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*“Empowering Healthcare Transformation
via Transdisciplinary Research”*

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MESTECH



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2nd International Conference On Medical Science Technology

*“Empowering Healthcare Transformation
via Transdisciplinary Research”*

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TABLE OF CONTENT

TITLE PAGE	1
TABLE OF CONTENT	2
MESSAGES	
<i>The President / CEO of Universiti Kuala Lumpur</i>	12
<i>The Dean of UniKL MESTECH</i>	13
<i>The President of KKJMP</i>	14
<i>The Chairman of ICMST 2018</i>	15
CONFERENCE SCHEDULE	16
LIST OF SPEAKERS	
<i>Keynote Address</i>	18
<i>Plenary Lectures</i>	19
<i>Symposium Speakers</i>	20
ABSTRACTS	21
KEYNOTE ADDRESS	
K1 <i>Cells, Molecules and the Pharmacology of Disease.</i> <i>Maurice Hallett</i>	22
K2 <i>Studying the Impact of Zoonotic Disease Surveillance in the Orang Asli Communities of the Peninsular Malaysia on Reducing the Risk of Zoonotic Disease Emergence.</i> <i>Tom Hughes</i>	23
PLENARY LECTURES	
P1 <i>Research in Pathology and Laboratory Medicine in the Ministry of Health (MOH) Hospitals – The Way Forward.</i> <i>Dr. Arni Talib</i>	24
P2 <i>Public Health and the Importance of Transdisciplinary Research: A Way Forward.</i> <i>Muhammad Amir bin Kamaluddin</i>	25
P3 <i>Laboratory Testing in Patients Treated with Direct Anticoagulant.</i> <i>Faraizah Abd Karim</i>	26
P4 <i>Clinical Enterococci Are Highly Adaptive and Notorious Pathogens: Do We Know Them Enough?</i> <i>Rukman Awang Hamat</i>	27
P5 <i>IOT Future of Healthcare Industry.</i> <i>Kushsairy Abdul Kadir</i>	28

SYMPOSIUM LECTURES

S1	<i>One Health Approach in Managing Zoonoses.</i> Rohani Jahis	29
S2	<i>Healthcare Innovation: Haruan Cream as Future Alternative Natural Product Medicine for Eczema.</i> Abdull Manan Mat Jais	30
S3	<i>Revisiting the Conceptual Education and Practice of Biomedical Sciences in Malaysia.</i> Muhammad Hamdi Mahmood	31
S4	<i>The Laboratory Diagnosis of Malaria.</i> Zulhainan Hamzah	32
S5	<i>A Community Based Approach (CBA) to Transdisciplinary Outcomes.</i> Sharifa Ezat Wan Puteh	33
S6	<i>CAD/CAM Technologies and 3D Printing in Medicine and Surgery.</i> Firdaus Hariri	34
S7	<i>Translational Immunology: Rewriting Innate Immunity.</i> Rahim Md Noah	35

ORAL PRESENTATIONS

Theme: Clinical Lab Diagnostic & Biomedical Science

OC1	<i>The Role of Tumour-associated Macrophage, Adhesion Molecule and IL-16 in Lymphovascular Invasion of Breast Carcinoma.</i> Chong Choi Yen, Sabreena Safuan	36
OC2	<i>FliI Role in Flagellar Assembly in Salmonella FlhA Deleted Strain Determines Motility and Biofilm Formation.</i> Iram Liaqat Awan, Shahid Khan	36
OC3	<i>Endophytic Fungi as Alternative and Reliable Sources for Potent Antimicrobial Agents.</i> Leong Chean Ring, Tong Woei Yenn, Tan Wen Nee	37

Theme: Public Health

OP1	<i>Knowledge, Attitude and Practice on Postpartum Haemorrhage among Women in Kuantan, Pahang.</i> Sharifah Nadiah Syed Idrus, Radiah Abdul Ghani, Nurjasmine Aida Jamani	37
OP2	<i>Validation of FAT4CP® Questionnaire to Assess Knowledge, Attitude and Confidence of Childcare Providers in First Aid.</i> Norsham Juliana, Nur Islami Mohd Fahmi Teng, Nur Iqmaliza Akmal Mohd Kamal, Nur Azma Amin, Sahar Azmani	38
OP3	<i>Al-Quran Memorization Enhances IQ and Serotonin Levels of Tahfidz Students in Selangor, Malaysia.</i> Santibuana Abd Rahman, Ismarulyusda Ishak, Nor Malia Abd Warif, Nur Farahin Asmadi, Farah Wahida Ibrahim, Ahmad Rohi Ghazali, Normah Che Din, Dzalani Harun, Sabri Mohamed	38

Theme: Healthcare Innovation

- OH1** *Integrated Medicine Management System for Malaysian Healthcare Sector.*
Rabbia Alamdar, Allan Mathews, Sharanjit Kaur, Khairulanwar Husain **39**
- OH2** *Antimicrobial Activity of Pithecellobium jiringa Against Oral Bacteria.*
Chai Hui Yoon, Nurul Husna Ab Rahman, Eza Najiha Abdul Aziz, Khairunnadwa Jemon, Nurriza Ab. Latif **39**
- OH3** *Date Palm and Goat Milk Improved Availability of Functional Iron and Haematological Parameters in Iron Deficient Rats.*
Nurainna Abd Majid, Zuriani Zainol, Nazefah Abdul Hamid, Nuruliza Roslan, Nor Aripin Shaaman, Noor Fadzilah Zulkifli **40**

Theme: Biomedical Science

- OB1** *Effect of Respiratory Syncytial Virus Infection of Host Translation Initiation Factors.*
Azimah Abdul Wahab, Rusydatul Nabila Binti Mahmad Rusli **40**
- OB2** *Protective Effects of Philanthotoxin (PhTX) on Alleviating Visual Impairments in NMDA-induced Glaucoma Rat Model.*
Muhammad Fattah Fazel, Izuddin Fahmy Abu, Renu Agarwal, Igor Iezhitsa, Ian R. Mellor, Henrik Franzyk, Mohamad Haiqal Nizar Mohamad **41**
- OB3** *Elucidating the New Insight of Immunomodulatory Study of THP-1 Macrophages Treated with Pleurotus sajor-caju Polysaccharide (PSC) Extracts.*
Munirah Mokhtar, Leow Chiuan Heng, Siti Sarah Fazalul Rahiman, Noor Fatmawati Mokhtar, Chuah Candy, Abu Bakar Abdul Majeed, Leow Chiuan Yee **41**

Theme: Clinical Lab Diagnostic & Public Health

- OC4** *Baroreflex Function in Malay Male Youth with Different BMI and Level of Adiposity.*
Norsham Juliana, Nadia Mohd Effendy, Nadia Ahmad Roslan, Ahmad Rohi Ghazali, Sahar Azmani, Ainul Huda Sulaiman, Nur Islami Mohd Fahmi Teng, Nur Azma Amin, Hayati Abd Rahman, Abdul Latiff Mohamed **42**
- OC5** *Sharp Medical Waste Disposal in Community: A Cross-sectional Study among Type II Diabetic Patients in Kelantan.*
Ummu Atiyyah Hasan, Suhaily Mohd Hairon, Aziah Daud, Najib Majdi Yaacob, Anees Abdul Hamid, Norzaihan Hassan, Mohd Faiz Ariffin, Lau Yi Vun **42**
- OC6** *Measuring Hand Hygiene Practice: Comparison between Self-reported Questionnaire and Direct Observation among Food Handlers of the Food Trucks.*
Masyita Mamot, Noor Suhaida Ali Khairudin **43**
- OC7** *Investigation of the Roles of Fibronectin-binding Proteins CadF and FlpA during Campylobacter Jejuni Interactions with Intestinal Epithelial Cells.*
Mahjanah Hussein, Neveda Naz, Ozan Gundogdu, Breandan W. Wren, Abdi Elmi, Nick Dorrell **43**

Theme: Public Health

- OP4** A Structural Equation Modeling of Job Burnout among Research University Academicians.
Shaiful Azlan K, Rosnah I, Nor Hassim I, Tahir A 44
- OP5** Application of Chemometric Techniques to Solve Environmental Issues in Malaysia: A Review.
Nur Zahidah Shafii, Ahmad Shakir Mohd Saudi, Pang Jyh Chyang, Izuddin Fahmy Abu, Norzahir Sapawe, Mohd Khairul Amri Kamarudin, Muhammad Muaz Mahmud 44
- OP6** Simplistic Analysis of Spartan Race and How it Aids Pilot's Chores.
Mohd Harridon, Abdul Malek Ya'acob, Imran Mohd Salleh, Fadzil Adly Ishak, Mohammed Fadzli Ismail, Khirul Anuar 45
- OP7** Nutrient Intake and Factors that Influence Feeding Practices of Infants in a Selected Rural Setting in Malaysia.
Naleena Devi Muniandy, Pascale Allotey, Devi Mohan, Daniel D Reidpath 45

Theme: Healthcare Innovation & Biomedical Science

- OH4** Nanoparticle Drug Delivery Systems for Antimicrobial Compounds.
Tong Woei Yenn, Leong Chean Ring, Tan Wen Nee 46
- OH5** Anti-HPV and Apoptosis-inducing Activities of the Baicalein-rich Fraction from *Oroxylum indicum* on Cervical Cancer Cell Lines, HeLa and SiHa.
Nurul Hidayah Wahab, Nor Fazila Che Mat 46
- OH6** Combination Treatment of Metformin and Severe Hyperthermia Induces Bax/Bid-dependent Apoptosis in MG-63 Cells In Vitro.
Aisha Mohd Din, Gabriele R. A. Froemming, Alyaa Al-Khateeb R. Mahmood 47
- OH7** Honey Versus Steroid Impregnated Nasal Packing Following Endoscopic Sinus Surgery: A Randomized Controlled Study.
Guhan Kumarasamy, Baharudin Abdullah, Ramiza Ramza Ramli, Harvinder Singh 47

Theme: Biomedical Science

- OB4** The Effect of Clinacanthus Nutans Extract on PCOS-induced Rats.
Nur Fatimah binti Ahmad, Sabreena Safuan 48
- OB5** Association of Vitamin D with Physiological and Biochemical Markers of Endothelial Function in Overweight and Obese Post-menopausal Women.
Azizah Mat Hussin, Mario Siervo, Tom Hill, John Mathers 48
- OB6** Philanthotoxin (PhTX) as Protective Agent against Retinal Damage in NMDA-induced Glaucoma Rat Model.
Mohamad Haiqal Nizar Mohamad, Izuddin Fahmy Abu, Renu Agarwal, Igor Iezhitsa, Ian R. Mellor, Henrik Franzyk, Muhammad Fattah Fazel 49
- OB7** Development and Validation of a New Knowledge, Attitude and Practice Questionnaire on Allergic Rhinitis Patients towards Intranasal Corticosteroids Usage.
Senthilraj Retinasekharan, Baharudin Abdullah, Ahmad Filza Ismail, Norasnieda Md Shukri 49

POSTER PRESENTATIONS

- P01** *Invasion of Aureobasidium Pullulans in Kidney and Eye of Immunocompromised Patients.*
Prem Ananth Palaniappan, Fairuz Amran, Valerie Ting Siau Mei, Alfarina Mohd Mustafa, Lee Wen Yee, Fairuz Abdul Rashid, Hamid Haji Ghazali **50**
- P02** *A Case Report: A Rare Case of Conjunctivitis in a Child Caused by Actinobacillus Equuli.*
Saraswathiy Maniam, Rohaidah Hashim, Liow Yii Ling **50**
- P03** *Prevalence and Specificity of Red Blood Cells Alloantibody among Patients in Hospital Seberang Jaya, Penang.*
Reezal Ishak, Chin Khien Wei, Khairulnisa A. Manap **51**
- P04** *Severe Fungal Infections Caused by Homographiella Sp. in Immunosuppressed Patients with Acute Leukemia.*
Salina Mohamed Sukur, Fairuz Amran, Hazilawati Binti Hussin, Nur Mukmina **51**
- P05** *Mucormycosis in Malaysia - A case Series between 2017 – 2018.*
Liow Yii Ling, Fairuz Amran, Mohan Rao, Saraswathiy Maniam **52**
- P06** *A Case of Metachromatic Leukodystrophy in a 5 Year Old.*
Julaina Abdul Jalil, Affandi Omar, Nor Azimah Abdul Azize, Yusnita Yakob **52**
- P07** *Optimization of Standard Protocol for MG63 in 3D Culture System.*
Alyaa Al-Khateeb, Mohammed Ali Nashiry, Yeap Swee Keong, Gabriele Anisah Ruth Froemming **53**
- P08** *Serum Retinol Binding Protein 4 (RBP-4) as a Biomarker for Cardiovascular Diseases (CVD): A Review.*
Mohd Naeem Mohd Nawi, Aswir Abd Rashed **53**
- P09** *Determination of Arylsulphatase B Enzyme Activity in Leukocytes using Microassay Technique for the Diagnosis of Mucopolysaccharidoses Type VI.*
Azirah Billy, Affandi O, Nadjiha J, Zabedah MY **54**
- P10** *Cerebrospinal Fluid (CSF) Biogenic Amines: A Specialized Diagnostic Method by High Performance Liquid Chromatography (HPLC) for Diagnosis of Neurotransmitter Disorders.*
Norashareena Mohamed Shakrin, Shahril AZ, Hema A, Nurzahidah K, Julaina AJ, Zabedah MY **54**
- P11** *IQC Validation of Tcoag Hemostasis DT100 Analyzer- by Local Modification from the Manufacturer Claim.*
Sumitha N.C, Ong K.S, Sharifah Shahidah S.M, Mohd Zaimey Z, Nor Hidayah S, Muhammad Faiz M.I, Ahmad Zakuan K, Ananth Kumar M.M **55**
- P12** *Method Verification for Coagulation Routine Tests and Validation of Automated PTT Reagent on Tcoag Haemostasis DT100 Analyzer.*
Aida Azma, M.N, Wan Mohd Bhory, W.M, Mahalatchmi, J, Foo Yao Lim, Muhammad Faiz M.I, Ebby Anuar, B., Ananth Kumar M.M., **Ahmad Zakuan, K.** **55**

P13	<i>Workflow Study Blood Collection Centre using BC ROBO-888 System.</i> <i>Ahmad Toha, Ain Nechfina, Kassim Taip, Khairul Idzuan, Ebby Annuar Bahari, Abdul Hadi</i>	56
P14	<i>Paper-based Lateral Flow Assay for Male Infertility Detection.</i> <i>Suzanah Abdul Rahman, Syazana Mohd Zahri and Zafri Azran Abdul Majid</i>	56
P15	<i>The Effect of Calcium Supplementation on Schwann Cells Growth.</i> <i>Nur Hidayah Hassan, Nur Ismah Hazirah Muhammad, Muhammad Fauzi Daud</i>	57
P16	<i>Antibiotic Profile for Carbapenem Resistant Enterobacteriaceae (cre) of Klebsiella Pneumoniae among Hospitalized Patient at Hospital Raja Permaisuri Bainun, Perak, Malaysia.</i> <i>Norsyafiqah Izura binti Mohd Idrus, Hamidah Abu Bakar</i>	57
P17	<i>Optimizing density separation method for isolating and purifying primary Schwann cells from adult rat Sciatic nerve.</i> <i>Muhammad Fauzi Daud, Fazlin Zaini, Normadiyah M.Kassim, Myo Than, Noorzaid Muhamad</i>	58
P18	<i>Next Generation Sequencing Identifies Potential miRNA to Correlate Response to Tyrosine Kinase Inhibitors and Biological Functions in Chronic Myeloid Leukaemia.</i> <i>Aliza Mohd Yacob, Chang Kian Meng, Nor Asiah Muhammad, Yuslina Mat Yusoff, Latifah Ibrahim, Ezalia Esa, Zubaidah Zakaria.</i>	58
P19	<i>Molecular Detection of Ki-67 Biomarker from Formalin-fixed Paraffin-embedded Tissues of Human Serous Ovarian Carcinoma.</i> <i>Rima Melati Mat Satar, Zed Zakari Abdul Hamid, Hartini Yusof, Nur Sahairah Awang, Maimunah Mustakim</i>	59
P20	<i>Evaluation of T-ARMS-PCR for Identification of SLC47A1 Gene rs2289669 G>A Variant by Using Saliva-derived DNA.</i> <i>Hazwanie Hashim, Choo Chee Chuan, Esther Teo Yong Xuan, Hong Siew Ching, Jack Pua Wee Kiet</i>	59
P21	<i>Disparity Index Test: A Tool to Compare the 18S, ITS and 28S rDNA Gene in Identifying Different Apicomplexa Species.</i> <i>Florence Lee Chi Hiong</i>	60
P22	<i>Development of Barcoding Analytical Tool of Cd Toxicity Using Yeast.</i> <i>Noor A. Mat-Daud, Jeanette M. Rotchell, Vesselin N. Paunov, Gillian M. Greenway, Frederique Ponchel, Jon Pittman</i>	60
P23	<i>Novel Roles of SAFB1 in Regulating RNA Processing and Cellular Stress Response.</i> <i>Jalilah Idris</i>	61
P24	<i>Effect of G140S/Q148R Double Mutation and E138K/G140A/Q148K Triple Mutation on the Affinity of Bictegravir: A Molecular Dynamic Simulation Approach.</i> <i>Ammarul Zaki Bin Rahman, Izzati Binti Mohamad, Shahrul Bin Amir</i>	61
P25	<i>Evaluating the In Vitro Anticoagulation Activities of Clinacanthus Nutans Leaves Extract.</i> <i>Norhaida Che Azmi, Nur Farahhim Abd Rahman, Azlina Muhsin</i>	62

P26	<i>Associations between Placental O6-Methylguanine DNA Methyltransferase (MGMT) Activity, Air Pollutants and Birth Outcomes.</i> Nurulshyha M. Yatim, Geoffrey P. Margison, Edward D. Johnstone, Andrew C. Povey	62
P27	<i>Effects of 2.45 GHz Microwave Radiation Exposure on Erythrocytes and Leukocytes in Rats.</i> Syahidatul Asraf Mohd Sopian, Azlina Muhsin, Norazureen Nadhira Zulkifle, Qalidah Mohd Ali, Noor Ezati Shuib	63
P28	<i>Analgesic and Antipyretic Activities of Methanolic Extract of Brucea Javanica Fruits on Sprague Dawley Rats.</i> Nur Shukriyah Mohamad Hazir, Norafida Che Mahmood	63
P29	<i>The Comparative Study of Hematological Parameters and Kidney Evaluation on Anemic-induced Rats using Gentamicin and Phenylhydrazine.</i> M. Taufiq Badaruddin, W. Elya Farahana W. Hashim	64
P30	<i>Effect of Citrus Aurantifolia Juice on Blood Glucose Level in Streptozotocin-induced Diabetic Rats.</i> Nor Ezleen Qistina Ahmad, Muhiyuddin Md Nasir	64
P31	<i>The Effects of Extract Combination of Smilax Myosotiflora, Persicaria Odorata and Syzygium Aromaticum towards the Growth of Bacillus Subtilis, Salmonella Typhi and Candida Albicans.</i> Pang Jyh Chyang, Mahfuzha Bt. Mustapa, Kaswandi M. Ambia	65
P32	<i>Antibacterial and In Vitro Wound Healing Activities of Helichrysum Italicum and Manuka (Leptospermum Scoparium) Essential Oils.</i> Mock Phooi Yan, Oi Jing Yi, Nurriza Ab Latif, Hanisah Azhari, Khairunadwa Jemo	65
P33	<i>The Effect of High Fiber Product towards Oxidative Stress, Haematology Parameters and Brain Histology on STZ-induced Diabetic Rats.</i> Ahmad Hasan, Faisol Aris, Nawi S.F., Jalil N.A	66
P34	<i>Evaluation of Wound Healing Properties of Musa Sp. (Banana) Sap Crude Extract.</i> Mohamad Hidayat Bin Mohamad Isa, Izuddin Fahmy Abu	66
P35	<i>Hibiscus Sabdariffa L. Extract Improved Plasma Catalase Activity but not Malondialdehyde Level in Hind Limb Immobilized Rats.</i> Zainie Aboo Bakkar, Nooraqilah Rubaai, Nur Afiqah Mahazi, Nurhanisah Hosni, Nik Nur Nadia Nik Mat, Nur Sahira Al-Fattah Yahaya, Hanan Kumar Gopalan	67
P36	<i>The Determination of Phytochemical Constituents in Leaves of Centella Asiatica (Linn.) Urban.</i> Ilyas Syafiq Darul Ridzuan, Norsuraya Adnan	67
P37	<i>Acute Oral Toxicity of Dioscorea Hispida Aqueous Extract on Sprague Dawley Rats.</i> Norizah A, Maizatul Hasyima O, Elda Nurafnie I R, Adham Afiq WZ, Nurulfariza R, Hussin M	68
P38	<i>Alleviation of Nephrotoxicity Caused by Paracetamol-induced Oxidative Stress by Cassia Alata.</i> Izuddin Fahmy Abu, Aflah Che Mat, Aina Akmal Mohd Noor, Anis Dzulaikha Zulkifli, Musfirah Zulkifli, Nabihah Abdullah, Hanan Kumar Gopalan	68

P39	<i>Gas Chromatography- Mass Spectrometry Analysis of Phytocomponents of Sargassum Polycystum (Brown Seaweed).</i> Noorhazayti Ab Halim, Nurul Najwa Zamimi, Widya Lestari, Deny Susanti Darnis, Md Muziman Syah	69
P40	<i>Angiotensin I-Converting Enzyme (ACE) Peptides: Production, Structural Implication and Future Trends.</i> Khairul Faizal Pa'ee, Abdul Manan Dos Mohamed, Nor Raihana Mohamed Zam	69
P41	<i>Investigation upon Mechanical Characteristics on Binary Mixture of Flowlac 100 and Date Power (Phoenix Dactylifera) Chewable Tablet.</i> Fara Wahida Ahmad Hamidi, Mohd Shamsul Anuar, Azhari Samsu Baharuddin, Mohd Afandi P. Mohamed, Mohd Nazli Naim, Suraya Mohd Tahirc	70
P42	<i>The Comparison of Salvia Hispanica L. (Chia Seeds) and Stevia Rebaudiana Bertoni in Lowering Blood Glucose Level in STZ-induced Diabetic Rats.</i> Nabilah Hanim Mohd Sabri, Siti Nurdiana Abdullah	70
P43	<i>Effect of Apelin-13 on Sympathetic-induced Vasocontractile Responses in Porcine Splenic Arteries.</i> Hamidah Abu Bakar, William Dunn, Vera Ralevic	71
P44	<i>Evaluation of Pomegranate (Punica Granatum) Juice on Thrombotic-induced Rat Model.</i> Hanan Kumar Gopalan, M. Syakir Jalim, Noman D Salih	71
P45	<i>Chronic Periodontitis and its Correlation with Socio-demographic and Oral Health Parameters: A Retrospective Study in Adult Population.</i> Munirah Yaacob, Nurul Farahin binti Fazid, Siti Mahirah binti So'odi, Juzaily Hussain, Suhaila Muhammad Ali	72
P46	<i>Assessment of Different Self-care Monitoring Guides to Improve Oral Hygiene.</i> Syarifah Haizan Sayed Kamar, Salwana Supa'at, Suhaila Muhammad Ali, Siti Sarah Abu Bakar, Akmal Ahmad	72
P47	<i>Awareness of Adjunctive Management in Periodontal Diseases.</i> Suhaila Muhammad Ali, Ameerah Dianah Izaddin, Siti Farah Amelia Ahmad Subhi, Munirah Yaacob, Yunita Dewi Ardini, Tin Myo Han	73
P48	<i>The Causes of Tooth Loss among Women in Kuantan, Pahang, Malaysia.</i> Suhaila Muhammad Ali, Naziyah Shaban Mustafa, Muhannad Ali Hamdon Kashmoola, Tin Myo Han	73
P49	<i>Assessment of Diet Intake and its Association with Caries Experience among First and Second Year Students Kulliyah of Dentistry, IIUM Kuantan.</i> Salwana Supaat, Syarifah Haizan Sayed Kamar, Norsyazana binti Zulkifli, Nurfatihah binti Mohd Yussof	74
P50	<i>Beverages Consumption Patterns among Highly Educated Youth in Malaysia.</i> Nur Islami Mohd Fahmi Teng, Aisyah Suraya Muhammad Shah, Norsham Juliana	74
P51	<i>Low Prevalence of Classical Galactosemia in Malaysian Population.</i> Mursyidah Mohd Azit, Affandi O, Nik Awatif K, Siti Aishah AW, Mardhiah M, Zabedah MY, Anasufiza H	75

P52	<i>Sharp Disposal Method among Diabetic Patients in Community - Need for Concern?</i> Ummu Atiyyah Hasan , Suhaily Mohd Hairon, Aziah Daud, Najib Majdi Yaacob, Anees Abdul Hamid, Norzaihan Hassan, Mohd Faiz Ariffin, Lau Yi Yun	75
P53	<i>Knowledge, Attitude, and Practice on Non-communicable Diseases (NCDs) among Urban Adult Population in Negeri Sembilan, Malaysia.</i> Muslimah Ithnin , Mohd Dzulkhairi Mohd Rani, Norsham Juliana Nordin, Nadeeya Ayn Umaisara Mohamad Nor, Nadia Mohd Effendy, Mohd Azmani Sahar, Khadijah Hasanah Abang Abdullah, Muhammad Shamsir Mohd Aris	76
P54	<i>Work-related Musculoskeletal Disorder (WRMSDs) in Female Teaching Profession: Prevalence and Impact.</i> Dang Anom BMR , Nor Emera Erliza BN, Nurjihan Kam BZK, Siti Zainab BZ, NurFarah Nadia BR, Nur Azma BA	76
P55	<i>A Narrative Review of Occupational Stress Prevalence and its Predictors among Selected Working Populations in Malaysia</i> Shaiful Azlan K , Rosnah I, Nor Hasshim I, Tahir A	77
P56	<i>Sero-prevalence of Leptospirosis among Ruminant Livestock and Farmers in Kuala Lumpur and Selangor, Malaysia (2016-2017).</i> Mohan Rao , Nur Nadia, Liow Yii Ling, Fairuz Amran	77
P57	<i>Seroprevalence of Leptospirosis in Rodents and Stray Dogs in Wet Markets of Selangor and Wilayah Persekutuan (2016-2017).</i> Nur Nadia , Mohan Rao	78
P58	<i>The Benefits of Mentha Species.</i> Ibtisam Abdul Wahab , Muhamad Zafri Abdul Karim, Hannis Fadzillah Mohsin	78
P59	<i>Awareness on the Importance of Infant Immunization among UniKL RCMP Staffs.</i> Norain Ab.Latif , Nurul Syafiqah Zulkifli, Siti Safiyyah Zafirah Shawaludin, Puteri Batrisyia Megat Idris, Kamaliah Hashim	79
P60	<i>Prediction of Severe Accident Occurrence in Radiation Laboratory using Fault Tree Method.</i> Siti Amira Othman	79
P61	<i>The Level of Physical Activity, Screen Time, Body Fat and serum lipid across body mass index (BMI) among young female adults.</i> Azlina Muhsin , Saiyidatul Syafiqah Ibrahim	80
P62	<i>Effect of Trigona Honey on Biochemical Parameters, Oxidative Stress and Brain Histopathological Structure in Streptozotocin-induced Diabetic Rat.</i> Ahmad Hasan , Basrowi N.A, Wafa' W.A.S., Abdul Halim H	80
P63	<i>An Ergonomic Assessment of the Musculoskeletal Disorder among Bag Handlers at Airport: A Case Study in Malaysia.</i> Ahmad Shakir Mohd Saudi , Nur Azma Amin, Mohamed Zul Fadhli Khairuddin, Ilyas Syafiq Darul Ridzuan	81

P64	<i>Depression, Anxiety, Stress and its Factors among Fire and Rescue Department Malaysia Personnel: A Preliminary Study.</i> Ainul Husna Kamarudin, Najaatun Nisa Abdul Rashid, Jamil Saadun, Mohd Fahmi Hussein, Khairilmizal Samsudin	81
P65	<i>Prevalence of Cryptosporidium Oocysts on Vegetables Collected from Rural Market in Selangor, Malaysia.</i> Mehru Nisha, Nur Atikah Amira, Nurul Nadiah, Ahmad Shakir Mohd Saudi, Norhaida Che Azmi, Fabian Davamani	82
P66	<i>Study of Heavy Metals Concentration in Vegetables at the Market that being Consumed by Malaysian: Case Study in the District of Kajang, Selangor.</i> Zakaria Hamid, Ahmad Shakir, Siti Haizum Hamdi, Nur Zahidah Shafii	82
P67	<i>Flood Risk Index Assessment: Case Study in Lenggong River Basin, Johor, Malaysia.</i> Ahmad Shakir Mohd Saudi, Nurul Afiqa Adila Zakaria	83
P68	<i>Determination of Heavy Metals in Fishes from Penchala River, Petaling District.</i> Zakaria Hamid, Muhammad Ikrimah Ahmad Zainuddin, Ahmad Shakir Mohd Saudi, Nur Zahidah Shafii	83
P69	<i>River Water Quality Assessment using Freshwater Algae as Bio-indicator and Identification of Waterborne Bacteria: A Case Study at Kampung Orang Asli in Gombak, Selangor.</i> Mohamed Azmil Azam, Nurul 'Aisyah Binti Zakaria	84
ORGANIZING COMMITTEE		85
PARTNERS & SPONSORS		87
OFFICIAL PUBLISHER		90
CONTACT INFORMATION		91
ACKNOWLEDGEMENTS		97
ADVERTISEMENTS		98

The President / Chief Executive Officer UNIVERSITI KUALA LUMPUR

It is with great pleasure that I extend my warmest welcome to all delegates in attendance at the 2ND INTERNATIONAL CONFERENCE ON MEDICAL SCIENCE TECHNOLOGY (ICMST 2018). Universiti Kuala Lumpur is proud to organize this conference as we continuously support the development of medical science technology in Malaysia. The theme for this year's ICMST, "EMPOWERING HEALTHCARE TRANSFORMATION VIA TRANSDISCIPLINARY RESEARCH" is in line with the dynamic and cross-cutting ethos of medical science technology field. This conference reflects the university's utmost commitment to research and innovation in the pursuit of elevating its researchers, academia and students to greater heights.

I believe that ICMST 2018 will benefit and encourage potential growths and collaborations between both academia and the industries to improve the healthcare delivery system. It is with great hope that this conference provides vast opportunities for universities and research institutes towards more collaborations in the effort of narrowing the gaps between research knowledge and application as well as commercializations.

I would like to congratulate the wonderful team of organizers, Universiti Kuala Lumpur, Institute of Medical Science Technology (UNIKL MESTECH), the National Union of Medical Laboratory Technologist Malaysia (KKJMP) and all esteemed partners and sponsors; please accept my sincere gratitude for all of your contributions in making this conference a reality.

I wish all delegates the most fruitful and enlightening conference.

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



***The Dean of UniKL MESTECH
UNIVERSITI KUALA LUMPUR***

I would like to welcome you to the 2ND INTERNATIONAL CONFERENCE ON MEDICAL SCIENCE TECHNOLOGY (ICMST 2018). We are indeed grateful and pleased to have great international and local speakers joining us this year. A very warm welcome to Malaysia! This year's conference is a wonderful opportunity for us to initiate movements towards Empowering Healthcare Transformation via Transdisciplinary Research. This is in line with Malaysia's on-going process of transforming its healthcare sector towards accelerating economic growth parallel with industrial revolution 4.0 where the medical sciences industry plays a prominent role.

ICMST 2018 aspires to revolutionize ways of thinking and expand our knowledge in scientific research to enhance the development of healthcare sectors. It is hoped that the conference would be able provide an international platform for the exchange of knowledge and disseminate research findings in medical science technology research and practice. I strongly feel that this conference offers a beautiful network of interaction in this unique environment and becomes an ideal platform to exchange experiences as well as creating ideas for a better future. Thus, I believe that all of us would gain some new insights from the research and development perspectives and bring back new ideas to our respective working sectors.

Lastly, I would like to express my utmost appreciation and sincere acknowledgement to the ICMST 2018 committee, our team of organizers from UNIKL MESTECH and KKJMP as well as our esteemed collaborators for their substantial effort in making ICMST 2018 a success. I wish you a rewarding and stimulating conference towards discovering new opportunities while getting immersed in the 'thought provoking' presentations and discussions. Thank you.

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



The President

Kesatuan Kebangsaan Juruteknologi Makmal Perubatan (KKJMP)

Kesatuan Kebangsaan Juruteknologi Makmal Perubatan (KKJMP) is honoured to host the 2nd International Conference on Medical Science Technology 2018 (ICMST 2018) with Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH) this year. I am overwhelmed and excited to be part of this grand platform of knowledge trade following a successful conference organized by the UniKL team in 2016.

In this era, scientists, researchers, academics and industrialists can no longer work in isolation, but must reach out to the global healthcare community and seed new scientific partnerships. Thus, the ICMST 2018 organizing team from both KKJMP and UniKL MESTECH have worked hard to come up with a high quality scientific programme to ensure a positive and productive environment of knowledge and skills exchange among participants during the conference.

I urge all delegates to make full use of the vast information gained from this gathering for the benefits and advancement of our healthcare industry. I hope that the dynamic interaction among researchers, scientists, and academicians forged in this two-day event will nurture a positive, successful and stimulating environment towards greater sustainability. ICMST 2018 will hopefully be the catalyst for further collaboration in our common goal for better advances in this field.

I would like to take this opportunity to extend my warmest welcome and sincere appreciation to all participants for supporting our event, and congratulate the organizing committee for their excellent work, which have made this conference possible.

I wish you a fruitful discussion ahead. Enjoy and have a pleasant day!

Thank you.

***Mr. Hamzah Mohamed
President
Kesatuan Kebangsaan Juruteknologi Makmal
Perubatan (KKJMP)***



***The ICMST 2018 Chairman
UNIVERSITI KUALA LUMPUR
Welcome to ICMST 2018!***

Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH) is pleased and honoured to welcome you to ICMST 2018. It is indeed a special occasion for us this year, as we delightfully welcome on-board, our friends from KKJMP as our co-organizer of the event. The inaugural conference held in 2016 was truly a huge triumph gathering more than 100 participants from across the globe. We wish to continue the success with our 2nd edition this year and hoped that it would be a more rewarding and delightful experience for all delegates!

This premiere event is one great congregating venue for academicians and industry players from a diverse spectrum of healthcare disciplines to share experiences, and recent advancements specifically in the field of medical science technology and environmental health. I hope that it provides a platform for participants to establish and promote national and global partnerships to fill in the research gaps towards improving the healthcare delivery system. Our two-day programme will discuss a broad range of issues and challenges in the field of healthcare which will be weaved through by world-renowned guest speakers. We are indeed fortunate to have so many expert speakers, as well as numerous excellent presentations and exhibitions at display throughout the conference. Therefore, I am confident that our conference this year will be very informative, productive and a memorable one for all.

Thank you to my hardworking committee members for their astounding effort, our collaborators and contributors, guest speakers, exhibitors, and mostly YOU, our honoured participants for joining and supporting ICMST 2018. I look forward to a stimulating academic discussion and an engaging conference experience!

DR. IZUDDIN FAHMY ABU
ICMST 2018 Conference Chairman
UniKL MESTECH



CONFERENCE SCHEDULE

Day 1: 14 November 2018	
0800 – 0900	Registration
Venue: Mawar I & II	
0900 – 0945	Plenary Lecture: Dr. Arni Talib (National Pathology Services, Ministry of Health) <i>Research in Pathology and Laboratory Medicine in the Ministry of Health (MOH) Hospitals – The Way Forward.</i>
0945 – 1030	Officiating ceremony by Datuk Dr. Shahnaz Murad, Deputy Director General of Health, (Research & Technical Support), Ministry of Health, Malaysia Photography session
1030 – 1100	Tea break
1100 – 1200	Keynote Address: Prof. Dr. Maurice Hallett (Cardiff University, United Kingdom) <i>Cells, Molecules and the Pharmacology of Disease.</i>
1200 – 1300	Poster presentations
1300 – 1430	Lunch break (Selasih Garden)
1430 – 1515	Plenary Lecture: Dr. Muhammad Amir Kamaluddin (Malaysian Association of Environmental Health) <i>Public Health and the Importance of Transdisciplinary Research: A Way Forward.</i>
Parallel Symposium	
1530 – 1615	Clinical Lab Diagnostic & Biomedical Science (Venue: Mawar I & II) Symposium Speaker: Dato' Dr. Faraizah Dato' Abdul Karim (Ampang Hospital) <i>Laboratory Testing in Patients Treated with Direct Anticoagulants.</i>
	Public Health (Venue: Orkid) Symposium Speaker: Dr. Rohani Jahis (Public Health, Ministry of Health) <i>One Health Approach for Controlling Zoonotic Diseases.</i>
	Healthcare Innovation (Venue: Melur) Symposium Speaker: Prof. Dr. Abdull Manan Jais (UniKL MESTECH Industrial Advisor) <i>Healthcare Innovation: Haruan Cream as Future Alternative Natural Product Medicine for Eczema.</i>
	Biomedical Science (Venue: Kemboja) Symposium Speaker: Dr. Muhammad Hamdi Mahmood (Universiti Malaysia Sarawak) <i>Revisiting the Conceptual Education and Practice of Biomedical Sciences in Malaysia.</i>
1615 – 1700	Parallel session: Oral presentations
1700	Tea break and end of day 1
2000	Conference Dinner

Day 2: 15 November 2018

Venue: Mawar I & II

0900 – 1000	Keynote Address: Mr. Tom Hughes (EcoHealth Alliance, USA) <i>Studying the Impact of Zoonotic Disease Surveillance in the Orang Asli Communities of the Peninsular Malaysia on Reducing the Risk of Zoonotic Disease Emergence.</i>
1000 – 1030	Tea break
1030 – 1115	Plenary Lecture: Prof. Dr. Rukman Awang Hamat (Universiti Putra Malaysia) <i>Clinical Enterococci are Highly Adaptive and Notorious Pathogens: Do We Know Them Enough?</i>
1115 – 1200	Plenary Lecture: Assoc. Prof. Dr. Kushsairy Abdul Kadir (Universiti Kuala Lumpur) <i>IOT Future of Healthcare Industry.</i>
1200 – 1300	Poster presentations
1300 – 1430	Lunch break (Selasih Garden)
Parallel Symposium	
1430 – 1515	Clinical Lab Diagnostic & Public Health (Venue: Mawar I & II) Symposium Speaker: Dr. Zulhainan Hamzah (National Public Health Laboratory, Ministry of Health) <i>The Laboratory Diagnosis of Malaria.</i>
	Public Health (Venue: Orkid) Symposium Speaker: Prof. Dr. Sharifa Ezat Wan Puteh (Universiti Kebangsaan Malaysia Medical Centre) <i>A Community Based Approach to Transdisciplinary Outcome.</i>
	Healthcare Innovation & Biomedical Science (Venue: Melur) Symposium Speaker: Assoc. Prof. Dr. Firdaus Hariri (University of Malaya) <i>CAD/CAM Technologies and 3D Printing in Medicine and Surgery.</i>
	Biomedical Science (Venue: Kemboja) Symposium Speaker: Prof. Dr. Rahim Md Noah (UniKL MESTECH) <i>Translational Immunology: Rewriting Innate Immunity.</i>
1515 – 1615	Parallel session: Oral presentations
1615 – 1630	Tea break
1630 – 1700	Award presentation and closing ceremony (Venue: Mawar I & II)

LIST OF SPEAKERS

KEYNOTE SPEAKERS



PROFESSOR DR. MAURICE HALLETT,
*Neutrophil Signalling Group,
School of Medicine,
University of Cardiff, United Kingdom*

Professor Dr. Maurice is currently Emeritus Professor of Experimental Cell Biology / Cellular Pharmacology at Cardiff University. He has a BSc (Pharmacology) and a PhD Degree from the Department of Pharmacology, both from the University College London (UCL). He has established the Neutrophil Signalling Group which he has lead for over 20 year now. His research is focused on understanding the complex and dynamic behaviour of neutrophils (immune white blood cells) and the group has set up a laboratory for the measurement, manipulation and imaging chemical changes in individual living neutrophils.

MR. TOM HUGHES,
*Senior Scientist & Malaysian Project Coordinator,
EcoHealth Alliance, USA*



Mr. Tom Hughes is a senior scientist and the Malaysian Project Coordinator at EcoHealth Alliance, USA, a nonprofit organization dedicated to protecting wildlife and public health from emergence of diseases. Tom has a BSc (Development Studies and Natural Resources) from the University of East Anglia and a Post Graduate Diploma in Public Health from the London School of Hygiene and Tropical Medicine. Tom has established the Deep Forest Project in Sabah studying the effects of land use change on viral diversity, setup the Wildlife Health Unit, and the Wildlife Health, Genetic and Forensic Laboratory with Sabah Wildlife Department and Danau Girang Field Centre, and works closely with partners from the Ministry of Health, the Department of Wildlife and National Parks, the Department of Veterinary Services, Sabah Wildlife Department and local universities.

PLENARY SPEAKERS



PROF. DR. RUKMAN AWANG HAMAT,
*Senior Consultant Microbiologist,
Faculty of Medicine & Health Sciences,
Universiti Putra Malaysia (UPM)*

DR. ARNI TALIB,
*Head of National Pathology Services,
Ministry of Health &
Head of Pathology Department,
Kuala Lumpur Hospital*



DATO' DR. FARAIZAH DATO' ABDUL KARIM,
*Senior Consultant Hematologist,
Ampang Hospital*

ASSOC. PROF. DR. KUSHSAIRY ABDUL KADIR,
*Director, Centre for Research & Innovation,
Universiti Kuala Lumpur*



DR. MUHAMMAD AMIR KAMALUDDIN,
*Council Member, Malaysian Association of
Environmental Health (MAEH)*

SYMPOSIUM SPEAKERS



ASSOC. PROF. DR. FIRDAUS HARIRI,
*Maxillofacial Surgeon & Humanitarian,
Faculty of Dentistry, University of Malaya (UM)*

DR. ROHANI JAHIS,
Head of Zoonosis Sector,

Disease Control Division, Ministry of Health, Malaysia



PROF. DR. SHARIFA EZAT WAN PUTEH,
*Deputy Dean (Relations & Generations) ,
Department of Community Health
Universiti Kebangsaan Malaysia Medical Centre (UKMMC)*

PROF. DR. ABDULL MANAN MAT JAIS,
*Founder of Abmanan Biomedical Sdn Bhd &
UniKL MESTECH Industrial Advisor*



PROF. DR. RAHIM MD NOAH,
*Clinical Immunologist &
Head of Technical Foundation Section, UniKL MESTECH*

DR. ZULHAINAN HAMZAH,
*Head Section of Parasitology & Mycology,
National Public Health Laboratory,
Ministry of Health Malaysia*



DR. MUHAMMAD HAMDİ MAHMOOD,
*Senior Lecturer, Faculty of Medicine & Health Sciences,
Universiti Malaysia Sarawak (UNIMAS)*

The background of the page is an abstract geometric pattern composed of numerous triangles in various shades of green and yellow, creating a low-poly, crystalline effect. The triangles are arranged in a way that they seem to flow and overlap, with some areas being more densely packed than others. The colors range from light, pale yellows and greens to deeper, more saturated greens and yellows.

ABSTRACTS

KEYNOTE ADDRESS

K1

Cells, Molecules and the Pharmacology of Disease.

Maurice Hallett

Cardiff University, United Kingdom

In order to design new drugs for the effective treatment of currently untreatable or difficult-to-treat diseases, it is important to understand the disease mechanism. In this talk, I will focus on the work which my research team has done over a number of years looking at the problem of inflammatory diseases, such as rheumatoid arthritis. In this group of diseases, white blood cells, especially neutrophils, leave the blood stream and accumulate in large numbers at the inflamed site and cause localized tissue damage. Neutrophils adhere to the endothelium and change their shape from spherical in the blood to flattened on the endothelium, so that they can squeeze between endothelial cells and escape from the blood stream. We have looked for an underlying mechanism which allows neutrophils to do this shape change and sought a step which could be inhibited by a small molecular drug. One key step which controls the way in which neutrophils change shape is the activation of a cytosolic protease, calpain-1, by a rise in cytosolic free Ca^{2+} . Calpain cuts the links between the plasma membrane and the cortical actin network of these cells and permits the formation of new pseudopodia and the cell to adopt a flattened shape. We have designed and synthesized some new inhibitors of calpain-1 which act at the Ca^{2+} activation site. We know that these inhibit the enzyme and also prevent neutrophils from changing shape *ex vivo*. These compounds are not yet useable in patients and further chemistry is needed, but the approach of targeting the disease process by trying to understand the key mechanism involved will lead to some effective treatments of inflammatory disease. My hope is that this combination of cell biology, molecular biology, chemistry and eventually clinical medicine will produce new drugs for a variety of diseases. The story that I will tell is about neutrophils and inflammation, but it is only one example of the success of this approach.

KEYNOTE ADDRESS

K2

Studying the Impact of Zoonotic Disease Surveillance in the Orang Asli Communities of the Peninsular Malaysia on Reducing the Risk of Zoonotic Disease Emergence.

Tom Hughes

EcoHealth Alliance, USA

More than 60% of human infectious diseases have an animal origin with the majority coming from wildlife, while emerging infectious diseases (EIDs) are twice as likely to be zoonotic. Almost all recent pandemics (e.g. HIV/AIDS, SARS, bird flu, Ebola) originated from viruses that naturally occur in wildlife. Over the past few decades the number of newly emerging diseases have increased significantly. These emergence events threaten human health and have the potential for devastating economic consequences globally. For example, the Nipah virus outbreak that occurred on Peninsular Malaysia in 1998, caused 105 human deaths, resulted in the culling of more than a million pigs and cost the Malaysian economy 550 million USD. Growing movement of people and animals around the world, allows zoonotic diseases the potential to spread, become pandemics, and cause devastating impacts beyond national borders. Increasing contact between people, livestock, and wild animals through intensified processes of agriculture expansion, land conversion, hunting, and urban growth are the driving factors behind this disease emergence. The speed with which these diseases can emerge and spread presents serious public health, economic, and development concerns. It also underscores the need for the development of comprehensive disease detection and response capacities, particularly in “hot spot” areas such as central Africa, South and Southeast Asia.

Although there is a growing awareness that most emerging viruses come from wildlife, there is relatively little surveillance of wildlife populations for zoonotic pathogens. Resources for disease surveillance are focused on human and domestic animal populations limiting the possibility of early detection or prevention of outbreaks. Understanding the diversity and prevalence of zoonotic agents in key wildlife species in areas where people, domestic animals, and wildlife have high degrees of contact (e.g. indigenous villages) has the potential to provide opportunities for early detection and response to spillover events, limiting human and livestock mortality. The USAID-funded PREDICT program, a component of the Emerging Pandemic Threats program, seeks to discover viruses in wildlife before they become global pandemics, and identify the factors that drive their emergence in human populations. In Peninsular Malaysia one focus of this program is zoonotic disease surveillance at a high risk interface - indigenous villages, while in Sabah the focus is on hospital based surveillance. This program will examine if indigenous communities with a high level of wildlife contact through hunting, butchering and consumption are an important sentinel population for disease emergence. It will evaluate if the surveillance of wildlife, domestic animals and human populations at the same interface at the same point in time is an effective form of disease surveillance. Finally it will consider if surveillance at a high risk interface is a more effective form of disease surveillance than hospital based surveillance.

PLENARY LECTURE

P1

Research in Pathology and Laboratory Medicine in the Ministry of Health (MOH) Hospitals – The Way Forward.

Arni Talib

*National Pathology Services, Ministry of Health, Malaysia &
Pathology Department, Hospital Kuala Lumpur*

Pathology and Laboratory Medicine of MOH hospitals in Malaysia play the major role in not only providing diagnostics services but also offers a wide range of tests for the various stages of disease from screening and early detection to prognostication and monitoring of disease and the effects of treatment. Throughout the years, the laboratories in these hospitals have expanded the scope of tests and services in tandem with the clinical demand. Along with these, the laboratory performances also need to maintain quality standards and this requires commitment, much effort and time. Hence, priority towards research does not take the forefront in these laboratories at present.

However, advances in technology that are already at our doorstep will change the entire paradigm and compel us to integrate research into our daily operations. Consequently, we have to prepare ourselves and create the right environment and culture to undertake it as the best as possible.

PLENARY LECTURE

P2

Public Health and the Importance of Transdisciplinary Research: A Way Forward.

Muhammad Amir bin Kamaluddin

Malaysian Association of Environmental Health (MAEH)

Disciplinary research refer to research only in one specific field. Public health issues have become more complex and by restricting to disciplinary research area only, cannot provide sustainable solution. Highly complex problem commonly termed 'wicked problem' denote resistance to scientific resolution. Public health research issues are an example of wicked problem. Challenges in global health from effects of environmental degradation and pollution via climate change and technological driven spinoff discharging nanoparticle in the environment to mention a few concerns. A myriad other newly emerging area of interest in infectious and non-infectious diseases in relation to sustainable development and public health have been recognized with no firm solution from conventional prevention and control programs. In short the rapidly changing built environment; climate change; seasonal instability and more frequent extreme weather events; changing lifestyle, dietary consumption pattern and technology driven food production; increasing importance of zoonosis and changing transmission pattern; emergence of new pathogen and mutated viruses; all impacting on public health and cannot solely depend on disciplinary research for solution. Transdisciplinary research requires the continuously and seamlessly effort at merging and integrating multiple scientific discipline at various levels of multifocal domains through collaborations with resulting synergy and completeness. Public health problems are becoming increasingly complex and require scientists to appreciate the multi-perspectiveness of complex problem in real life in seeking solutions that require cultivating new habits of interacting thought-styles. As the saying goes 'no man is an island'. Current and future achievement in resolving public health issues would depend on how successful in the migration towards transdisciplinary research to provide better science and a sustainable solution to public health.

PLENARY LECTURE

P3

Laboratory Testing in Patients Treated with Direct Anticoagulant.

Faraizah Abd Karim

Ampang Hospital

Direct oral anticoagulant (DOAC) therapy are for prevention and/or treatment in patients who are at risk of thrombosis. Assessment of DOAC exposure and anticoagulant effects may be useful in various clinical scenarios. The five approved DOACs (apixaban, betrixaban, dabigatran, edoxaban and rivaroxaban) have different characteristics impacting assay selection and interpretation of results. Different reagent sensitivities and variabilities in the laboratory may impact assay results, and also DOACs may also cause false positive or negative results in haemostasis assay. This can be minimized by using a specific assay. Which tests to use, the advantages and limitations, and when to assay DOAC levels will be discussed. The presentation will also talk on the interpretation of results relating to bleeding risks, emergency situations and perioperative management, as well as the impact of DOACs on routine and specialized coagulation assays will also we discussed.

PLENARY LECTURE

P4

Clinical Enterococci Are Highly Adaptive and Notorious Pathogens: Do We Know Them Enough?

Rukman Awang Hamat

Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

Enterococcus faecalis and *Enterococcus faecium* have now increasingly been recognized as among the most important nosocomial pathogens reported worldwide. These two clinical enterococci have shaken the world of scientific and clinical communities for its facile acquisition of antibiotic and virulent determinants between intra and inter species of bacteria. A plethora of mobile genetic elements are undoubtedly responsible for this phenomenon. More than billion years, enterococci are ubiquitously found in the environments and used to be docile as commensals or colonizers in/on all living things ranging from man to insects. The explanation for the ability of this friendly bacterium to be highly adapted to the hospital environments and be the most notorious foe is still inconclusive. More intriguingly, different traits such as clearly diverse antibiotic and virulent profiles have been observed among these two different species i.e. *E. faecalis* and *E. faecium* in hospital settings compared to the environments. It has been postulated that the “modern style” of these bacteria is acquired by inherent enterococcal factors rather than mere evolutionary process. Pertinent yet highly developed mechanisms have been clearly interpreted from the analysis of their detailed genomic content, which later contribute to its successful proliferation and survival in one or more habitats especially in modern hospital environment. Molecular epidemiology, genome sequencing and comparative genomics have sequentially advanced our understanding of enterococcal antimicrobial resistance, virulence, biology, and evolution. Nonetheless, this is only the tip of the iceberg, comparison of these clinical enterococci to enterococci from other environments will reveal more new discoveries and insights about these highly adapted bacteria that have confounded human infection.

PLENARY LECTURE

P5

IOT Future of Healthcare Industry.

Kushsairy Abdul Kadir

Universiti Kuala Lumpur

Our world is becoming increasingly connected through the development of technology. With these extensive levels of connectivity, the Internet of Things (IoT) is making a significant impact. In the Internet of Things (IoT), devices gather and share information directly with each other and the cloud, making it possible to collect, record and analyze new data streams faster and more accurately. As the technology for collecting, analyzing and transmitting data in the IoT continues to mature, we'll see more and more exciting new IoT-driven healthcare applications and systems emerge. IoT is driving multiple trends and inspiring new practices and workflows featuring efficiency and more precise diagnostic recommendations. IoT offer greater promises in the field of healthcare, where its principles are already being applied to improve access to care, increase the quality of care and most importantly reduce the cost of care. Within healthcare, the IoT represents the frontier, the place where outer limits are being tested and tried in both facility management and patient care.

SYMPOSIUM LECTURE

S1

One Health Approach in Managing Zoonoses.

Rohani Jahis,

Disease Control Division, Ministry of Health, Malaysia

Zoonotic diseases (Zoonoses) are infections naturally transmitted from animals to humans. It is estimated that 70% of emerging diseases and pathogens are originating from animals or from products of animal origin. Hence, it's vital to recognize the threat poses to human by domestic animal and wildlife; and to assess its impact on human's health, social and economy. Spread of diseases is also precipitated by the environments and functioning ecosystems. In order to prevent and control zoonoses, an effective and efficient interagency and intersectoral collaboration called one health approach is pivotal. This approach is about team work, working together to protect human, animal and environmental health. This initiative was mooted by Dr. Tracy MacNamara in 1999 who was then working at the Bronx zoo. He noted many wild crows and the zoo's exotic birds were dying and a month later people in New York were getting sick. By 2001, this new virus in Americas known as West Nile Virus had claimed 18 lives with 131 others were confirmed infected. Looking back in Malaysia, One Health Approach was implemented when the Nipah outbreak occurred in 1998 - 1999. When the outbreak claimed many human life and affected the pig farming industry, a multiagency task force was established and coordinated by the National Security Council to carry out control activities, to prevent the virus from further spreading. One Health Approach is a coordinated control through efficient responses by multiple agencies including human and animal health which will give the desired outcome faster at a lesser cost.

SYMPOSIUM LECTURE

S2

Healthcare Innovation: Haruan Cream as Future Alternative Natural Product Medicine for Eczema.

Abdull Manan Mat Jais

*Founder & Project Leader, Abmanan Biomedical Sdn Bhd
Universiti Kuala Lumpur, Institute of Medical Science Technology Industrial Advisor*

Healthcare (or medical) is an industry, an aggregating and integrating sector in an economic system that provides goods as well as services to treat patients with curative, preventive, rehabilitative and palliative care. It is one of the world's largest and fastest-growing industries, requiring at least 10 % of the gross domestic product (GDP) in most developed nations, including Malaysia. The industry is involving both professional and non- or para-professionals in an interdisciplinary team in hospital (diagnostic, preventive, remedial, and therapeutic services), dental-practices, equipment, bioengineering, biotechnology, biomedical, pharmaceuticals, other related life-sciences and other human-health activities. Since 19 centuries, especially after world-war 2 people are crazy over single-chemical as pesticides, fertilizers and medicines. Although traditional elements were co-existed but it was overshadowed for chemicals can be mass-produced, cheap and easier-handling. However, things are changing now where perceptions, believes and trust on single-chemical which is a non-specific, indiscriminating with side-effects, developing addiction, resistance and environmental issues is beginning to fade. People are now looking for alternatives, back to tradition, beginning organic farming and re-introducing biological control. Natural product is becoming popular, accepted and receiving attention. Many are having great potential, complying with regulation and properly manufactured. Although diagnostic and care should remain unchanged, a proper administering, handling as well monitoring will making traditional therapy a safe choice, improving quality of care and patients life. It is time for transformation, and Haruan Cream (**HC**) is a good option as future alternative natural product remedy to treat the no-cure chronic inflammation of the skin, eczema. The product is containing 5 % of the Haruan's *Channa striatus* extract known as Haruan Manan (**HM**), is a natural product, non-single chemical remedy, non-steroidal, non-carcinogenic and truly Malaysia. Safety and efficacy of the **HC** is fully supported by animal and human model, a clinical trial Phase 1 and Phase 2.

SYMPOSIUM LECTURE

S3

Revisiting the Conceptual Education and Practice of Biomedical Sciences in Malaysia.

Muhammad Hamdi Mahmood

Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak

The increasing Malaysian population each year translates into escalating healthcare cost and the need for well-trained Biomedical Scientists to work in the clinical service niche area. Since the 90s, there are several Malaysian Higher Education Institutions known to offer both Biomedical Sciences and Biomedical Science courses. Those courses produce inimitable human resources with the former emphasized for practice in medical research. Whereas the latter practice as professionals in clinical science including niches of health, academic and industry. Although the Allied Health Profession Act (Act 774) has been enacted in 2016; at present the impact of this act on those courses offered by education institutions are not clear. Furthermore, in this country, other seemingly related acts have also been enacted and more new health courses has been offered by the learning institutions to the public. With occurrence of Industrial Revolution 4.0, this unavoidable evolution of education and practice challenges the present Biomedical Scientists and those who inspires to venture into this area to contemplate about their future direction. As the above scenario, this present study attempt to re-visit the biomedical education and practice in Malaysia, previously described by the author in 2013. Several international education and practice models will be examined and compared to the local context. This present study, will also discuss on how to effectively develop the four niche areas in Biomedical and Clinical Science along with other healthcare professionals in this country.

SYMPOSIUM LECTURE

S4

The Laboratory Diagnosis of Malaria

Zulhainan Hamzah

National Public Health Laboratory, Ministry of Health, Malaysia

Laboratory diagnosis by microscopic examination of stained blood smears continues to be the gold standard for confirming a clinical diagnosis of malaria and epidemiological studies, but with the availability of the polymerase chain reaction (PCR) methods which has been shown to be more sensitive and specific than other approaches, especially in detecting the low parasitemia and the sub-microscopic malaria, this PCR technology should be fully utilized in addition to the “gold standard” Giemsa-stained blood smear in diagnosis of malaria. Thus, the utilization of the PCR technology coupled with the current microscopy method will help to ensure and strengthening the laboratories diagnosis of malaria in future.

SYMPOSIUM LECTURE

S5

A Community Based Approach (CBA) to Transdisciplinary Outcomes.

Sharifa Ezat Wan Puteh

Faculty of Medicine, Universiti Kebangsaan Malaysia

Multiple health issues and disarray are occurring nowadays and unfortunately most of these community problems, could not be overcome through just one solution. Many requires a transdisciplinary approach, multiple prongs targeting specific domains and in the end, a holistic solution is achieved. According to the United Nations, in 2015, countries and the international community should prioritize to achieve the new 17 targets of Sustainable Development Goals (SDGs) ensuring “no one is left behind”. Community based approach (CBA) is the most preferred method of intervention, this is seen to be most cost effective, holistic in nature and as close to the roots of the problem to be solved. The community, in turn has an active role to play, participate and propagate the activities ensuring benefits to its population and high risks groups. Many collaborators may play a role to ensure knowledge sharing occurs and at the same time, become CBA stakeholders. Through a CBA, knowledge can also be propagated through word of mouth, increasing positive practice, improving attitudes, and long term sustainability, be it in health, disaster management or education. Through not without flaws; CBA has its merits but also downfalls. Issues contributing to its barriers include governance in the community, financial sustainability, lack of drive, its’ unclear outcomes/targets, political influence and short lived objectives. Well managed, a CBA may reap many rewards to its stakeholders, garnering profits, increasing health and quality of lives to its population. In conclusion, CBA has the potential to solve many community issues and at a cheaper cost. This can be used to solve transdisciplinary problems that are too complex to be dealt in a solitary manner.

SYMPOSIUM LECTURE

S6

CAD/CAM Technologies and 3D Printing in Medicine and Surgery.

Firdaus Hariri

Faculty of Dentistry, University of Malaya

Healthcare practitioners are on the brink of technological revolution that may fundamentally alter the delivery of service, management of disease and optimization of treatment outcome. With the integration of CAD/CAM engineering and 3-dimensional printing, certain medical specialty such as the surgical field has significantly benefited from this technological breakthrough. This lecture comprises of a 10-year experience of application and integration of these technologies in a highly subspecialized surgical area of craniofacial reconstructive surgery and how the industrial revolution has greatly contributed to the advancement of medical and surgical field, not only in reducing the morbidity and mortality, but at the same time achieving successful and optimizing its treatment outcomes

SYMPOSIUM LECTURE

S7

Translational Immunology: Rewriting Innate Immunity.

Rahim Md Noah

Universiti Kuala Lumpur, Institute Of Medical Science Technology

Historically, the innate immune system has always been known to represent the first line of defense against pathogens providing an immediate response to infections. This conceptual understanding is said to be conserved throughout evolution. For the last decade, the simple role of innate immunity in particular as displayed by one of the cellular components, the neutrophils, has to be evaluated and re-assessed due to the complexity of functions surfacing in various inflammatory reactions. From variations in phenotypic expressions to multiple roles not only within the traditional innate immunity itself but also in the adaptive immune response, the plasticity of neutrophils has emerged as one of the most intriguing features to be explored in the era of translational immunology. The excitement continues with the discovery of “renovated” neutrophil functions.

SYMPOSIUM: ORAL PRESENTATION

OC1

The Role of Tumour-associated Macrophage, Adhesion Molecule and IL-1 β in Lymphovascular Invasion of Breast Carcinoma.

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Tumour inflammatory infiltrates and their secreted cytokines are crucial for tumour promotion and invasion. However, tumour microenvironment involving connection of tumour-associated macrophage (TAM), adhesion molecule, and interleukins are not well understood. This study aims (1) to examine the influence of increasing total tumour paraffin blocks per case to the clinical data and outcomes and (2) to investigate the relationship of macrophage count, IL-1 β and ICAM-1 intensities in breast carcinoma specimens and its association with vessel density and vessel invasion. 99 archived formalin fixed paraffin embedded (FFPE) breast carcinoma samples were collected. Haematoxylin and eosin (H&E) and immunohistochemical (IHC) staining (CD34, D2-40, CD163, ICAM-1, and IL-1 β) were used to stain consecutive breast carcinoma tissue. Total blood vessel invasion (BVI) detected from three CD34-stained tumour blocks shows significant increases compared to one and two block(s) per case ($p < 0.0001$ and $p = 0.007$ respectively). Total LVI observed from three D2-40-stained tumour blocks per case is significant increases compared to one block per case ($p = 0.0003$). The macrophage count, ICAM-1 and IL-1 β intensities show no significant different between one, two, and three tumour block(s). Although the blood vessel density (BVD) is higher than lymphatic vessel density (LVD), $p < 0.0001$, the lymphatic vessel invasion (LVI) is higher than blood vessel invasion (BVI), $p = 0.008$. The M2 macrophage count is significantly increases with increasing tumour size ($p = 0.01$) and IL-1 β intensity ($p = 0.03$). The increases of ICAM-1 intensity significantly increases the peri-tumoural BVD and intra-tumoural LVI ($p = 0.04$ and $p = 0.03$ respectively). Increase of IL-1 β intensity significantly increases intratumoural LVI ($p = 0.009$). Conclusion: Blood vessel and M2 macrophage might play an important role in tumour development. In contrast, lymphatic vessel plays an important role in tumour metastasis. ICAM-1 and IL-1 β could be the targeted molecules in reducing tumour metastasis rate.

Keywords: Lymphovascular invasion, Tumour associated macrophages

OC2

FliI Role in Flagellar Assembly in Salmonella FlhA Deleted Strain Determines Motility and Biofilm Formation

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Biofilms formation is a major hazardous problem from both clinical and environmental perspective. Flagellum-mediated motility is important for biofilm formation by several gram-negative bacteria. >50 genes are involved in flagellar biosynthesis and function in *Salmonella typhimurium*. The flagella basal body is a representative of Type III protein secretion systems; used by several gram-negative bacterial pathogens to colonize foreign tissues and substrates. The mechanism of flagellar assembly was analyzed in *S. typhimurium*, using bioinformatics analysis to identify conserved structural elements. In this study, *FliI* a flagellar protein that is needed for flagellar assembly and may be involved in a specialized protein export pathway was cloned and overexpressed. *FlhA* deleted mutant salmonella strain SJW1616 was used to transform *FliI* overproducing plasmid by electroporation. Using vital dyes (Alexafluor 488), visualization of motility was observed in wild type, SJW1616 ($\Delta FlhA$) and *FlhA* transductant strain which was further assessed by biofilm formation ability. Swimming, swarming motility along with significantly reduced biofilm formation was observed in SJW1616 ($\Delta FlhA$) compared to wild type and *FlhA* transductant strains. This study will extend initial evidence that *FliI* plays important role in flagellar export system and flagellum-mediated rotation is critical for swimming, swarming motility and biofilm formation. The flagellar basal body is a particularly convenient drug target, since the architecture of most its components has been determined near atomic resolution and it is an ancient evolutionarily conserved macromolecular assembly. The knowledge gained will also have implications for elucidation of the mechanistic design principles underlying protein secretion complexes.

Keywords: *FliI*, *Salmonella*, Alexa fluor staining, *FlhA*, Flagellar motility

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The inappropriate use of antibiotics over the past three decades caused complacency about the threat of antibiotic resistance. This led to increase in morbidity, mortality rate and also health care spending. Thus, a new antimicrobial agent is necessary to combat these pathogens. Endophytes are microorganisms that reside in living plant tissues for all or part of their life cycle. They live symbiotically with their host plants, without causing any disease symptoms to the host. Endophytes are known to produce antimicrobial metabolites that enhance the survival of the host. Hence, the focus on our research team is on the discovery of antimicrobial compounds from endophytic fungi. We discovered a new compound, Phomopsidione that exhibited excellent antimicrobial activity on several Gram negative bacteria such as Klebsiella, Escherichia, Pseudomonas and Acinetobacter. Phomopsidione is a ketone derivative that is obtained as a colorless solid, with a melting point of 82°C. The compound also exhibited excellent anti-candidal and antioxidant activities. The fungicidal activity of this compound is comparable to fluconazole and voriconazole, the first line antifungal options for candidiasis. Recently, we reported the antibacterial activity of phomopsidione on extensively drug resistant *P. aeruginosa* isolated from cystic fibrosis patient. We also found synergistic antibiotic effects of fungal stigmaterol and ampicillin in against beta producing clinical isolates. The combination of stigmaterol and ampicillin exhibits significant inhibitory effect on both Gram positive and Gram negative bacteria compared to stigmaterol and ampicillin alone. This finding is important as it shows potential application of fungal stigmaterol as an antibiotic adjuvant to combat multidrug resistant pathogens. In conclusion, an endophytic fungal source of a desired antimicrobial compound is of particular value, as fungal fermentation can be carried out to provide a virtually inexhaustible source of compounds.

Keywords: Endophytic fungi, Antimicrobial, Drug discovery

Knowledge, Attitude and Practice on Postpartum Haemorrhage among Women in Kuantan, Pahang.

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Postpartum haemorrhage (PPH) is defined as excessive bleeding of 500 ml or more within 24 hours after birth. It is known as one of the leading cause of maternal mortality worldwide. In Malaysia, from 2009-2014, PPH remained to be one of the top contributors to maternal deaths, suggesting that the knowledge, attitude and practice on PPH among mothers in Malaysia is still uncertain. This cross-sectional study aimed to determine the level of knowledge, attitude and practice on PPH and to examine the association of socio-demographic factors with knowledge, attitude and practice of women in Kuantan. This study involved 105 women who have experienced pregnancy and delivery at least once and lives in Kuantan. Self-administered questionnaires were distributed from February 2018 until March 2018. Data was analyzed using the Statistical Package Software for Social Sciences (SPSS). Descriptive frequency table, Mann-Whitney U test, Kruskal-Wallis test and Spearman correlation test was used in this study. From the findings, the level of knowledge on PPH among most of the women in Kuantan, Pahang was average (n=73, 69.5%), whereas the level of attitude and practice of most women in Kuantan was found to be in good level; (n=101, 96.2%) and (n=98, 93.3%) respectively. Factors that have significant association with knowledge on PPH in this study were age group (p=0.016) and background of education (p<0.001). In conclusion, this study showed that most of the participants in Kuantan have moderate level of knowledge on PPH with good attitude and practice on management of PPH.

Keywords: Postpartum haemorrhage, Maternal mortality, Malaysia, Perception, Kuantan

OP2

**Validation of FAT4CP® First Aid Module and Assessment Tool:
Evaluating Module Acceptance and the Knowledge, Attitude and Confidence (KAC)
on First Aid Response among Childcare Providers.**

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At present, there is paucity of Malaysian policy on paediatric first aid training for childcare providers. Thus, this study has developed a first aid module called FAT4CP® for childcare providers and aim to determine the acceptance level of the module and validate an instrument that evaluates the competency of their knowledge, attitude and confidence (KAC) in conducting first aid. Focusing on the content, graphic and design, evaluation of acceptance for the module involved 15 childcare providers with at least one year experience in handling children at childcare centres and 15 healthcare professionals. Together with the module, an assessment tool was developed, with content and face validity assessed by content experts. A self-administrated questionnaire was distributed to 70 childcare providers to measure their first aid KAC. Construct validity of the questionnaire was examined using Exploratory Factor Analysis (EFA) with principle component methods and varimax rotation. Cronbach's α values were used to estimate the reliability of the questionnaire. This study revealed that the module was well accepted with majority of the childcare providers (93.3%, n=14) indicated that they understood the information contained in the module. The first aid assessment tool was also found to be reliable in measuring knowledge, attitude and confidence among childcare providers with Cronbach's alpha of 0.56, 0.95 and 0.92, respectively. For content validity, the questionnaires were critically reviewed in terms of relevance, clarity, simplicity, and ambiguity. In conclusion, findings of this study demonstrated that the module was well received, and the assessment tool is valid and reliable in measuring first aid KAC among childcare providers.

Keywords: First aid, Knowledge Attitude and Confidence, Assessment tool

OP3

**Al-Quran Memorization Enhances IQ and Serotonin Levels of
Tahfidz Students in Selangor, Malaysia.**

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Al-Quran memorization has been reported to have beneficial effects on IQ and individual health. However, scientific studies on Al-Quran memorization in relation to intelligence quotient (IQ), hormones and immune system are still lacking. Hence, this study aimed to determine the association between Al-Quran memorization with intelligence quotient (IQ), hormones and cytokines levels of tahfidz students in Selangor, Malaysia. A cross sectional survey was conducted involving 159 students from three tahfidz schools and two control schools in Selangor. A self-administered questionnaire was distributed to obtain sociodemographic data and the Wechsler Abbreviated Scale of Intelligence-Second Edition (WASI-II) kit was used to measure the IQ level. 10 ml of blood was taken for determination of hormones (cortisol and serotonin) and cytokines (IL-10 and IFN- γ) levels using Enzyme-linked Immunosorbent Assay (ELISA) kit. Data were analyzed using descriptive and inferential statistics. The findings revealed that the IQ level of tahfidz and non-tahfidz students was average. There was a significant difference ($p < 0.05$) between the Al-Quran memorization, the IQ level and the hormones level. The Al-Quran memorization was positively associated with the IQ level ($r = 0.242$, $p < 0.05$) and the hormones level (cortisol, $r = 0.242$, $p < 0.05$; serotonin, $r = 0.244$, $p < 0.05$) and negatively associated with the cytokines level (IL-10, $r = -0.243$, $p < 0.05$; IFN- γ , $r = -0.014$, $p > 0.05$). After controlling the covariates, the Al-Quran memorization remained significantly associated with the IQ level and the serotonin level. In conclusion, this study suggested that Al-Quran memorization enhancing IQ and serotonin levels. Future studies should explore the underlying mechanisms that contribute to the health benefits of Al-Quran memorization.

Keywords: Al-Quran memorization, IQ, Serotonin, Tahfidz students

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Medicines management is an evidence-based approach for prescribing and managing the patient's medicines to ensure the safety, tolerability, and effectiveness of treatments. It helps practitioners to provide an optimum use of medicines for a patient and to optimize the benefits of treatment that offer and attain the best outcome for each patient. Three components of the Medicine Management System (MMS) which are Electronic Health Record (HER), e-Prescription, and Clinical Decision Support System (CDSS) are vastly used. Despite the importance of MMS, only 15.2% of Malaysian Public Hospitals implemented the system using different features. This study will investigate the requirement of the MMS using qualitative and quantitative method for evaluation and to find the response rate toward MMS. The proposed MMS is based on two theories, namely Utilization Theory, and Evidence Based Theory. The main features of MMS are e-prescription, appropriateness of dosage regimen, cover best current evidence, show alerts if any medicine related issue, centralization of patient data that will be designed for both public and private hospitals, private clinics and community pharmacies as well as health centers. If there is any issue related to the prescribed medicine an alert will be based on the current best evidence to show on the prescriber's system. If there is no issue detected, the prescription will be saved in the patient's record and will show on the pharmacy system with direction and cautions related to the medicines. The proposed MMS increase in the productivity of the healthcare system by reducing medicine related issues, improving communication among healthcare professionals, improved patient care, and improved practitioner performance.

Keywords: Medicine management, Healthcare sector

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Dental caries is a major oral health problem in most countries. Current data from FDI World Dental Federation shows that it has a global prevalence over 40 % for all age combined. Research on finding alternative compounds for controlling the diseases are extensively done, with many focusing on plant-derived natural compounds. *Pithecellobium jiringa*, locally known as jering, is a famous plant that can be found abundantly in Malaysia. The locals especially Malays, have eaten *P. jiringa* seed either raw or half boiled with rice and used pounded leaves for skin ailments or toothache as they believe that it has medicinal effects. Therefore, due to the potential of its medicinal values, antimicrobial activity of *P. jiringa* leaves against oral bacteria was investigated. In this study, *P. jiringa* leaves were extracted using ethanol and the extract was analyzed by High Performance Liquid Chromatography (HPLC). The minimum inhibitory concentration (MIC) of the extract against *Staphylococcus aureus*, *Streptococcus mutans* and *Streptococcus sobrinus* was determined using the broth microdilution method. The influence of the extract on bacterial adhesion and biofilm development was also investigated. From the phytochemical screening, gallic acid, quercetin and kaempferol were detected in *P. jiringa* extract. It was observed the MIC of the extract against *S. aureus*, *S. mutans* and *S. sobrinus* were 3.13 mg/mL, 1.56 mg/mL and 3.13 mg/mL, respectively. *P. jiringa* extract was found to be most effective against adherent cells of *S. aureus* with more than 50% reduction and moderate effect for *S. sobrinus* and *S. mutans*. Excellent inhibition was shown by the extract towards *S. sobrinus*. However, low antibiofilm activity was identified against *S. aureus* and no significant inhibition detected on *S. mutans*. The results from this study provide an interesting preliminary data for the development of *P. jiringa* extract as oral care agents against several bacteria.

Keywords: *Pithecellobium jiringa*, Medicinal plants, Oral bacteria, Antibacterial activity, Dental caries

**Date Palm and Goat Milk Improved Availability of Functional Iron
and Haematological Parameters in Iron Deficient Rats.**

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Noor Fadzilah Zulkifli

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Iron deficiency anaemia (IDA) is a global health problem. It is common in poverty areas and indicates poor nutrition and health. A wholesome natural food that is highly nutritious is a possible solution to prevent IDA. Many reports stated that dates and goat milk have numerous beneficial effects on health. Therefore, this study aimed to evaluate the effects of dates and goat milk on the iron bioavailability and haematologic parameters using IDA-induced rats. The iron-deficient model rats were assigned to 5 groups (n=6) with different supplementation protocol (low iron diet, dates, goat milk, both dates and goat milk and ferrous fumarate) and were compared to the normal control. Full blood count and iron profile were assessed after 28 days of supplementation. Iron bioavailability was assessed using haemoglobin regeneration efficiency (HRE). Result showed that supplementation of date palm and goat milk (singly or in combination) for 28 days significantly improved iron bioavailability ($p<0.05$). The level of Haemoglobin, Red cell count, Packed cell volume, Mean cell volume, Mean corpuscular haemoglobin, serum iron and transferrin saturation were also significantly increased ($p<0.05$) in all treatment groups when compared to negative control group. The study indicated that date palm and goat milk favoured the recovery from iron deficiency anaemia. It improves the haematological parameters as well as the availability of functional iron for erythropoiesis. Therefore, it is recommended that these dates and goat milk should be included in the diet of general population, particularly in groups vulnerable to IDA.

Keywords: Dates, *Phoenix dactylifera*, Goat milk, Iron deficiency anaemia, Bioavailability

Effect of Respiratory Syncytial Virus Infection of Host Translation Initiation Factors.

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Respiratory Syncytial Virus (RSV) is a leading cause of respiratory infections primarily in children. Presently, there is no effective vaccines able to fight the RSV infection, instead of treatments that tend to be limited in relieving the signs and symptoms only. Currently, the development of RSV antivirals and vaccines is much more focused on viral attachment and RNA transcription and there is few information regarding the effect of RSV infection on host translation initiation factors. This study aimed to analyze the level of translational initiation factors (eIF4A, eIF4E, eIF4G) in RSV-infected cells, in which play major role as translation control target. Human Epithelial type-2 (HEp-2) cells were optimized and observed for the morphological changes in RSV-infected cells in which involved with the formation of multinucleated cells (syncytia) and disintegration of the cellular membrane. Following these, the time course infection study was carried out at 0, 24, 48, 72, 96, 120 hpi at MOI 1 and the virus titer was determined using TCID50 method. Based on the growth curve of RSV in the HEp-2 cells, it clearly shown that the entry of RSV into the HEp-2 cells were initiated between 12 hpi to 36 hpi, whereas at 48 hpi, RSV started to synthesis their viral proteins as the new viral particles were found to increase gradually until 72 hpi. Level of proteins was determined by immunoprecipitation Western Blotting. From this analysis we found that, there were no changes on the levels of eIF4G and eIF4E during the RSV infection. This finding suggests that, the translation initiation factor; eIF4G that function as scaffold protein and eIF4E, known as cap binding protein might not cleaved or depleted during the RSV infection. However, we found that eIF4A has shown a reduction at 24hpi, primarily suggesting that this helicase factor of eIF4A might be useful in the RSV replication. RSV infection affects level of translation initiation factors that probably important for their protein synthesis. With that, in future, confirmatory study should be done to determine the functional requirement of these initiation factors (eIF4A, eIF4E, eIF4G).

Keywords: Respiratory Syncytial Virus, eIF4F complex, eIF4A, eIF4E, eIF4G

OB2***Protective Effects of Philanthotoxin (PhTX) on Alleviating Visual Impairments in NMDA-induced Glaucoma Rat Model.***

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Philanthotoxin (PhTX) is a potent *N*-methyl-D-aspartate receptor (NMDAr) modulator. This study aimed to provide evidence that PhTX would provide retinal ganglion cell (RGC) protection by NMDAr blockade through the inhibition of excitotoxicity thus alleviating visual impairments in glaucoma. Male Sprague Dawley rats (200-250g) used in this study were divided into three groups; group 1 and 2 were intravitreally injected with 2 μ L of phosphate buffer saline (PBS) and NMDA (160 nM) as the negative and positive control group respectively, while group 3 was pre-treated with PhTX (160 nM) followed by NMDA after 24 hours. Following 7 days of treatment, the rats were subjected to object recognition test consisting of four different tasks: open field (trial 1), familiarization phase of 5 different objects [A-E] (trial 2, 3, 4), spatial memory test [displacement of object D and E] (trial 5, 6) and spatial memory test [replacement of object A to A(1)] (trial 7). In trial 1, open field test expectedly showed no significant differences in total distance travelled in all groups as they are all equally new to the environment. In trial 2, 3 and 4, the total time spent at all objects for NMDA-injected group is higher than the negative control group and rats pre-treated with PhTX prior to NMDA induction, although insignificant ($p>0.05$). Trial 5 and 6 conducted consecutively, demonstrated that NMDA-injected group recorded significant increase of total time spent at all objects compared to the other two groups, where the latter groups recorded much lesser time spent in trial 6 ($p<0.05$). Similarly for trial 7, NMDA-injected group recorded significant increase of total time spent at object B-E compared to the other two groups ($p<0.05$). These findings suggests that NMDA excitotoxicity caused visual impairments in our glaucoma rat model, and pre-treatment of PhTX prior to NMDA injection alleviates the condition similar to the negative control ($p>0.05$) group as observed in the object recognition test.

Keywords: Philanthotoxin, Glaucoma, *N*-methyl-D-aspartate receptors, NMDA excitotoxicity, Visual impairment

OB3***Elucidating the New Insight of Immunomodulatory Study of THP-1 Macrophages Treated with Pleurotus Sajor-caju Polysaccharide (PSC) Extracts.***

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In recent years, mushroom polysaccharides have raised as the most robust mushroom-derived substances responsible for antitumor and immunomodulating activities. In the present study, we studies the immunomodulation effect of *Pleurotus sajor-caju* polysaccharide (PSC) extracts toward human macrophage THP-1. The aim of the present study was to determine the ability of the water-soluble PSC extracts in inducing the proliferation and immunostimulation effects in macrophage cell line. THP-1 macrophage cell were incubated with PSC concentrate (PSC, 0-80 μ g/ml) in the absence and presence of lipopolysaccharide (LPS), respectively. Firstly, the cell proliferation response was evaluated using the MTS assay. To understand the immunostimulation effect of PSC extract at the gene level, the THP-1 cells were tested for its gene expression profile using real-time PCR. PSC significantly induced the proliferative response of the cells in dose-dependent manner. PSC also up-regulated the gene expression level of interleukin 6 (IL-6), interleukin 1 β (IL-1 β) and tumour necrosis factor-alpha (TNF- α) significantly in the cells. In contrast, PSC suppressed the expression of these cytokines when the cells were treated in combination with LPS. Our study suggests that *Pleurotus sajor-caju* polysaccharide (PSC) may possess it's of importance role in immunomodulatory activities and this may shed light on the potential of adjuvanticity of polysaccharides isolated from mushroom.

Keywords: *Pleurotus sajor-caju*, Immunomodulation, Polysaccharides, Macrophage, Cytokines.

OC4***Baroreflex Function in Malay Male Youth with Different BMI and Level of Adiposity.***

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Heart rate variability (HRV) which is a vital component of the heart's condition is mainly controlled by the autonomic nervous system (ANS). It is proposed that HRV can be associated with body weight and adiposity as adipose tissues are mediated by ANS. The level of HRV is a strong indicator of cardiovascular diseases and it has been reported that males have higher mortality rates related to cardiovascular conditions. This study aimed to determine the HRV status of the Malaysian male youths associated with adiposity. A total of 201 Malaysian male youths aged between 19 to 25 years old were screened and measured for their body anthropometry and physical activities. The subjects were then divided into Group 1: normal adiposity and Group 2: high adiposity. Three non-invasive ANS function tests; Valsalva Manoeuvre, orthostatic response and 30/15 ratio of heart rate were performed. HRV domains were recorded as the time domain and the frequency domain. Parameters for the time domain include maximum R-R time (ms), minimum R-R time(ms), and R-R standard deviation (SD) meanwhile the frequency domain include low frequency (LF), high frequency (HF) and LF/HF ratio. Group 2 reported significantly lower mean of R-R SD in time domain and lower mean of LF/HF ratio in frequency domain. The orthostatic reflex results revealed that Group 2 subjects had significantly lower mean of LF and HF. A decrement of -0.28 ms² HF/LF during Valsalva manoeuvre, -0.35 LF ms² in orthostatic reflex and 0.33 ms² in orthostatic reflex per 1% of body fat percentage were observed. HRV parameters were inversely proportional to the adiposity level which were suggestive for modulation of sympathetic function at early age. Further studies are warranted to provide a more detailed overview on the sympathetic overactivity and parasympathetic withdrawal among young adults.

Keywords: Baroreflex, BMI, Level of adiposity, Malay male

OC5

***Sharp Medical Waste Disposal in Community:
A Cross-sectional Study among Type II Diabetic Patients in Kelantan.***

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Universiti Sains Malaysia

Patients with Type 2 Diabetes Mellitus are major users of medical sharps in the community. Disposal of used sharps among them were reported to be not properly being practiced and these could lead to unfavorable consequences. This study aims to determine the level of knowledge and factors associated with practice of disposing sharps at healthcare facility among Type 2 diabetic patients in Kelantan. In this cross-sectional study, 304 Type 2 diabetic patients who were on insulin therapy attending health clinics were randomly selected and interviewed using a validated questionnaire. The factors associated with practice of disposing sharps at healthcare facility were determined using binary logistic regression analysis. The mean knowledge score of respondents was found to be 59.3 (20.25), corresponding to a level of moderate knowledge. Only 11.5% of them bring their used sharps to be disposed at healthcare facilities. Duration of diabetes of less than five years (Adj. OR 2.42; 95% CI: 1.06, 5.54; p=0.037), previous advice on sharp disposal (Adj. OR 3.57; 95% CI: 1.50, 8.52; p=0.004), and knowledge score (Adj. OR 1.06; 95% CI: 1.03, 1.08; p<0.001) were significantly associated with practice of disposing sharps at healthcare facility. Improper sharp disposal practice in the community has implications for disease transmission and environmental pollution. Thus, community sharp disposal should be integrated into formal diabetic education to improve their disposal practice.

Keywords: Community, Sharp disposal, Diabetes mellitus

Measuring Hand Hygiene Practice: Comparison between Self-Reported Questionnaire and Direct Observation among Food Handlers of the Food Trucks.

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Hand hygiene is a greatly manner to reduce the infections from harmful pathogens. Any person who employed in the operating of food establishment, either that person is an employee or employer, it must be a person who have contact with cooking, cooking utensil or eating during handling, preparation, manufacture, service and sell the foods. The aims of this study are to assess the hand hygiene practice among food handler based on self-reported questionnaire and direct observation. This study is cross-sectional study carried out among food handlers in the food truck at Klang Valley. The self-reported questionnaire and direct observation were used to identify the significant between these two instruments. There were significant of differences on hand hygiene practices between self-reported questionnaire and direct observation among food handlers where the mean and standard deviation for self-reported questionnaire and direct observation were 17.77 ± 3.15 and 11.45 ± 3.00 respectively with the value of ($r=0.220$) and ($p=0.003$). Cohen kappa was reveals the inter-rater agreement between these two instruments which is fair agreement of reliability. Also, the classification of good hand hygiene practices and poor hand hygiene practice among food handlers were identified. This study indicates that hand hygiene practices was one of the manner to reduce the foodborne outbreaks. By conducting self-reported questionnaire and direct observation, the results indicate that the food handlers may or may not practicing hand hygiene. Based on the result, there was high knowledge hand hygiene practice but through observation done, they did not practicing it.

Keywords: Hand hygiene, Direct observation, Self-reported questionnaire, Food trucks

Investigation of the Roles of Fibronectin-binding Proteins CadF and FlpA During *Campylobacter jejuni* Interactions with Intestinal Epithelial Cells

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The two highly conserved fibronectin-binding proteins CadF and FlpA play a role in *Campylobacter jejuni* adhesion to intestinal epithelial cells (IECs). Divergent or combinatorial mechanisms exist for *C. jejuni* entry into IECs which can involve host structures such as microfilaments, microtubules, lipid rafts and host kinases. Investigation on further roles of CadF and FlpA with regard to adhesion and invasion of IECs were done. Mutation of cadF or flpA in the two widely-studied *C. jejuni* strains 11168H and 81-176 reduced binding to fibronectin in vitro. Mutation of cadF or flpA reduced bacterial interactions with and invasion of Caco-2 and T84 IECs for both 11168H and 81-176 strains, however intracellular bacterial numbers increased over time between 3 and 24 hours. In the 11168H strain, mutation of flpA reduced activation of the small GTPase Rac1 more than mutation of cadF. Inhibitors were used to identify the different pathways used by *C. jejuni* during adhesion to and invasion of IECs. Cytochalasin D, methyl-beta-cyclodextrin, colchicine and wortmannin all reduced 11168H invasion of T84 IECs. However, the adhesion mediated by CadF and FlpA was shown to initiate different invasion pathways as wortmannin showed no effect on the ability of the 11168H cadF mutant to invade T84 IECs, whilst colchicine showed no effect on the ability of the 11168H flpA mutant to invade T84 IECs. This suggests that CadF and FlpA display different pathway mechanisms of invasion which depend on PIK3 and microtubules respectively. These findings hope to shed more light to better understand and unravel the complex invasion mechanisms of *C. jejuni*.

Keywords: *Campylobacter jejuni*, Fibronectin, Pathogenesis, Intracellular, Inhibitors

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Job burnout is a modern epidemic. The aim of this study was to determine how academicians cope with the various burdens of work stressors, via structural equation modeling analysis, in an academia, to overcome burnout. A cross sectional study was conducted in January 2017, whereby 327 Research University academicians were selected using proportional stratified sampling. Data on perceived work stressors (teaching, research, interpersonal conflicts, career development), coping strategies (adaptive & maladaptive coping), and perceived burnout (emotional exhaustion, depersonalization, personal accomplishment) were gathered via computer assisted self-interviewing (CASI). Guided by Lazarus & Folkman's "Transactional Model of Stress and Coping", a hypothesized model was developed. Covariance-based Structural Equation Modeling (CB-SEM) with bootstrapping procedure was used to generalize the sample to the hypothesized model. Overall, the data fits the hypothesized model well (CMIN/df=1.572, CFI=0.934, GFI=0.834, TLI=0.928, RMSEA=0.042) with various degree of explanatory value, especially for each component of burnout (R² EE=0.61, R² DP=0.49, R² PA=0.24). Academicians were resilient against burden of teaching however did adopt coping mechanism to overcome research challenges and interpersonal conflicts. The effects of research and interpersonal conflicts on tri-dimensional burnout was mediated by maladaptive coping (f² effect size= 0.54) and had a larger effect than interpersonal conflicts towards burnout mediated by adaptive coping (f² effect size= 0.04). Coping strategies alone will not suffice to suppress burnout progression without primary stressors intervention. Integrative approach (organization & individual level) is crucial to prevent burnout among academicians.

Keywords: Burnout, Work stressors, Coping strategies, Mediation

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There has been a growing concern on the rising of environmental issues in Malaysia over the last decade. Many environmental studies conducted in this country began to utilize the chemometrics technique to overcome the limitation in the environmental monitoring studies. Chemometrics become an important tool in environmental fields to evaluate the relationship of various environmental variables particularly in a large and complex database. The review aimed to analyses and summarize the current evidences and limitations on the application of chemometric techniques in the environmental studies in Malaysia. The study performed a comprehensive review of relevant scientific journals concerning on the major environmental issues in the country, published between 2013 and 2017. A total of 43 papers which focused on the environmental issues were reviewed. Available evidences suggested that chemometric techniques have a greater accuracy, flexibility and efficiency to be applied in environmental modelling. It also reported that chemometric techniques are more practical for cost effective and time management in sampling and monitoring purposes. However, chemometrics is relatively new in environmental field in Malaysia and various scopes need to be considered in the future as the current studies focused on very limited number of major environmental issues. Overall, chemometric techniques have a lot of advantages in solving environmental problems. The development of chemometrics in environmental studies in the country is necessary to advance understanding, thus able to produce more significant impacts towards the effective environmental management.

Keywords: Chemometric, Environment, Flood, Malaysia, Pollution

OP6***Simplistic Analysis of Spartan Race and How It Aids Pilot's Chores.******Mohd Harridon, Abdul Malek Ya'acob, Imran Mohd Salleh, Fadzil Adly Ishak,
Mohammed Fadzli Ismail, Khirul Anuar****Universiti Kuala Lumpur, Malaysia Institute of Aviation Technology (UniKL MIAT), Sepang, Malaysia*

This paper elucidates the Spartan Race in terms of its intensity and also upon the obstacles that clad the race. One fourth of the total obstacles of the race are deemed gravely difficult by the participants that were interviewed. This paper also evaluated the obstacles and results showed 45% of the obstacles require the participants to carry their own body weight. This means the strength of the participant's arms and hands should be at an optimum value. Survey showed the participants had trained hard to gain this strength and the race itself along with its training are shown to aid pilots in flying airplanes manually.

Keywords: Spartan Race, Pilot's chores

OP7***Nutrient Intake and Factors that Influence Feeding Practices of Infants in a
Selected Rural Setting in Malaysia.******Naleena Devi Muniandy^{1, 3}, Pascale Allotey², Devi Mohan³, Daniel D Reidpath³****¹Faculty of Health Sciences, University Teknologi MARA**²United Nations University, International Institute of Global Health**³School of Medical and Health Sciences, Monash University Malaysia*

Nutrition during the first two years of life is vital to ensure a healthy development of a child. Studies show that over or under nutrition during the early development may affect the health of the child in adulthood. Existing studies in Malaysia show that there is a dual burden of malnutrition and a disparity in nutrition intake among the rural and urban population. Since, limited studies have focused on the nutritional intake of the infants in the rural settings; this study assessed the nutrition intake and factors that influence the nutritional intake among infants at 11 months old in a rural setting in Segamat, Malaysia. The study was conducted using a mix methods design in 2 phases. 91 mother-infant pairs were involved for the quantitative phase and selected mothers were interviewed using in depth interview for the qualitative phase. Diet intake was assessed using a 2 days 24 hour diet recall while the eating practices of the infants were assessed using an infant feeding style questionnaire. The results show that the energy (858 ± 258 kcal for males and 1030 ± 323 kcal for females) and protein (26.8 ± 1.39 g) consumption of the infants were higher than the Recommended Nutrient Intake of Malaysia. However there were no significant differences between the energy and protein intake of the infants according to ethnic groups. Thematic analysis shows that education level and income were important factors that influence infant feeding practices among the participants. This study suggests that the community would benefit from an intervention program that educates on nutrition requirement and food choices for infants.

Keywords: Development origin of health and diseases, Breastfeeding, Infant nutrition, Mix method design, Complementary feeding

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Chemotherapy of infections is facing a number of uncommon challenges due to the inefficiency in drug delivery system. Although the therapeutic efficacy of some bioactive compounds has been well recognized, inefficient delivery could result in insufficient therapeutic index. Nanotechnology driven drug delivery approaches can be a possible option to overcome this problem. The technology can be used to overcome challenges like drug effectiveness, toxicity, stability, pharmacokinetics and drug regulatory controls. In our studies, we develop several nanoparticles-based drug delivery system using biodegradable polymeric matrix to enhance the therapeutic efficiency of natural compounds. The nanoparticles were synthesized with FDA approved polymeric matrix such as polyvinyl alcohol, polyvinylpyrrolidone, dextran, nanocellulose and chitosan. We successfully synthesized the nanoparticles for curcumin and phomopsidione. The nanoparticles significantly improved the antimicrobial efficiencies of the compounds on pathogenic microorganisms. The nanoparticles also prolonged the release of the bioactive compounds on the target site, which helps to provide optimum dose regimen. All the nanoparticles did not show any burst release effect on in vitro drug release test. The nanoparticles synthesized are suitable to be used in wound care product to prevent chronic microbial infections. In conclusion, nanoparticles can be applied to improve the therapeutic efficiency of naturally-derived bioactive compounds.

Keywords: Nanoparticles, Antimicrobial activity, Bioactive compound

Anti-HPV and Apoptosis-inducing Activities of the Baicalein-Rich Fraction from *Oroxylum indicum* on Cervical Cancer Cell Lines, HeLa and SiHa.

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Oroxylum indicum (*O. indicum*) has been implicated as a promising anti-cancer agent for cancer treatment including cervical cancer. It shows that this plant was able to inhibit the proliferation of cancer cells by acting as an anti-human papillomavirus (HPV) and an apoptosis inducer. The therapeutic effect of *O. indicum* is strongly due to the anti-cancer properties of its major compound such as chrysin, oroxylin A and baicalein. In this present study, baicalein-rich fraction was extracted to elucidate its anti-cancer potential in cervical cancer cells, HeLa (HPV 18 positive) and SiHa (HPV 16 positive) cells. This fraction was prepared from the methanol crude extract of *O. indicum* by preparative TLC (n-hexane:ethyl acetate; 50:50) and subjected to HPLC for baicalein quantitation. Biological activities of this fraction were tested using methylene blue assay to determine the IC₅₀ and western blot to observe its effect on the HPV oncoproteins; E6 and E7, and the tumour suppressor proteins; p53 and pRb. From the determination of IC₅₀ value, baicalein-rich fraction showed the most potent concentration compared to the known chemotherapy drug, cisplatin, and the methanol crude extract of *O. indicum* for both HeLa and SiHa cell lines. After 24 hours treatment period, western blot analysis showed that treated HeLa and SiHa cells exhibited anti-HPV effect by down-regulating E6 and E7 and explained the induction of apoptosis through the up-regulation of p53 and pRb in treated cells. The overall data suggested that the treatment of baicalein-rich fraction from *O. indicum* has anti-proliferative, anti-HPV and strongly induce apoptosis in the treated cervical cancer cell lines. Therefore, baicalein isolated from *O. indicum* can be further exploited as a potential anti-cancer candidate for cervical cancer treatment.

Keywords: Anti-HPV, apoptosis, baicalein-rich, *Oroxylum indicum*

Combination Treatment of Metformin and Severe Hyperthermia Induces Bax/Bid-Dependent Apoptosis in MG-63 Cells In Vitro.

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Osteosarcoma is a rare malignancy associated with the development of chemotherapy resistance and late detection leading to a reduced 5-year survival. A new strategy for cancer treatment involves a combination of hyperthermia with metformin. This hasn't been tested on bone cancer cells. Our previous studies have shown that osteosarcoma MG-63 cell line (i) was sensitive to severe hyperthermia and (ii) exposure to metformin, an anti-glycemic drug with anti-tumor properties. Targeting the Warburg effect, we applied a combination of metformin and hyperthermia and measured MG-63 (i) cell viability, (ii) glucose metabolism, (iii) damage to DNA and (iv) genes and proteins involved in apoptotic cell death. MG-63 cells were treated with /metformin (30M) for 48h followed by an exposure to moderate (39°C) and severe (45°C) hyperthermia for 2h meanwhile 37°C served as control. Cell viability was measured using MTS assay. DNA damage and repair were determined through comet assay and ATM mRNA expression respectively. The type of cell death was determined via Flow Cytometry. Gene and protein expression of (i) genes involved in glucose metabolism; AKT1 & GSK3 and (ii) apoptotic pathway; DR5, Bax, Bid, Bcl-2, AIF, cytochrome c, Apaf1, Caspase 8, 9 & 3 were measured using real-time PCR and ELISA. Our results showed significant downregulation of GSK3, AKT1 and ATM mRNA which in turn reduced MG-63 cell viability and increased DNA damage. Exposure to metformin alone induced apoptosis by 57.9±1.2% and increased to 92.1±5.6% in combination with hyperthermia. Combination treatment led to upregulation of pro-apoptotic DR5, Bax and Bid mRNA while the anti-apoptotic Bcl-2 mRNA was downregulated. Apoptotic intrinsic pathway was not activated as the expression of AIF, cytochrome c, caspase 9 and 3 remained downregulated. This study suggests that the combination treatment induces cell death in MG-63 via Bax/Bid-dependent pathway, suggesting a possible anticancer activity.

Keywords: Apoptosis, Metformin, Severe hyperthermia, MG-63

Honey Versus Steroid Impregnated Nasal Packing Following Endoscopic Sinus Surgery: A Randomized Controlled Study.

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The aim of this study was to compare the effectiveness of Tualang honey impregnated nasal packing against steroid impregnated nasal packing in post ESS patients. Design: Prospective, randomized, single blinded, positive-controlled trial. Setting: Two tertiary hospitals in Malaysia. Subjects: Thirty two patients aged 18 years old and above, diagnosed with chronic rhinosinusitis and underwent endoscopic sinus surgery from March 2017 to April 2018. Intervention: The study group received 2 cc of Tualang honey nasal pack and the control group received nasal packs with 2cc of triamcinolone 20mg / ml. A 2 cm nasal pack was placed longitudinally into the middle meatus of both nasal cavities. Outcome: Postoperative healing assessments of edema, crusting, secretions, scarring and symptoms were done at postoperative days 7, 14, 28 and at 3 months using validated modified Lund-Kennedy scoring system, SNOT-22 questionnaire and perioperative sinus endoscopy (POSE) scores. Result: There was no statistically significant differences were noted in the scores of SNOT 22, POSE and modified Lund-McKay at Day 7, 14 and 28 (p value > 0.05) for both groups. At the 3rd month, patients in the triamcinolone group had better endoscopic findings and lesser symptoms (p value < 0.05). Conclusion: Honey is not an alternative to the use of steroids in post ESS patients. As compared to steroids, it is not effective in reducing symptoms and preventing recurrence of disease in patients with CRSwNP after surgery.

Keywords: Tualang honey, Steroid, Impregnated nasal packing, Sinus surgery

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Polycystic ovarian syndrome (PCOS) is one of the most common reproductive and endocrinal disease that affects about one in 15 women worldwide. It is a major disorder characterized by elevated levels of male hormones (androgens), acne and hirsutism. The objective of this study was to evaluate the effect of *Clinacanthus nutans* (CN) extract in an animal model of induced PCOS. Rats were chemically induced into PCOS using Dehydroepiandrosterone (DHEA) and treated using CN water extract for 15 days. Ovaries were removed at the end of the treatment phase for macroscopic and microscopic evaluation. Induction of PCOS in rats lead to significantly elevated body weight, follicular cyst and corpus luteum compared to the control group ($p=0.01$, $p<0.001$ and $p=0.011$ respectively). During the treatment phase, although the number of follicular cyst and antral follicle are reduced, the differences are not significant. However, the number of corpus luteum shows significant increase in the CN group compared to control group ($p=0.05$). In conclusion, CN is able to reduce PCOS characteristics in induced rat model.

Keywords: *Clinacanthus nutans*, Polycystic ovarian syndrome, Rats

Association of Vitamin D with Physiological and Biochemical Markers of Endothelial Function in Overweight and Obese Post-menopausal Women.

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Cardiovascular diseases (CVDs) are a major public health concern and are associated with an increased risk for mortality and morbidity. Many studies suggest that low vitamin D status [as assessed by the circulating plasma 25-hydroxyvitamin D (25(OH)D) concentration] are associated with an increased risk of CVD. This association may be explained by the mechanistic action of vitamin D metabolites pathways involved in the regulation of insulin signaling and endothelial function (EF). The aim of this cross-sectional study was to investigate associations between plasma 25(OH)D concentration and EF (pulse wave velocity; PWV). Eighty healthy (with no established medical diagnosis), non-smoking, overweight and obese, post-menopausal women with a body mass index (BMI) between 25.0 and 40.0 kg/m², and age range between 50 to 70 years old were recruited from December 2014 until August 2015. Plasma 25(OH)D was measured using an immunoassay. Anthropometric measurements, body composition, resting blood pressure and PWV were obtained using standard protocols. The mean age of participants was 61 (range 50 – 70) years and mean BMI was 29.6 (range 24.7 – 42.9) kg/m². Overall, vitamin D status was low with 41% of the participants being vitamin D insufficient (25 (OH)D concentration between 25 – 50 nmol/L) while 21% were vitamin D deficient (25(OH)D concentration <25nmol/L). PWV correlated negatively with SBP ($r=-0.41$, $P<0.01$) and DBP ($r=-0.48$, $P<0.01$). There was an apparent inverse association between PWV and 25(OH)D levels ($r=-0.18$) but this association was not significant ($P=0.11$). The results of the present study does not support the hypothesis that serum 25(OH)D status is associated with vascular endothelial function among overweight and obese, post-menopausal women. Further research is needed to clarify the relationship of vitamin D with arterial stiffness and whether higher vitamin D status may play a role in prevention of cardiovascular disease.

Keywords: Overweight, Obese, Post-menopausal women, Vitamin D

**Philanthotoxin (PhTX) as Protective Agent against Retinal Damage in
NMDA-induced Glaucoma Rat Model.**

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Excessive activation of *N*-methyl-D-aspartate receptors (NMDAr) can mediate calcium-dependent neurotoxicity associated with glaucoma. Thus, NMDAr represent a relevant therapeutic target to prevent retinal ganglion cell (RGC) death which occur in this condition. The purpose of the present study was to examine the potential effects of Philanthotoxin (PhTX) as a protective agent against RGC death induced by NMDAr excitotoxicity. PhTX and many of its analogues are potent NMDAr inhibitors and may prove useful as neuroprotective agents. Sprague Dawley rats (200-250g) were used as animal model and divided into 3 groups; Group 1 and 2 were intravitreally injected with phosphate buffer saline (PBS) and NMDA as the negative and positive control respectively, whereas group 3 was pre-treated with PhTX 24 hours prior to NMDA as the experimental group. Both NMDA and PhTX were diluted in PBS and injected at equimolar doses of 160 nmol. Seven days following treatment, rat eyes were enucleated, fixed and the retinae were stained with hematoxylin and eosin (H&E). The thickness, area and length of the inner retinal (IR) layer and ganglion cell layer (GCL) were measured, and the number of cells counted. Morphometric analysis were subsequently performed and analyzed statistically via ANOVA. Our findings revealed that the fraction of GCL thickness in NMDA-injected rats ($29.88 \pm 1.729 \mu\text{m}$) were significantly reduced 1.3-fold ($p < 0.05$) compared to the negative control ($40.03 \pm 0.927 \mu\text{m}$). Pre-treatment with PhTX prior to NMDA induction significantly increased ($p < 0.05$) GCL thickness 0.8-fold to $38.22 \pm 1.204 \mu\text{m}$ compared to NMDA-injected group, and similar to the negative control ($p > 0.05$). There was also a significant 1.9-fold reduction ($p < 0.05$) in the number of retinal cell nuclei/100 μm^2 of IR in the NMDA-injected group compared to the negative control with mean values of 0.19 ± 0.122 and 0.37 ± 0.046 respectively. PhTX pre-treatment also significantly increased the number of cell nuclei/100 μm^2 of IR by 0.55-fold ($p < 0.05$) compared to the NMDA-injected group. These results suggested that pre-treatment of PhTX in NMDA-induced glaucoma rat model managed to significantly reduce retinal cell damage.

Keywords: Philanthotoxin, Glaucoma, *N*-methyl-D-aspartate receptors, NMDA excitotoxicity, Retinal ganglion cell

**Development and Validation of a New Knowledge, Attitude and Practice Questionnaire
on Allergic Rhinitis Patients towards Intranasal Corticosteroids Usage.**

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Universiti Sains Malaysia

Intranasal corticosteroids (INCS) are presently the most effective overall treatment for allergic rhinitis (AR) and are first-line therapy for adults in moderate-to-severe cases of allergic rhinitis or in individuals who are still symptomatic despite the regular use of antihistamines. Although INCS are the most commonly prescribed AR treatment, less than half of patients are fully satisfied with their INCS. In spite of numerous studies and the appreciation of the clinical importance of INCS usage for AR patients, research in this area has been impeded by absence of a questionnaire devoted to an assessment of self-reported evaluation of knowledge, attitude and practice of AR patients towards INCS usage. The questionnaire comprised development and validation stages. The development phase encompassed a literature review, expert panel review, focus group testing, and evaluation of the developed questionnaire. The validation phase consisted of content validity, face validity, construct validity, exploratory factor analysis and test-retest method. Cronbach's alpha was used to verify internal consistency. A total of 77 patients from Hospital Universiti Sains Malaysia and Hospital Pulau Pinang were recruited for this study. The first part of the questionnaire consists of demographic data and the second part was the knowledge, attitude and practice domains. After undergoing content and face validity, the questionnaire consist of 14 items. Then exploratory factor analysis and Cronbach's alpha are two statistical methods that we used for measuring construct validity and internal consistency. Four factors were derived with two factors from knowledge domain with a Cronbach's alpha of 0.614 and 0.735. Attitude and practice domain each with one factor with Cronbach's alpha of 0.809 and 0.774 respectively. The instrument has satisfactory reliability and validity indices and can be used to measure AR patients' knowledge, attitude and practice regarding INCS usage. This study acts as a stepping stone towards deriving the KAP among AR patients to better understand and in turn improve treatment outcome by educating patients and rectifying their perception towards INCS usage.

Keywords: Allergic rhinitis, Intranasal corticosteroids, KAP

SYMPOSIUM: POSTER PRESENTATION

P01

Invasion of *Aureobasidium Pullulans* in Kidney and Eye of Immunocompromised Patients.

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There were series of proven cases revealing opportunistic fungal infections in cornea, cutaneous, subcutaneous and renal transplant patients. Renal involvements of opportunistic mould in immunocompromised especially in renal transplant recipients have remained a significant problem and major cause of death worldwide. However, extensive literature reviews revealed no case of invasion in urolithiasis and rarely reported in endophthalmitis. We are reporting two rare cases of which both are related to a dermatiaceous fungus, *Aureobasidium pullulans*. It was reported from a foreign body found in renal calyx of renal calculi patient and vitreous bodily fluid in endophthalmitis patient. Both had atypical presentation. Possible modes of entry and dissemination are discussed. Invasive surgical procedures, frequent uses of antibiotics and steroid could possibly predispose to its invasion in immunocompromised. This organism was identified through fungal polymerase chain reaction since culture yielded no growth. There was a good outcomes following surgical intervention in both cases.

Keywords: Immunocompromised, Opportunistic fungal infection, *Aureobasidium pullulans*, Kidney, Eye

P02

A Case Report: A Rare Case of Conjunctivitis in a Child Caused by *Actinobacillus Equuli*.

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This report describes a rare case of conjunctivitis caused by *Actinobacillus equuli* in a 6 years old child. The child who is a known case of left eye nasolacrimal duct obstruction presented with complaints of red, teary left eye. Diagnosis of left eye conjunctivitis was made and eye swab was taken for further investigation. Initial investigations of the eye swab reveal a gram-negative rod which was oxidase positive but catalase negative. The organism was unable to be identified by the conventional biochemical tests. Commercial biochemical tests using API 20NE identified it as *Psychrobacter phenylpyruvius* with scoring of only 52.3%. Further identification using 16s rRNA sequencing revealed *Actinobacillus equuli* subspecies *equuli* strain 19392. *Actinobacillus equuli* is a species from *Actinobacillus* genus. This organism is a commensal on the mucosal membrane of adult horses. This species also is a common pathogen in animals such as pigs, cattle, and horses. It is rarely associated with human infection, however there are reports describing *Actinobacillus equuli* causing septicaemia and meningitis. High index of suspicion is needed when treating paediatric patients so that the patients will get appropriate treatment. In conclusion molecular diagnostic techniques is very important especially in diagnosing rare pathogens. Error in identification of pathogen may happen if the laboratory depended solely on conventional methods for bacteria identification. In this case the causative organism was only identified by 16s rRNA molecular technique. Identification of the causative organism is very important in order to treat the patient with appropriate antimicrobial therapy as complications of mistreated conjunctivitis can lead to serious vision threatening and life threatening complications.

Keywords: Conjunctivitis, Child, *Actinobacillus equuli*

P03***Prevalence and Specificity of Red Blood Cells Alloantibody among Patients in Hospital Seberang Jaya, Penang.*****Reezal Ishak¹, Chin Khien Wei², Khairulnisa A. Manap²**¹*Universiti Kuala Lumpur Institute of Medical Science Technology (UniKL MESTECH), Kajang, Selangor, Malaysia*²*Pathology Department, Hospital Seberang Jaya, Pulau Pinang, Malaysia*

Alloimmunization is common among transfusion recipient due to our body defense mechanism as it is exposed to foreign antigen on the donor's red blood cells. The antibody developed in transfusion recipients varies among different population. This study determines the prevalence and specificity of red blood cells alloantibody detected during pre-transfusion testing among patients at Hospital Seberang Jaya, Pulau Pinang. A cross-sectional study was carried out among the 17,708 patients admitted and undergoes the antibody screening test within 1 year. The study was then narrowed down focusing on the patients that showed positive antibody screening results for further analysis. A total of 226 patients were selected out of the total 17,708 samples with the incidence of 1.28%. The red blood cells alloantibodies were detected in 179/226 (79.2%) of the patients, and a combination of auto and alloantibodies were identified in 2/226 (0.9%) of the patients. Autoantibodies and alloantibodies identified from the samples were 3 and 241 patients respectively. There were 44 (19.5%) patients with undetermined antibody specificity. 170 (75.2%) patients had developed single antibody, while 56 (24.8%) patients had developed multiple antibodies. For single alloantibody, non-specific antibody was the most identified with 44 (19.5%) patients, followed by anti-D 31 (13.7%) patients, and anti-Lea 26 (11.5%) patients. As for multiple specificity antibody cases, the combination of anti-Lea and anti-Leb were the most common antibodies identified with 33 (14.6%) of the cases. Among the 226 patients, 50 (22.1%) have a history of blood transfusion, while 118 (52.2%) were without blood transfusion, and no information was available for the remaining 58 (25.6%) of the patients. In view of the alloimmunization cases among patients, antibody screening is a crucial part of the pre-transfusion testing in order to provide the most suitable blood and avoid compromising patient's safety.

Keywords: Alloimmunization, Pre-transfusion, Autoantibodies, Alloantibodies

P04***Severe Fungal Infections Caused By *Homographiella* Sp. In Immunosuppressed Patients with Acute Leukemia.*****Salina Mohamed Sukur¹, Fairuz Amran¹, Nur Mukmina¹, Hazilawati Binti Hussin²**¹*Institute for Medical Research, Kuala Lumpur*²*Pathology Department, Hospital Kuala Lumpur*

Homographiella sp. which is anamorph of the mushroom *Coprinus* has been reported to cause severe and fatal pulmonary infections amongst the immunosuppressed patients. In this report we describe 2 *Homographiella aspergillata* and one *Homographiella verticillata* in 3 patients with acute leukemia. With the expanding population of the immunocompromised patients, unusual fungi including mushrooms are becoming significant opportunistic pathogens. Therefore it is important to consider clinical relevance of every fungus isolated from these group of patients. This report also illustrate the importance of molecular identification as adjunctive technique in detection and identification of unusual pathogens as this could lead to earlier diagnosis and targeted therapy which could save life. The Internal Transcribed Spacer sequence analysis was carried out to support the morphological identification of these 3 isolates.

Keywords: Fungal infections, *Homographiella* Sp., Acute leukemia

Mucormycosis is a rare, but often life threatening opportunistic fungal infection. It particularly affects diabetic and immunocompromised patients. With its rapidly progressive fulminant course, if left untreated, the outcome is devastating. Generally, these species are vasotropic, causing rapid onset of tissue infarctions and necrosis. The highly variable clinical presentation of mucormycosis is partly the clinical problem for early diagnosis. Namely, rhinocerebral, cutaneous, pulmonary, gastrointestinal, central nervous system, disseminated and miscellaneous form (from commonest to least). Here, among the most common clinical manifestations, we are reporting 6 such cases of mucormycosis seen in 2017-2018. These cases were confirmed by polymerase chain reaction (PCR)-based techniques on histological specimens. One third of the described cases did not survive the ordeal. PCR-based technique used in these cases prove promising for establishing diagnosis of mucormycosis when cultures are negative in Malaysia. Strong suspicion, early detection and prompt diagnosis with pathological confirmation, coupled with suitable administration of anti-fungal agents and aggressive surgical intervention gives a better outcome. Importantly, control of risk factors like uncontrolled diabetes mellitus are important parameters for successful management of this lethal infection.

Keywords: Fungal infection, Mucormycosis, PCR

Metachromatic leukodystrophy (MLD) is an autosomal recessive inherited disorder. This condition is caused by mutations in the ARSA and PSAP genes resulting in defective arylsulfatase A (ARSA) enzyme. Patients may present with progressive deterioration of intellectual functions and motor skills. We described a 2 year old girl presented to the hospital with neuromotor regression and dismissed without diagnosis. At 5 years old she came back with deteriorating condition and suspected for MLD. Sample was sent to IMR for ARSA enzyme assay. The method used for detection of ARSA was adapted from Willink laboratory, UK with some modification which utilized *p*-nitrocatechol sulphate (PNCS) as a synthetic substrate. Leukocyte from suspected patients was incubated in PNCS at 37°C for 1 hour in a 96-well microtitre plate. The reaction was terminated with sodium hydroxide and absorbance was measured spectrophotometrically at 515nm. Mutational analysis was carried out in ARSA gene. All the eight exons and exon-intron boundaries of ARSA gene were amplified by PCR using specific primers followed by direct sequencing. When the patient presented at 2 years old, ARSA enzyme assay was not available in Malaysia. She came back later at 5 years old with dysmorphic features, hypotonia, developmental delay and mental retardation. Whole blood sample was sent to IMR for ARSA enzyme assay. There was undetected enzyme activity of arylsulphatase A in her leukocyte. Mutational analysis performed in ARSA gene revealed homozygous duplication of C at c.1283_1284dupC p.(Leu429Argfs*31) in exon 8. This mutation caused frameshifting of amino acids and predicted to introduce a stop codon at codon 31. She was confirmed to have MLD. Establishment of ARSA enzyme analysis test in IMR has given an opportunity for patients suspected with MLD to be diagnosed locally.

Keywords: ARSA enzyme, Metachromatic leukodystrophy, PNCS

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Two-dimensional (2D) cell culture system has been widely used for in vitro studies of human osteosarcoma cell line (MG63). While it is helpful in developing therapies for osteosarcoma cancer, the 2D culture system does not really represent the actual environment as in vivo environment. Recently, more attention has been directed towards the 3-dimensional (3D) culture system for MG63 since it closely resembles tumour tissue in vivo. Despite the progress, development of a suitable 3D culture model for the osteosarcoma studies remain a challenge. Therefore, the purpose of this study is to establish an optimised 3D cell culture method that is suitable for MG63 by determining the viability and characterise its morphology. MG63 was seeded in VECELL 3D 96-well cell culture plate at different density using 2 different methods; 1) by mixing cells with media (normal seeding method) before seeding and 2) by drop-on method at densities of 10,000-100,000 cells/well. Cells were left for one hour to attach to membrane and maintained in DMEM/F-12 culture medium supplemented with 10% FBS and 1% Pen/Strep solution. Media was changed every 2 days. The morphology of the cells was observed using a phase contrast microscope and the spheroid culture was photographed using scanning electron microscopy. The spheroids formation can be seen in all seeding densities at approximately 4-5 days after seeding. However, spheroids were only formed on the areas that were dropped with cells by using drop-on method. In conclusion, we have successfully established standard method for MG63 in 3D culture system.

Keywords: Osteosarcoma cell line, MG63, 3D culture system

***Serum Retinol Binding Protein 4 (RBP-4) as a Biomarker for Cardiovascular Diseases (CVD):
A Review.***

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Serum retinol binding protein 4 (RBP-4) is a cytokine secreted by adipocytes and hepatocytes. It acts as a carrier of retinol (Vitamin A) in blood. RBP-4 is recognized as a biomarker for obesity and insulin resistance. Since obesity and insulin resistance are one of the risk factors for cardiovascular diseases (CVD), it is probable that RBP-4 has the potential to be a biomarker for CVD. A systematic review of the literature was performed on the association between RBP-4 and CVD. A search of PubMed, Scopus and the Cochrane Central Register of Controlled Trials yielded 246 articles published up to 2018. An additional 12 articles were retrieved through manual searching of the reference lists and citations. After title and abstract screening, 76 articles were found to be potentially eligible. 16 articles were excluded after full-text screening and 60 articles were included in this review. Upon full-text screening five studies highlights that higher circulating RBP-4 concentrations in patients suffering from arteriosclerosis, carotid stenosis, and coronary heart compared to control patients. However, other studies did not find any differences between RBP-4 concentrations in patients suffering from coronary artery diseases and healthy subjects. It is probable that RBP-4 plays a role in oxidative stress, which caused the activation of vascular inflammation. RBP-4 levels are associated with carotid artery intima media thickness although results in human trials have been contradictory. The contradictory results could be due to factors such as differences in sample size, sex and ethnicity. RBP-4 is a potential biomarker for CVD but better designed studies that incorporate larger sample sizes, along with control of confounders such as ethnicity and alcohol intake are needed to properly assess its effectiveness.

Keywords: Cardiovascular diseases, Retinol binding protein 4

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Mucopolysaccharidoses type VI (MPS VI) is one of subtype in MPS which caused by deficiency of arylsulphatase B (ASB) which was involved in catabolism of glycosaminoglycan. Without this enzyme, chondroitin sulphate (CS) and dermatan sulphate (DS) will build up causing cell, tissue and organ dysfunction. Affected children usually presented with joint contractures and hepatosplenomegaly. Confirmation of diagnosis relied heavily on laboratory diagnosis which is still not available in Malaysia. Our aim is to set up a method to measure ASB enzyme activity in leukocytes. This method was adopted from method published by Fluharty et al (1974). 4-methylumbelliferyl-sulphate (4-MUFS) was used as a fluorogenic substrate. Whole blood samples were collected from 19 normal individual and a patient suspected of MPS VI disease. Leukocytes were harvested and lysed in 0.1% Triton X100 and subsequently centrifuged. 250 μ L of lysate was applied onto 50% DE 52 cellulose column equilibrated with 25 mM Tris-HCl, pH 7.5 to separate the isoenzyme of arylsulphatase. Later, 50 μ L of eluate was transferred into a well of black microtitre plate containing 100 μ L of 4-MUFS substrate and incubated at 37°C for 2 hour. The enzyme in eluate reacted with 4-MUS and released 4-methylumbelliferone (4-MUF). The reaction was terminated with 200 μ L of 0.5M carbonate buffer pH 10.5 and fluorescence count was measured at 366 nm (excitation) and 442 nm (emission) with a fluorometer. Method validation was performed and the assay was found to be linear up to 40,000 nM with coefficient of determination (r^2) of 0.999. Repeatability and reproducibility was 9.1% and 24.7% respectively. Range of enzyme activity among the normal individual was between 9 - 118 nmol/hour/mg proteins. Undetectable enzyme activity of ASB was noted in the blood of suspected patient. We have successfully set up a reliable enzyme assay method for diagnosis of MPS VI.

Keywords: Arylsulphatase B, Microassay technique, Mucopolysaccharidoses Type VI

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Inherited disorders of neurotransmitters are a group of neurometabolic syndromes attributable to a disturbance of neurotransmitter metabolism. The defective of certain enzymes in catecholamine, serotonin and tetrahydrobiopterin pathway will results in various neurological symptoms such as dystonia, seizure, progressive encephalopathy and mental retardation. Measurement of neurotransmitter metabolites in cerebrospinal fluid (CSF) can provide valuable clues for diagnosis of these disorders. Thus, our aim is to verify and set up a method for CSF biogenic amines using High Performance Liquid Chromatography (HPLC). Method validation study was performed by adapting method from The Children Hospital in Westmead, Sydney with a modification. 50 μ L of filtered light protected CSF sample was directly injected into an HPLC system using isocratic mode and separated at flow rate of 1.0ml/min through reversed phase column (Nucleosil C18, 4.6x150mm, 5 μ m, Phenomenex). The mobile phase consisted of 25mM phosphate buffer and acetonitrile with 10% SOS and 5% EDTA was adjusted to pH 2.1. Electrochemical detection was performed by coulometric mode at potential of 0.6V. The method was found to be linear up to 10000nmol/L with a good linear relationship (R^2) over concentration for 3-OMD, 5-HIAA and HVA ranging from 0.992 to 1.000. The intra-day and inter-day precision CV were good (<10%) for all analytes ranging from 1.3 to 1.6% (n=10) and 6.5 to 9.7% (n=10) using spiked control samples. The accuracies for low and high level were between 82.6-98.2% and 87.1-95.8% respectively. The detection limit for all analytes was 7.2 to 18.8nmol/L and quantification limit was 23.8 to 62.8nmol/L. We have successfully set up a precise and reliable method of biogenic amines in CSF to diagnose neurotransmitter disorders.

Keywords: Cerebrospinal fluid, HPLC, Neurotransmitter disorders

***IQC Validation of Tcoag Hemostasis DT100 Analyzer- by Local Modification
From the Manufacturer Claim.***

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Internal quality control (IQC) involves a continuous and critical evaluation of the laboratory's own analytical methods. The main objective of IQC is to ensure day to day consistency of an analytical process and thus help to determine whether patient results are reliable enough to be released. A poor approach may lead to a scenario from validation of incorrect patient results to over investigation of falsely rejected analytical runs and increased the chances of random error. The aim of this study is to validate the quality control (QC) performance by introducing the new method of preparation and storage which differs from manufacturer setting guided by CLSI EP5-A2 document. The method permits users of the same instrument to perform the basic two-run per day (within run) experiment for 20 days (between run) for PT, INR and aPTT as described in the guideline. The data is then analyzed and summarized according to the formulae provided. The claim is accepted when user /claim variance is lower than the critical chi-squared value (χ^2). After 20 days of repetition, precision estimated result obtained is compared with performance /manufacturer claims to obtain the total intermediate measure of precision. Result revealed all claim (for PT, INR and aPTT) are accepted due to the independent test result (user variance/claim variance) obtained is less than critical chi-square value (R). As a conclusion, modifications and standardization of approaches made to the selection of IQC material in term of preparation and storage can improve quality of results and facilitate harmonization of pathology services thus reducing reagent expenditure has been proved in the current study.

Keywords: Internal quality control, Local modification, Tcoag DT100

***Method Verification for Coagulation Routine Tests and Validation of Automated
PTT Reagent on Tcoag Haemostasis DT100 Analyzer.***

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TCoag DT 100 is a fully automated coagulation system that newly installed analyzer for routine tests, Factor Assays, Fibrinogen, Antithrombin, D-Dimer, and Thrombophilia screening. It offers the unique choice of multiple measuring modes for clot based optical and micro-mechanical clot detection as well as chromogenic and Immunoturbidimetric methodology. This study aimed to verify the routine test for coagulation, validate the usage of Automated APTT reagent on DT 100 Tcoag analyzer and determine the normal range for our local population in coagulation tests. Performance of DT100 Analyzer was measured by the verification test including Precision, Linearity, and establishment of reference range for routine test of coagulation. Method validation for Automated APTT reagents performed following the CLSI EP15 to validate its performance on DT100 analyzer. Precision study for PT, APTT HS and Fibrinogen showed that all results for Within Run and Between Run analysis were within the manufacturer claims for both mechanical and optical methods. Linearity for fibrinogen also provide good results with $r=0.9992$ ranging from 117.1-345 mg/dl for mechanical and $r=0.9970$ ranging from 115.25-373.25 mg/dl for optical. Verification of reference range for all routine tests also within the manufacturer claim (PT = 12.7-15.4 Seconds, APTT = 25.5-34.7 Seconds, Fibrinogen 200-400 mg/dl). For Automated APTT reagent validation also showed good precision results which the CV were within the manufacturer claim for both methods. Quality control range using TriniCHECK Control 1 and 2 were validated as 32.3 ± 3.4 and 68.4 ± 9.9 respectively whereas reference range for APTT using this reagent was validated as 26-43 seconds for both methods. Tcoag DT100 demonstrated good reproducibility and repeatability for PT, APTT and Fibrinogen test when compared to the manufacturer claim. It also showed good performance for fibrinogen linearity mechanical and optical. This study also validate the Automatic APTT reagent on Tcoag DT100 analyzer.

Keywords: Coagulation, Tcoag Haemostasis DT100 Analyzer

P13***Workflow Study Blood Collection Centre Using BC ROBO-888 System.****Ahmad Toha¹, Ain Nechfina¹, Kassim Taip¹, Khairul Idzuan², Ebby Annuar Bahari², Abdul Hadi²**¹Queen Elizabeth Hospital, Kota Kinabalu, Sabah**²Utas Maju Sdn Bhd, No 15, Block H, Jalan PJU 1A/3, Taipan 2 Damansara, Ara Damansara, 47301 Petaling Jaya, Selangor*

Pre-analytical, Analytical and Post-analytical are the three important processes in most clinical laboratories. However, the pre-analytical phase is often looked as the major source of error in the analytical process. The main purpose of this study is to analyze and identify the current workflow and processes at phlebotomy area in Blood Collection Centre (PPD), Hospital Queen Elizabeth Sabah while improving patient's waiting time and turn-around time with BC ROBO-888. This has been done by collecting information through observation and interviews, monitoring number of staffs on duty and recording patient's waiting time. The BC ROBO-888 was installed and the data for current workflow and workflow after introducing BC ROBO-888 were recorded and compared. The data included are registration and tube labeling time, time for phlebotomy process and patient total waiting time. This study has shown that with the aid of BC ROBO-888, the current workflow at phlebotomy area is improved to be more efficient. Moreover, patient waiting time can be decreased while the productivity of the work is increased thus resulting in shorten turn-around time. These findings proved that BC ROBO-888 helps to improve and reduce the time taken for pre-analytical process in clinical laboratories processes.

Keywords: BC ROBO-888 system, Blood collection, Workflow study

P14***Paper-Based Lateral Flow Assay for Male Infertility Detection.****Suzanah Abdul Rahman, Syazana Mohd Zahri and Zafri Azran Abdul Majid**International Islamic University Malaysia (IIUM)*

Male infertility is a complex reproductive disorder with many confounding factors including hormonal imbalances. Due to invasive diagnostic testing and privacy issues, infertility consultation has always been a difficult process. Well-trained staff and specialized equipment are needed, hence the process is time consuming, laborious and expensive. Rapid and reliable testing using non-invasive samples will be sought by both patients and clinicians. The purpose of this study was to detect testosterone levels as a male fertility biomarker using paper-based lateral flow assay (PLFA) strip and smartphone. Urine from adult male Sprague-Dawley rats was collected and testosterone hormone levels were measured using enzyme-linked immunosorbent assay (ELISA) kit. PLFA strip was fabricated using the nitrocellulose membrane (NC) as a test pad, incubated in Testosterone Monoclonal Antibody (mAB) for 90 min at room temperature and kept dried at 4°C overnight.

Chromatography paper was used to make the sample and waste pads. Testosterone, as the target analyte in the standard solution competed with Testosterone-conjugated Alkaline Phosphatase (T-AP) to bind to the antibody mAB on the test pad forming an antigen-antibody complex. P-nitrophenyl phosphate (pNpp) substrate which reacted with the T-AP, then form p-nitrophenol, a chromogenic product that coloured yellow on the test pad following attachment to the antibody. The colour change was captured using a smartphone camera and an application that captured the Red Green Blue (RGB) colour value. Six testosterone standard solutions (1000 pg/ml, 1200 pg/ml, 1400 pg/ml, 1600 pg/ml, 1800 pg/ml and 2000 pg/ml) and a blank were used to obtain the standard curve. The urine samples were then tested using the strip and testosterone levels were compared with ELISA results which showed no significant differences. This sensor holds the potential of testing infertility in men using non-invasive samples while increasing compliance in the sampling approach.

Keywords: Testosterone, Biosensor, Paper-based Lateral Flow Assay, Smartphone application

The Effect of Calcium Supplementation on Schwann Cells Growth.

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Injuries to the nervous system are the most common cause of permanent disability. Several treatment approaches are currently used to help affected people from experiencing paralysis. It includes nerve autograft (gold standard), hollow nerve guidance conduits, tissue engineered nerve and cell-based therapy. Among all of these treatment approaches, cell-based therapy has become one of the vital alternatives of treatment. To exploit the benefits of therapeutic cell delivery for peripheral nervous system, it is crucial to obtain high-purity cultures of Schwann cells (SCs) in vitro in the shortest period. Schwann cells are the principle glia of the peripheral nervous system that helps to support nerve growth by providing cellular guidance and control the development of neuropathic pain through a variety of mechanisms. Optimum supplementation of calcium (Ca²⁺) in the culture media is considered to be important in eukaryotic cell culture because it involved with a wide range of cell functions including enzyme activities and cell attachment. This study aimed to determine the effect of calcium supplementation on SCs growth in vitro. SCs was isolated from rat's sciatic nerve and were cultured in (1) DMEM d-valine + 1.8 mM Ca²⁺ and (2) DMEM d-valine + 5.0 mM Ca²⁺. Cell attachment was observed in both conditions and the cultured cells were subjected for immunocytochemistry analysis with SCs surface marker, s100b. At day 40 of culture, 90% of cells attachment was observed in plate containing DMEM d-valine + 1.8 mM Ca²⁺. However, no attachment was seen in DMEM d-valine + 5.0 mM Ca²⁺ with the same timeline of observation. The cultured cells were also positives towards expression of S100b. In conclusion, higher concentration of Ca²⁺ inhibits the cell attachment and growth by interfere the state of cell electrolyte, thus resulted the damage of the cell membrane.

Keywords: Calcium supplementation, Schwann cells growth

Antibiotic Profile for Carbapenem Resistant Enterobacteriaceae (cre) of Klebsiella Pneumoniae among Hospitalized Patient at Hospital Raja Permaisuri Bainun, Perak, Malaysia.

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The Carbapenem Resistant Enterobacteriaceae (CRE) have high levels of resistance to antibiotics and also a significant emerging threat to public health. CRE cases have increased sharply (66 cases in 2015 to 184 case in 2017) in Hospital Raja Permaisuri Bainun, Perak. Antibiotics sensitivity tests are essential for the diagnosis of CRE as it can assist health practitioners to provide accurate antibiotic treatments to patients with CRE infection. The present study investigated the fermenter status and antibiotic sensitivity profile of *Klebsiella pneumoniae* from the various body fluid samples at Hospital Raja Permaisuri Bainun between January 2017 and August 2017. CRE-*Klebsiella pneumoniae* was identified and confirmed using the Gram staining method, Mac Conkey fermenter status culture test, and biochemical tests. Antibiotic tests were carried out to determine the susceptibility pattern for CRE profiles. 152 CRE-*Klebsiella pneumoniae* samples were inoculated from body fluids showed that 112 (73.7%) were nonlactose fermenters while 40 (26.3%) were lactose fermenters. An appropriate treatment for CRE *Klebsiella pneumoniae* using polymyxin b and tigecycline produced susceptibility level with 89.5% and 86.8% respectively. The present study demonstrated that ertapenem antibiotic was the most resistant (100%) antibiotic, followed by meropenem (98%) and imipenem (93.4%). The CRE-*Klebsiella pneumoniae* infection mostly afflicted Malay (57.9%) followed by Chinese (27%), Indian (13%) and others (2%). Males (60.5%) were more susceptible to CRE-*Klebsiella pneumoniae* infection compared to females (39.5%). In the present study, age between 56 to 86 years old was the most infected group. In conclusion, the present study provides information on the CRE-*Klebsiella pneumoniae* infection pattern which may improve the selection of antibiotic agents against CRE-*Klebsiella pneumoniae* infection. Collectively, the present data is useful for the management of CRE-*Klebsiella pneumoniae* infection in Malaysia.

Optimizing Density Separation Method for Isolating and Purifying Primary Schwann Cells from Adult Rat Sciatic Nerve.

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Primary Schwann cells culture is a useful in vitro model for myelination studies. These cells are commonly isolated from the rodent sciatic nerves. However, fibroblasts contamination, originating from the connective tissue, is a commonplace problem when isolating Schwann cells from the peripheral nerve. In addition, it is difficult to clear the connective tissue sheath during these procedures. To overcome this problem, this preliminary study introduces a separation method using Percoll gradient density medium to isolate and purify primary Schwann cells from adult rat sciatic nerves. After extracting the sciatic nerves, the epineurium was carefully removed and followed by teasing the nerve fascicles into individual nerve fibres. Then, the teased nerve fibres was incubated in 1% collagenase for 30 minutes along with mechanical digestion using a sterilized borosilicate glass pipette at 15 minutes interval. The medium with serum was added to stop the enzymatic activity and followed by centrifugation. Cell pellet was resuspended in Schwann cells culture medium and layered on top of a discontinuous Percoll gradient with five different density layers i.e. 1.04 (top), 1.065, 1.069, 1.073, 1.077 (bottom) g/ml. After centrifugation, each Percoll layer including the cell suspension layer was separately collected and centrifuged to remove Percoll medium. The cell pellet was then resuspended with culture medium and finally plated into the poly-L-lysine-laminin coated 24-well cell culture plates. Cell growth was observed at day 0, 3, 6, 9 and 12. Phase contrast microscopy analysis revealed that high number of cells was observed in the cell suspension layer even after highest speed centrifugation (4000 rpm) while very low number of cells was observed in the Percoll layers (1.04, 1.065, 1.069 g/ml). The preliminary data shows that the gradient density separation method using Percoll separated rat sciatic nerve cell suspension very minimally. However, cell purity is to be conducted to determine the ability of such method to separate Schwann cells and fibroblasts from rat sciatic nerve.

Keywords: Gradient density, Percoll, Schwann cells

Next Generation Sequencing Identifies Potential miRNA to Correlate Response to Tyrosine Kinase Inhibitors and Biological Functions in Chronic Myeloid Leukaemia.

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Tyrosine kinase inhibitors (TKIs) are currently used as a front-line treatment for Chronic Myeloid Leukaemia (CML) with choices of imatinib, nilotinib or dasatinib. In the event of intolerance or failure, the subsequent or other approved TKIs will be used as appropriate. Currently treatment success is measured by minimal presence or absence of BCR-ABL1 transcripts by RT-QPCR. Further investigation is needed to correlate response to treatment to other biological functions for a comprehensive monitoring. This could be achieved with a high sensitivity, high coverage and high throughput platform such as Next Generation Sequencing (NGS). Therefore, this study aims to identify suitable miRNA(s) in relation to response to treatment with TKIs in CML using NGS. CML patients were those who were non-responsive to imatinib and receiving other TKIs. Peripheral blood was collected from CML patients and blood donors using PAXgene® Blood RNA tube and purified using PAXgene® Blood miRNA Kit. tRNA was later used to prepare libraries for NGS using Illumina® TruSeq Small RNA kit, ran on Miseq and alignment was carried out using BaseSpace. A total of 18 miRNAs was selected from NGS and ordered as custom array plate with controls. The selected miRNAs were validated using real time RT-QPCR whereby tRNA from CML patients and blood donors were run in triplicate and analyzed using Qiagen GeneGlobe Data Analysis Centre. Hsa-miR 22-3p, hsa-miR92a-3p, hsa-miR 191-5p and hsa miR 486-5p were among the selected 18 miRNAs. Only one was found differentially significant and was downregulated in CML patients when compared to normal controls. Conclusion: The significant, differentially expressed miRNA showed that NGS has successfully identifies suitable miRNA in response to TKIs treatment in CML. Further analysis is required in order to correlate response to treatment to other biological functions.

Keywords: Next Generation Sequencing, microRNAs, Chronic Myeloid Leukaemia, Tyrosine kinase inhibitors

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Serous ovarian carcinoma (SEOC) is the most common malignant ovarian cancer originated in the fallopian tube which significantly promotes morbidity and mortality in the female with poor prognosis at an advanced stage. Many research focused on the molecular marker in ovarian cancer for diagnosis and better management of the patient. Ki-67 is a proliferation marker widely used on formalin-fixed paraffin-embedded (FFPE) tissues to assess cancer. However, deparaffinization of FFPE tissues before deoxyribonucleic acid (DNA) extraction becomes crucial step because xylene is hazardous to human's health. This study is aimed to detect and compare the Ki-67 biomarker from FFPE tissues of SEOC and normal ovarian carcinoma tissue. In addition, we also investigated the quality and quantity of DNA after deparaffinization using xylene and boiling method. Twenty two SEOC and twenty two benign ovarian tissues were used in this study. Total DNA was extracted from FFPE tissues and Ki-67 was successfully amplified using hot-start polymerase chain reaction (PCR). The PCR product was separated using gel electrophoresis and the DNA band was visualized using ultra-violet (UV) Transilluminator. The result shows no significant difference in quality and quantity of DNA using both methods. Thus, boiling method is acceptable to replace toxic solvent of xylene without affecting the amplification of target product. The research also demonstrated that the Ki-67 marker is detected in both SEOC and benign ovarian FFPE tissues.

Keywords: Ki-67 biomarker, Deparaffinization, DNA extraction, FFPE tissues, Hot-start PCR, SEOC

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Interindividual responses of metformin, a widely used drug for type 2 diabetes mellitus (T2D) have been reported in several studies. SLC47A1 gene encodes for multidrug and toxic compound extrusion protein (MATE1), a key role in the transport and excretion of metformin. A single nucleotide polymorphism (SNP) known as SLC47A1 rs2289669 (G>A) variant has been associated with increasing the glucose lowering effect of metformin by slowing the renal elimination in T2D. Hence, a reliable and efficient method is essential to identify rs2289669 (G>A) variant in clinical laboratory setting for future implementation of personalized medicine. A tetra-primer amplification refractory mutation system polymerase chain reaction (T-ARMS-PCR), a rapid and simple genotyping assay was developed to detect SLC47A1 rs2289669 (G>A) variant. The concentration and purity of saliva-derived DNAs were evaluated by using nanophotometer. The absorbance ratio of A260/280 and A260/230 were used to determine DNA quality and purity. Subsequently, the validated method was used to determine the genotype distribution and allele frequencies of SLC47A1 rs2289669 (G>A) variant in 150 of healthy volunteers. The assay demonstrated 100% concordance between the direct sequencing and T-ARMS PCR detection. The genotypes distribution of SLC47A1 rs2289669 (G>A) variant namely; AA, AG and GG were 18%, 54.7% and 27.30%, respectively in accordance with Hardy-Weinberg Equilibrium. In summary, we successfully performed a diagnostic validation of T-ARMS PCR for detection of SLC47A1 rs2289669 (G>A) variant by using saliva derived DNA. T-ARMS-PCR is rapid and ideal assay for genotypes screening in the clinical laboratory settings.

Keywords: T-ARMS-PCR, SLC47A1 gene rs2289669, Saliva-derived DNA

Disparity Index Test: A Tool to Compare the 18S, ITS and 28S rDNA Gene in Identifying Different Apicomplexa Species.

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Parallel to the trend of using the 16S rDNA gene for species identification among prokaryotes, the 18S rDNA gene has been used similarly for eukaryotes. However, studies have shown that this gene may not always be able to fulfill the task. Therefore, other genes are also used for species identification, which include the ITS and 28S rDNA genes. This causes an inconvenient situation whereby the sequences of microorganisms are reported in fragments, when the 18S, ITS and 28S genes are actually linked. The disparity index test is a measure of nucleotide substitution patterns. It is based on the principle that the further two species differentiates, the more different the nucleotide substitution pattern would become. This study aims to compare the abilities of the 18S, ITS and 28S in identifying different species. Sequences of 10 apicomplexa species that span from the 18S to the 28S genes were retrieved from public domain. The sequences were aligned, and divided into segments of 18S, ITS and 28S based on the alignment consensus. Disparity index test was performed on the three regions using the Mega 7 software. The results show that 79% of the compared pairs in the 28S region were significantly different, followed by 69% in the ITS region and 44% in the 18S region. This means that the 28S gene, and the ITS gene were better than the 18S gene in pair-wisely identifying two different species. This simple conclusion in turn, questions the common practice of using the 18S gene for species identification. It also highlights the need to report gene sequences from the 18S to the 28S genes, not in fragments of the individual genes, for a more holistic future database reference.

Keywords: Disparity Index Test, Apicomplexa species

Development of Barcoding Analytical Tool of Cd Toxicity Using Yeast.

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The existence of Cadmium (Cd) in water bodies has gain attention owing of its persistence and highly reactive even at low concentrations. A detrimental effects associated of Cd are genotoxicity, hepatotoxicity, nephrotoxicity, immunotoxicity and osteotoxicity. This non-essential metal has been listed as priority substance which needed a comprehensive monitoring. Instead of precise measurement contribute by conventional techniques, it suffer with expensive and required skilled handling. Therefore an alternative analytical tool which is simple, cheap, sensitive and portable instruments are required for a real-time measurement and continuous analysis of natural sample. In the presence study, the whole cell biosensor which employing a genetically modified yeast, *Saccharomyces cerevisiae* cells in detection of environmental relevant concentration of Cd in the aquatic medium has been developed. This biosensor takes an advantage of fluorescent gene as a reporter, fused to Cd responsive gene and interrogation via optical approaches. The expression of candidate Cd responsive genes were validated by real time PCR (qPCR) approach, which result in selection of CUP1 (metallothionein) and OGG1 (8-oxoguanine-DNA glycosylase-1) as a target gene while TAF10 (TATA-Box Binding Protein Associated Factor 10) as a control/reference gene. The reporter system consists of promoter region of selected genes; CUP1, OGG1 and TAF10 that were linked to fluorescence gene; GFPturbo, mCherry and EYFP respectively are transformed into yeast cells. In order to evaluate the efficacy of the developed reporter system, all yeast strains were exposed to different concentration of Cd for 8 hours in microplate format. The fluorescence intensity of target gene (GFPturbo and mCherry) were measure as relative to control gene (EYFP). The CUP1-GFPturbo system response in a dose response manner following the exposure to Cd while OGG1-mCherry shows a variation in fluorescence emission. On the other hand, the construct of TAF10-EYFP show a dose response manner which indicated inappropriate as a control reporter system. Therefore, the fabricated constructs needed to be optimized prior the use in the environmental monitoring purpose.

Keywords: Barcoding analytical tool, Cadmium, Toxicity

P23***Novel Roles of SAFB1 in Regulating RNA Processing and Cellular Stress Response.******Jalilah Idris****Universiti Kuala Lumpur, Institute of Medical Science & Technology (UNIKL MESTECH),
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SAFB1 is an RNA binding protein implicated in the regulation of multiple cellular process such as in regulating RNA processing and stress response. However, the exact mechanism for these processes are unknown. iCLIP analysis, a method to detect protein-RNA interactions at nucleotide level, has identified a large number of SAFB1 binding targets including the neural cell adhesion molecule 1 (NCAM1). Following further investigation using NCAM1 minigene, we showed that SAFB1 altered the expression of two of the three NCAM1 alternatively spliced isoforms. However, when the putative the putative AGA/GAA/AAG recognition motifs were mutated, SAFB1 did not mediate any decrease in the NCAM1 9-10 isoform. SAFB1 was also found to alter the expression of MAP3K7 protein (but not mRNA) during the recovery period following hyper thermic condition. These results indicate that SAFB1 plays an important role in RNA processing and in the cellular adaptation to heat stress.

Keywords: Regulating RNA processing, SAFB1

P24***Effect of G140S/Q148R Double Mutation and E138K/G140A/Q148K Triple Mutation on the Affinity of Bictegravir: A Molecular Dynamic Simulation Approach.******Ammarul Zaki Bin Rahman, Izzati Binti Mohamad, Shahrul Bin Amir****Universiti Kuala Lumpur, Institute of Medical Science & Technology (UNIKL MESTECH),
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The research focuses on the drug resistance mechanism on integrase strand transfer inhibitors (INSTIs) via computational biology methods; specifically molecular dynamics. HIV-1 integrase function as an enzyme catalyzing the integration of viral DNA (vDNA) into the host genome/chromosome. This allows the virus to enter lysogenic phase of its life cycle instead of the lytic cycle during the initial invasion of the virus. Integrase (IN) is a tri-domain protein that catalyzes two mechanisms in the integration process. The first step is the hydrolytic 3'-processing where IN removes two nucleotides in the region adjacent to the conserved 3'-CA sequence. The second reaction is called "strand transfer" or "transesterification" where the newly processed 3'-viral DNA end are joined to the 5' phosphates in the host target DNA. INSTIs inhibits this second step by competitively bind to the active site (D, D-35-E motif) in the catalytic core domain (CCD) of the IN protein. Currently the group selected two prominent mutation profiles which have shown in in vitro study to cause a drug resistance in the newly developed INSTI; bictegravir (BIC). The mutations are double mutation G140S/Q148R and triple mutation E138K/G140A/Q148K on the HIV-1 integrase enzyme. A free, BIC-bounded and raltegravir-bounded wild type (WT) HIV-1 integrase were simulated for 1 ns and compared to the selected mutated HIV-1 integrase of the same condition. An early finding (1 ns simulation) shows some destabilizing effect of both mutations towards the global structure of HIV-1 integrase as compared to wild type.

Keywords: Bictegravir, E138K/G140A/Q148K triple mutation, G140S/Q148R double mutation

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Limitations of existing anticoagulants have prompted a search for natural origin of anticoagulants. Since there is an increasing need to source for pharmacological and medicinal materials from plant source, thus an exploratory effort towards identifying and characterizing new anticoagulants from plants is worthwhile. *Clinacanthus nutans* (*C. nutans*) commonly known as Sabah snake grass belongs to Acanthaceae family was chosen since it has therapeutic and medicinal benefits. This plant possessed anti-oxidant, anti-microbial, anti-inflammatory and anti-diabetic activities. This study was carried out to identify the anticoagulant activities of *C. nutans* leaves in aqueous and methanol extracts at different concentrations based on prothrombin time (PT) and activated partial thromboplastin time (aPTT). The dried leaves of *C. nutans* were ground into fine powder and extracted using aqueous and methanol. Anticoagulant assays of PT and aPTT were done on three different concentrations of *C. nutans* aqueous and methanol extracts (10 mg/mL, 20 mg/mL, and 30 mg/mL) and control group respectively. PT and aPTT of plasma samples were prolonged in both types of extracts ($p < 0.05$). This study highlights that the anticoagulant activity of aqueous and methanol extracts of *C. nutans* affects the intrinsic and extrinsic pathway by causing deficiency in clotting factors. These results suggested that aqueous and methanol extracts of *C. nutans* exhibited anticoagulant activity at certain concentrations.

Keywords: *Clinacanthus nutans*, Anticoagulant activities, PT, aPTT

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Maternal exposure to air pollutants in the environment has been associated with poor birth outcomes. Nitrogen oxides (NO_x) can generate toxic alkylating agents (Aas) that form O6-alkylguanine, a promutagenic and toxic DNA base modification. The DNA repair protein, O6-methylguanine-DNA methyltransferase (MGMT) transfers the alkyl group from the O6 position to the active site cysteine, and so provides protection against AA induced toxicity. To determine the association between MGMT placental activity, air pollutant exposure and small for gestational age (SGA) births. 81 pregnant women residing in Greater Manchester for the duration of their pregnancy, opted for Elective Caesarean Section (ELCS) and consented for placenta sampling. MGMT activity was quantified in placental extracts using a radioisotopic [3H] methyl transfer assay that used calf thymus DNA methylated in vitro with N-nitroso-N- [3H]-methylurea, as the MGMT substrate. Participant's postcodes and pollutant exposure for the duration of pregnancy was geocoded in ArcGIS. SGA was defined as <20 birthweight centile. MGMT activity varied 6.8 fold (mean $\pm$ SD 0.097 $\pm$ 0.03 fmole/ μ g protein). Mean exposure levels for participants during pregnancy were for NO₂ 32.1 $\pm$ 7.8, Nox 55.2 $\pm$ 14.5, PM_{2.5} 17.4 $\pm$ 0.7 and PM₁₀ 10.6 $\pm$ 1.5 μ g/m³, which were within Air Quality Standards Regulation. Associations were observed between SGA and NO₂; 3 months prior to pregnancy OR 1.06 (95% CI 0.99–1.14), 1st trimester OR 1.05 (95% CI 0.99–1.11) and 2nd trimester OR 1.07 (95% CI 0.99–1.15). MGMT activity was not associated with SGA ($p=0.12$) but was correlated with 2nd trimester PM₁₀ ($r^2=0.08$, $p=0.01$) and PM_{2.5} ($r^2=0.09$, $p=0.01$) and inversely with 3rd trimester Nox ($r^2=-0.08$, $p=0.01$). Conclusion: There is an association between NO₂ and SGA, but this does not relate to placental DNA repair, measured by MGMT activity

Keywords: O6-Methylguanine DNA Methyltransferase, Air pollutants, Birth outcomes

P27**Effects of 2.45 GHz Microwave Radiation Exposure on Erythrocytes and Leukocytes in Rats.**

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Exposure to microwave (MW) radiation causes a variety of changes in biological systems, including the hematopoietic and immune systems. This study was conducted to evaluate the effects of low-frequency MW radiation on erythrocytes and leukocytes in Sprague Dawley rats. Twelve male Sprague Dawley rats with an average body mass of 250 g were divided into control group (n=6) and exposed group (n=6). Rats in exposed group were irradiated to 2.45 GHz MW radiation for eight weeks (five days a week, eight hours a day). Blood profile was then analyzed following completion of exposure regime. Findings of this study demonstrated that MW radiation exposure caused significant increase in the total erythrocyte count, total leukocyte count and total differential count of lymphocyte, neutrophil, monocyte and eosinophil compared to non-exposed group. In contrast, the basophil count was significantly decreased in comparison to control group. However, the mean corpuscular value (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC) values were not significantly affected by MW radiation exposure. For blood morphology, neutrophils exhibited alteration in cell where degradation of cytoplasm was observed, while lymphocyte, monocyte, basophil and eosinophil were found to be normal after exposure. In summary, exposure to MW radiation affects several hematological parameters and morphological changes which may pose deleterious negative health impacts.

Keywords: Microwave radiation, Erythrocyte, Leukocyte, Blood morphology

P28**Analgesic and Antipyretic Activities of Methanolic Extract of *Brucea javanica* Fruits on Sprague Dawley Rats.**

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Analgesic drugs can act in central and peripheral pain stimulation. *Brucea javanica* fruits are effective to treat many diseases. This study investigates the central and peripheral analgesic activities of *Brucea javanica* fruits methanolic extract in mice. 28 male mice were divided into four groups which consist of control group (10 mL/kg 0.9% normal saline), extract groups (100 mg/kg and 200 mg/kg), and Panadol Extend group (200 mg/kg). The mice were tested using tail immersion test for central analgesic action and acetic acid- induced writhing test for peripheral analgesic action. In central analgesic study, both extract groups were significantly increase the latency of nociceptive response. The time taken for the mice to show nociceptive response higher in 200 mg/kg extract compared to 100 mg/kg extract. In peripheral analgesic study, both extract groups were significantly reduce the number of writhing reflex and increase the inhibition of writhing reflex compared to control and Panadol Extend. Higher inhibition activity was observed in the 200 mg/kg compared to 100 mg/kg extract. As a conclusion, *Brucea javanica* fruits are able to promote analgesic activity through central and peripheral mechanism.

Keywords: *Brucea javanica*, Analgesic, Tail immersion, Acetic acid induced writhing

P29***The Comparative Study of Hematological Parameters and Kidney Evaluation on Anemic-induced Rats Using Gentamicin and Phenylhydrazine.******M. Taufiq Badaruddin, W. Elya Farahana W. Hashim****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Anemia is a worldwide problem that affects people of all ages, approximately for over 30% of the world's population which is the most common public health problem specifically in developing countries. One of the causes is nephrotoxicity which is a condition distinguished by any adverse kidney functional or structural changes due to the effects of the chemical or biological product which yields metabolite that leads to toxicity in kidney. Single dosage of gentamicin and phenylhydrazine were commonly used to induce anemia in rats but less data obtained for the effects of that drugs combined. Therefore, the objective is to investigate the combination effects of gentamicin and phenylhydrazine on anemic-induced rats. Twenty rats were divided into four groups; controlled, induction with gentamicin, phenylhydrazine and combination of both drugs respectively. Intraperitoneal injection was given once for each two days within 28 days and blood samples were collected for analysis consisted of hemoglobin (Hb), erythrocyte count (RBC count), packed cell volume (PCV), mean corpuscle volume (MCV), mean corpuscle hemoglobin (MCH) and hematocrit (Ht). Histological examination was conducted for kidneys. There were significant differences of RBC count, hemoglobin count (Hb), PCV, MCV and MCH with p value is < 0.05 between the groups. The significant reduction of hematological parameters in combined group proved the interaction of gentamicin and phenylhydrazine in causing the nephrotoxicity that yield the more notable result compared to single dose of both drugs.

P30***Effect of Citrus Aurantifolia Juice on Blood Glucose Level in Streptozotocin-Induced Diabetic Rats.******Nor Ezleen Qistina Ahmad, Muhiyuddin Md Nasir****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Diabetes is a chronic disorder of carbohydrate, fat and protein metabolism characterized by defects in insulin secretion, insulin action, or both. Lime (*Citrus aurantifolia*) contains flavonoids such as eriocitrin and hesperidin with antioxidant effects and effectively reduces blood sugar level. However, there are not many comparative studies looking at the effect of *Citrus aurantifolia* on type I diabetes or blood parameters in animal models. This research sought to investigate the effects of fresh lime juice on glucose level and the weight in streptozotocin-induced diabetic rats. Streptozotocin (STZ) was administered as a single dose (65mg/kg BW) to induce diabetes. Three equal sized group of 21 male Sprague-Dawley rats were formed. The first group is the control diabetic given normal saline. The second group being the diabetic rats with lime treatment and the third group being the normal rats with lime treatment. ST-induced diabetic rats and normal rats were treated with fresh lime juice with concentration of 50% by gavage during the study period of 21 Days. Blood glucose levels and weights are measured on the third, seventh, fourteenth and twenty first day of treatment. The weights are further measured for three more weeks after the treatment have ended. The blood glucose level in diabetic control rats were steadily increased throughout the study period whereas, significant decreased ($p < 0.05$) were found in normal and diabetic rats treated with lime juice. The weight of diabetic rats treated with lime shows a steady decrease throughout the treatment period and a sharp decline after the treatment were completed. While the weight of normal rats steadily increase throughout the treatment period. These results suggest that lime exhibits an antihyperglycemic effect in experimental diabetic rats.

Keywords: Citrus aurantifolia, Blood glucose, Diabetes

P31

The Effects of Extract Combination of Smilax Myosotiflora, Persicaria Odorata and Syzygium Aromaticum towards the Growth of Bacillus Subtilis, Salmonella Typhi and Candida Albicans.

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Antibiotic resistance of infectious microbe has become a major threat in clinical treatment. Besides controlling the misuse of antibiotic, an alternative antimicrobial agent is also crucially needed to cater this issue. This study was carried out to assess the antibacterial, antifungal activity and to evaluate the effectiveness of all single or combination extracts of *Smilax myosotiflora* (SM), *Persicaria odorata* (PO) and *Syzygium aromaticum* (SO). All plant extracts were prepared employing a methanol extraction procedure. Antibacterial activities of the crude extracts were determined by agar well diffusion method. The mixed extracts were prepared by adding 25µg/µl concentration of each crude extract based on the volume of ratio 1:1, 1:2, 2:1, 1:1:1, 1:1:2, 1:2:1 and 2:1:1. Single extracts of SM, PO and SO showed positive effects towards the growth of *Bacillus subtilis*, *Salmonella typhi*, and *Candida albicans*. All crude extracts showed increase diameter of inhibition zones when combined with positive control. Therefore, it indicates that the synergism activity is present and extracts do not react antagonistically with each other.

Keywords: Antibacteria, Antifungal, *Smilax myosotiflora*, *Persicaria odorata*, *Syzygium aromaticum*

P32

Antibacterial and In Vitro Wound Healing Activities of Helichrysum Italicum and Manuka (Leptospermum Scoparium) Essential Oils.

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Helichrysum italicum and Manuka (*Leptospermum scoparium*) essential oils (EOs) contain phytochemical compounds which have been reported to inhibit bacterial growth and promote wound healing. The present study was designed to evaluate the antibacterial and wound healing activities of *Helichrysum* and Manuka EOs in vitro. The antibacterial activity of *Helichrysum* and Manuka EOs was evaluated by disc diffusion assay against selected Gram-positive and Gram-negative bacteria. The in vitro cytotoxicity effect and wound healing activity of both EOs was investigated by cytotoxicity assay and scratch wound assays respectively on Human Skin Fibroblast cells (HSF1184). In scratch wound assay, the gap closure were monitored at different time intervals and images were then analyzed using ImageJ™ software. In disc diffusion assay, it was observed that both *Helichrysum* and Manuka EOs inhibited the growth of all Gram-positive bacteria but not Gram-negative bacteria, thus reflected the selective antibacterial potencies of these EOs. Results from cytotoxicity assay revealed that both EOs were proved to be non-toxic to the fibroblasts at concentration ranging from 0.03125 µl/ml to 1µl/ml. Both EOs enhanced the wound closure progression significantly as compared to untreated cells in scratch wound assay when treated with concentrations of EO ranging from 0.125 µl/ml to 0.25 µl/ml. Based on the results, it was suggested that *Helichrysum* and Manuka EOs possess antibacterial and wound healing capacities and could be useful for the advancement of antibacterial and wound healing treatments in the future.

Keywords: Antibacterial activity, Essential oil, *Helichrysum italicum*, Manuka, Wound healing

P33***The Effect of High Fiber Product towards Oxidative Stress, Haematology Parameters and Brain Histology on STZ Induced Diabetic Rats.******Ahmad Hasan, Faisol Aris, Nawi S.F., Jalil N.A****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Diet plays an important role in maintaining a healthy body nowadays especially those who are living with diabetes need to have stricter menu plan to control their blood glucose level. Extra high fiber diet has been proven to regulate blood glucose level naturally and reduce diseases that caused by high oxidative stress due to diabetes. The study was carried out to investigate the effect of high fiber diet toward oxidative stress and brain histology on STZ induced diabetic rats. 18 Wistar rats divided into 3 groups (control, untreated and treated) and were given high fiber diet made from several fruits (Banana, Oranges, Watermelon, Pineapple, Papaya and Chia Seed) that were turned into a cake. The rats were declared diabetic when their fasting blood glucose level reached $>7\text{mmol/L}$. After 2 weeks of treatment, all the rats were sacrificed for biochemical and histological study. Fasting blood glucose showed significant reduced in treated group as compared to untreated ($p<0.05$). In addition, the weight of brain also showed reduced in the untreated group as compared to their counterparts ($p<0.05$). Furthermore, catalase Assay showed significant increase in its level in the untreated group as compared to their counterparts ($p<0.0001$). The results show positive patterns in Nissl staining and clear comparison can be seen between control, treated and untreated group. Hematoxylin and Eosin stain revealed neuronal damage, early stage of apoptosis and cellular necrosis in untreated group. Catalase result shows significant difference between treated and untreated groups. The high fiber diet helps in slowing down absorption and regulate the leptin production which help with the feeling of satiety. The extra fiber diet helps in altering hormonal signals, slowing down nutrient absorption or altering fermentation in the large intestine, along with promoting feelings of satiety. This research suggested that high fiber diet can reduce the effects of oxidative stress on the brain of the diabetic rats.

Keywords: Biochemical parameters, Oxidative stress, *Trigona honey*,

P34***Evaluation of Wound Healing Properties of Musa Sp. (Banana) Sap Crude Extract.******Mohamad Hidayat Bin Mohamad Isa, Izuddin Fahmy Abu****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Musa Sp. (banana) is known to possess several medicinal properties and have been frequently used traditionally as an alternative and complementary medicine. However, the sap composition and its ability to repair damaged epithelial tissues in skin wound has not been fully explored. Therefore, this study was carried out to investigate the potential effect of banana sap crude extract treatment in repairing damaged skin tissues in Sprague Dawley rat model. 20 rats were divided equally into three groups: (i) skin wounded rat control, (ii) wounded rat treated with acriflavine, and (iii) wounded rat treated with banana sap extract. Prior to wound induction, the animals were intraperitoneally administered with a combination of ketamine (75mg/kg) and xylazine (5mg/kg) to induce anaesthesia. Subsequently, an area of 6 x 4 cm (length x width) was shaved at the dorsal region followed by a standard 0.8 cm round biopsy puncture performed on each rat. All treatments were applied topically daily and macroscopic biometrics were measured on day 5, 10 and 15 to record the wound closure. The control group only recorded a wound closure of 2.5% after 15 days. Acriflavine induced 11.25%, 23.8% and 42.5% of wound closure at day 5, 10 and 15 respectively. Banana sap treatment induced significant wound closure of 30.0%, 61.3% and 86.25 at the three timeline measured. One way ANOVA revealed a significant difference between all groups [$F(2, 45) = 15.094$, $p = 0.000$], and post-hoc comparison indicated significant differences between banana sap treatment compared to the other two groups ($p<0.05$). These results demonstrated that banana sap possess wound healing properties and is more effective than the standard drug, acriflavine to repair epithelium tissue damage in our rat model.

Keywords: *Musa sp.*, Banana sap, Acriflavine, wound healing

P35***Hibiscus Sabdariffa L. Extract Improved Plasma Catalase Activity but not Malondialdehyde Level in Hind Limb Immobilized Rats.*****Zainie Aboo Bakkar, Nooraqilah Rubaai, Nur Afiqah Mahazi, Nurhanisah Hosni, Nik Nur Nadia Nik Mat, Nur Sahira Al-Fattah Yahaya, Hanan Kumar Gopalan***Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Disused muscle atrophy (DMA) causes severe problems in aging society especially bedridden people. Oxidative stress has been suggested to be involved in pathogenesis of DMA. *Hibiscus sabdariffa L.* (HS) or roselle contains high flavonoids, previously shown to be effective as antioxidant, antihypertensive and antidiabetic. Thus, the present study investigated the protective effects of HS against oxidative stress in hind limb immobilized rats. Twenty-eight male Sprague-Dawley rats were randomly divided into four groups (n=6 per group): Control group received no intervention; Immobilized group received unilateral hind limb immobilization for 5 days; HS group received 100 mg/kg/bw through oral force feeding for 28 days; Immobilized + HS group received unilateral hind limb immobilization for 5 days followed by HS treatment with same dosage until day-28. Blood samples were measured for DNA damage, lipid peroxidation and oxidative enzyme. Data were analyzed by ANOVA and presented as mean $\pm$ SEM. The results showed a significant increase in percentage of mild DNA damage after HS treatment in hind limb immobilized rat (Control: 86.5 $\pm$ 1.4%; Immobilized: 25.0 $\pm$ 5.5%; HS: 37.0 $\pm$ 3.5%; Immobilized + HS: 56.7 $\pm$ 7.9%, P=0.003). There was also significant increase in plasma catalase activity after HS treatment (Control: 72.5 $\pm$ 0.3 U/ml; Immobilized: 56.5 $\pm$ 4.9 U/ml; HS: 68.3 $\pm$ 3.2 U/ml; Immobilized + HS: 65.1 $\pm$ 1.3%, P=0.006) but not in plasma malondialdehyde (MDA) level. In conclusion, these findings suggested that HS treatment may prevent oxidative stress-induced DMA in rats' hind limb immobilization model.

Keywords: Catalase, *Hibiscus sabdariffa L.*, Malondialdehyde,

P36***The Determination of Phytochemical Constituents in Leaves of Centella Asiatica (Linn.) Urban.*****Ilyas Syafiq Darul Ridzuan, Norsuraya Adnan***Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

The aim of this study is to determine the qualitatively and quantitatively the phytochemical constituents in leaves of *Centella asiatica* which are saponin, flavonoid, alkaloid and phenol. *Centella asiatica* claimed that have medicinal values and bioactive compounds but these claims were not determined quantitatively the total concentration of phytochemical constituents in leaves extract of *Centella asiatica*. The result showed the qualitative study carried out on the methanol extract of *Centella asiatica* leaves revealed the present of saponin, flavonoid and phenol but alkaloid compound was absence in the leaves extract. The quantitative analysis result for saponin stated (8.9%) in leaves while for flavonoid and phenolic compound, the percentage were determined by spectrophotometric. The flavonoid compound in leaves extract was (88.11 QE/g) with 510 nm wavelength and phenol compound was (80.94 GAE) with 550 nm wavelength. The selected phytochemical constituents in leaves of *Centella asiatica* are traditionally used for medicinal purpose that effective to treat the various types of diseases. As conclusion, the leaves of *Centella asiatica* were composed of saponin, flavonoid and phenol compound that have the potential source of useful drugs in order to improve the healthcare status of consumer.

Keywords: Alkaloid, *Centella asiatica*, Flavonoid, Phenol, Saponin

P37***Acute Oral Toxicity of Dioscorea Hispida Aqueous Extract on Sprague Dawley Rats.*****Norizah A¹, Elda Nurafnie I R¹, Adham Afiq WZ¹, Nurulfariza R¹, Hussin M¹, Maizatul Hasyima O²**¹*Toxicology and Pharmacology Unit, Herbal Medicine Research Centre, Institute for Medical Research, Jalan Pahang, Kuala Lumpur*²*Phytochemistry Unit, Herbal Medicine Research Centre, Institute for Medical Research, Jalan Pahang, Kuala Lumpur*

The *Dioscorea hispida* Dennst (DH) commonly known as Asiatic bitter yam has been traditionally consumed among villagers in Malaysia. Despite of its pharmacological properties, the presence of chemical compound called dioscoreine and dioscorine could produce toxicity effects. The study was designed to evaluate potential acute toxicity of standardized aqueous extract of DH (SAEDH). Chemical profile of SAEDH was analyzed using Ultra high performance liquid chromatography liquid chromatography (UHPLC). The acute toxicity study was performed according to OECD TG No. 420. Four doses of SAEDH (3, 50, 300 & 2000 mg/kg body weight (BW) were administered in the sighting phase to four different rats. The dose of 2000 mg/kg BW was selected for main phase since no death and toxic effect observed in the sighting phase. The rats were observed for clinical signs, general behavior, BW gain and foods & water intake for 14 days. Animals were sacrificed on day 15. The phytochemistry analysis showed the present of Dioscin, the main steroidal saponin present in the tuber. For the acute study, SAEDH did not cause acute toxicity effects as no changes on measured parameters at the highest dose of 2000 mg/kg body weight of rat.

Keywords: *Dioscorea hispida*, Chromatography, Toxicity, Acute, Dioscin

P38***Alleviation of Nephrotoxicity Caused by Paracetamol-Induced Oxidative Stress by Cassia Alata.*****Izuddin Fahmy Abu, Aflah Che Mat, Aina Akmal Mohd Noor, Anis Dzulaikha Zulkifli, Musfirah Zulkifli, Nabihah Abdullah, Hanan Kumar Gopalan***Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Paracetamol (PCM) functions as pain relievers and widely used as antipyretics to reduce fever. Overdose intake of paracetamol can cause liver damage which may lead to nephrotoxicity as a secondary effect. Despite the advancements of modern medicine, treatment of kidney damage particularly caused by paracetamol toxicity has limited availability. Due to their high flavonoid contents, this study aimed to investigate the protective and treatment effects of *Cassia alata* leaves aqueous extract to alleviate kidney toxicity of PCM-induced rats assessed by histological morphology evaluation and biochemical oxidative stress parameters. 20 male Sprague-Dawley rats were divided into 4 groups: (i) negative control with standard diet for 7 days, (ii) positive control with PCM -induced at dosage of 3000mg/kg for 24 hours, (iii) experimental group given single dose of PCM for 24 hours followed by treatment of *Cassia alata* leaf extract (200mg/kg) for 21 days, (iv) experimental group given *Cassia alata* leaf extract for 21 days followed by single high dose of PCM for 24 hours, and (v) supplementation with *Cassia alata* only for 21 days. The rats were sacrificed following completion of treatment to harvest the kidneys. Histological analysis were conducted to measure the extent of kidney damage, while biochemical parameters (malondialdehyde - MDA, catalase and 2, 2-diphenyl-1-picrylhydrazyl - DPPH) were measured spectrophotometrically to analyze the state of oxidative stress. All groups treated with *Cassia alata* shows improvement in kidney morphology indicated by the histological features, the size of glomerulus and ratio of normal versus damaged glomerulus compared to PCM-induced rats. *Cassia alata* also appear to increase antioxidant potential (catalase and DPPH-scavenging activity) and reduce lipid peroxidation (MDA content). This study concludes that *Cassia alata* aqueous extract with a dosage of 200 mg/kg has mild to moderate effects on the alleviation of nephrotoxicity caused by paracetamol toxicity in our experimental rat model.

Keywords: *Cassia alata*, Nephrotoxicity, Oxidative stress, Paracetamol toxicity

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Sargassum polycystum is brown seaweed that generally inhabit in a variety of substratum including mangroves, sandy areas, mudflats, coral reefs and rocky shores. The presence of various phytoconstituents has been reported from the various seaweed species. However, the study on phytochemical components and the biological activity of *S. polycystum* are not fully understood yet. Thus, this study was conducted to evaluate the best extraction solvents for *S. polycystum* and to determine the phytocomponent (%) in the n-hexane, Dichloromethane (DCM) and methanol extract of *S. polycystum* via Gas Chromatography-Mass Spectrometry (GC-MS) analysis. *S. polycystum* was collected from the coastal area of Sabah, Malaysia. After collection, it was subjected to purification, drying and soxhlet extraction using n- hexane, DCM and methanol. GC-MS analysis of extracts of *S. polycystum* focusing on fatty acid compound was executed using a Perkin Elmer Turbo Mass Spectrophotometer. The mass spectrometer was coupled with a Perkin Elmer Auto sampler XLGC and Perkin Elmer Elite- 5 capillary column. It is observed that, methanol is the most efficient solvent as it recorded the highest extraction yield in *S. polycystum*. Nineteen phytocomponents have been identified from all extracts of *S. polycystum* by GCMS analysis. This analysis revealed the presence of major constituents like palmitic acid, myristic acid, oleic acid, pentadecanoic acid, behenic acid, etc. Perusal of literature studies has revealed that, most of the identified major compounds were proven to exhibit antibacterial, antifungal, anti-inflammatory, antiviral, etc. Hence, it is apparent that *S. polycystum* have the potential to be used as seaweed of phytopharmaceutical importance as it contains numerous bioactive compounds.

Keywords: Gas chromatography- mass spectrometry, *Sargassum polycystum*

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Utilization of food source has heightened the interest to study the production of ACE-inhibitory peptides. Milk has been the main source of ACE-inhibitory peptides. Common production of protein hydrolysate containing ACE-inhibitory peptides is through batch hydrolysis in solution. However, batch hydrolysis produced a complex mixture of peptides, which require subsequent purification step to achieve high potency. Moreover, enzyme inactivation during hydrolysis due to feedback inhibition contributes to the inefficiency and high cost. Recent development to address the issue is through suitable process selection and cost-effective. Numerous techniques have been suggested such as immobilized enzyme reactors, enzyme membrane reactor (EMR), and ion-exchange chromatography. However, these techniques have been regarded as expensive and some of them are inefficient and unsuitable for large-scale production. An integrative process has been deemed promising, which integrates the separation of protein precursor and hydrolysis in situ. The use of ion-exchange resin minimized the product feedback inhibition of the enzyme and allows the pre-enrichment of peptides produced permeating peptides with high bioactivity. Most importantly, these processes are all occur within a single cell, thus, minimized the processing steps with subsequent reduced in cost of operation. Initially, sweet whey and acid whey has been used as feed for the integrative process producing potent ACE-inhibitory peptides such as Ile-Ile-Ala-Glu (IIAE) from β -lactoglobulin, Ile-Pro-Pro (IPP) and a novel octa-peptide Gln-Asp-Lys-Thr-Glu-Ile-Pro-Thr (QDKTEIPT) from casein. ACE prefers inhibitor with hydrophobic amino acids at the C-terminal of the peptides. Different performance was observed when acid whey was used as feed owing to its high ionic calcium content. However, in vitro digestion of the peptides was stable and sensory evaluation has showed no bitterness at different IC₅₀, which is the inhibition concentration at 50%. Therefore, the integrative process had shown its advantages as an alternative process not only for whey protein but also plausibly for other proteins such as collagen derived-fish by-products, especially those of cage farm freshwater fish.

Keywords: Angiotensin I-converting enzyme

P41***Investigation upon Mechanical Characteristics on Binary Mixture of Flowlac 100 and Date Powder (*Phoenix Dactylifera*) Chewable Tablet.******Fara Wahida Ahmad Hamidi¹, Mohd Shamsul Anuar², Azhari Samsu Baharuddin², Mohd Afandi P. Mohamed², Mohd Nazli Naim², Suraya Mohd Tahirc³***¹*Bioengineering Technology Section, UniKL MICET*²*Department of Process & Food Engineering, Universiti Putra Malaysia, Serdang, Selangor*³*Department of Mechanical & Manufacturing Engineering, Universiti Putra Malaysia, Serdang, Selangor*

This study aims to develop a formulation for chewable tablet by using date powder (DP) and Flowlac 100 by using direct compression. The powders were compacted as single and binary mixtures at five different formulations in order to study their compaction behaviour using stresses ranging from 15 to 74 MPa in a cylindrical die with planar punches. The tablets formed were investigated on their mechanical properties (plastic work, elastic work and tensile strength). The results clearly demonstrate that, higher percentage of DP in the formulation gave lower reading of plastic work, while low amount of DP provide high elastic work. Compressive strength of the tablet on the hand, vary with the percentage of DP present and applied pressure used. Formulation with 60% DP gave the highest tensile strength compared to the other. These findings can be used to enhance the approach and tableting properties in the production of date chewable tablet.

Keywords: Binary mixture, Flowlac 100, *Phoenix dactylifera*

P42***The Comparison of *Salvia Hispanica L.* (Chia Seeds) and *Stevia Rebaudiana Bertoni* in Lowering Blood Glucose Level in STZ-induced Diabetic Rats.******Nabilah Hanim Mohd Sabri, Siti Nurdiana Abdullah****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Salvia Hispanica L. (Chia Seed) and *Stevia Rebaudiana Bertoni* (Stevia) having a high demand among people nowadays due to its nutritional benefits towards human body health. Several studies state that chia seed and stevia could lowered the blood glucose level. The purpose of this study was designed to investigate and evaluate the effectiveness of chia seed and stevia in lowering blood glucose level in Streptozotocin (STZ) induced diabetic rats. Twenty female Sprague Dawley rats were divided into four groups (n=5); i) control group, ii) treated with chia seed, iii) treated with stevia, iv) treated with chia seed and stevia. Hyperglycemia was induced by STZ for 1 to 2 weeks. STZ was injected intraperitoneally at single dose of 65mg/kg. In order to determine the effect of chia seed and stevia in diabetic rats, body weight and fasting blood glucose were measured every three days after the administration of treatment. At the end of the experiment, blood were collected from animals through cardiac puncture to measure insulin level. The blood plasma insulin level was measured by using the Biovendor Rat insulin Wide Range ELISA kit. There is no significant different effect between *Salvia Hispanica L.* (Chia seed) and *Stevia Rebaudiana Bertoni* in lowering blood glucose level on the Streptozotocin induced diabetic rats even though the result showed that stevia and chia Seed have the ability to reduce fasting blood glucose in diabetic rats. The p-value is > 0.05. Thus the result is not significant. This study suggest that the stevia and chia seed possess hypoglycaemic properties on diabetic rats. As a conclusion, there is no significant different effect between *Silvia Hispanica L.* (Chia seed) and *Stevia Rebaudiana Bertoni* in lowering blood glucose level on the Streptozotocin induced diabetic rats.

Keywords: Chia seed, Stevia, Streptozotocin, Fasting blood glucose level, Diabetic

Effect of Apelin-13 on Sympathetic-induced Vasocontractile Responses in Porcine Splenic Arteries.

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Apelin, an endogenous peptide identified as a ligand of the G protein-coupled receptor APJ has been shown to regulate physiology and involves in pathophysiology processes of many body systems including the cardiovascular system. Recently, apelin has been demonstrated to be released by perivascular adipose tissue (PVAT), a layer of fat which plays an important role in controlling vascular tone. Furthermore, there is a growing body of evidence that PVAT is innervated by sympathetic nerves. However, the interaction between apelin-derived PVAT and sympathetic neurotransmission within PVAT is unknown. Hence, the present study investigated the effect of exogenous apelin-13 treatment on sympathetic perivascular neurotransmission. Porcine splenic arteries (PSAs) were collected and then prepared in two conditions, one with intact PVAT and the other with PVAT removed. The arteries were placed in organ baths containing Krebs-Henseleit buffer maintained at 37°C (gassed constantly, 95 % O₂, 5 % CO₂) and subjected for isometric recording experiments. The responses to EFS (1-20 Hz, 50-100 mA, 1-3 ms, 30 s) were determined after assessing the viability of the arteries with two challenges of 60 mM potassium chloride. Apelin-13 (0.01 µM) was added into the organ bath for a duration of 30 min after the first FRC was completed. Two-way ANOVA with Bonferroni post-hoc test was conducted using GraphPad Prism (version 6). In both preparations, apelin-13 significantly inhibited neurogenic contractile responses of PVAT-intact preparations (P<0.001) and PVAT-denuded preparations (P<0.0001) at 20 Hz. The present data suggest that apelin-13 appears to inhibit sympathetic neurotransmission within PVAT, thus leads to vasorelaxation. Further investigation to determine whether the apelin-potentiated vasorelaxation involves a pre-and/or postjunctional mechanism is warranted.

Keywords: Apelin-13, Perivascular adipose tissue, Sympathetic neurotransmission, Porcine splenic artery

Evaluation of Pomegranate (*Punica Granatum*) Juice on Thrombotic-induced Rat Model.

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Thrombosis is a disease which leads to thrombus development and arterial diseases associated with myocardial infarction, anoxia, hypertension, stroke and venous thromboembolic disorders that accounts for a considerable number of deaths worldwide. The formed clot within the vessels are dissolved using thrombolytic agents but however these drugs have certain limitations which cause serious and sometimes fatal consequences. These shortcomings have paved the way to find alternative natural sources that may act as a thrombolytic agent or a preventative agent against thrombus formation. Thus the purpose of this study was to evaluate the thrombolytic potential of pomegranate (*Punica granatum*) juice. This study uses female rats (n=4) which were divided into normal, treated and control groups. Pomegranates were obtained from the local market and the pulps of the fruits were removed and squeezed to obtain fresh juice daily. The juice was fed to treated groups at 20 ml/kg orally for 4 weeks. At the end of the 4th of week of treatment, coagulation parameters such as Prothrombin Time (PT), Activated Partial Thrombin Time (APTT) and Thrombin Time (TT) were measured. Ligation of the Inferior Vena Cava was done to assess clot weight and is observed histologically. Lipid, kidney and liver profile along with hormonal studies were evaluated using spectrophotometry and ELISA kits. The results from these studies showed a significant time increase in coagulation studies along with significant increase in anti-oxidant activity. Hormonal changes were observed in rats treated with extract whereby significant increase of estradiol is observed at (p<0.05), however biochemical parameters revealed no significant changes in values when compared to normal groups. Histological appearance of the ligated Inferior Vena Cava showed a reduction of clot size in treated groups and overall reductions in clot weight were observed between treated and non-treated groups. Our study concludes the beneficial effects of pomegranate extract that may serve as a supplementation in preventing hyper-coagulation and in the maintenance of general well-being.

Keywords: *Punica granatum*, Thrombotic-induced rat model

Chronic Periodontitis and its Correlation with Socio-Demographic and Oral Health Parameters: A Retrospective Study in Adult Population.

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Chronic periodontitis is the second most common oral disease worldwide. It is a multifactorial disease with bacterial plaque as the necessary factors but other factors such age, systemic conditions and social habits do play a determining role in the development of periodontitis. Therefore this study evaluated the correlation between severity of chronic periodontitis with a series of socio-demographic background and clinical variables. This was a retrospective, observational study of chronic periodontitis population that attended IIUM Dental Clinic from the year 2014 to 2017. The data was extracted from patients' case records systematically using structured data extraction form. Only case records with full clinical history and periodontal charting were undertaken as samples. IBM SPSS-24 was used for data analysis. χ^2 and Man Whitney U test was applied to infer the above relationship. Over 4 years, 157 adults were diagnosed with chronic periodontitis, which comprised of 68.8% suffered with severe form. The mean age group was 48.6 ± 11.55 with majority of them were Malays, male ($p < 0.05$), and aged between 50 to 64 years old. Professional workers, those suffered with systemic diseases and were addicted to tobacco exhibited more severe disease though statistically not significant. Patients with moderate and severe chronic periodontitis showed greater plaque deposits and have deeper periodontal pockets than mild form ($p < 0.05$). They also presented with more tooth lost. Severe chronic periodontitis was prevalent in the studied population. The clinical and socio-demographic characteristics showed non-significant correlation except gender, plaque control levels, and number of deep sites showed significant correlation with severity of the disease. Future study should consider to include more sample size from multicenter population.

Keywords: Chronic periodontitis, Socio-demographic, Periodontal parameters

Assessment of Different Self-care Monitoring Guides to Improve Oral Hygiene.

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Patients have difficulties in monitoring their oral hygiene at home. This study aimed to assess whether take-home disclosing tablets and recent plaque score chart can assist in monitoring and improving one's oral hygiene. A quasi experimental study was conducted among 30 volunteers in Kuantan, Pahang. Subjects were divided into three groups: control (A) ($n=10$), chart (B) ($n=10$) and tablet(C) ($n=10$) groups. At baseline, all subjects were given Oral Hygiene Instructions (OHI). Subjects in group B were given their own recent plaque score charts, meanwhile group C were given disclosing tablets as oral hygiene monitoring guides at home. Percentages of surfaces with cervical (PS) and more than one third of plaque retention ($>1/3$ PS) were recorded using adapted O-Leary Plaque Score at baseline and 4-weeks review.

All subjects had high PS at baseline (Mean PS 71.6%, SD 10.6%). After 4 weeks, PS and $>1/3$ PS reduced significantly in group A ($p < 0.01$, 0.03) and C ($p < 0.01$, < 0.01). However no difference was detected in group B in both PS and $>1/3$ PS ($p > 0.05$, $p > 0.05$). When compared in reduction percentage among groups, no significant difference was detected in PS percentage reduction between all groups ($p > 0.05$). However, group C had significantly higher percentage reduction of surfaces with $>1/3$ PS than group B ($p = 0.04$). Disclosing tablets was more effective than chart in reducing surfaces with more than one third plaque retention. Therefore, this study gives some evidence that take-home disclosing tablets may assist in monitoring oral hygiene at home.

Keywords: Disclosing tablet, Plaque score, Chart, Monitoring guide, Oral hygiene

P47***Awareness of Adjunctive Management in Periodontal Diseases.***

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Periodontal disease is a disorder of the tissues surrounding and supporting the teeth caused by groups of specific microorganisms. Local antimicrobial appears as attractive agent to halt the disease progression. The objective of this study is to assess the present status on the use of local antimicrobial in periodontal diseases management. This study was a cross-sectional study among periodontists in the national universities. Self-administered online questionnaires were distributed through email. Ethical approval was obtained. The data was analyzed by using Statistical Package for Social Sciences (SPSS) Version 21 using Chi-square test. A total of seventeen periodontists participated in this study. 53% of them were from government universities with professional experience less than 10 years. Most of the respondents practiced in Kuala Lumpur and Selangor (63%). Majority of them were aware about the availability of local antimicrobial in the country. All respondents agreed the importance of local antimicrobial as adjunctive management. However, 53% of the periodontists never use local antimicrobial in managing periodontal diseases. All respondents believed that local antimicrobial was an important adjunct to periodontal treatment. Most of them agreed on effectiveness of antimicrobial as adjunctive treatment in managing periodontal diseases. Majority of periodontists had awareness of adjunctive local antimicrobial in periodontal disease management.

Keywords: Awareness, Local antimicrobial, Periodontal disease

P48***The Causes of Tooth Loss among Women in Kuantan, Pahang, Malaysia.***

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The tooth loss is a primary public health problem. The tooth loss can be resulted from various causes. Many studies have been carried out world widely, which have been investigated the causes for this problem. The objective of this study is to assess the causes and patterns of tooth loss among women patients attending International Islamic University Malaysia (IIUM), Kulliyah of Dentistry Polyclinic which is situated in Kuantan, Pahang, Malaysia. This is a cross-sectional retrospective record review study. The patient's age, race and reasons of their tooth loss were retrieved from the records. Reasons of teeth loss and its relation to their age, race and total number of teeth loss among the women patients were analyzed using Chi-Square test. A total of 586 teeth were extracted. Dental caries was the main reason for 53.3% of tooth loss, followed by periodontal disease (15.7%) and other causes (10.4%). Reasons of teeth loss were significantly related with age and race ($p < 0.05$). Dental caries is the main causes for tooth loss among women patients attending IIUM Kulliyah of Dentistry Polyclinic. A further study should be carried out to verify the other factors such as medically co-morbidity; social-economic status; literacy of health education and awareness on available oral health services.

Keywords: Tooth loss, Causes, Pattern, Caries, Periodontal disease.

P49***Assessment of Diet Intake and its Association with Caries Experience among First and Second Year Students Kulliyyah of Dentistry, IIUM Kuantan******Salwana Supaat, Syarifah Haizan Sayed Kamar, Norsyazana Binti Zulkifli, Nurfatihah Binti Mohd Yussof****Kulliyyah of Dentistry, International Islamic University Malaysia (IIUM)*

Diet plays a major role in the etiology of caries disease. The correlation between several types of food group and caries had been previously studied. This research aimed to assess the association between the frequency and estimated amount of dietary sugar and dietary food groups intake with caries experience among first and second year IIUM dental students. A convenience sampling approach was adopted in this cross-sectional study. First and second year IIUM dental students were selected to fill in a 3-days diet diary form. Their DMFT score were recorded. The survey response rate was 83.3%. Statistical Package for Social Science (SPSS) version 18.0 was used for data analysis. The prevalence of having dental caries among the study participants is 54%. Their average DMFT index is 1.68. Majority of them have moderate consumption of sugary food and drinks. The highest mean of DMFT score in association to both frequency ($p < 0.05$) and estimated amount of sugar ($p < 0.05$) intake are found to be in the moderate consumption group. They take inadequate cereals and grains, fruits and vegetables, fish, legumes, milk and milk products. However, they take adequate meat and poultry as recommended by Malaysian Dietary Guideline 2010. All the dietary food groups have insignificant relationship to DMFT score ($p > 0.05$). The frequency and the estimated amount of dietary sugar intake have significant association to caries experience among first and second year students Kulliyyah of Dentistry, IIUM Kuantan. However, the dietary food groups intake shows no significant difference in relation to DMFT score among the students.

Keywords: Diet intake, Caries, Dental students

P50***Beverages Consumption Patterns among Highly Educated Youth in Malaysia.******Nur Islami Mohd Fahmi Teng¹, Aisyah Suraya Muhammad Shah¹, Norsham Juliana Nordin²****¹Faculty of Health Sciences, Universiti Teknologi MARA**²Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*

Studies have reported that the added sugar intake was highest among adolescents. High intake of sugar sweetened beverages (SSB) will contribute towards obesity and Type 2 Diabetes Mellitus. This study aims to determine SSB intake among highly educated young adult at urban areas in Malaysia. A total of 376 university students aged 18 to 30 years were recruited. A self-administered questionnaire was used to determine SSB consumption pattern. The questionnaire consists of five sections which include participants' background, knowledge about SSB, SSB preferences, frequency and also portion size. The highest daily consumption is plain water (92.3%), where majority of them drink more than two cups at each intake. Those who are overweight consumes greater amount of plain water each intake (79.8%) as compared to underweight ($p < 0.05$). Caffeinated drinks (coffee or tea) are the most popular SSB among the students (18.4%). Most students (79.7%) do not consume SSB on daily basis. To conclude, significantly higher intake of plain water among overweight students may reflect their intention for weight reduction. Further study on SSB intake among youth with different education background warrant serious attention in stratifying future risk of NCD.

Keywords: Sugar sweetened beverages, Educated youth

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Classical galactosemia (CG) is a rare inherited metabolic disorder due to a deficiency of galactose-1-phosphate uridylyltransferase (GALT) in galactose metabolism. This leads to accumulation of total galactose (TG-combination of galactose and galactose-1-phosphate) in blood. To date, no comprehensive study had been performed on the prevalence of CG in Malaysia. The aim of this study was to estimate the prevalence of CG in Malaysian population. Prevalence was defined as the number of CG patients alive on December 31, 2017 amongst all CG patients diagnosed since 2008. Diagnoses were based on quantitative determination of total galactose by fluorometric method and assays of GALT activity by Perkin Elmer kit. Suspected patients were confirmed for the common mutation in GALT gene using PCR-based assays. During the 10-year study period, 12,399 of newborn and high risk of galactosemia patients (7,239 male; 5,302 female) were screened with mean age of patients was 145 days $\pm$ 4.91. Majority of patients were Malay race (64%) followed by 15.2%, 4.4% and 16.5% from Chinese, Indian and others ethnicity respectively. Most of the samples were received from government hospital. A total of 135 patients had biochemical abnormality either TG elevated or low level of GALT. It was noted that 7/135 patients were suspected of having CG (elevation of TG and low level of GALT) and only three patients of them had positive mutation analysis. The calculated prevalence of CG was estimated 1 in 344,334 in the Malaysian population, comparable with Korean population (1 in 158,126). This probably due to the unique genetic makeup in Malaysia as galactosemia is more notable among African-Americans. In conclusion, our findings revealed that CG is rare in Malaysia as well as other Asian populations.

Keywords: Classical galactosemia, Malaysian population

Ummu Atiyyah Hasan, Suhaily Mohd Hairon, Aziah Daud, Najib Majdi Yaacob, Anees Abdul Hamid, Norzaihan Hassan, Mohd Faiz Ariffin, Lau Yi Vun

Universiti Sains Malaysia

The number of home-generated medical sharp waste is reported to be escalating, and mainly contributed by Type 2 diabetic patients who use medical sharps on a consistent basis in the community. This study aims to identify the various methods of sharp disposal among Type 2 diabetic patients in Kelantan. This cross-sectional study was conducted between February and April 2018 involving 304 randomly selected Type 2 diabetic patients who were on insulin therapy attending selected health clinics in Kelantan. Participants were interviewed using a validated questionnaire and their methods of sharp disposal were described as number and percentage. Out of 304 respondents, 37.8% of them threw into domestic bin, 20.7% buried in the ground, 34.5% burned, and another 3.0% of them either threw into river, bush, or unused well. Only 11.5% of respondents brought their used sharps to be disposed at healthcare facilities. Most of them used improper container to hold the used sharps, which include plastic bags (47.4%), mineral water bottle (8.2%), paper bag (2.0%) and metal container (2.0%). Only 9.9% of respondents used proper heavy-duty plastic container to hold the sharps prior to disposal. Majority of Type 2 diabetic patients do not practice proper sharp disposal methods, thus imposing the risk for disease transmission and environmental pollution in the community. Therefore, a proper community sharp disposal programme need to be initiated.

Keywords: Community, Sharp disposal, Diabetes Mellitus

P53***Knowledge, Attitude, and Practice on Non-communicable Diseases (NCDs) Among Urban Adult Population in Negeri Sembilan, Malaysia.******Muslimah Ithnin, Mohd Dzulkhairi Mohd Rani, Norsham Juliana Nordin, Nadeeya Ayn Umaisara Mohamad Nor, Nadia Mohd Effendy, Mohd Azmani Sahar, Khadijah Hasanah Abang Abdullah, Muhammad Shamsir Mohd Aris****Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*

Studies assessing the level of knowledge, attitude, and practice on Non-communicable diseases (NCDs) among the general population are still insufficient in literature. This study aimed to assess the baseline levels of knowledge, attitude, and practices of the adult general population of the urban area of Malaysia towards NCD. A suitably designed and validated KAP questionnaire was administered and responses were coded and analyzed. This survey involved 207 respondents from the urban area of Ampangan, Negeri Sembilan with an average age of 53.52 (SD: 17.857). Seventy-six (36.7%) were males and 131 (63.3%) were females. Majority of the respondents had a good knowledge (81.2%) and attitude (53.1%) towards non-communicable diseases. However, only 8.7% of the respondent has a good practice with majority had moderate (56.5%) score towards NCD. Older age category more than 40 year old had better knowledge score [25 (4) vs 23 (5), $p=0.001$]. Female had a higher attitude [25(7) vs 56 (6), $p=0.025$] and practice [5(2) vs 5(3), $p=0.007$] score compared to male. Respondents with the disease of hypertension [25(4) vs 24(5), $p=0.002$] and diabetes mellitus [25(4) vs 24(4), $p=0.014$] had higher knowledge score compared to non-diseases respondent. The findings of this study depicted that respondents in urban area had a good knowledge and attitude towards non-communicable disease. However, the practice was moderate. Repeated reinforcement with health education will definitely bring about a positive change in urban general population knowledge towards NCD, especially in younger and non-disease population

Keywords: KAP, Non-communicable diseases, Adult population

P54***Work-related Musculoskeletal Disorder (WRMSDs) in Female Teaching Profession: Prevalence and Impact.******Dang Anom BMR, Nor Emera Erliza BN, Nurjihan Kam BZK, Siti Zainab BZ, Nurfarah Nadia BR, Nur Azma BA****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Number of evidences shows that Work Related Musculoskeletal Disorder (WRMSDs) are common among teaching professionals. This study aimed to investigate the prevalence and impact of WRMSDs among teachers in the Kajang, Selangor. A cross-sectional study was conducted among female secondary school in Kajang district using the Malay translated self-administrated questionnaire. The validated Malay version of the Standardized Nordic Musculoskeletal Questionnaire (M-SNMQ) was used to estimate the prevalence and impact of WRMSDs. The socio-demographic and occupational information were also obtained from the female teachers. A total of 150 out 243 female teachers submitted the completed questionnaire (response rate 61.7%). The study indicated 59.3% of the studied population suffered of WRMSDs for past 12 months. Of these, shoulders was the most prevalent site (38.7%) followed by knee (38.0%) whereas, least complaint was received for elbow (8.7%) with majority of them claimed experienced of mild pain due to the disorders of level of pain was mild pain. High prevalence of WRMSDs was reported among female secondary school in Kajang, Selangor

Keywords: WRMSDs, Prevalence, Teachers

A Narrative Review of Occupational Stress Prevalence and Its Predictors among Selected Working Populations in Malaysia.

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Occupational stress is a modern epidemic. Prevalence and predictors of occupational stress in specific workforce are critical in justifying the type of intervention. The aim of this review is to explore the current prevalence of occupational stress and its predictors among selected Malaysian working population based on published articles from 2008 to 2017. Methods: A systematic search of articles published between 2008 and 2017 was conducted in several databases (ISI Web of Knowledge, PubMed, Scopus, Medline, Google scholar). A total of eleven articles met the inclusion criteria, included in the review. The current prevalence of occupational stress was between 6.0 % to 71.7 %. Mean prevalence of stress was 29.9%. From eight job categories, most stressful job was primary teachers and least stressful job was academican in private university. Predictors of occupational stress were: 1) organizational factors: high job demand, poor workplace condition, lack of organization support, job insecurity, long working hours, burden of career development and interpersonal conflicts 2) individual (extra- organization) factors: gender, age, marital status, number of children, coping strategies. Although the predictors of occupational stress vary among different job categories, most job categories present similar risk factors such as high job demand, poor workplace condition, lack of organization support, job insecurity, long working hours, burden of career development and interpersonal conflicts. Dual approaches involving organization and individual level pertaining towards each stressor are recommended in alleviating occupational stress among those selected workforces.

Keywords: Occupational stress, Prevalence, Predictors, Malaysia

Sero-Prevalence of Leptospirosis among Ruminant Livestock and Farmers in Kuala Lumpur and Selangor, Malaysia (2016-2017).

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Leptospirosis in humans is of great concern worldwide. Ruminant livestock and farmers are well known secondary hosts for pathogenic leptospira. This illness among livestock animals predispose the farmers to disease as well as subjected to economic loss. Ill-defined early clinical manifestations and time consuming laboratory confirmation rather delays effective antibiotic initiation. The objective of this study is to determine the seroprevalence of leptospiral antibodies and distribution of serovars among ruminant livestock including trapped rodents and farmers from various localities in Kuala Lumpur and Selangor, Malaysia. A total of 191 ruminant livestock of different age, sex and species were sampled from 14 farms located in Kuala Lumpur and Selangor, Malaysia. Dairy cattle (n=91); beef cattle (n=37) and goats (n=63). An addition of 29 sera from consented farmers and 26 sera from trapped rodents were collected. Leptospiral antibodies were screened and quantified in these sera via microscopic agglutination test (MAT). Any sample titre that is ≥ 100 , to any serovars/serotypes, was considered positive for leptospirosis infection. The leptospirosis seroprevalence detected amongst ruminant livestock animals: highest was beef cattle-97.3%, followed by dairy cattle-80.2%, and goats-54%. Seropositivity among farmers was 75.9% and trapped rodents were 11.5%. Sejroe/Hardjoprajitno was the predominant serotype of leptospira observed among ruminant livestock. Whereas Sejroe/Hardjoprajitno, Icterohaemorrhagiae/Copenhageni and Australis were predominant serotype found among farmers. The results indicate the endemic nature of leptospirosis across ruminant livestock and close-contact workers such as farmers are at risk of infection. The zoonotic nature of leptospirosis among ruminant livestock further adds significance to prevention of disease as the pathogenic Leptospira are readily available in the environment.

Keywords: Leptospirosis, Ruminant livestock, Farmers

P57***Seroprevalence of Leptospirosis in Rodents and Stray Dogs in Wet Markets of Selangor and Wilayah Persekutuan (2016-2017).******Nur Nadia, Mohan Rao****Institute for Medical Research, Jalan Pahang, Kuala Lumpur*

Leptospirosis is a widespread zoonotic disease caused by spirochetes of the genus *Leptospira*. Rodents and dogs are well known hosts for leptospirosis. Rodents are the primary hosts for leptospirosis while dogs usually transmit the disease as secondary hosts. These infected animals may not have any symptoms, but they can be carriers. A study was conducted with an objective of assessing the seroprevalence of leptospirosis among rodents and stray dogs in wet markets of Selangor and Wilayah Persekutuan. Serum samples from rodents (n = 144) and stray dogs (n = 47) were collected and tested by the microscopic agglutination test (MAT) using 24 *Leptospira* serovars. Any sample titre that is ≥ 100 , to any serovars was considered as positive for leptospirosis infection. Seroprevalence was recorded at 36.8% in rodents and 31.9% in stray dogs. The highest seroprevalence was observed for serovar Malaya and LEP 175 Sarawak for rodents whereas serovar Bataviae and Icterohaemorrhagiae/Copenhageni for stray dogs. The study showed that there is presence of seroprevalence in rodents and stray dogs at the wet markets. The unhealthy environment of the wet market helps in the reproductivity of rodents and stray dogs that will lead to favourable transmission of leptospirosis.

Keywords: Leptospirosis, Rodents, Stray dogs, Wet markets

P58***The Benefits of Mentha Species.******Ibtisam Abdul Wahab, Muhamad Zafri Abdul Karim, Hannis Fadzillah Mohsin****Department of Pharmacology & Chemistry, Faculty of Pharmacy, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor Darul Ehsan, Malaysia*

Mentha, which is known as mint, is a genus of the Lamiaceae plants. It is regarded as a traditional medicine. The aim of this study is to obtain knowledge on *Mentha* species, including their pharmacological properties, via literature reviews. Based on the publications, *Mentha* species have three different pathways; which are menthol, carvone and linalool pathway. These pathways determine that the respective compound will be in its highest composition. The benefits of *Mentha* are huge, especially *Mentha piperita*. *M. piperita* is reported having antibacterial activity, even to the multi-drug resistant ones. The extracts have good antibiofilm properties, too. Both *M. piperita* and *M. spicata* are described having good antioxidant characteristics, comparable to ascorbic acid. The essential oil of *M. piperita* could be extracted and subjected to gas chromatography – mass spectrometry (GC-MS) for chemical composition analyses. The constituents could also be qualitatively analyzed by performing colour reaction tests. It is hypothesized that the chemical composition will vary between *Mentha* species, however menthol composition will be the highest, due to the reported menthol pathway in *M. piperita*. The natural components of *M. piperita* would include the terpenoids. Hence, the test for terpenoids could mostly provide positive results in the phytochemical screening. In conclusion, *Mentha* have many health potentials. *Mentha* usage and benefits would not be ignored, and should the research on these plants continues, new drug potentials could be certainly discovered.

Keywords: *Mentha*, Pharmacology, Phytochemistry

P59***Awareness on the Importance of Infant Immunization among UniKL RCMP Staffs.***

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Although infant immunization has been proven to be effective in preventive care, still there are parents who find it difficult to decide on their child's vaccination program. Study of parents' knowledge, attitude and practice (KAP) on the subject is important in recognizing the needs and issues they have on the matter and the main reason for not vaccinating. A cross-sectional study was carried out among the non-medical staff of UniKL RCMP in December 2016. A set of questionnaire was given to the targeted 62 respondents. Data were analyzed using SPSSv.11 and Chi-Square test was done to confirm the association of age group, education level and religious belief with the respondents' level of KAP. Respondents showed a good level of KAP (67.7% on knowledge, 87.1% on attitude, 51.6% on practice and 66.1% on overall KAP) on the importance of infant immunization. There was a statistically significant ($p < 0.05$) association between respondents' level of education with their level of KAP on infant immunization. The higher the education level, the better the KAP level. Reasons for vaccination refusal among respondents are due to concern about the safety and side effects of vaccines, the high cost of vaccines, and the perception that vaccine-preventable diseases are not life-threatening and can be treated easily. These findings suggest that parents are not completely against the idea of infant immunization, however they are concerned about the safety and side effects of vaccines, as well as the ingredients, which may be due to either misconception or not well-informed about it. It is important for parents to get reliable and accurate information regarding infant immunization from the health care professionals and other reliable sources.

Keywords: Infant immunization, Awareness, Vaccination

P60***Prediction of Severe Accident Occurrence in Radiation Laboratory Using Fault Tree Method.***

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This paper reviews the prediction of severe accident occurrence in radiation laboratory using fault tree method. Accident can be happened everywhere either near-miss or not. Accident includes any unintended event including operating errors, equipment failures or other mishaps and the consequences or potential consequences of which are not negligible from the point of view of protection and safety. The primary benefit of fault tree (FT) method is it provides a unique insight into the operation and potential failure of a system. The FT process may lead to a single component or material that causes many paths to failure thus improving that one element may minimize the possibly of many failures. Besides that, by using the logic of a detailed failure analysis and suitable tools, FT helps the system focus on the causes of each event in a logical sequence that leads to the failure.

Keywords: Fault Tree Method, Radiation Laboratory, Severe Accident

The Level of Physical Activity, Screen Time, Body Fat and Serum Lipid across Body Mass Index (BMI) Among Young Female Adults.

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Advancement in technology has promoted a current lifestyle that increases in physical inactivity and sedentary life. This situation may cause obesity, an important risk factor for diseases such as dyslipidemia and coronary artery disease. This study was conducted to evaluate the level of physical activity, screen time, body fat percentage and serum lipid profiles across body mass index (BMI) among young female adults. A total of 22 female individual aged 19-23 years consented and recruited in this study. Level of physical activity and screen time were determined using Global Physical Activity Questionnaire (GPAC), BMI and body fat percentage were calculated using body fat analyzer and serum lipid profiles (total cholesterol and HDL) was analyzed using spectrophotometry. From total participants, 13.6% was categorized as underweight, 40.9% normal, 31.8% overweight and 13.6% obese. Briefly, mean (SD) of body fat (%) was 29.7 (5.1) and HDL (mg/dL) was 56.9 (9.8). Median (IQR) of screen time (minutes) was 284.0 (214) and total cholesterol (mg/dL) was 179.8 (78.3). Only 9 (40.9%) respondents were identified as physically active. A significant strong positive correlation between BMI to body fat ($r=0.881$, $p<0.001$) and strong negative correlation ($r=-0.730$, $p<0.001$) between BMI and HDL were observed. There was no significant association between BMI to physical activity, screen time and total cholesterol level. As a conclusion, majority of the respondents were physically inactive regardless of their BMI status. Increase of BMI was associated with increased body fat and decreased HDL but not associated with physical activity level and screen time

Keywords: Body Mass Index, Female

Effect of Trigona Honey on Biochemical Parameters, Oxidative Stress and Brain Histopathological Structure in Streptozotocin-induced Diabetic Rat.

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Diabetes mellitus known as a disease that related to a condition such as hyperglycemia and caused many complications. This condition occurs because of defects in insulin secretion, action or both. The aim of this study was to determine the effect of *Trigona honey* (Kelulut honey) on fasting blood glucose level, insulin level, body weight and lipid profile in streptozotocin-induced diabetic rats. The Sprague-Dawley rats were divided into three group which are control group (n=4), untreated group (n=6), and treated group (n=4). Diabetes was induced with streptozotocin (80mg/kg body weight) and nicotinamide (100mg/kg body weight) intraperitoneally. Diabetic rats in treated group were administrated with Trigona honey (10ml honey/kg/5ml of distilled water) by oral gavage for three weeks. STZ significantly increased the blood sugar level ($24.8\text{mmol/L} \pm 3.2$) ($p<0.005$), triglyceride level ($115.20\text{mg/dL} \pm 25.73$) ($p<0.05$), reduced body weight ($245.05\text{g} \pm 15.56$) ($p<0.005$) and insulin level ($0.34\text{ng/ml} \pm 0.11$) (0.005) in diabetic rats. In histopathology study, the results showed there is an observable difference between the three groups while nissl staining showed significantly lower number of living cell in untreated group. Insufficient of insulin production or action could increase fasting blood glucose level and reduced of body weight. Lipid abnormalities such as hypertriglyceridemia and elevated of LDL cholesterol level usually occur in diabetes. Honey had been proven as an antidiabetic effect that can control blood glucose level and management of diabetic complications. *Trigona honey* helps to reduce blood glucose level, triglyceride level, increase body weight and insulin level. Due to the short duration of treatment, the study was unable to obtain.

Keywords: Biochemical parameters, Oxidative stress, *Trigona honey*

An Ergonomic Assessment of the Musculoskeletal Disorder among Bag Handlers at Airport: A Case Study in Malaysia.

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Flight baggage handler needs special attention and solutions to musculoskeletal disorder issue. This issue needs to be highlighted since aviation industry in this country is growing up and it needs an efficient working practice that is able to smooth out the entire operation. This study aims to identify whether heavy lifting is associated with musculoskeletal disorders among baggage handlers. This study also was being done to determine whether age is a factor for the prevalence of lower back pain among baggage handlers. The main collecting data method applied in this study was the application of Nordic Musculoskeletal Questionnaire (NMQ), daily observation and informal interviews. Result shows that the majority of bag handlers in the study area have musculoskeletal disorder (MSD) problem caused by the daily routine work. The most affected body parts of these workers are lower back, upper arm and shoulder. Prevention of MSD in the workplace requires strong commitment between the employer and employees in any organization. The employer is fully responsible in providing a safe workplace, sound ergonomic principle and proper training for all employees

Keywords: Airport, Bag handlers, Musculoskeletal disorder

Depression, Anxiety, Stress and Its Factors among Fire and Rescue Department Malaysia Personnel: A Preliminary Study.

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Emergency responders are at greater risk of injury and death than most other professions. Multiple factors faced by them should be identified as they are most vulnerable to depression, anxiety, and stress, which may resulted to adverse health impacts. To the researcher's discernment, no study has been made towards Fire and Rescue Department Malaysia (FRDM) responders. The objective of this study to provide preliminary studies in identifying the depression, anxiety, and stress among FRDM responders and its correlation towards the factors contributing to it. A total of 47 respondents from FRDM Kajang Station, Selangor were evaluated using questionnaire from DASS-21 and NIOSH-GJSQ to evaluate depression, anxiety, stress level and its factors. Findings indicate that 40.4% of responders to have an above than normal level of depression, anxiety, and stress. "General health", "social support from supervisor" and "job satisfaction" factors are found to be the contributing factors to the depression, anxiety, and stress amongst FRDM responders. The evidences also suggested that, social supports from co-worker, family and colleagues may assist in managing depression, anxiety, and stress. Finally, this study presents several recommendations in pursuing a more detailed study among FRDM responders

Keywords: Emergency, responders, Depression, Anxiety, Stress

P65***Prevalence of Cryptosporidium Oocysts on Vegetables Collected from Rural Market in Selangor, Malaysia.******Mehru Nisha, Nur Atikah Amira, Nurul Nadiyah, Ahmad Shakir Mohd Saudi, Norhaida Che Azmi, Fabian Davamani****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

Cryptosporidiosis is a zoonotic protozoan parasite diseases caused by coccidial species of the genus *Cryptosporidium*. Oocysts from this parasite can be found and transmitted to human via contaminated raw vegetables, fruits and water. Hence, this study was carried out to investigate the presence of *Cryptosporidium* oocysts in vegetables collected from rural market in Selangor, Malaysia. The study was carried out from May (dry season) until October 2017 (wet season). Approximately 250 grams of fresh leafy vegetables such as centella (*Centella asiatica*), water spinach (*Ipomoea aquatica*), celery (*Apium graveolens*), spring onion (*Allium fistulosum*) and Vietnamese coriander (*Persicaria odorata*) were collected separately and investigated for *Cryptosporidium* oocysts using microscopic technique. Among all of the collected vegetables, water spinach (*Ipomoea aquatica*) showed presence of *Cryptosporidium* oocysts during wet season. Findings of this study depict the possibilities of this vegetable in the transmission of cryptosporidiosis among the consumers. Future study is needed to explore more vegetables from rural markets in Selangor to detect the presence of *Cryptosporidium* parasites as a public health safety precaution.

Keywords: Environmental contamination, *Cryptosporidium* oocysts, local vegetables, Malaysia, water spinach

P66***Study of Heavy Metals Concentration in Vegetables at the Market That Being Consumed by Malaysian: Case Study in the District of Kajang, Selangor.******Zakaria Hamid, Ahmad Shakir, Siti Haizum Hamdi, Nur Zahidah Shafii****Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH), 43000 Kajang, Selangor, Malaysia*

According to scientific researches, there are many evidences that fruits, cereals and vegetables that can prevent disease and make human healthy. This is because fruits, cereal and vegetables rich in mineral salt, vitamins, carbohydrate as well as protein. They also help in increase the meals quality and very great for dietary and nutritional purposes. It is believed that these types of food can cure and help as barrier against infectious agents that can cause illness. However, some of contaminants such as pesticides or fertilizer can cause toxic contaminants to these types of foods. The using of chemical pesticides that contain heavy metal may be leach in crops and cause environmental toxicants to the plants. For many years, landfills have been one of the most comprehensive forms of disposal of municipal solid waste due to the operative easiness and the low economic cost. Landfill material contains organic matter and plant nutrients such as nitrogen and phosphorus which is good for fertilizing agricultural soils. These inorganic fertilizers are expensive and will induce the tendency of people to take the soil from landfill sites for their agricultural activities especially for farmers whom cannot afford to buy the fertilizer. Landfill site contains heavy metals, which could accumulate in the agricultural fields where the landfill material is applied. Moreover, landfill sites also contain an amount of organic and inorganic pollutants include plastics, metals, glasses, fibers and heavy metals which can pollute the agricultural soils in the long term of period. Although these considered as pollution problems, there are still no awareness exists on the potential risk of invisible pollutants like heavy metals. This research was intended to determine the heavy metal concentration in vegetables, cereals and fruits.

Keywords: Heavy metals, Market, Kajang, Vegetables

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Johor has been hit by series of storms generated by Northeast Monsoon caused severe floods in its region. On 2017, National Disaster Management Agency (NADMA) listed Mersing-Kluang as one of the flood-prone area since the pattern of flood across this district has been changing becoming more frequent and unpredictable. The objective of this study is to determine the correlation of selected hydro-logical variables, to determine the significance factors to flood occurrence, to propose the control limit system for flood and to establish new flood risk index model in Lenggong River Basin based on secondary data derived from Department of Drainage and Irrigation (DID). The Application of Chemometric technique such as Spearman's Correlation Test, Principle Component Analysis, Statistical Process Control and Flood Risk Index created the most efficient results. Result shows water level has strong factor loading of 0.78 and is the most practicable variables to be used for the flood warning alert system. The Upper Control Limit (UCL) for the water level in study area is 33.23m and the risk index for the water level been set by the constructed formula of flood risk index consisting 0-100. The results shows 20.6% classified as High Risk Class with a risk index range from 70 and above. Thus, this findings are able to facilitate state government to come out with a comprehensive plan of action in strengthening the flood risk management at Lenggong River basin, Johor.

Keywords: Flood risk index, Chemometric technique PC, SPC, Future Prediction, Lenggong River Basin

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This study focusing on determining lead and cadmium concentrations in fish from Penchala River and compared it with permissible limit by Malaysian Food Act 1983 and Food Agriculture Organization 1983. Water pollution especially heavy metal pollution is becoming one of the major environmental issues in Malaysia. Heavy metal pollution can be harmful to human's health whereby the prolong exposure to the heavy metals can develop a serious disease and illness. The rapid growth of human population and industrial development caused in heavy metal pollution in river and it is become one of environmental concern nowadays. The pollution of heavy metals in the river is the nonpoint source pollution and it can occur from various sources such from industrial activities, agriculture and others. This experimental study involved three different species of *Clarias gariepinus*, *Oreochromis mossambicus* and *Pangasianodon hypophthalmus*. Fish catchment using random sampling method, while for determination of lead and cadmium concentration, samples were taken from three different parts of fish and analyzed in laboratory using Spectrophotometer. The mean concentration of lead for three species showing muscle part 1.43mg kg⁻¹(0.44) was not exceed the permissible limit (2.00mg kg⁻¹). Cadmium concentration showed with mean of 0.51mg kg⁻¹ (0.079) in liver which slightly exceeding the permissible limit (0.50mg kg⁻¹) by Malaysian Food Act 1983. In conclusion, the level of lead and cadmium concentration in Penchala River was become concerned to human health threat.

Keywords: Metal concentration, Lead, Cadmium, Penchala River

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Water is an essential element that is used to sustain the life. It is dangerous to consuming the water straightly if the water is vulnerable towards poor sanitation environment. Thus, by evaluating the condition of the river, it can prevent the consumers from any health implication. Therefore, the bio-indicator freshwater algae and waterborne bacteria use to peruse the status of the river that located at Kampung Orang Asli in Gombak, Selangor. The study was carried out to determine the presence of *Salmonella sp* and *Vibrio Cholera* bacteria in the river. Besides, it also attempted to examine the level of organic pollution by using Palmer's Algal Index. All the samples are taken in 3 different weeks for 3 different sections. The traditional method is used for detecting both bacteria. Principally, the bacteria were cultured on simple and selective differential agar with a confirmation of biochemical test. While for perusing the level of organic pollution, the scoring index of algae is implemented. By assigning the index score to each genus that present in the water, the average score was calculated and the level of organic pollution is justified based on the scoring index. As the result, this river is conformably having a present of *Salmonella sp* while for bacteria *Vibrio Cholera*, it existent is absence. Moreover, with the score of Palmer's Algal Index 13.37, the river is significantly justified as moderately polluted with organic pollution. Hence, it can be concluded that the river water is unsafe for direct consumption as it has the presence of *Salmonella sp* bacteria, as well as the river also is moderately organic polluted.

Keywords: Freshwater algae, River Water quality, Waterborne bacteria

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(HONS.)**

OVERVIEW

This Bachelor of Environmental Health (Hons.) course is designed to prepare students for the technical and professional demands of careers dedicated to the protection of human health and environment. This course embraces broad environmental ethics through human cooperation with nature, including safe home and workplace, clean water supplies, safe and available food supply, waste management and careful resource management for the future. With the development rising and population growing, this Environmental Healthcare course should be able to produce highly specialized trained workforce equipped with knowledge on theory and practical aspects to protect the environment and the wellbeing of Malaysian citizens. This programme has been accredited by Chartered Institute of Environmental Health (UK) since 2012.

FINANCIAL ASSISTANT

HRDF Claimable
**subject to company levy contribution*

EPF WITHDRAWAL

PTPTN
**subject to PTPTN approval*

CREDIT CARD

ENTRY REQUIREMENT

- 1) Pass Matriculation / Pre-University / STPM programme or equivalent qualification with minimum GPA 2.33 in TWO of the following subject:
 - Biology
 - Physics / Mathematics
 - ChemistryOR
- 2) A-Level programme or equivalent qualification with minimum Grade D in TWO of the following subjects:
 - Biology
 - Physics / Mathematics
 - ChemistryOR
- 3) Recognized Diploma with minimum CGPA of 2.75 in related field; OR
- 4) Recognized Diploma with CGPA less than 2.75 in related field and minimum of 3 years (36 month) working experience in the related field.

ENGLISH REQUIREMENT

Local Student

Obtained MUET Band 3 or IELTS (5.5) / TOEFL (550)

International Student

Candidate should obtained IELTS (5.5) / TOEFL (550) paper-based or equivalent.

PROGRAMME STRUCTURE

SEMESTER 1
Fundamental English
Professional English 1
Tamadun Islam & Tamadun Asia (TITAS)
Technopreneurship
Cell Biology

SEMESTER 2
Basic Microbiology
Human Biochemistry
Human Anatomy & Physiology
Introduction to Environmental Health
Basic Occupational Safety & Health
Hubungan Etnik
Pengajian Malaysia 3 (International Students)
Professional English 2

SEMESTER 3
Principles of Psychology
Principles of Human Nutrition
Basic Human Genetics
Environmental Health Law
Communicable & Non Communicable Disease
Innovation Management
Mandarin 1

SEMESTER 4
Principle of Immunology
Air Quality Assessment & Control
Environmental Microbiology
Environmental & Occupational Management System
Pest & Vector Control
Mandarin 2
Isu-Isu Kontemporari Muslim di Malaysia
Culture and Lifestyle in Malaysia

SEMESTER 5
Scientific Communication
Biostatistics
Land Use and Housing
Industrial Hygiene & Ergonomics
Environmental Health Epidemiology
Co-Curriculum
Human Behavioral Science

SEMESTER 6
Food Hygiene & Technology
Water and Sewage Management
Waste Management
Environmental Toxicology
Radiation Protection
Final Year Project 1

SEMESTER 7
Environmental Health Education & Promotion
Environmental Impact Assessment
Environmental Health Risk Assessment
Final Year Project 2

SEMESTER 8
Industrial Training

***Additional Module (Credit not included in Total Credit to Graduate)
Bahasa Kebangsaan A

*credit transfer or exemption based on prior learning



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