-IONIC OMNISCAN™ GADODIAMIDE

Non-ionic, low-osmolar, general purpose gadolinium based contrast agent with a broad range of indications[6]

With Best Compliments,

LABEDAR MARKETING

(SA0047339-H)

No. 7, Jalan Cangkul 19/3, 40300 Shah Alam,
Selangor Darul Ehsan

Telephone: 03-51261922
Fax: 03-55416320
Email: labmarket@yahoo.com.my

Pembekal Kementerian Kewangan:
- Kelengkapan makmal perubatan
- Perkakas hospital & pakai buang
- Peralatan & bahan kimia makmal
- Kelengkapan perabot makmal

With Best Compliments,

CHENUR SUPPLIER (001801135-A)

No. 23, Jalan Impian Murni 2/3, Taman Impian Murni, Saujana Impian, 43000 Kajang, Selangor Darul Ehsan

Fax: 03-87330357
Email: chenursupplier@gmail.com

Membekal bahan kimia, peralatan makmal, makanan ternakan dan haiwan makmal

SETIA CITY
CONVENTION CENTRE

BEYOND CONVENTIONS



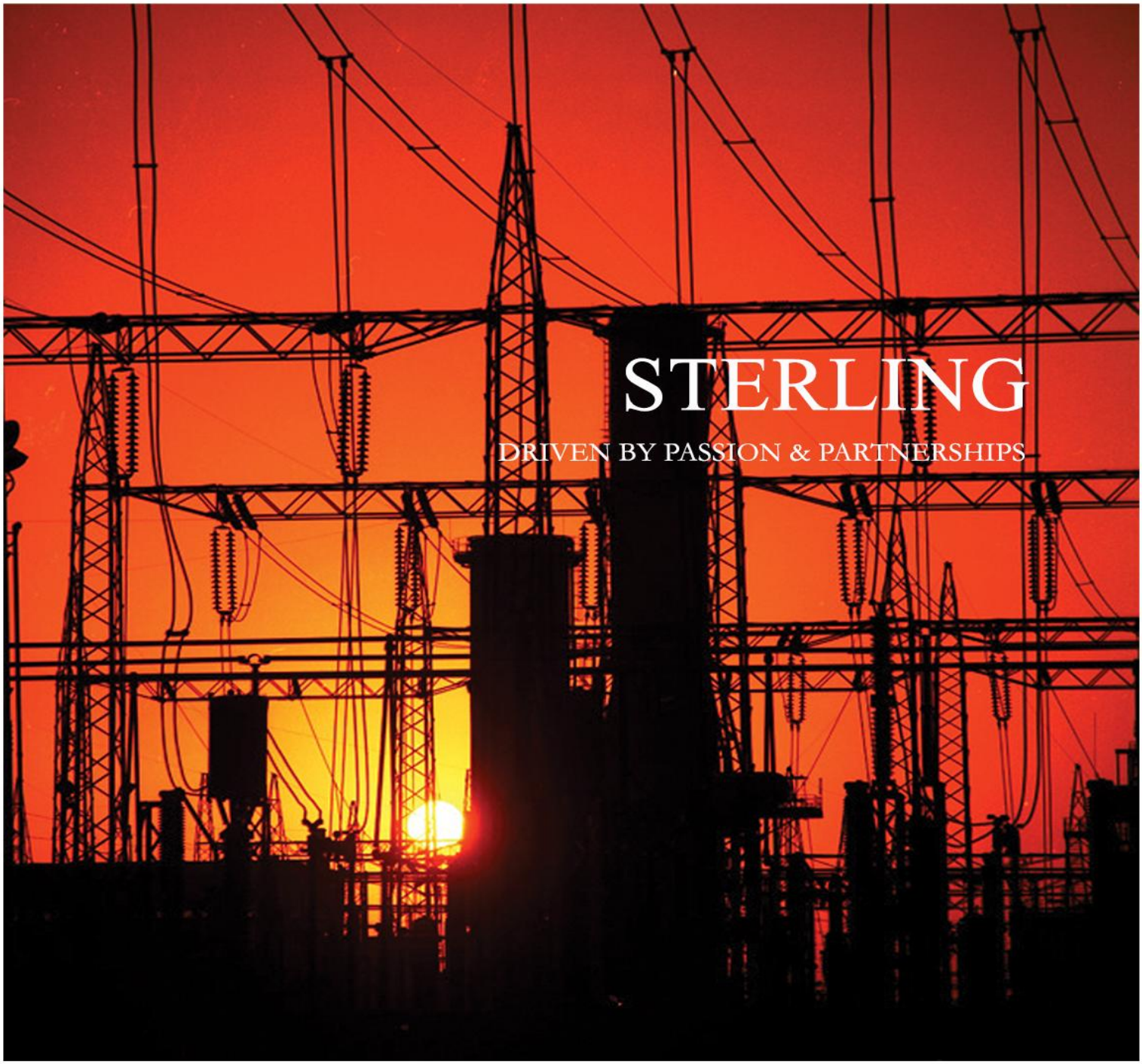
We believe that events are no longer just about venues. It is about space for creativity and engagement where memorable experiences are made. Here at Setia City Convention Centre, we help connect associations, corporate organizations and government bodies with all the necessary elements to ensure your event is a success.

Do call us at 03-3359 5252

SETIA CITY CONVENTION CENTRE

No.1, Jalan Setia Dagang AG U13/AG, Setia Alam Seksyen U13 40170 Shah Alam, Selangor Darul Ehsan, Malaysia.

setiacityCC@spsetia.com **www.setiacityCC.com**

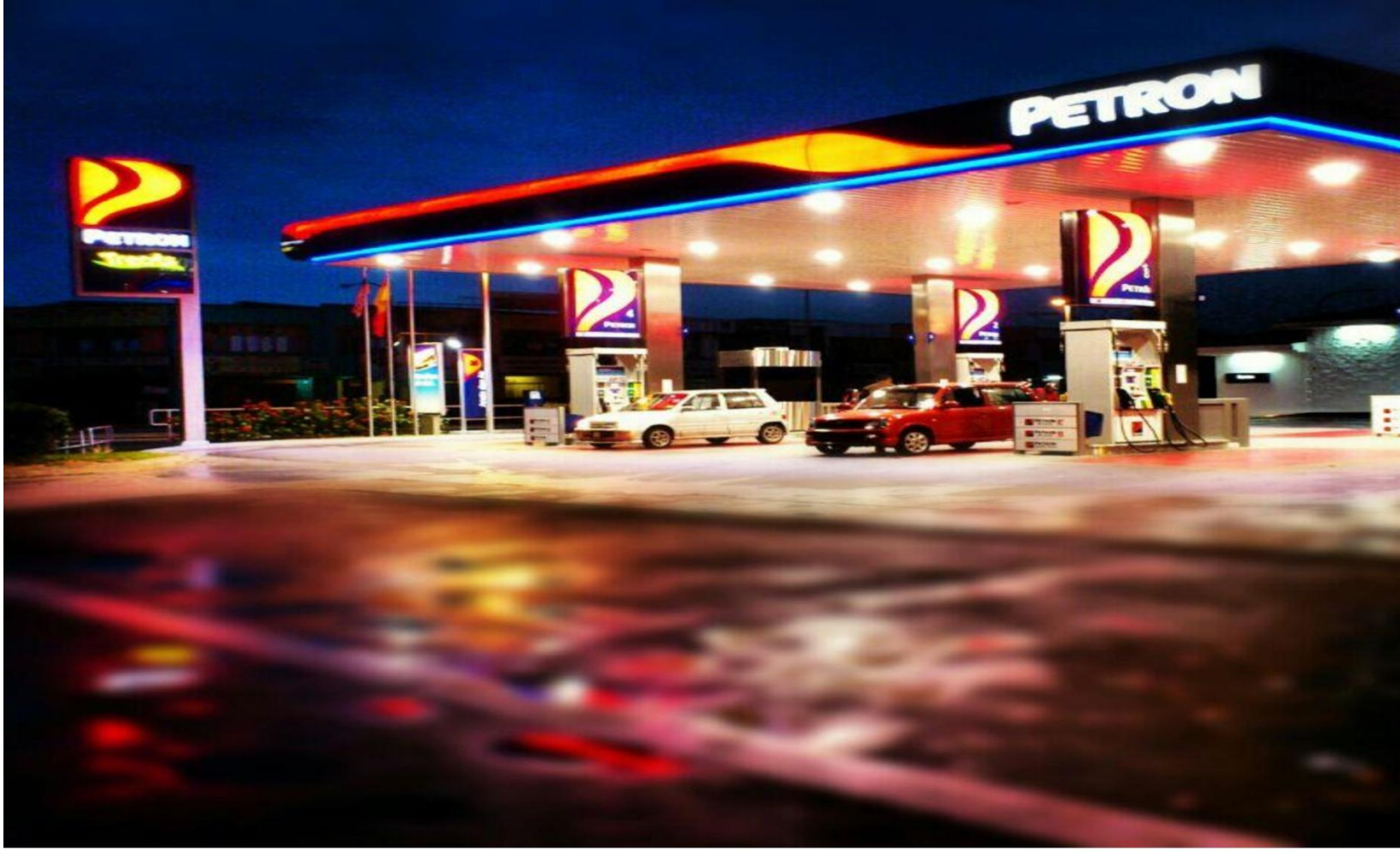


STERLING
INSURANCE BROKERS

www.sterlingbrokers.com.my

STERLING INSURANCE BROKERS SDN BHD (35219-T)

Kuala Lumpur No. 27-2 The Boulevard, Mid Valley City, Lingkaran Syed Putra 59200 Kuala Lumpur t: +603-2938 6888 f: +603-2938 7888
Penang No. 18-30-A, 30th Floor, Gurney Tower, Jalan Kelawai 10250 Penang t:+604-818 2488 f: +604-818 2489



PETRON TAMAN SRI MUDA, SEKSYEN 25 SHAH ALAM, SELANGOR DARUL EHSAN.

Reach Out for Faster Points and Better Rewards.

The new Petron Miles Privilege Card is unlike any other. For starters, you get 1 Miles point for every RM1 spent on fuel. That's more than any other fuel loyalty card out there. Which means you get to enjoy more rewards, more often. Isn't that great? And with over 560 stations nationwide, it's even easier to earn and splurge! Your card also comes loaded with other benefits. They include merchant tie-ups, discounts, redemptions and so much more. Stay tuned for new privileges as we bring them to you from time to time.

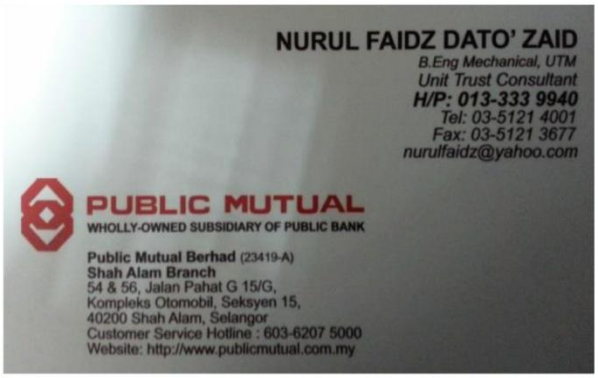
Benefits that are MILES better.

- **Better Privileges**
- **Better Value**
- **Better Rewards**
- **Better Savings**

MORE INFORMATION PLEASE GO TO www.petronmiles.com.my

Year	Savings Account Total monthly investment 2.500.000 Assumed average annual rate of return 1%	Unit Trust Monthly Installment Plan Total monthly investment 2.500.000 Assumed average annual rate of return 10%
Year 1	30,300,000	33,000,000
Year 2	60,903,000	69,300,000
Year 3	91,812.030	109,230,000
Year 4	123,030,150	153,153,000
Year 5	154,560,452	201,468,300
Year 16	522,913,294	1,186,341,085
Year 17	558,442,427	1,337,975,194
Year 18	594,326,851	1,504,772,713
Year 19	630,570,120	1,688,249,985
Year **20**	**667,175,821**	**1,890,074,983**

CONTACT FOR FREE CONSULTATION:



NURUL FAIDZ DATO' ZAID
UNIT TRUST CONSULTANT
013-3339940

Acknowledgement

We wish to express our gratitude to following companies who through their generosity, have help to make this conference possible.