<table>
<thead>
<tr>
<th>No</th>
<th>Publication</th>
<th>Page no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Abu Bakar Suleiman. Reflections on IMU’s success in the last two decades and the way forward into the third decade. <em>IeJSME</em>, 2013; 7(1): 21-23. (IF: 0.024; H-index: 1).</td>
<td>*</td>
</tr>
<tr>
<td>8</td>
<td>Agarwal R, Izehitsa I, Agarwal P, Spasov A. Magnesium deficiency: Does it have a role to play in cataractogenesis? <em>Experimental Eye Research 101</em>, 2012; 82-89. (IF: 3.013; HI: 74; Tier Q1).</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>Ahmed SI, Sulaiman SAS, Hassali MA, Christopher LKC. Assessing HIV and AIDS treatment safety and health-related quality of life among cohort</td>
<td>30</td>
</tr>
</tbody>
</table>


22 Barua A, Shuva D, Bani M, Passang CS, Milan T, Kumaraswamy K, Kumar GS, Rohit Kumar V, Muhammad Shahid I. Alcoholism among


32 Cho Naing, Mak JW, Kyan Aung, Wong JYR. Efficacy and safety of dihydroartemisinin-piperaquine for the treatment of uncomplicated Plasmodium falciparum malaria in endemic countries: Meta-analysis of...


57 Gupta ED, Sakthiswary R. Myocardial infarction false alarm: Initial electrocardiogram and cardiac enzymes. *Asian Cardiovascular & Thoracic Annals* (on line) published online 8 October 2013. (IF: 0.511; H-index: 14; Tier: Q3).


62 Hasan SS, Wong PS, Ahmed SI, Chong DWK, Mai CW, Pook P, Therese K. Perceived impact of clinical placements on students preparedness to provide patient-centred care in Malaysia. *Currents in Pharmacy Teaching and Learning, 2013; doi: http://dx.doi.org/10.1016/j.cptl.2013.01.010. (IF: 0.289; H-index: 3; Tier: Q4).*

63 Hasan SS, Wong PS, Ahmed SI, David CWK, Mai CW, Pook PCK. Perceived impact of clinical pharmacy placements on students’ preparedness to provide patient-centered care in Malaysia. *Currents in Pharmaceutical Teaching and Learning, 2013; 5(4): 303-310. CPTL: http://dx.doi.org/10.1016/j.cptl.2013.01.010. (SCI IF: 0.4; H-index: 3; Tier: Q2).*

64 Hassali A, Ahmadi K, Goh CY. A need to rethink and mold consensus in developing countries pharmacy education. *American Journal of


70 Ithoi I, Makmud R, Abdul Basher MH, Abdulsalam AM, Ibrahim J, Mak JW. Acanthamoeba genotype T4 detected in naturally-infected feline corneas found to be in homology with those causing human keratitis. Tropical Biomedicine, 2013; 30(1): 131-140. (ISI IF: 0.6; SJR SCIMAGO: 0.798; HI: 12; Tier: Q2).


76 Kew ST. Third Decade of Health professional education at the
International Medical University: Driven by the 3 I's of IMU. *leJSME*, 2013; 7(1): 24-28. (IF: 0.024; H-index: 1).


87 Kumaravadivel DT, Nor Azian AZ, Thiruselvi S, Abdul Aziz J. Case report: Left bundle branch block under general anaesthesia in an athlete’s heart. Med J Malaysia, 2013; 68(2). (IF: 0.43; H-index: 16; Tier: Q2).


90 Lee SY, Gan SN. The adhesion properties of natural rubber pressure-sensitive adhesives using palm kernel oil-based alkyd resins as a tackifier. Composite Interfaces, 2013; 20(3): 177-188. (ISI IF: 0.438).


103 Lu KTE, Ng MSS, Siew WF. Patient perception about preoperative information to allay anxiety towards major surgery. *IeJSME*, 2013; 7(1): 29-32. (IF: 0.024; H-index: 1).


105 Lum SK, Lee WR, Ch’ng SD, Balachandran NR, Tee CK. Opportunities for medical students to perform four common ward procedures in a Malaysian teaching hospital. *IeJSME*, 2013; 7(1): 10-14. (IF: 0.024; H-index: 1).


120 Nakamura Y, Taruno Y, Sugimoto M, Kitamura Y, Seng HL, Kong SM, Ng CH, Chikira M. The DNA binding site specificity and antiproliferative

121 Ng A, Ng E, Er HM. Anti-proliferative and mutagenic activities of aqueous and methanol extracts of *Elephantopus mollis*. *Journal of Science and Technology in the Tropics* 9, 2013; 157-167. (IF: N/A).


125 Nor Aini J, Poh BK, Chee WSS. Validity of a children’s physical activity questionnaire (cPAQ) for the study of bone health. *Pediatrics International*, 2013; 55: 223–228. (IF: 0.626); (SCI IF: 0.714; H-index: 36; Tier: Q2).


Journal Abstracts 2013

13


Rathbone MJ. Collaboration at the departmental, school, national and international levels at the International Medical University, Kuala Lumpur. *IeJSME*, 2013; 7(Suppl1): S57. (IF: 0.024; H-index: 1).


156 Shobana M, Saravanan C. Comparative study on attitude and psychological problems of mothers towards their children with developmental disability. *East Asian Archives of Psychiatry*, 2013; (in press). (SCI IF: 0.4; H-index: 2; Tier: Q4).


159 Siew KK, Gupta ED. Oral hyperpigmented lesions, a case study. *Australian Family Physician*, 2013; 42(7): 490-491. (ISI IF: 0.73; SCI IF: 0.857; H-index: 21; Tier: Q2).


Tan BS, Razak IA. Impact of water filters and consumption of bottled water on fluoride Intake. *Sains Malaysiana*, 2013; 42(1): 115–121. (JCR/SE IF: 0.268; Tier: Q3); (IF: 0.386, HI: 6; Tier Q3).


*Journal Abstracts 2013*

Teng CL, Wong CH. Does negative IgM dengue serology rule out dengue fever in an adult with fever for three days? *Malaysian Family Physician*, 2013; (in press). (IF: 0.143; H-index: 5; Tier: Q3).


Verma RK, Chua G, David SR. Obesity and overweight management in


189 Visunathan V, Somawera N, Koh KC. Neurocysticercosis. (Accepted for publication by Malaysian Family Physician on 12 August 2013). (SCI IF: 0.143; H-index: 5; Tier: Q3).


* Abstracts not available

**Tocotrienol-adjuvanted dendritic cells inhibit tumor growth and metastasis: A murine model of breast cancer**

Sitti Rahma Abdul Hafid^{1,2}, Srikumar Chakravarthi^{1}, Kalanithi Nesaretnam^{2}, Ammu Kutty Radhakrishnan^{1}.

^{1} Pathology Division, Faculty of Medicine and Health, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
^{2} Nutrition Unit, Malaysian Palm Oil Board, Bandar Baru Bangi, Selangor, Malaysia

**Abstract**

Tocotrienol-rich fraction (TRF) from palm oil is reported to possess anti-cancer and immune-enhancing effects. In this study, TRF supplementation was used as an adjuvant to enhance the anti-cancer effects of dendritic cells (DC)-based cancer vaccine in a syngeneic mouse model of breast cancer. Female BALB/c mice were inoculated with 4T1 cells in mammary pad to induce tumor. When the tumor was palpable, the mice in the experimental groups were injected subcutaneously with DC-pulsed with tumor lysate (TL) from 4T1 cells (DC+TL) once a week for three weeks and fed daily with 1 mg TRF or vehicle. Control mice received unpulsed DC and were fed with vehicle. The combined therapy of using DC+TL injections and TRF supplementation (DC+TL+TRF) inhibited (p<0.05) tumor growth and metastasis. Splenocytes from the DC+TL+TRF group cultured with mitomycin-C (MMC)-treated 4T1 cells produced higher (p<0.05) levels of IFN-γ and IL-12. The cytotoxic T-lymphocyte (CTL) assay also showed enhanced tumor specific killing (p<0.05) by CD8+ T-lymphocytes isolated from mice in the DC+TL+TRF group. This study shows that TRF has the potential to be used as an adjuvant to enhance effectiveness of DC-based vaccines.

**Effect of liners on microleakage in Class II composite restoration**

Normaliza Ab. Malik¹, Seow Liang Lin², Normastura Abd. Rahman³, Marhazlinda Binti Jamaludin⁴.

¹ Faculty of Dentistry, University Sains Islam Malaysia (USIM), Kuala Lumpur
² School of Dentistry, International Medical University, Kuala Lumpur
³ School of Dental Sciences, Health Campus, University of Science Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia
⁴ Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

**Abstract**

Four types of composite resins (Esthet-X-Denstply, USA, FiltekTMZ350-3M ESPE, USA, Beautifil- Shofu, Japan and Solare P-GC, Japan) were used and the lining were the Fuji IXGP (GC, Japan), the Beautifil flow (Shofu, Japan), the FilteXTMZ350 flow (3M ESPE, USA) and the Esthet-X flow (Denstply, USA). All the specimens were thermocycled and immersed in 0.5% basic fuschin dye for 24 h. The microleakage was scored using the ISO microleakage scoring system. The data were entered using SPSS version 12.0 and analyzed using STATA software programme. This study showed that none of the materials used in this study was able to eliminate microleakage. However, it was shown that the glass ionomer cement was better in reducing the incident of microleakage at the cervical margin. Among the flowable composite resin, FilteXTMZ350 flow showed less microleakage at the cervical margin.

**Keywords**: Cervical margin, class II cavities, flowable composite resin, glass ionomer cement, microleakage.

**Prevalence, predictors and clinical significance of *Blastocystis* sp. in Sebha, Libya**

Awatif M Abdulsalam¹, Init Ithoi¹, Hesham M Al-Mekhlafi¹,⁵, Abdul Hafeez Khan², Abdulhamid Ahmed³, Johari Surin¹, Joon Wah Mak⁴.

¹ Department of Parasitology, Faculty of Medicine, University of Malaya, Kuala Lumpur 50603, Malaysia
² Department of Parasitology, Faculty of Medicine, University of Sebha, Sebha, Libya
³ Department of Biology, Faculty of Natural and Applied Sciences, Umaru Musa Yar’adua University, Katsina, Katsina State, Nigeria
⁴ School of Postgraduate Studies and Research, International Medical University, Bukit Jalil, Kuala Lumpur 57000, Malaysia
⁵ Department of Parasitology, Faculty of Medicine and Health Sciences, Sana’a University, Sana’a, Yemen

**Abstract**

**Background:**

*Blastocystis* sp. has a worldwide distribution and is often the most common human intestinal protozoan reported in children and adults in developing countries. The clinical relevance of *Blastocystis* sp. remains controversial. This study was undertaken to determine the prevalence of *Blastocystis* infection and its association with gastrointestinal symptoms among outpatients in Sebha city, Libya.

**Methods:**

A total of 380 stool samples were collected from outpatients attending the Central Laboratory in Sebha, Libya for routine stool examination. The presence of *Blastocystis* sp. was screened comparing light microscopy of direct smears against in vitro cultivation. Demographic and socioeconomic information were collected with a standardized questionnaire.

**Results:**

The overall prevalence of *Blastocystis* infection was 22.1%. The prevalence was significantly higher among patients aged ≥18 years compared to those aged < 18 years (29.4% vs 9.9%; x² = 19.746; P < 0.001), and in males compared to females (26.4% vs 17.5%; x² = 4.374; P = 0.036). Univariate analysis showed significant associations between *Blastocystis* infection and the occupational status (P = 0.017), family size (P = 0.023) and educational level (P = 0.042) of the participants. Multiple logistic regression analysis confirmed that the age of ≥ 18 years (OR = 5.7; 95% CI = 2.21; 9.86) and occupational status (OR = 2.2; 95% CI = 1.02, 4.70) as significant predictors of *Blastocystis* infection among this population. In those who had only *Blastocystis* infection but no other gastrointestinal parasitic infections, the prevalence of gastrointestinal symptoms was higher compared to those without *Blastocystis* infection (35.3% vs 13.2%; x² = 25.8; P < 0.001). The most common symptoms among these patients were abdominal pain (76.4%), flatulence (41.1%) and diarrhoea (21.5%).

Journal Abstracts 2013
Conclusions: 
*Blastocystis* sp. is prevalent and associated with gastrointestinal symptoms among communities in Sebha city, Libya. Age and occupational status were the significant predictors of infection. However, more studies from different areas in Libya are needed in order to delineate the epidemiology and clinical significance of this infection.

**Keywords:** *Blastocystis*, Gastrointestinal symptoms, Sebha, Libya.

**Glaucomatous neurodegeneration: An eye on tumor necrosis factor-alpha**

Renu Agarwal\(^1\), Puneet Agarwal\(^2\).

\(^1\) Department of Pharmacology, Universiti Teknologi MARA  
\(^2\) Department of Ophthalmology, International Medical University, Malaysia

**Abstract**

Glaucoma, a neurodegenerative disease, is currently being treated by modulation of one of its primary risk factors, the elevated intraocular pressure. Newer therapies that can provide direct neuroprotection to retinal ganglion cells are being extensively investigated. Tumor necrosis factor-α, a cytokine, has been recognized to play an important role in pro and antiapoptotic cellular events. In this paper we review the relevant literature to understand (1) The association of increased expression of tumor necrosis factor-α with glaucomatous neurodegeneration, (2) Modulation of tumor necrosis factor-α expression by exposure to various risk factors of glaucoma, (3) Downstream cellular signaling mechanisms following interaction of tumor necrosis factor-α with its receptors and (4) Role of tumor necrosis factor-α as a possible target for therapeutic intervention in glaucoma. Literature was reviewed using PubMed search engine with relevant key words and a total of 82 English language papers published from 1990 to 2010 are included in this review.

**Keywords:** Apoptosis, glaucoma, intraocular pressure, retinal ganglion cells, retinal ischemia, tumor necrosis factor-alpha.

**Anticholinesterase, antioxidant and nitric oxide scavenging activity of the aqueous extract of some medicinal plants**

Renu Agarwal¹, S. K. Gupta², Puneet Agarwal³, S. Srivastava², Renad Alyayutdin¹.

¹ Deaprtment of Pharmacology, University Teknologi MARA. Faculty of Medicine, Sungai Buloh, 47000, Malaysia
² Division of Ocular Pharmacology, Delhi Institute of Pharmaceutical Sciences & Research, New Delhi, India
³ Department of Ophthalmology, International Medical University, 70300 Seremban, Malaysia

**Abstract**

**Aims:**
Enhancement of cholinergic activity and reduction of oxidative stress by scavenging free radicals such as nitric oxide are well recognized therapeutic approaches in several pathological conditions. We evaluated the anticholinesterase, antioxidant and nitric oxide scavenging activity of the aqueous extracts of *Ocimum basilicum*, *Curcuma longa*, and *Solanum nigrum*.

**Study Design:** Experimental.

**Place and Duration of Study:**
Delhi Institute of Pharmaceutical Sciences & Research, Delhi University, New Delhi, India between January 2008 and December 2008.

**Methodology:**
The aqueous extracts of the rhizome of *Curcuma longa*, berries of *Solanum nigrum* and seeds of *Ocimum basilicum* were authenticated by HPTLC fingerprinting. The anticholinesterase activity of these extracts was estimated spectrophotometrically as described by Ellman in 1961 and IC50 was calculated. Total antioxidant capacity of extracts was also estimated spectrophotometrically based on the reduction of molybdenum (Mo) (VI) to Mo(V) by the sample and the subsequent formation of a green phosphate/Mo(V) complex at acidic pH. Ascorbic acid was used as standard. Estimation of nitric oxide scavenging activity of extracts was based on the diazotization reaction.

**Results:**
The anticholinesterase activity (IC50) was observed at the concentrations of 2.73 ± 0.09, 3.38 ± 0.05 and 3.88 ± 0.11 gram/l for *Solanum nigrum*, *Curcuma longa*, and *Ocimum basilicum* respectively. At these concentrations, maximum antioxidant capacity equivalent to 4.36 ± 0.14 mM of ascorbic acid was shown by *Curcuma longa*, followed by *Solanum nigrum*, and *Ocimum basilicum*. *Curcuma longa* showed the maximum nitric oxide scavenging activity equivalent to 29.78 ± 1.28 mM of sodium nitrite followed by *Solanum nigrum* and *Ocimum basilicum*.

**Conclusion:**
Plant derived pharmacological agents may provide an attractive therapeutic option in future for several pathological conditions especially the neurodegenerative diseases due to their anticholinesterase, antioxidant and nitric oxide scavenging properties.

**Keywords:** Anticholinesterase; antioxidant; nitric oxide scavenging activity; aqueous plant extracts.

**Magnesium deficiency: Does it have a role to play in cataractogenesis?**

Renu Agarwal¹, Igor Iezhitsa¹,², Puneet Agarwal³, Alexander Spasov².

¹ Universiti Teknologi MARA, Faculty of Medicine, Level 20, Tower 1, Science & Technology Complex, 40450 Shah Alam, Selangor, Malaysia
² Volgograd State Medical University, Department of Pharmacology, 1 Pavshikh Bortsov sq., 400131 Volgograd, Russia
³ International Medical University, IMU Clinical School, Department of Ophthalmology, Jalan Rasah, Seremban, Malaysia

**Abstract**

Magnesium is one of the most important regulatory cation involved in several biological processes. It is important for maintaining the structural and functional integrity of vital ocular tissues such as lens. Presence of high magnesium content especially in the peripheral part of lens as compared to aqueous and vitreous humor has been observed. Magnesium plays significant role as a cofactor for more than 350 enzymes in the body especially those utilizing ATP. Membrane associated ATPase functions that are crucial in regulating the intracellular ionic environment, are magnesium-dependent. Moreover, the enzymes involved in ATP production and hydrolysis are also magnesium-dependent. Magnesium deficiency by interfering with ATPase functions causes increased intracellular calcium and sodium and decreases intracellular potassium concentration. Furthermore, magnesium deficiency is associated with increased oxidative stress secondary to increased expression of inducible nitric oxide synthase and increased production of nitric oxide. Thus the alterations in lenticular redox status and ionic imbalances form the basis of the association of magnesium deficiency with cataract. In this paper we review the mechanisms involved in magnesium homeostasis and the role of magnesium deficiency in the pathogenesis of cataract.

**Keywords:** cataract, magnesium, potassium, calcium, Ca²⁺-ATPase, Na⁺, K⁺-ATPase, experimental (animal) models, treatment.
Effects of magnesium taurate on the onset and progression of galactose-induced experimental cataract: In vivo and in vitro evaluation

Renu Agarwal¹, Igor Iezhitsa¹,², Nur Adilah Awaludin¹, Nur Farhana Ahmad Fisol¹, Nor Salmah Bakar¹, Puneet Agarwal³, Thuhairah Hasrah Abdul Rahman¹, Alexander Spasov², Alexander Ozerov², Mohamed Salama Mohamed Ahmed Salama⁴, Nafeeza Mohd Ismail¹.

¹ Universiti Teknologi MARA, Faculty of Medicine, Level 20, Tower 1, Science & Technology Complex, 40450 Shah Alam, Selangor, Malaysia
² Volgograd State Medical University, Research Institute of Pharmacology, 1 Pavshikh Bortsov sq., 400131 Volgograd, Russian Federation
³ International Medical University, IMU Clinical School, Department of Ophthalmology, Jalan Rasah, Seremban, Malaysia
⁴ Universiti Teknologi MARA, Faculty of Pharmacy, Level 10, FF1 Building, Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia

Abstract
Cataract, a leading cause of blindness, is characterized by lenticular opacities resulting from denaturation of lens proteins due to activation of calcium-dependent enzyme, calpain. Magnesium (Mg²⁺) plays an important role not only in maintaining a low lenticular calcium (Ca²⁺) and sodium concentration but also in preserving the lens redox status. Taurine has also been shown to reduce lenticular oxidative stress. Present study evaluated the anticataract effects of magnesium taurate in vivo and in vitro. Among the five groups of 9 Sprague Dawley rats each, two groups received 30% galactose diet with topical (GDMT) or oral treatment (GDMO) with magnesium taurate. Two groups received 30% galactose diet with topical (GDT) or oral vehicle (GDO). Remaining 1 group received normal diet (ND). Weekly slit lamp examination was done during 21 days experimental period and then all rats were sacrificed; Ca/Mg ratio and antioxidant parameters including reduced glutathione (GSH), catalase and superoxide dismutase (SOD) activities were measured in the isolated lenses using ELISA. In the in vitro study, 2 groups of 10 normal rat lenses were incubated in Dulbecco’s Modified Eagle’s Medium (DMEM) with galactose while 1 similar group was incubated in DMEM without galactose. In one of the groups, galactose containing medium was supplemented with magnesium taurate. After 48 h of incubation, lenses were photographed and Ca²⁺/Mg²⁺ ratio and antioxidant parameters were measured as for in vivo study. The in vivo study, at the end of experimental period, demonstrated delay in the development of cataract with a mean opacity index of 0.53 ± 0.04 and 0.51 ± 0.03 in GDMO (p < 0.05 versus GDO) and GDMT (p < 0.01 versus GDT) respectively. Histopathological grading showed a lower mean value in treated groups, however, the differences from corresponding controls were not significant. Lenticular Ca²⁺/Mg²⁺ ratio with a mean value of 1.20 ± 0.26 and 1.05 ± 0.26 in GDMO and GDMT was significantly lower than corresponding controls (p < 0.05) and in GDMT no significant difference was observed from ND. Lenticular GSH and catalase activities were significantly lower and SOD activity was significantly higher in all galactose fed groups. However, in GDMT, GSH and catalase were significantly higher than corresponding control with mean values of 0.96 ± 0.30 mmol/gm lens weight and
56.98 ± 9.86 mmol/g lens protein respectively (p < 0.05 for GSH and p < 0.01 for catalase). SOD activity with mean values of 13.05 ± 6.35 and 13.27 ± 7.61 units/mg lens protein in GDMO and GDMT respectively was significantly lower compared to corresponding controls (p < 0.05) signifying lesser upregulation of SOD due to lesser oxidative stress in treated groups. In the in vitro study, lenses incubated in magnesium taurate containing medium showed less opacity and a lower mean Ca²⁺/Mg²⁺ ratio of 1.64 ± 0.03, which was not significantly different from lenses incubated in DMEM without galactose. Lens GSH and catalase activities were restored to normal in lenses incubated in magnesium taurate containing medium. Both in vivo and in vitro studies demonstrated that treatment with magnesium taurate delays the onset and progression of cataract in galactose fed rats by restoring the lens Ca²⁺/Mg²⁺ ratio and lens redox status.

**Keywords:** cataract, experimental (galactose-induced) cataract, treatment, magnesium taurate (oral, topical), magnesium, potassium, calcium, glutathione, catalase, superoxide dismutase.

**Assessing HIV and AIDS treatment safety and health-related quality of life among cohort of Malaysian patients: A discussion on methodological approach**

Imran Ahmed Syed¹ ², Syed Azhar Syed Sulaiman¹, Mohammad Azmi Hassali¹, Christopher K. C. Lee³.

¹ School of Pharmaceutical Sciences, University Sains Malaysia (USM), Penang, Malaysia
² Department of Pharmacy Practice, International Medical University, Kuala Lumpur, Malaysia
³ Department of Medicine, Hospital Sungai Buloh, Selangor, Malaysia

**Abstract**

**Background:**
Health-related quality of life (HRQoL) is increasingly recognized as an important outcome and as a complement to traditional biological end points of diseases such as mortality. Unless there is a complete cure available for HIV/AIDS, development and implementation of a reliable and valid cross cultural quality of life measure is necessary to assess not only the physical and medical needs of HIV/AIDS people, but their psychological, social, environmental, and spiritual areas of life.

**Methods:**
A qualitative exploration of HIV/AIDS patients' understanding, perceptions and expectations will be carried out with the help of semi structured interview guide by in depth interviews, while quantitative assessment of patient reported adverse drug reactions and their impact on health related quality of life will be carried out by using data collection tool comprising patient demographics, SF-12, Naranjo scale, and a clinical data sheet.

**Results/Outcomes:**
The findings may serve as baseline QOL data of people living with HIV/AIDS in Malaysia and also a source data to aid construction of management plan to improve HIV/AIDS patients' QOL. It will also provide basic information about HIV/AIDS patients' perceptions, expectations and believes towards HIV/AIDS and its treatment which may help in designing strategies to enhance patients' awareness which in turn can help in addressing issues related to compliance and adherence.

**Keywords:** adverse drug reactions, HIV/AIDS, patients' perspective, quality of life.
Dengue fever knowledge, awareness, and practice among selected urban, semi-urban, and rural communities in Malaysia

Sami Abdo Radman Al-Dubai1,2, Kurubaran Ganasegeran1, Mohanad Rahman Alwan1, Mustafa Ahmed Alshagga3, Riyadh Saif-Al4.

1 Department of Community Medicine, International Medical School, Management and Science University, Shah Alam, Selangor
2 Department of Community Medicine, International Medical University, Kuala Lumpur
3 Newcastle University Medicine Malaysia, Nusajaya, Johor
4 Department of Biochemistry, Faculty of Medicine, Sana’a University, Sana’a, Yemen

Abstract
Dengue fever is a major public health problem in Malaysia. This study aimed to assess factors affecting knowledge, attitudes, and practices regarding dengue fever among a selected population in Malaysia. A descriptive, community based, cross sectional study was conducted with 300 participants from three different geographical settings in urban, semi-urban, and rural areas within the states of Selangor and Kuala Lumpur. The questionnaire included questions on demographic data, knowledge, attitudes, and practices regarding dengue fever. Mean age of respondents was 34.4 (± 5.7) years, and the age ranged from 18 to 65 years. The majority of respondents were married (54.7%), Malays (72.7%) and heard about dengue fever (89.7%). Television was the common source of information about dengue fever (97.0%). Participants answered 4 out of 15 items of knowledge incorrectly. There was no significant association between knowledge score and socio-demographic factors. About one-fifth of the respondents (24%) believed that immediate treatment is not necessary for dengue fever, and the majority of them were not afraid of the disease (96.0%). Attitudes toward dengue fever were significantly associated with the level of education and employment status (p<0.05). Practice was associated significantly with age, marital status, and geographic area (p<0.05) and knowledge on dengue fever (p=0.030). There is a need to increase health promotion activities through campaigns and social mobilization to increase knowledge regarding dengue fever. This would help to mold positive attitudes and cultivate better preventive practices among the public to eliminate dengue in the country.

Keywords: dengue fever, awareness, knowledge, practice, Malaysia.
Mustafa Ahmed Alshagga, Amal R Nimer, Looi Pui Yan, Ibrahim Abdel Aziz Ibrahim, Saeed S Al-Ghamdi, Sami Abdo Radman Al-Dubai.

1 Division of Biomedical Sciences, Faculty of Medicine, CUCMS, Cyberjaya 63000, Selangor, Malaysia
2 Newcastle University Medicine Malaysia, Kota Ilmu Edcucity@Iskandar, Nusajaya 79200, Johor, Malaysia
3 Faculty of Pharmacy, CUCMS, Cyberjaya 63000, Selangor, Malaysia
4 Department of Pharmacology and Toxicology, Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia
5 Department of Community Medicine, International Medical University, Kuala Lumpur, Malaysia

Abstract

Background:
The main purpose of the study was to assess the prevalence, body distributions and factors associated with musculoskeletal pain (MSP) among medical students in a private Malaysian medical college.

Method:
This cross-sectional study was conducted among 232 medical students in a private medical college using an online questionnaire. The questionnaire was a modified Standardized Nordic Questionnaire focused on neck, shoulder and low back pain in the past week and the past year.

Results:
Two hundred and thirty-two medical students responded to the questionnaire out of 642. Mean age was 20.7 ± 2.1 years. The majority were female (62.9%), Malay (80.6%) and in the preclinical years (72%). One hundred and six (45.7%) of all students had at least one site of MSP in the past week and 151 (65.1%) had at least one site of MSP in the past year. MSP in the past week was associated significantly with the academic year, (OR 2.0, 95% CI 1.15-3.67, P = 0.015), history of trauma (OR 2.6, 95% CI 1.2-5.3, P = 0.011), and family history of MSP (OR 2.1, 95% CI 1.1-3.9, P = 0.023). MSP in the past year was significantly associated with computer use (P = 0.027), daily hours of computer use (median ± IQR (5.0 ±3.0), history of trauma (OR 1.15-3.67, P = 0.015), history of trauma (OR 2.6, 95% CI 1.2-5.3, P = 0.011), family history of MSP (OR 2.1, 95% CI 1.1-3.9, P = 0.023) and Body Mass Index (BMI) (P = 0.028). On multivariate analysis, factors associated with MSP during the past week were a family history of MSP (p = 0.029) and BMI (p = 0.03). Factors associated with MSP during the past year were being in clinical years (p = 0.002), computer use (p = 0.038), and a history of trauma (p = 0.030).
Conclusion:
MSP among medical students was relatively high, thus, further clinical assessment is needed in depth study of ergonomics. The study results indicate that medical school authorities should take measures to prevent MSP due to factors related to medical school. Students should make aware of importance of weight reduction to reduce MSP.

**Keywords:** Musculoskeletal pain, Medical students, Malaysia.

**Long-term clinical effect of adjunctive antimicrobial photodynamic therapy in periodontal treatment: A randomized clinical trial**

Haider A. Alwaeli¹, Susan N. Al-Khateeb², Amani Al-Sadi³.

¹ School of Dentistry, International Medical University (IMU), No.126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
² Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, 22110, Irbid, Jordan
³ Master Public Health, Irbid, Jordan

**Abstract**

Mechanical removal of microbial biofilm dental plaque from tooth surfaces is important for treatment of periodontal diseases. However, the effectiveness of conventional scaling and root planing (SRP) is affected by the local conditions and residual bacteria which may affect the healing process. We performed a randomized clinical trial to test our hypothesis that adjunctive antimicrobial photodynamic therapy (aPDT) plus SRP has significant effect compared with SRP alone, which can last for 1 year. The study included 136 sites in 16 patients with previously untreated chronic periodontitis, at least one premolar and one molar in every quadrant (minimum, four teeth/quadrant) and at least one tooth with attachment loss of ≥4 mm in every quadrant. In all patients, two randomly assigned quadrants were treated with SRP and the other two were treated with SRP + aPDT. The clinical parameters of probing pocket depth (PPD), bleeding on probing (BOP), and clinical attachment level (CAL) were evaluated at baseline and after 3, 6, and 12 months. There were no significant differences between the two groups at baseline. PPD and BOP showed significant reduction, and CAL showed significant gain from baseline for all three time points in both groups. In addition, there were significantly greater reduction and gain for SRP + aPDT than for SRP at all three time points. No adverse effects of aPDT were observed. These data demonstrate significant improvement in all evaluated clinical parameters for at least 1 year and suggest that aPDT as an adjunctive therapy to SRP represents a promising therapeutic concept for persistent periodontitis.

**Keywords**: Periodontitis, Antimicrobial photodynamic therapy, Scaling and root planning, Probing pocket depth, Bleeding on probing, Clinical attachment level.

The importance of data in developing environmental health guidelines: An IMU perspective

Stephen Ambu

School of Postgraduate Studies and Research, 126, Jalan Jalil Perkasa 19, 57000 Kuala Lumpur, Malaysia.

Abstract

The global environment is in a dynamic flux due to rapid development. As a result of this, new diseases are emerging and old diseases are re-emerging in many parts of the world. Therefore there is a constant need for appropriate data for formulation of effective policies to mitigate the adverse effects of environmental degradation on human health. The Kyoto Protocol of 1997 is a milestone that sets the direction for good environmental management initiatives and the success of this depends on good data. Malaysia currently has the Environmental Quality Act 1974 in place to control environment related problems. However good guidelines must be developed to keep the initiatives for good environmental management on course, for this we need good data. The Centre for Environmental and Population Health at IMU, coordinates research activities in specific thrust areas in an endeavour to produce important data that is required for developing appropriate guidelines for environmental health.

Keywords: Climate Change, environment, health.

**Synthesis of palm oil-based polyester polyol for polyurethane adhesive production**

Khoon Poh Ang¹, Choy Sin Lee², Sit Foon Cheng¹, Cheng Hock Chuah¹.

¹ Unit of Research on Lipids (URL), Department of Chemistry, Faculty of Science, University Malaya, Kuala Lumpur, Malaysia
² Department of Pharmaceutical Chemistry, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

Palm oil-based polyester polyol is synthesized by ring opening reaction on epoxidized palm olein by phthalic acid. The reaction is carried out in a solvent free and noncatalyzed condition with the optimal reaction condition at 175°C for 5 h reaction time. The physical state of the product is a clear bright yellowish liquid with low viscosity value of 5700–6700 cP at 25°C and pour point of 15°C. The chemical structure and molecular weight of the polyester polyol were characterized by FTIR, 1H-NMR, 13C-NMR, and GPC. The optimal polyol with molecular weight of 36,308 dalton and hydroxyl value of 78.17 mg KOH/g sample was reacted with polymeric 4, 4'-methylene diphenyl diisocyanate (pMDI) at isocyanate index of 1.3 to produce polyurethane adhesive. The lap shear strength of the polyurethane adhesive showed two times higher than the commercial wood adhesives.

**Keywords:** polyesters, polyurethanes, adhesives.
A trend analysis of major congenital anomalies in Penang, Malaysia

Leela Anthony¹, Nagarajah Lee², Stephen Ambu³, Lokman Hakim S¹.

¹ Institute for Medical Research, Jalan Pahang, 50588 Kuala Lumpur, Malaysia
² Open University Malaysia, Jalan Tun Ismail, 50480 Kuala Lumpur, Malaysia
³ International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia.

Abstract

Background:
This study examined the trend of major congenital anomalies (CA) in the state of Penang using the ICD 10 database from 1999 to 2004. The data was collected from various health centres and hospitals. The aim was to study the magnitude of the problem for congenital anomalies in the state of Penang in terms of trends and also to calculate the incidence rate by districts. If a trend was noticed, this in turn will determine whether to carry out further in-depth studies in the future and to find out the linkages to the environment if any.

Methods:
This was a retrospective study of congenital anomalies that were registered in the state of Penang and the data was obtained from the ICD10 database from 1999 to 2004. Under ICD 10, congenital anomalies are coded as “Q”. Only major congenital anomalies coded as “Q” from Q1 to Q11 were extracted and analysed. Only new cases were analysed, double and repeat entries were excluded. Trend analysis was then carried out according to districts in Penang.

Results:
Incidence rate per 1000 birth was calculated to determine the common congenital anomalies. It was found that there was an increasing trend in the incidence of CA for all the five districts studied; topping the list was Barat Daya while Seberang Perai Selatan had the lowest incidence rate. It is noteworthy to mention that Barat Daya is an industrialised district while Seberang Perai Selatan is mainly an agricultural and residential area. This preliminary study however did not look into the reasons or causative factors for the high or low incidence in the respective districts. In terms of the types of congenital anomalies, the highest was that from malformation of circulatory system while the lowest from respiratory system. The congenital anomalies with the incidence rate at least 3 per 1000 births were malformations from the nervous system, circulatory system, digestive system, genital organs, malformation/deformation of musculoskeletal system and cleft lip and cleft palate.

Conclusion:
This study showed a rising trend in congenital anomalies in all districts in the state of Penang and a high incidence was observed in the district of Barat Daya, where a number of factories are located in the Bayan Lepas Industrial Zone. However further studies need to be carried out to determine the causative factors and their linkage to the environment. The limitation of this study was that the data analysed was only from notified cases to the Penang State Health
Department.

**Keywords:** Trend, ICD, Congenital, Anomalies, Environment.

**Alcoholism among adolescent students of Tadong in east Sikkim**

Ankur Barua¹, Shuva Dasgupta², Bani Mitra², Passang Chiki Sherpa², Milan Tirwa², Kumaraswamy Kademane³, Kumar Shiva Gubbiyappa³, Rohit Kumar Verma³, Muhammad Shahid Iqbal³.

¹ Department of Community Medicine, International Medical University, Malaysia
² College of Nursing, Sikkim-Manipal Institute of Medical Sciences (SMIMS), Sikkim, India
³ International Medical University (IMU), Malaysia

**Abstract**

**Background:**
Adolescents often indulge in alcohol consumption either on peer pressure or for enjoyment. A few studies were conducted on alcoholism among adolescent students in Indian settings.

**Materials & Methods:**
A Cross-sectional study was conducted during January-March 2005 for three months on 226 adolescent students in the age group of 15 to 18 years belonging to two senior secondary schools in Tadong area of East Sikkim. Simple Random Sampling Technique was applied after obtaining informed written consent for the selection of respondents. A pre-tested interview schedule was used to study the association between Knowledge, Attitude and Practice in relation with alcoholism. CAGE questionnaire was used to assess alcohol abuse. The collected data were tabulated and analysed by using the statistical package SPSS (Statistical Package for Social Sciences) version 10.0 for Windows. Findings were described in terms of proportions.

**Results & Conclusions:**
In this study, stress reduction, relaxing effect and mere pleasure were considered by the participants to be the major reasons for alcohol consumption. Though 66.4% of respondents were found to consume alcohol regularly, 33.3% of them wanted to give up the habit. Among the regular alcohol consumers who had developed alcohol abuse (68%), majority (65.3%) felt the need to cut down on drinking while 58.7% felt guilty about drinking.

**Keywords:** Alcohol, Abuse, Adolescent, Alcoholism, Questionnaire.

**A tool for decision-making in norm-referenced survey questionnaires**

Ankur Barua¹, Kumaraswamy Kademane¹, Kumar Shiva Gubbiyappa², Rohit Kumar Verma², Muhammad Shahid Iqbal², Sami Abdo Radman AL-Dubai¹.

¹ School of Medicine, International Medical University (IMU), Malaysia  
² School of Pharmacy, International Medical University (IMU), Malaysia

**Abstract**

Setting up a cut-off point is necessary for opinion-based questionnaires on health care utilization, facilitating factors and barriers to arrive at a conclusion and also for assessing Knowledge, Attitude and Practice. This study and shows how to formulate a tool for decision-making in Norm-referenced survey questionnaires and readjust their cut-off points to incorporate the population variation for items containing continuous variables. This procedure will help the researchers to perform finer adjustments in the cut-off values of any Norm-referenced survey instrument based on the local population data and in situations where no gold-standard instrument is available for comparison.

**Keywords:** Point, Cut-off, Reliability, Item, Analysis, Cronbach’s alpha, Correlation.
In vitro antibacterial effects of *Cinnamomum* extracts on common bacteria associated with wound infections with emphasis on Methicillin - Resistant *Staphylococcus aureus*

Ayuba Sunday Buru¹, Mallikarjuna Rao Pichika¹, Vasanthakumari Neela², Kavitha Mohandas¹.

¹ International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Medical Microbiology and Parasitology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang Selangor, Malaysia

Abstract
Ethnopharmacological relevance: *Cinnamomum* species have been widely used in many traditional systems of medicine around the world. In the Malaysian traditional system of medicine, the leaves, stem bark and stem wood of *Cinnamomum iners*, *Cinnamomum porrectum*, *Cinnamomum altissimum* and *Cinnamomum impressicostatum* have been used to treat wound infections. To study the antibacterial effects of *Cinnamomum iners*, *Cinnamomum porrectum*, *Cinnamomum altissimum* and *Cinnamomum impressicostatum* against common bacteria found in wound infections with primary focus on methicillin-resistant *Staphylococcus aureus* (MRSA).

Materials and methods:
The crude extracts from the leaves, stem-bark and stem-wood of *Cinnamomum iners*, *Cinnamomum porrectum*, *Cinnamomum altissimum* and *Cinnamomum impressicostatum* were obtained using sequential extraction with hexane, ethylacetate, methanol and water. The volatile oils were obtained by hydro-distillation. The antibacterial activities of extracts were investigated using disk diffusion assays and broth microdilution assays.

Results:
The volatile oils obtained from the stem-bark of *Cinnamomum altissimum*, *Cinnamomum porrectum* and *Cinnamomum impressicostatum* have shown significant antibacterial activity against a wide range of Gram positive and Gram negative bacteria including MRSA. A few test extracts have shown better activity against MRSA as compared to methicillin sensitive *Staphylococcus aureus* (MSSA). Amongst all the test extracts, *Cinnamomum impressicostatum* stem-bark water extract produced the largest inhibition zone of 21.0 mm against MRSA while its inhibition zone against MSSA was only 8.5 mm. The minimum inhibitory concentration (MIC) of this extract against MRSA was 19.5 μg mL⁻¹ and the corresponding minimum bactericidal concentration (MBC) was 39.0 μg mL⁻¹.

Conclusions:
This study has scientifically validated the traditional use of *Cinnamomum* species in treating wound infections. Of high scientific interest was the observation that the antibacterial effect of...
**Cinnamomum impressicostatum** stem-bark crude water extract against MRSA was significantly higher than its effect against MSSA, suggesting that the extract contains a compound(s) with higher specific neutralising activity against the drug resistance markers of MRSA.

**Keywords**: Antibacterial effect, *Cinnamomum*, Wound pathogens, Malaysian traditional system of medicine, Methicillin resistant *Staphylococcus aureus* (MRSA).

**Treatment of acute gout in patients with coronary artery disease**

Chan Chun Wai¹, Cheah Xin Ying².

¹ Department of Family Medicine, International Medical University, Seremban, Malaysia
² International Medical University, Seremban, Malaysia

**Abstract**

Mr. L, aged 63 years, was recently diagnosed to have with acute gouty arthritis. He had an acute gout flare last month and was given diclofenac injection by a private general practitioner. He comes to you for advice whether he should take the injection if he has another flare. Mr. L has been on treatment for his chronic essential hypertension and dyslipidaemia for the past 10 years. He also had two previous episodes of myocardial infarction in year 2005 and 2010, and he had angioplasty done twice. He stopped smoking and consuming alcohol three months ago.

**Keywords**: gout, therapy, treatment, coronary artery disease, coronary heart disease, commentary.

**Effect of Traditional Chinese Medicine Complex for diabetes (TCM-D™) on experimentally induced diabetic mice**

Donald Koh Fook Chen¹, Joon Wah Mak¹, Soo Shen Ooi¹, Kok Fee Mak², Kwai Hoe Chong¹.

¹ International Medical University, 126 Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² SEGi University Malaysia, Malaysia

**Abstract**

**Background:**
We previously evaluated the biochemical changes induced by the local product TCM for diabetes (TCM-D™) on blood glucose levels and other biochemical changes in normal mice fed orally with the recommended human dose (30 ml/kg daily) and ten times this dose for eight weeks. TCM-D™ is an aqueous extract of the roots of *Trichosanthes kirilowii* Maxim, *Paonia lactiflora* Pall, *Glycyrrhiza uranensis* Fisch. and *Panax ginseng* Meyer (red) combined at the dry weight proportions of 36%, 28%, 18% and 18% respectively. The study showed that at these dosages the blood glucose levels as well as the body weights in treated mice were significantly reduced when compared with pretreatment values and control animals. The present study evaluated the effect of the extract in a mouse model of Type 1 diabetes mellitus.

**Methods:**
TCM-D™ extract was prepared as a 10x concentrate and given orally at 0.3 ml/100 g and 1.5 ml/100 g to mice which were experimentally induced diabetic with intraperitoneal injections of streptozotocin (5 mg/100g) in sodium citrate (pH 4.5). Control diabetic mice were dosed with extract diluent (distilled water).

**Results:**
At the doses studied the compound did not show any significant lowering of the glucose levels in a mouse model of Type 1 diabetes. There were significant increases in the alanine aminotransferase (ALT) and creatinine levels which were most likely due to the treatment with the compound. There were no significant changes in the aspartate aminotransferase (AST) and blood urea levels due to the treatment. Neither was there any significant effect on the weight of the treated animals due to the treatment.

**Conclusions:**
It is concluded that TCM-D™ did not have any significant blood glucose lowering effect on streptozotocin induced diabetic mice when fed orally at 1-5 times the recommended human dose. Further work is needed to determine if the extract has any significant effect in a mouse model with Type 2 diabetes mellitus.
Optimal waist circumference cut-off values for predicting cardiovascular risk factors in a multi-ethnic Malaysian population

Kee C. Cheong¹, Sumarni M. Ghazali¹, Lim K. Hock², Ahmad F. Yusoff¹, Sharmini Selvarajah³, Jamaiyah Haniff³, Ahmad Ali Zainuddin², Chan Y. Ying², Khor G. Lin⁴, Jamalludin A. Rahman⁵, Suzana Shahar⁶, Amal N. Mustafaa¹.

¹ Institute for Medical Research, Malaysia  
² Institute for Public Health, Ministry of Health, Malaysia  
³ Clinical Research Centre, Ministry of Health, Malaysia  
⁴ International Medical University, Bukit Jalil, Malaysia  
⁵ International Islamic University, Malaysia  
⁶ Universiti Kebangsaan Malaysia, Malaysia

Abstract
Introduction:  
Previous studies have proposed the lower waist circumference (WC) cut-offs be used for defining abdominal obesity in Asian populations.

Objective:  
To determine the optimal cut-offs of waist circumference (WC) in predicting cardiovascular (CV) risk factors in the multi-ethnic Malaysian population.

Methods:  
We analysed data from 32,703 respondents (14,980 men and 17,723 women) aged 18 years and above who participated in the Third National Health and Morbidity Survey in 2006. Gender-specific logistic regression analyses were used to examine associations between WC and three CV risk factors (diabetes mellitus, hypertension, and hypercholesterolemia). The Receiver Operating Characteristic (ROC) curves were used to determine the cut-off values of WC with optimum sensitivity and specificity for detecting these CV risk factors.

Results:  
The odds ratio for having diabetes mellitus, hypertension, and hypercholesterolemia, or at least one of these risks, increased significantly as the WC cut-off point increased. Optimal WC cut-off values for predicting the presence of diabetes mellitus, hypertension, hypercholesterolemia and at least one of the three CV risk factors varied from 81.4 to 85.5 cm for men and 79.8 to 80.7 cm for women.

Conclusions:  
Our findings indicate that WC cut-offs of 81 cm for men and 80 cm for women are appropriate for defining abdominal obesity and for recommendation to undergo cardiovascular risk screening and weight management in the Malaysian adult population.
Keywords: Waist circumference, Optimal cut-off, Cardiovascular risk factors, Malaysian population,

**Detecting phase separation of freeze-dried binary amorphous systems using pair-wise distribution function and multivariate data analysis**

Norman Chieng¹,²,³, Hjalte Trnka¹, Johan Boetker¹, Michael Pikal², Jukka Rantanen¹, Holger Grohganz¹.

¹ Department of Pharmacy, Faculty of Health and Medical Sciences, University of Copenhagen, 2100 Copenhagen, Denmark  
² Department of Pharmaceutical Sciences, University of Connecticut, Storrs, CT 06269-3092, United States  
³ Department of Pharmaceutical Technology, School of Pharmacy, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

The purpose of this study is to investigate the use of multivariate data analysis for powder X-ray diffraction-pair-wise distribution function (PXRD-PDF) data to detect phase separation in freeze-dried binary amorphous systems. Polymer-polymer and polymer-sugar binary systems at various ratios were freeze-dried. All samples were analyzed by PXRD, transformed to PDF and analyzed by principal component analysis (PCA). These results were validated by differential scanning calorimetry (DSC) through characterization of glass transition of the maximally freeze-concentrate solute (Tg'). Analysis of PXRD-PDF data using PCA provides a more clear ‘miscible’ or ‘phase separated’ interpretation through the distribution pattern of samples on a score plot presentation compared to residual plot method. In a phase separated system, samples were found to be evenly distributed around the theoretical PDF profile. For systems that were miscible, a clear deviation of samples away from the theoretical PDF profile was observed. Moreover, PCA analysis allows simultaneous analysis of replicate samples. Comparatively, the phase behavior analysis from PXRD-PDF-PCA method was in agreement with the DSC results. Overall, the combined PXRD-PDF-PCA approach improves the clarity of the PXRD-PDF results and can be used as an alternative explorative data analytical tool in detecting phase separation in freeze-dried binary amorphous systems.

**Keywords:** Freeze-drying, Phase separation, Powder X-ray diffraction, Pair-wise distribution function, Principal component analysis.

**Intra articular injection of autologous bone marrow-derived mesenchymal stromal cells in patients with moderate to severe osteoarthritis**

SP Chin¹,², NN Wazir³, CY Cheok⁴, CY Wong⁵, KY Then⁶, SK Cheong⁷.

¹ Mawar Hospital, Negeri Sembilan, Malaysia  
² Beverly Wilshire Medical Centre, Kuala Lumpur, Malaysia  
³ International Medical University, Negeri Sembilan, Malaysia  
⁴ Penang Adventist Hospital, Penang, Malaysia  
⁵ Cytopeutics, Selangor, Malaysia  
⁶ Cryocord, Selangor, Malaysia  
⁷ Tunku Abdul Rahman University, Selangor, Malaysia

**Abstract**

**Background:**
Bone marrow-derived mesenchymal stromal cells (BMMSC) can be expanded ex vivo which have the ability to regenerate cartilage for accelerated healing of the knee as demonstrated by animal studies and early clinical reports. In this study we have evaluated the safety and feasibility of using autologous BMMSC as an intra-articular injection for the treatment of symptomatic moderate to severe osteoarthritis.

**Methods:**
Fifteen patients with symptomatic moderate to severe knee osteoarthritis were recruited. All patients have persistent non-improving or deteriorating pain despite regular oral analgesics and multiple hyaluronic injections. Autologous BMMSC was resuspended in a mixture of hyaluronic acid and autologous platelet rich plasma before intra-articular injection procedure. Patients were assessed and followed-up using the Oxford Knee Score (OKS) and magnetic resonance imaging (MRI) for up to 12 months.

**Results:**
The mean OKS at 6 and 12 months after BMMSC injection increased significantly (42.6 ± 6.2 and 44.8 ± 8.1) when compared to baseline scores (35.2 ± 6.5). At 12 months, an improvement of OKS of 4 points or more was observed in 10 patients when compare to their baseline scores for both knees while 2 patients experienced improvement in the right knee only. MRI at 12 months post-BMMSC treatment showed noticeable improvement in 60% of patients including mean increase in cartilage thickness from baseline, resolution of subchondral cysts and reduction of effusion.

**Conclusion:**
Autologous BMMSC injection is safe, feasible and may be beneficial for the symptomatic treatment of patients with moderate to severe osteoarthritis who have failed conventional treatment.

**Safety and efficacy of transdermal buprenorphine for the relief of cancer pain**

Cho Naing¹,², Kyan Aung², Vanessa Racloz¹, Peng Nam Yeoh².

¹ ACITH/School of Population Health, The University of Queensland, Level 3, Edith Cavell Building, Herston, QLD, 4006, Australia  
² International Medical University (IMU), 57000, Kuala Lumpur, Malaysia

**Abstract**

**Purpose:**

This study aimed to synthesize the available evidence on the efficacy and safety of transdermal (TD) buprenorphine.

**Methods:**

We searched studies in electronic databases. Randomized controlled trials (RCTs) assessing the efficacy of TD buprenorphine comparing with placebo or other comparator drug in relieving cancer pain were included. The primary end points are patient-reported pain intensity and pain relief. For dichotomous data, the summary relative risk (RR) and its 95 % confidence interval (CI) were derived using random-effect model in view of heterogeneity testing.

**Results:**

Eight clinical trials (n = 909) were included in the analysis. Only a few studies reported the same outcome in similar way, which created difficulty in the pooling of outcome data. Two studies (n = 288) assessed ‘responders’ and showed a significant difference between TD buprenorphine and placebo in all three doses of TD buprenorphine, 35.5, 52.5, or 70 μg/h (RR 1.74, 95 % CI 1.31–2.32; I² 0 %); the numbers-needed-to-treat was 5.8 (3.9–11). Two studies (n = 331) showed a comparable requirement for rescue SL buprenorphine between TD buprenorphine and placebo (RR 1.25, 95 % CI 0.84–1.88; I² 0 %). The preferred outcome measure ‘50 % pain relief’ was not reported in any included studies. On the basis of summary quality, further research is likely to have an important impact on our confidence in the estimate.

**Conclusion:**

Transdermal buprenorphine has an increasing role for the relief of cancer pain. Further research in this field is needed. Multicentre studies in this field using a common protocol and strict supervision will be more practicable.

**Keywords:** Buprenorphine, Transdermal, Cancer, Pain.

Efficacy and safety of dihydroartemisinin-piperaquine for the treatment of uncomplicated Plasmodium falciparum malaria in endemic countries: Meta-analysis of randomised controlled studies

Naing C¹,², Mak JW¹, Aung K², Wong JY¹.

¹ School of Postgraduate Studies and Research, International Medical University (IMU), Kuala Lumpur 57000, Malaysia
² School of Medical Sciences, IMU, Malaysia

Abstract
The present review aimed to synthesise available evidence on the efficacy of dihydroartemisinin-piperaquine (DP) in treating uncomplicated Plasmodium falciparum malaria in people living in malaria-endemic countries by performing a meta-analysis of relevant studies. We searched relevant studies in electronic data bases up to December 2011. Published results from randomised controlled trials (RCTs) comparing efficacy of DP with other artemisinin-based combination therapies (ACTs), or non-ACTs, or placebo were selected. The primary endpoint was 28-day and 42-day treatment failure. We identified 26 RCTs. Many of the studies included in the present review were of high quality. Overall, DP, artesunate-mefloquine (MAS3) and artemether-lumefentrine (AL) were equally effective for reducing the risk of recurrent parasitaemia. The PCR confirmed efficacy of DP (99.5%) and MAS3 (97.7%) at day 28 exceeded 90%; both are efficacious. Comparable efficacy was also found for DP (95.6%) and AL (94.3%). The present review has documented that DP is comparable to other currently used ACTs such as MAS3 and AL in treating uncomplicated falciparum malaria. The better safety profile of DP and once-daily dosage improves adherence and its fixed co-formulation ensures that both drugs are taken together. Our conclusion is that DP has the potential to become a first-line antimalarial drug.

Keywords: Malaria, Plasmodium falciparum, Dihydroartemisinin-piperaquine, Treatment.
Meta-analysis: The association between HIV infection and extrapulmonary tuberculosis

Cho Naing$^{1,2}$, Joon Wah Mak$^1$, Mala Maung$^2$, Shew Fung Wong$^1$, Ani Izzuani Binti Mohd Kassim$^1$.

$^1$ School of Postgraduate Studies and Research, International Medical University (IMU), 57000 Kuala Lumpur, Malaysia
$^2$ School of Medical Sciences, IMU, Kuala Lumpur, Malaysia

Abstract

Background:
Extrapulmonary tuberculosis has been an AIDS-defining condition. Individual studies that highlight the association between HIV and extrapulmonary TB are available. Our objectives were to synthesis evidence on the association between extrapulmonary tuberculosis and HIV and to explore the effective preventive measures of these two diseases.

Methods:
This is a meta-analysis of observational studies reporting effect estimates on how HIV is associated with extrapulmonary tuberculosis. We searched for the eligible studies in the electronic databases using search terms related to HIV and extrapulmonary tuberculosis. Where possible, we estimated the summary odds ratios using random effects meta-analysis. We stratified analysis by the type of study design. We assessed heterogeneity of effect estimates within each group of studies was assessed using I2 test.

Results:
Nineteen studies (7 case control studies and 12 cohort studies) were identified for the present study. The pooled analysis shows a significant association between HIV and extrapulmonary tuberculosis (summary odds ratio: 1.3; 95 % confidence interval (CI) 1.05–1.6; I2: 0 %). In a subgroup analysis with two studies, a significant association was found between CD4+ count less than 100 and the incidence of extrapulmonary tuberculosis (summary OR: 1.31; 95 % CI 1.02–1.68; I2: 0 %).

Conclusions:
Findings show evidence on the association between extrapulmonary tuberculosis and HIV, based on case control studies. Further studies to understand the mechanisms of interaction of the two pathogens are recommended.

Keywords: Extrapulmonary tuberculosis, HIV, Risk factor, Meta-analysis.

**Diabetes and infections - Hepatitis C: Is there type 2 diabetes excess in hepatitis C infection?**

Cho Naing¹, Joon Wah Mak¹, Nyunt Wai², Mala Maung².

¹ School of Postgraduate Studies and Research, International Medical University (IMU), Kuala Lumpur, Malaysia
² School of Medical Sciences, International Medical University (IMU), Kuala Lumpur, Malaysia

**Abstract**

Individual epidemiologic studies as well as the pooled analysis of observational studies have indicated the association between type 2 diabetes (T2D) and hepatitis C virus infection (HCV). Whether HCV infection is the cause of diabetes or diabetic patients are more prone to get HCV infection is still in question. The objective of the present review was to provide answers to this issue, based on available evidence from epidemiologic, molecular, experimental and therapeutic studies. Our current understanding of how chronic HCV infection could induce T2D is incomplete, but it seems twofold based on both direct and indirect roles of the virus. HCV may directly induce insulin resistance (IR) through its proteins. HCV core protein was shown to stimulate suppressor of cytokine signalling, resulting in ubiquitination and degradation of tyrosine kinase phosphorylated insulin receptor substrates (IRS1/2) in proteasomes. HCV-nonstructural protein could increase protein phosphatase 2A which has been shown to inactivate the key enzyme Akt by dephosphorylating it. Insulin signalling defects in hepatic IRS-1 tyrosine phosphorylation and PI3-kinase association/activation may contribute to IR, which leads to the development of T2D in patients with HCV infection. The peroxisome proliferator-activated receptors (PPARs) are also implicated. PPARα/γ, together with their obligate partner RXR, are the main nuclear receptors expressed in the liver. PPARα upregulates glycerol-3-phosphate dehydrogenase, glycerol kinase, and glycerol transport proteins, which allows for glucose synthesis during fasting states. Decreased activity of PPARs could attribute to HCV-induced IR. Immune-mediated mechanisms may be involved in the indirect role of HCV in inducing IR. It is speculated that TNF-alpha plays a major role in the pathogenesis of IR through lowering IRS1/2. Furthermore, HCV infection- triggered ER stress could lead to the activation of PP2A, which inhibits both Akt and the AMP-activated kinase, the regulators of gluconeogenesis. In summary, we illustrate that HCV infection is accompanied by multiple defects in the upstream insulin signalling pathway in the liver that may contribute to the observed prevalence of IR and diabetes. Future studies are needed to resolve this issue.

**Keywords:** Type 2 diabetes, Hepatitis C infection, Insulin resistance, IRS1/2, HCV protein, Peroxisome proliferator-activated receptors, α/γ, TNF-alpha, ER.

**Predicting the success of MPharm graduates in the pharmacy twinning programme**

Cho Naing, Noraidah Yusoff, Peng Nam Yeoh, Peter Chuen Keat Pook

International Medical University, Kuala Lumpur, Malaysia

**Abstract**

**Background:**
The twinning programme, an international collaborative education system with credit transfer scheme, is growing increasingly.

**Aims:**
To determine the association between academic banding classification on admission and the end-point academic achievement and to identify predictor(s) for the end-point academic achievement in the twinning programme.

**Method:**

**Results:**
A significant positive association was found between the students’ banding classification on admission to the admission university, International Medical University and their award on the first attempt at the degree-awardng university, University Strathclyde (UoS) in the United Kingdom ($r = .113$, $p = 0.009$). The credit-mark average from semester 1 through semester 5 in the admission university was the only significant predictor of the likelihood of end-point success in the twinning programme (Odds ratio, 3.9; $p < 0.001$).

**Conclusion:**
The academic performance in the pre-university institution and the admission institution were crucial for subsequent success in the twinning programme.

**Keywords:** achievements, pharmacy, predictors, twinning programme.
Efficacy and safety of dihydroartemisinin-piperaquine for treatment of \textit{Plasmodium vivax} malaria in endemic countries: Meta-analysis of randomized controlled studies

Cho Naing\textsuperscript{1,2}, Vanessa Racloz\textsuperscript{1}, Maxine Anne Whittaker\textsuperscript{1}, Kyan Aung\textsuperscript{2}, Simon Andrew Reid\textsuperscript{1}, Joon Wah Mak\textsuperscript{2}, Marcel Tanner\textsuperscript{3}.

\textsuperscript{1} School of Population Health, University of Queensland, Herston, Australia
\textsuperscript{2} International Medical University, Kuala Lumpur, Malaysia
\textsuperscript{3} Swiss Tropical and Public Health Institute, Basel, Switzerland

Abstract

Background:
This study aimed to synthesize available evidence on the efficacy of dihydroartemisinin-piperaquine (DHP) in treating uncomplicated \textit{Plasmodium vivax} malaria in people living in endemic countries.

Methodology and Principal Findings:
This is a meta-analysis of randomized controlled trials (RCT). We searched relevant studies in electronic databases up to May 2013. RCTs comparing efficacy of (DHP) with other artemisinin based combination therapy (ACT), non-ACT or placebo were selected. The primary endpoint was efficacy expressed as PCR-corrected parasitological failure. Efficacy was pooled by hazard ratio (HR) and 95\% CI, if studies reported time-to-event outcomes by the Kaplan-Meier method or data available for calculation of HR Nine RCTs with 14 datasets were included in the quantitative analysis. Overall, most of the studies were of high quality. Only a few studies compared with the same antimalarial drugs and reported the outcomes of the same follow-up duration, which created some difficulties in pooling of outcome data. We found the superiority of DHP over chloroquine (CQ) (at day > 42-63, HR: 2.33, 95\% CI:1.86-2.93, I\textsuperscript{2}: 0\%) or artemether-lumefentrine (AL) (at day 42, HR:2.07, 95\% CI:1.38-3.09, I\textsuperscript{2}: 39\%). On the basis of GRADE criteria, further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Discussion/Conclusion:
Findings document that DHP is more efficacious than CQ and AL in treating uncomplicated \textit{P. vivax} malaria. The better safety profile of DHP and the once-daily dosage improves adherence, and its fixed coformulation ensures that both drugs (dihydroartemisinin and piperaquine) are taken together. However, DHP is not active against the hypnozoite stage of \textit{P. vivax}. DHP has the potential to become an alternative antimalarial drug for the treatment uncomplicated \textit{P. vivax} malaria. This should be substantiated by future RCTs with other ACTs. Additional work is required to establish how best to combine this treatment with appropriate antirelapse therapy (primaquine or other drugs under development).

**Willingness to take screening test for colorectal cancer: A community-based survey in Malaysia**

Cho Naing, Yip Kar Jun, Wai Mun Yee, Syazana J.D. B/T Waqiyuddin, Lau Chiew Lui, Ooi Yin Shaung, Fong Jenn Haw.

School of Postgraduate Studies and Research, International Medical University (IMU), Kuala Lumpur, Malaysia

**Abstract**

The aims of the study were (i) to determine the knowledge and perceptions of colorectal cancer (CRC), (ii) to explore the willingness of the study population to take a screening test for CRC, and (iii) to identify factors affecting the willingness to take a screening test for CRC. A cross sectional survey was carried out in a semiurban town in Malaysia using a pretested structured questionnaire. Descriptive statistics were determined for all important variables. A binary logistic regression model was introduced to identify independent predictors of the willingness to take a screening test. Factors influencing willingness were explored according to the constructs of the health belief model. Of the 256 respondents who had heard about CRC, the majority were aware of altered bowel habits (67.3%) or the presence of blood in stool or rectal bleeding (63.4%) as the warning symptoms. Although 38% of the respondents knew of colonoscopy as the screening test, 22% were not aware of any screening test for CRC. A majority (77.4%) showed willingness to take a screening test for CRC. In the multivariate analysis, ‘having family or friends with history of CRC’ and ‘self-perceived risk’ were the two significant variables for predicting the acceptance of CRC screening among the study population. Findings suggested that the respondents’ knowledge of the CRC screening test was inadequate, albeit a high proportion expressed their intention to take screening tests. Health education on the CRC addressing available screening tests and the benefits of early screening for CRC should be scaled up.

**Keywords:** colorectal cancer, health belief model, knowledge, screening test.
Malaria and soil-transmitted intestinal helminth co-infection and its effect on anemia: A meta-analysis

Cho Naing¹,², Maxine A Whittaker¹, Victor Nyunt-Wai², Simon A Reid¹, Shew Fung Wong², Joon Wah Mak², Marcel Tanner³.

¹ School of Population Health, University of Queensland, Queensland 4006, Australia
² International Medical University, Kuala Lumpur 57000, Malaysia
³ Swiss Tropical and Public Health Institute, Basel 4002, Switzerland

Abstract
This study aimed to synthesize available evidence on the extent of malaria and soil-transmitted intestinal helminth (STH) co-infections in people living in endemic countries and to explore the effect of interactions between malaria and STHs on anemia. We searched relevant studies in electronic databases up to March 2013. Studies comparing malaria and STH co-infected patients with those not co-infected were included and the effect estimates were pooled using a random-effects model. We identified 30 studies for meta-analyses of which 17 were cross-sectional design. The majority of included studies (80%) were carried out in African countries. Among pregnant women, those infected with hookworm were found to have higher association with malaria infection compared with those without (summary OR: 1.36; 95% CI: 1.17-1.59; I(2): 0%). Among non-pregnant adults, the summary OR of the association between anemia and the combined malaria and STH was 2.91 (1.38-6.14). The summary OR of the association between anemia and malaria alone was 1.53 (0.97-2.42), while the association between anemia and STH alone was 0.28 (0.04-1.95). There is no good evidence to support a different effect of malaria and STH on anemia. A subgroup analysis showed a higher risk of malaria infection in the primigravidae (summary OR: 1.61; 95% CI: 1.3-1.99; I(2): 0%). In conclusion, the malaria-STH co-infection was variable with complex outcomes on anemia.

Keywords: Anemia, Co-infection, Helminths, Malaria, Prevalence.
Malaria and soil-transmitted intestinal helminths co-infection and its effect on anemia: A meta-analysis

Cho Naing1,2, Maxine A Whittaker1, Victor Nyunt-Wai2, Simon A Reid1, Shew Fung Wong2, Joon Wah Mak2, Marcel Tanner3.

1 School of Population Health, University of Queensland, Queensland 4006, Australia
2 International Medical University, Kuala Lumpur 57000, Malaysia
3 Swiss Tropical and Public Health Institute, Basel 4002, Switzerland

Abstract

This study aimed to synthesize available evidence on the extent of malaria and soil-transmitted intestinal helminth (STH) co-infections in people living in endemic countries and to explore the effect of interactions between malaria and STHs on anemia. We searched relevant studies in electronic databases up to March 2013. Studies comparing malaria and STH co-infected patients with those not co-infected were included and the effect estimates were pooled using a random-effects model. We identified 30 studies for meta-analyses of which 17 were cross-sectional design. The majority of included studies (80%) were carried out in African countries. Among pregnant women, those infected with hookworm were found to have higher association with malaria infection compared with those without (summary OR: 1.36; 95% CI: 1.17-1.59; I(2): 0%). Among non-pregnant adults, the summary OR of the association between anemia and the combined malaria and STH was 2.91 (1.38-6.14). The summary OR of the association between anemia and malaria alone was 1.53 (0.97-2.42), while the association between anemia and STH alone was 0.28 (0.04-1.95). There is no good evidence to support a different effect of malaria and STH on anemia. A subgroup analysis showed a higher risk of malaria infection in the primigravidae (summary OR: 1.61; 95% CI: 1.3-1.99; I(2): 0%). In conclusion, the malaria-STH co-infection was variable with complex outcomes on anemia.

Keywords: Anemia, Co-infection, Helminths, Malaria, Prevalence.
Cho Naing, Yew CK, Cheah HY, Ng SY, Loh MY, Lim XJ, Wong CK, Selvanathan S. Knowledge of medication use and factors influencing the utilization of public health clinic. *International Health.* (In Press). (IF: 0.985; H-index: 5; Tier: Q2).

**Knowledge of medication use and factors influencing the utilization of public health clinic**

Cho Naing, Yew Chun Kai, Cheah Hao Yi, Ng Shien Yee, Loh Min Yi, Lim Xiu Jun, Wong Chee Kin, Sivasanggari A/P Selvanathan.

International Medical University (IMU), Kuala Lumpur 57000, Malaysia

**Abstract**

**Background:**
This study aimed to determine knowledge of medication use, to investigate the treatment-seeking pattern and to identify factors affecting the use of public health clinics among the study population.

**Methods:**
A survey was conducted in Mantin Town of Malaysia using a structured questionnaire based on a literature review. Households were recruited through a three-stage sampling technique.

**Results:**
Of 183 respondents (mean age 44.6 [±16.9] years; 115 [62.8%] women), 157 (85.8%) did not know about the term ‘generic name’ and 159 (86.9%) were not sure about the difference in price between a generic medicine and a branded medicine. The majority sought healthcare from the public health clinics (102/183; 55.7%). In the multivariate analysis, higher education level of respondents (p = 0.028), good quality of services in public health clinics (p = 0.001) and short distances between their residences and the public health clinics (p<0.001) were the significant variables for predicting the use of a public health clinic.

**Conclusion:**
This study highlights that health education on the use of generic drugs needs to be scaled up. These findings are important to the health policy makers who may need to consider addressing factors such as quality of care and physical distance to the clinic in the design and implementation of health facilities and the selection of the catchment areas.

**Keywords:** Health care utilization, Treatment seeking behaviour, Medication knowledge.

**Spatial pattern in Antarctica: What can we learn from Antarctic bacterial isolates?**

Chun Wie Chong¹, Yuh Shan Goh², Peter Convey³,⁴, David Pearce³, Irene Kit Ping Tan²,⁴.

¹ Department of Life Sciences, International Medical University, Kuala Lumpur, Malaysia
² Institute of Biological Sciences, University of Malaya, Kuala Lumpur, Malaysia
³ Ecosystems Programme, British Antarctic Survey, Cambridge, UK
⁴ National Antarctic Research Center, University of Malaya, Kuala Lumpur, Malaysia

**Abstract**

A range of small- to moderate-scale studies of patterns in bacterial biodiversity have been conducted in Antarctica over the last two decades, most suggesting strong correlations between the described bacterial communities and elements of local environmental heterogeneity. However, very few of these studies have advanced interpretations in terms of spatially associated patterns, despite increasing evidence of patterns in bacterial biogeography globally. This is likely to be a consequence of restricted sampling coverage, with most studies to date focusing only on a few localities within a specific Antarctic region. Clearly, there is now a need for synthesis over a much larger spatial to consolidate the available data. In this study, we collated Antarctic bacterial culture identities based on the 16S rRNA gene information available in the literature and the GenBank database (*n* > 2,000 sequences). In contrast to some recent evidence for a distinct Antarctic microbiome, our phylogenetic comparisons show that a majority (~75 %) of Antarctic bacterial isolates were highly similar (≥99 % sequence similarity) to those retrieved from tropical and temperate regions, suggesting widespread distribution of eurythermal mesophiles in Antarctic environments. However, across different Antarctic regions, the dominant bacterial genera exhibit some spatially distinct diversity patterns analogous to those recently proposed for Antarctic terrestrial macroorganisms. Taken together, our results highlight the threat of cross-regional homogenisation in Antarctic biodiversity, and the imperative to include microbiota within the framework of biosecurity measures for Antarctica.

**Keywords:** Antarctic microbiology, Biodiversity, Psychrophile ecology.

Detection of Human Herpes virus 6 (HHV-6) in saliva of healthy adults in Malaysia

Choo HL¹, Shoji Y², Leong CO³.

¹ School of Postgraduate Studies and Research, International Medical University
² School of Dentistry, International Medical University
³ School of Pharmacy and Health Sciences, International Medical University

Abstract

Background:
Human herpesvirus-6 (HHV-6) levels have been considered as markers for various diseases. The aim of this study was to evaluate the prevalence of HHV-6 infection in healthy adults in Malaysia.

Methods:
The level of HHV-6 in saliva was investigated in 36 healthy adults, age 19 to 23 years, at Kuala Lumpur, Malaysia using variant-specific TaqmanTM quantitative real-time PCR (qPCR).

Results:
The amount of HHV-6 DNA in the saliva of healthy adults ranged from negative to 10,000 HHV-6 genomes/ml of saliva (median, 360 genomes/ml of saliva). Of the 36 samples tested, 30 (83%) contained HHV-6 DNA. HHV-6B was the only variant detected in the saliva of all the positive cases.

Conclusions:
The detection of HHV-6 DNA in saliva by real-time PCR assay provides a sensitive and specific quantitation of HHV-6. Our pilot study suggests the wide prevalence of HHV-6 in saliva.

Keywords: Herpesvirus 6, HHV-6, prevalence, real-time PCR, saliva.

**Effect of Spirulina (Arthrospira) supplementation on the immune response to tetanus toxoid vaccination in a mouse model**

Wan-Loy Chu¹, Le Van Quynh², Ammu Kutty Radhakrishnan³.

¹ School of Postgraduate Studies and Research, Faculty of Medicine and Health, International Medical University, Kuala Lumpur, Malaysia
² School of Medicine, Faculty of Medicine and Health, International Medical University, Kuala Lumpur, Malaysia
³ Pathology Division, Faculty of Medicine and Health, International Medical University, Malaysia

**Abstract**

The aim of this study was to investigate whether Spirulina (Arthrospira) supplementation could enhance the immune response to tetanus toxoid (TT) vaccine in a mouse model. Vaccination of TT was performed on day 7 and 21 in mice fed daily with Spirulina (50 and 150 mg/kg body weight). Both Spirulina supplementation and TT vaccination did not significantly affect body weight gain of the mice. Supplementation of Spirulina significantly enhanced IgG level \( (p = .01) \) after the first but not after the second TT vaccination. The anti-TT IgG levels of the groups that received low dose and high dose of Spirulina were not significantly different. Spirulina supplementation did not show significant effects on in vitro splenocyte proliferation and cytokine (IFN-\( \gamma \) and IL-4) production induced by Con A and TT. This study showed that Spirulina supplementation could enhance primary immune response in terms of antibody production, but not secondary immune response following TT vaccination in a mouse model.

**Keywords:** antibody IgG, interferon-gamma (IFN-\( \gamma \)), interleukin-4 (IL-4), Spirulina, tetanus toxoid, vaccination.

**A survey of airborne algae and cyanobacteria within the indoor environment of an office building in Kuala Lumpur, Malaysia**

Wan-Loy Chu¹, Shao-Yang Tneh², Stephen Ambu¹.

¹ School of Postgraduate Studies and Research, International Medical University, Kuala Lumpur, Malaysia
² School of Medicine, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

This study investigates the occurrence of airborne algae and cyanobacteria (AAC) within the indoor environment of an office building in Kuala Lumpur, Malaysia. Samples of air, wall scrapings and soils of potted plants were collected from various sites within the building and surrounding areas. In addition, AAC were collected by exposing a culture medium to the indoor air. Based on the cultured material, 14 taxa of AAC consisting of cyanobacteria such as *Phormidium angustissima* and *Chroococcus minor* and chlorophytes such as *Chlorella vulgaris* and *Chlorococcum humicola* were recorded. The surrounding areas of the building recorded the highest occurrence (75%) of AAC. Within the building, the highest occurrence of AAC (45%) was recorded on the lower ground floor, an area exposed to the outdoor environment. Some of the AAC recorded were also detected in the wall scraping and soil samples. Areas with heavy human movement appeared to have high occurrence of AAC. Human movement appeared to be an important factor in affecting the dispersal of the AAC.

**Keywords:** airborne algae, cyanobacteria, indoor environment, sick building syndrome, Phormidium, Kuala Lumpur.

**Research at IMU: Achievements, thrust areas and future challenges**

Wan-Loy Chu

Institute of Postgraduate Studies and Research, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

There have been significant achievements in research at IMU as indicated by the increasing amount of external funds obtained, and number of publications and postgraduate students produced since it started its research activities in the year 2000. However, it is a great challenge indeed to ensure sustainability of our research, which is currently heavily dependent on internal funding. There is a need to realign our strategies to further enhance our competitiveness in securing external funding for research. In line with this, the Institute for Research, Development and Innovation (IRDI) was officially established on 18 September 2012. The Institute will serve as a platform to support all research activities at IMU. There are four Centres of Excellence based on the identified thrust areas under IRDI, namely 1) Centre for Bioactive Molecules and Drug Discovery; 2) Centre for Environmental and Population Health; 3) Centre for Cancer and Stem Cell Research, and 4) Centre for Health Professional Education Research. Major findings based on research in these four thrust areas are reviewed in this paper. With the strategic planning and establishment of IRDI, it is our aspiration to bring research at IMU to a higher level.

**Keywords:** Research achievements, International Medical University (IMU), bioactive molecules and drug discovery, environmental and population health, cancer and stem cell research, health professional education research.

**Oritavancin - A new semisynthetic lipoglycopeptide agent to tackle the challenge of resistant gram positive pathogens**

Biswadeep Das¹, Chayna Sarkar², Jeffrey Schachter³.

¹ Department of Pharmacology, Division of Pathology, School of Medicine, International Medical University (IMU), No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Pharmacology, Chennai Medical College Hospital & Research Center (SRM Group), Irungalur, Trichy-Chennai Bypass Road (NH-45), Tiruchirapalli-621 105, Tamil Nadu, India
³ International American University College of Medicine, Gable Woods South, Vieux Fort, St. Lucia, West Indies

**Abstract**

Natural glycopeptide antibiotics like vancomycin and teicoplanin have played a significant role in countering the threat posed by Gram-positive bacterial infections. The emergence of resistance to glycopeptides among enterococci and staphylococci has prompted the search for second-generation drugs of this class and semi-synthetic derivatives are currently under clinical trials. Antimicrobial resistance among Gram-positive organisms has been increasing steadily during the past several decades and the current development of antibiotics falls short of meeting the needs. Oritavancin (LY-333328 diphosphate), a promising novel second-generation semisynthetic lipoglycopeptide, has a mechanism of action similar to that of other glycopeptides. It has concentration-dependent activity against a variety of Gram-positive organisms specially methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-intermediate resistant *Staphylococcus aureus* (VISA), *Streptococcus pneumoniae* and vancomycin-resistant enterococcus. It is rapidly bactericidal against many species and in particular for enterococci where vancomycin and teicoplanin are only bacteriostatic even against susceptible strains. The pharmacokinetic profile of oritavancin has not been fully described; however, oritavancin has a long half-life of about 195.4 hours and is slowly eliminated by renal means. Oritavancin is not metabolized by the liver in animals. Oritavancin will most probably be prescribed as a once-daily dose and it demonstrates concentration-dependent bactericidal activity. Oritavancin has demonstrated preliminary safety and efficacy in Phase I and II clinical trials. In a Phase III clinical trial, oritavancin has achieved the primary efficacy end point in the treatment of complicated Gram-positive skin and skin-structure infections. To date, adverse events have been mild and limited; the most common being administration site complaints, headache, rhinitis, dry skin, pain, increases in liver transaminases and accumulation of free cholesterol and phospholipids in phagocytic (macrophages) and nonphagocytic (fibroblast) cells. Oritavancin appears to be a promising antimicrobial alternative to vancomycin (with additional activity against Staphylococcus and Enterococcus resistant to vancomycin) for the treatment of complicated Gram-positive skin and skin-structure infections. Additional clinical data are required to fully explore its use.

**Keywords:** Oritavancin LY-333328 semisynthetic second-generation lipoglycopeptide resistant *Staphylococcus aureus* Gram-positive organisms.

Cyclodextrins – The molecular container

Sanjoy Kumar Das\textsuperscript{1,2}, Rajan Rajabalaya\textsuperscript{3}, Sheba David\textsuperscript{3}, Nasimul Gani\textsuperscript{4}, Jasmina Khanam\textsuperscript{2}, Arunabha Nanda\textsuperscript{2}.

\textsuperscript{1} Institute of Pharmacy, Jalpaiguri, Pin: 735101, West Bengal, India
\textsuperscript{2} Department of Pharmaceutical Technology, Jadavpur University, Kolkata-700032, India
\textsuperscript{3} School of Pharmacy & Health Sciences, International Medical University, No.126, Jalan 19/155B, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
\textsuperscript{4} Department of Chemistry, Jodhpur Park Boys School, Kolkata-700068, India

Abstract

Cyclodextrins (CDs) are cyclic oligosaccharides, which have recently been recognized as useful excipients in different fields. Cyclodextrin (CD) can form water-soluble complexes with lipophilic guests that hide in the cavity of CDs. This review paper will address the historical background of cyclodextrin discovery and highlights the chemistry and physico-chemical properties of three-well-known industrially produced cyclodextrins. Besides this, the article addresses the techniques for CD-complexation, determination of CD-complexes and the mechanism of guest release from cyclodextrin complexes and production of cyclodextrin. To list more, the present paper includes various utilities of cyclodextrins and cyclodextrin complexes in numerous fields, e.g. pharmaceutical, food, biotechnological, chemical and cosmetic industry.

Keywords: Cyclodextrins, Production of cyclodextrins, Mechanism of guest release, Utility of cyclodextrins, Cyclodextrin complexes, Physico-chemical properties.
Formulation and in vitro evaluation of Ethosomes as vesicular carrier for enhanced topical delivery of Isotretinoin

Sheba Rani Nakka David¹, Mah Si Hui¹, Chong Fui Pin¹, Foo Yun Ci¹, Rajan Rajabalaya¹.

¹ School of Pharmacy, Department of Life Sciences, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil 57000, Kuala Lumpur, Malaysia

Abstract
The purpose of the present research was to evaluate the ability of ethosomes for topical delivery of isotretinoin. The ethosomal vesicles were prepared with various concentrations of lecithin and ethanol by using hot method. The ethosomal based isotretinoin gel (GEL-ES) was compared to that of marketed formulations isotretinoin (GEL-MF) by using hydrophobic hydroxyl propyl methyl cellulose as gel base. The physicochemical and stability of ethosomal based isotretinoin and a marketed gel (control) were evaluated for organoleptic properties, drug entrapment, drug content uniformity and in vitro drug release and skin permeation studies. F2 ethosomal vesicles containing 2%w/w lecithin and 30%w/w ethanol was found to have shown the best entrapment percentage (99.21%) and also showed suitable physicochemical characteristics for topical administration. Physical stability studies were also conducted for 45 days at 4°C and 25°C. GEL-ES and GEL-MF were applied to rat skin and penetration was assessed by Franz diffusion cells. In vitro release studies showed that less than 10% of isotretinoin reached the receptor compartment compared to GEL-MF till 8 h. On comparing F2 and F4 gel formulations, F2 gel has shown better controlled release by in vitro drug release and in vitro skin permeation profile than F4 gel. However, the in vitro skin permeation was increased with the addition of enhancers. From the experimental data, it may be concluded that the ethosomal vesicles and enhancers increased the skin permeation and depot formation of drug in the skin.

Keywords: Ethosomes, topical delivery, isotretinoin, N-methyl-2-pyrrolidone, eugenol.

**Clinical features and complications of scorpion sting: A descriptive study**

Praveen Kumar Devarbhavi¹, Vasudeva Murthy², Sami Abdo Al-Dubai³, Mustafa Ahmed Alshagga⁴.

¹ Department of Medicine, S.S. Institute of Medical Science and Research centre. Davangere, India
² Department of Pathology, International Medical University, 126 Jalan 19/155b, 57000 Kuala Lumpur
³ Department of Public Health & Community Medicine, International Medical University, 126 Jalan 19/155b, 57000 Kuala Lumpur.
⁴ Newcastle University Medicine Malaysia, No.1, Jalan Sarjana 1, Kota Ilmu, Educity@Iskandar, 79200 Nusajaya, Johor, Malaysia

**Abstract**

**Background:**
Scorpion sting is a common problem in rural parts of India. It is uncommon for patients with scorpion sting to present with life threatening complications. This study aimed to describe the clinical manifestations and complications of scorpion sting.

**Methods:**
A descriptive study of clinical features and complications of patients diagnosed with scorpion sting and admitted in two hospitals attached to Jagadguru Jayadeva Murugarajendra (J.J.M) Medical College in Davangere, a state at the southern India.

**Results:**
A total of 52% of scorpion sting cases were patients between the age group of 15 to 30 years. Pain at the sting site (100%) and tachycardia (78%) were the most common presenting signs and symptoms respectively. Pulmonary oedema (24%) and myocarditis (18%) were the two most serious complications. Most of the cases (94%) recovered completely without any sequelae. Mortality (4%) was secondary to severe pulmonary oedema and myocarditis.

**Conclusion:**
Cardiovascular complications were most common causes of death from scorpion sting. Early treatment may prove to be necessary for complete recovery.

**Keywords:** complications, envenomation, pulmonary oedema, mesobuthus tamulus, myocarditis, scorpion sting.

Scorpion sting envenomation

Praveen Kumar Devarbhavi¹, Vasudeva Murthy C.R², Kavya.S.Praveen³.

¹ Department of Medicine, S.S. Institute of Medical Science and Research centre. Davangere. India
² Department of Pathology, International Medical University, 126 Jalan 19/155b, 57000 Kuala Lumpur
³ Department of Pediatrics, S.S. Institute of Medical Science and Research centre. Davangere. India

Abstract
Scorpion stings are a major public health problem in many underdeveloped tropical countries, especially in rural parts of India. Patients often presents with life threatening complications. Envenomation due to scorpion sting results in various clinical manifestations. They range from mild local pain to diffuse intolerable pain of whole limb and body to systemic manifestation involving almost all systems, predominantly cardiovascular and may sometimes lead to death.

Keywords: Scorpions, Envenomation, Pathophysiology, Management.

Hepatotoxic effect of doxorubicin in Sprague Dawley rats: Evidence from histopathological study

Senthil Rajan Dharmalingam¹, Kumarappan Chidambaram¹, Srikumar Chakravarthy², Ng Kee Ping¹, Shamala Nadaraju¹.

¹ School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia.
² Faculty of Medicine, Perdana University Graduate School of Medicine, Malaysia

Abstract
Background:
The present study was undertaken to establish the cumulative toxic effect of doxorubicin associated hepatic damage in Sprague dawley rat's liver. Doxorubicin belongs to anthracycline anticancer antibiotic chemical class has been extensively used for chemotherapy of various cancers. Despite extensive investigations into its hepatic damage there is very limited information on its cumulative hepatotoxic effects on the structure of liver in vivo.

Methods:
Effect of doxorubicin (intraperitoneal, ip) induced cumulative hepatotoxicity on Sprague dawley rat's liver using at light microscopical study was investigated.

Results:
Microscopical study revealed that cumulative dose of doxorubicin at 18 mg/kg body weight for 11 days resulted massive hepatic injury compared to control group (p<0.05), including large congestion, inflammation of perportal areas, inflammation between hepatocytes and focal clusters of necrotic hepatocytes. Interestingly, the cumulative dose of doxorubicin at 6 mg/kg body weight exhibited slight scattered areas of congestion in the central vein. Similarly, the cumulative dose of 12 mg/kg body weight for 7 days caused moderate inflammation and congestion in many rat liver sections, including heavy areas of congestion, dilated vascular spaces and parenchymal extravasation of RBCs. The histopathological results provided direct in vivo evidence at cellular level by direct hepatotoxicity caused by doxorubicin in a cumulative way.

Conclusion:
Finally, the results may provide the guidance for the appropriate treatment to modify the hepatotoxic effects of doxorubicin. Further studies are warranted to justify its cumulative hepatic injury at molecular and ultra-structural levels.

Keywords: Doxorubicin, cumulative toxicity, heptotoxicity, histopathology, Sprague dawley rats.

**Epidemiological profile of hospitalised injuries among electric bicycle riders admitted to a rural hospital in Suzhou: A cross-sectional study**

Wei Du¹², Jie Yang³, Brent Powis⁴, Xiaoying Zheng¹, Joan Ozanne-Smith⁵, Lynne Bilston², JingLin He⁶, Ting Ma⁷, Xiaofei Wang⁷, Ming Wu³.

¹ Institute of Population Research, Peking University, Beijing, China
² Neuroscience Research Australia, University of New South Wales, Randwick, NSW, New South Wales, Australia
³ Jiangsu Provincial Centre for Disease Control, Nanjing, China
⁴ School of Postgraduate Studies and Research, International Medical University, Kuala Lumpur, Malaysia
⁵ Department of Forensic Medicine, Monash University, Melbourne, Victoria, Australia
⁶ The World Health Organization Beijing Office, Beijing, China
⁷ The Third Municipal Hospital in Zhangjiagang, Suzhou, China

**Abstract**

Police reports indicate an increasing burden of electric bike (E-bike) casualties in China; however, hospitalised injury data have not been reported. The aim of the present work was to describe hospitalised injury patterns for E-bikers involved in road crashes and explore injury risk disparities among them. For the period October 2010 to April 2011, this cross-sectional study retrospectively collected information for hospitalised E-bikers involved in road crashes from hospital records, in Suzhou China, using the International Classification of Diseases, 10th revision (ICD-10) injury diagnosis codes. Injury nature and body region were further categorised using ICD-10 codes. Multivariate logistic regression was used to assess the risk of specific injury types. We found that hospitalised E-biker injuries (n=323) accounted for 57.2% of road traffic hospitalisations over the 6-month study period. The average age, length of stay and hospitalisation cost were 43.8 years, 10.0 days and ¥8229 (US$1286), respectively. Fractures and head injuries were common. The odds of traumatic brain injuries were significantly elevated for night-time E-bike crashes and incidents other than colliding with motor vehicles. These findings confirm E-bike injuries as an important population health problem and identify elevated injury odds in different E-biker groups. Future injury prevention initiatives should include encouraging helmet use among E-bikers.

**Development of solid dispersion systems of Dapivirine to enhance its solubility**

Adinarayana Gorajana, Chan Chiew Ying, Shuang Yeen, Fong Pooi, Tan Zhi, Jyoti Gupta, Meghna Talekar, Sharma Manisha; Garg Sanjay.

**Abstract**

Dapivirine, formerly known as TMC 120, is a poorly-water soluble anti-HIV drug, currently being developed as a vaginal microbicide. The clinical use of this drug has been limited due to its poor solubility. The aim of this study was to design solid dispersion systems of Dapivirine to improve its solubility. Solid dispersions were prepared by solvent and fusion methods. Dapivirine release from the solid dispersion system was determined by conducting in-vitro dissolution studies. The physicochemical characteristics of the drug and its formulation were studied using Differential Scanning Calorimetry (DSC), powder X-ray Diffraction (XRD), Fourier-transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). A significant improvement in drug dissolution rate was observed with the solid dispersion systems. XRD, SEM and DSC results indicated the transformation of pure Dapivirine which exists in crystalline form into an amorphous form in selected solid dispersion formulations. FTIR and HPLC analysis confirmed the absence of drug excipient interactions. Solid dispersion systems can be used to improve the dissolution rate of Dapivirine. This improvement could be attributed to the reduction or absence of drug crystallinity, existence of drug particles in an amorphous form and improved wettability of the drug.

**Keywords:** Dapivirine, Dissolution rate, HIV, Microbicides, Solid dispersion, Solubility improvement.

**Antiplasmodial activity of cucurbitacin glycosides from *Datisca glomerata* (*C. Presl*) Baill**

Rocky Graziose¹, Mary H. Grace², Thirumurugan Rathinasabapathy⁴, Patricio Rojas-Silva¹, Carmen Dekock³, Alexander Poulev¹, Mary Ann Lila², Peter Smith³, Ilya Raskin¹.

¹ Department of Plant Biology and Pathology, SEBS, Rutgers, The State University of New Jersey, New Brunswick, NJ 08901, USA
² Plants for Human Health Institute, North Carolina State University, North Carolina Research Campus, 600 Laureate Way, Kannapolis, NC 28081, USA
³ Division of Pharmacology, University of Cape Town Medical School, K45, OMB Groote Schuur Hospital, Observatory 7925, South Africa
⁴ Department of Pharmaceutical Chemistry, School of Pharmacy, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

The traditionally used antimalarial plant, *Datisca glomerata* (*C. Presl*) Baill, was subjected to antiplasmodial assay guided fractionation. This led to the isolation of seven cucurbitacin glycosides, datiscosides I–O, along with two known compounds, datiscoside and datiscoside B, from the aerial parts of *D. glomerata*. Their structures and relative stereochemistry were determined on the basis of mass spectrometry, 1D and 2D NMR spectroscopic data. Antiplasmodial IC50 values were determined for all isolated compounds against a chloroquine sensitive strain of *Plasmodium falciparum* (D10), which were also evaluated in vitro for their antileishmanial activity against *Leishmania tarentolae*. Cytotoxicity was evaluated against rat skeletal muscle cells (L6) and Chinese ovarian hamster cells (CHO). The antiplasmodial activity of the compounds was moderate and ranged from 7.7 to 33.3 μM. None of the compounds showed appreciable antileishmanial activity. The compounds displayed cytotoxicity against L6 but not CHO mammalian cells.

**Keywords**: *Datisca glomerata*, Cucurbitales, Datiscaceae, Durango root, Bioassay guided fractionation, Cucurbitacin, Antimalarial, Antileishmanial, Cytotoxicity.
Myocardial infarction false alarm: Initial electrocardiogram and cardiac enzymes

Esha Das Gupta¹, Rajalingham Sakthiswary².

¹ Department of Medicine, International Medical University, Seremban, Malaysia
² Department of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Cheras, Malaysia

Abstract
Objective:
The objectives of this study were to determine the incidence of a myocardial infarction “false alarm” and evaluate the efficacy of the initial electrocardiogram and cardiac enzymes in diagnosing myocardial infarction in Malaysia.

Methods:
We recruited patients who were admitted with suspected myocardial infarction from June to August 2008. The medical records of these patients were reviewed for the initial electrocardiogram, initial cardiac enzyme levels (creatinine kinase-MB and troponin T), and the final diagnosis upon discharge. The subjects were stratified into 2 groups: true myocardial infarction, and false alarm.

Results:
125 patients were enrolled in this study. Following admission and further evaluation, the diagnosis was revised from myocardial infarction to other medical conditions in 48 (38.4%) patients. The sensitivity and specificity of the initial ischemic electrocardiographic changes were 54.5% and 70.8%, respectively. Raised cardiac enzymes had a sensitivity of 44.3% and specificity of 95.8%.

Conclusion:
A significant proportion of patients in Malaysia are admitted with a false-alarm myocardial infarction. The efficacy of the electrocardiogram in diagnosing myocardial infarction in Malaysia was comparable to the findings of Western studies, but the cardiac enzymes had a much lower sensitivity.

Keywords: Biological markers, creatine kinase, MB form, electrocardiography, Malaysia, myocardial infarction, troponin T.

**Simultaneous UV-spectrophotometric estimation of hydrocortisone acetate and sulphacetamide sodium in combined dosage form**

Myneni Harika¹ and G.S. Kumar².

¹ GITAM Institute of Pharmacy, GITAM University, Visakhapatnam-530045, Andhra Pradesh, India
² Department of Life Sciences, School of Pharmacy and Health Sciences, International Medical University, Jalan Jalil Perkasa, Bukit Jalil, Kuala Lumpur – 57000, Malaysia

**Abstract**

Two simple, precise and accurate methods were developed and validated for the Simultaneous estimation of Hydrocortisone acetate and Sulphacetamide sodium in the combined dosage forms. The first method involves the usage of Simultaneous equation for the determination and the second method employed is the Multicomponent mode. For both the methods the wavelengths selected were 241.5nm and 271.0nm which are the absorbance maxima of Hydrocortisone acetate and Sulphacetamide sodium respectively. The drugs obeyed Beer's law in the concentration range of 5-50μg/mL for hydrocortisone acetate and 5-40 μg/mL for Sulphacetamide sodium. The results of the analysis were validated statistically and by recovery studies.

**Keywords:** Hydrocortisone acetate, Sulphacetamide sodium, Simultaneous equation, Multicomponent mode.

**The validity of the menopause-specific quality of life questionnaire in women with type 2 diabetes**

S. S. Hasan¹, K. Ahmadi, R. Santigo², S. I. Ahmed².

¹ The University of Queensland, 20 Cornwall Street, Woolloongabba, 4102, Queensland, Australia
² International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia

**Abstract**

**Objectives:** To examine the validity and reliability of the Menopause-specific Quality of Life (MENQOL) questionnaire in a sample of women with diabetes in Malaysia, with the secondary aim of determining whether MENQOL domain scores were associated with depression and diabetes.

**Methods:** A total of 337 postmenopausal women (241 with diabetes, 96 controls) were evaluated. Construct validity was evaluated using principal components analysis (PCA) and comparing scale items against the mental component score of the Short Form-12 (SF-12 MCS), and against the Center for Epidemiologic Studies Depression Scale 10 (CES-D 10). Consistency assessment was conducted using Cronbach’s α.

**Results:** The internal consistencies for the physical (PHS), psychosocial (PS), sexual (VSS) and vasomotor domains were 0.86, 0.79, 0.79 and 0.70, and 0.90 for the full scale of MENQOL. PCA revealed a four-factorial model. Diabetes and non-diabetes subjects experienced their first period (13.25 vs. 13.10 years, \( p = 0.680 \)) and achieved menopause around the same age (49.35 vs. 48.87 years, \( p = 0.426 \)). We found significant variations in the MENQOL’s PHS and PS domain scores that could be explained by SF-12 PCS (25%) and SF-12 MCS (20%) sub-scales. The validity of the MENQOL domains was demonstrated through significant associations with the equivalent SF-12 MCS and PCS subscales. The PS domain of the MENQOL also predicted the likelihood of symptoms of depression (1.42, 95% confidence interval 1.01–2.02).

**Conclusions:** This study confirms the validity and internal consistency of the MENQOL questionnaire for measuring quality of life in postmenopausal women with diabetes, suggesting that the instrument can be used to screen people for menopausal symptoms.

**Keywords:** validity, menopause, quality of life, diabetes.

**Pregnancy complications, mental health-related problems and type 2 diabetes mellitus in Malaysian women**

Syed Shahzad Hasan¹, Kaeshaelya Thiruchelvam², Syed Imran Ahmed², Alexandra M. Clavarino¹, Abdullah A. Mamun³, Therese Kairuz¹.

¹ The University of Queensland, 20 Cornwall Street, Woolloongabba 4102, Queensland, Australia  
² International Medical University, Jalan Jalil Perkasa 19, 57000 Bukit Jalil, Kuala Lumpur, Malaysia  
³ The University of Queensland, Herston Road, Herston 4006, Queensland, Australia

**Abstract**

**Aims:**  
The aim of this study was to investigate the association between pregnancy complications, mental health-related problems, and type 2 diabetes mellitus (T2DM) in Malaysian women.

**Materials and methods:**  
A case–control study of women with T2DM (n = 160) matched by age range to controls without T2DM (n = 160). Data were collected in the Negeri Sembilan and Putrajaya regions in Malaysia, from two hospital outpatient clinics, Putrajaya Hospital and Tuanku Jaafar Hospital Seremban, and one health clinic at Seremban. Validated, interviewer-administered questionnaires were used to obtain the data. The unadjusted and adjusted estimates were calculated using the Mantel–Haenszel method.

**Results:**  
Neither depression (RR 0.74, 95% CI: 0.39–1.41) nor anxiety (RR 1.00, 95% CI: 0.53–1.88) symptoms increased the risk of T2DM significantly. However, gestational diabetes (RR 1.35, 95% CI: 1.02–1.79), and 3 pregnancies (RR 1.39, 95% CI: 1.08–1.79) were significant risk factors for the development of T2DM. T2DM was not a significant risk factor for either depression (RR 1.26, 95% CI: 0.91–1.74) or anxiety symptoms (RR 1.13, 95% CI: 0.59–2.19).

**Conclusion:**  
In this study, T2DM is not a significant risk factor for depression and anxiety; similarly, neither are depression and anxiety significant risk factors for T2DM. Although prevalence of depression and anxiety is not alarming, the findings reported here should alert clinicians to screen and treat anxiety and depression in people with diabetes and also note the importance of monitoring women with complications in pregnancy for risk of later T2DM.

**Keywords:** Type 2 diabetes mellitus, Depression, Anxiety, Malaysian, Women.

**Perceived impact of clinical placements on students’ preparedness to provide patient-centred care in Malaysia**

Syed Shahzad Hasan¹, Pei Se Wong², Syed Imran Ahmed², David Weng Kwai Chong³, Chun Wai Mai², Peter Pook², Therese Kairuz¹.

¹ School of Pharmacy, the University of Queensland, Brisbane, Australia
² International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
³ Monash University, Sunway Campus Malaysia, Bandar Sunway, Malaysia

**Abstract**

**Objective:**
Over the last two decades the pharmacy profession has seen a major revision to patient-focused teaching and practice. This study evaluated the perceived impact of experiential clinical pharmacy placements on students’ preparedness to provide patient-centered care.

**Methods:**
This cross-sectional study among Bachelor of Pharmacy (BPharm) final-year students used a validated self-administered questionnaire, administered before and after the students’ clinical placements undertaken at hospitals. Subjects’ responses were rated on a 7-point Likert scale anchored at 1 (not at all) and 7 (very well prepared). The Wilcoxon test was applied to assess the differences in pre- and post-mean scores of individual items.

**Results:**
One hundred six students agreed to participate in the study. Despite the low percentage of clinical curricular content coverage, significant augmentation in post-placement overall mean scores in aspects of patient-centered care was found; therapeutic (4.8 vs 3.5; 38.3% change), psycho-social (4.9 vs 4.1, 19.5% change) and communication skills (5.05 vs 3.9, 30.8% change) aspects of patient-centered care were noted. The mean score for each item in the three aspects increased from pre- to post-clinical placements and were statistically significant (p<0.05).

**Conclusion:**
Perceived patient centered care skills grow as the students’ complete coursework, and changes to that coursework, including clinical learning, can impact both actual and perceived patient-centered-care competencies. The findings highlight areas for curriculum improvement and this evaluation reinforces the need for experiential placements in the BPharm curriculum. There is value in the development of pharmacy practice skills which occurs during undergraduate placements through experiential learning.

**Keywords:** Perceived impact, Clinical placements, Students, Preparedness, Patient-centered, Care.

**Transcultural diabetes nutrition algorithm: A Malaysian application**

Zanariah Hussein\(^1\), Osama Hamdy\(^2\), Yook Chin Chia\(^3\), Shueh Lin Lim\(^4\), Santha Kumari Natkunam\(^5\), Husni Hussain\(^6\), Ming Yeong Tan\(^7\), Ridzoni Sulaiman\(^8\), Barakatun Nisak\(^9\), Winnie Siew Swee Chee\(^10\), Albert Marchetti\(^11\), Refaat A. Hegazi\(^12\), Jeffrey I. Mechanick\(^13\).

\(^1\) Department of Medicine, Hospital Putrajaya, Pusat Pentadbiran Kerajaan Persekutuan, Presint 7, 62250 Putrajaya, Malaysia
\(^2\) Division of Endocrinology, Diabetes and Metabolism, Joslin Diabetes Center, Harvard Medical School, Boston, MA 02215, USA
\(^3\) Department of Medicine, University Malaya Medical Centre, Kuala Lumpur, Malaysia
\(^4\) Department of Medicine, Hospital Pulau Pinang, Penang, Malaysia
\(^5\) Department of Medicine, Hospital Tengku Ampuan Rahimah, Selangor, Malaysia
\(^6\) Family Medicine, Putrajaya Health Clinic, Putrajaya, Malaysia
\(^7\) Department of Health Care, International Medical University, Kuala Lumpur, Malaysia
\(^8\) Department of Dietetics and Food Services, Hospital Kuala Lumpur, Kuala Lumpur, Malaysia
\(^9\) Department of Nutrition and Dietetics, University Putra Malaysia, Selangor, Malaysia
\(^10\) Department of Nutrition and Dietetics, International Medical University, Kuala Lumpur, Malaysia
\(^11\) Preventive Medicine and Community Health, University of Medicine and Dentistry of New Jersey, Newark, NJ 07101, USA
\(^12\) Abbott Nutrition, Columbus, OH 43219, USA
\(^13\) Division of Endocrinology, Diabetes, and Bone Disease, Icahn School of Medicine at Mount Sinai, New York, NY 10029, USA

**Abstract**

Glycemic control among patients with prediabetes and type 2 diabetes mellitus (T2D) in Malaysia is suboptimal, especially after the continuous worsening over the past decade. Improved glycemic control may be achieved through a comprehensive management strategy that includes medical nutrition therapy (MNT). Evidence-based recommendations for diabetes-specific therapeutic diets are available internationally. However, Asian patients with T2D, including Malaysians, have unique disease characteristics and risk factors, as well as cultural and lifestyle dissimilarities, which may render international guidelines and recommendations less applicable and/or difficult to implement. With these thoughts in mind, a transcultural Diabetes Nutrition Algorithm (tDNA) was developed by an international task force of diabetes and nutrition experts through the restructuring of international guidelines for the nutritional management of prediabetes and T2D to account for cultural differences in lifestyle, diet, and genetic factors. The initial evidence-based global tDNA template was designed for simplicity, flexibility, and cultural modification. This paper reports the Malaysian adaptation of the tDNA, which takes into account the epidemiologic, physiologic, cultural, and lifestyle factors unique to Malaysia, as well as the local guidelines recommendations.

**Urethral catheter knotting: An avoidable complication**

Ismail Burud¹, Davaraj Balasingh², Hikmatullah Qureshi¹, Davendralingam Sinniah¹.

¹ International Medical University, Clinical School, Seremban 70300, Negeri Sembilan, Malaysia
² Department of Surgery, Hospital Tuanku Jaafar, Seremban 70300, Negeri Sembilan, Malaysia

**Abstract**

Urethral catheterisation is a common and safe procedure performed routinely. The small size of the urethra in a child necessitates the use of an infant feeding tube (Size 5 to 8 F) for catheterisation. Knotting within the bladder is a rare complication with significant morbidity often necessitating surgical or endoscopic removal. Insertion of an excessive length of tube contributes to coiling and knotting. We report an instance of knotting of an infant feeding tube in the proximal penile urethra of a 4 year-old male child requiring urethrotomy to remove it. Awareness of the risk and proper technique can reduce this complication.

**Keywords:** Urethral catheter, knotting, infant feeding tube.
Ithoi I, Makmud R, Abdul Basher MH, Abdulsalam AM, Ibrahim J, Mak JW. *Acanthamoeba* genotype T4 detected in naturally-infected feline corneas found to be in homology with those causing human keratitis. *Tropical Biomedicine*, 2013; 30(1): 131-140. (ISI IF: 0.6; SJR SCIMAGO: 0.798; HI: 12; Tier: Q2).

*Acanthamoeba* genotype T4 detected in naturally-infected feline corneas found to be in homology with those causing human keratitis

Ithoi, I.¹, Mahmud, R.¹, Abdul Basher, M.H.¹, Jali, A.¹, Abdulsalam, A.M.¹, Ibrahim, J.¹ and Mak, J.W.².

¹ Department of Parasitology, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia,
² School of Postgraduate Studies and Research, International Medical University, Kuala Lumpur, Malaysia

Abstract

A total of 10 out of 65 cornea swab samples from cats with eye symptoms showed *Acanthamoeba*-like morphology after cultivation. By PCR and DNA sequencing of *Acanthamoeba* diagnostic fragment 3 (DF3), all 10 isolates from the positive samples were categorized into two homologous groups of AfC1 (PM1, PM2, PM3, PF6, KM7, KF8, KMK9) and AfC2 (PM4, PM5, KFK10) due to the presence of bases A354 and G354, respectively. Furthermore, DF3 of AfC1 and AfC2 showed 100% similarity with Genbank reference isolates with the accession numbers DQ087314, EU146073 and U07401, GU808323, which were *Acanthamoeba castellanii* strains genotype T4 originating from human keratitis. This finding suggests that *A. castellani* strains have the capability to infect cats and human under favourable conditions.

**Antibiotics for mastitis in breastfeeding women**

Shayesteh Jahanfar¹, Chirk-Jenn Ng², Cheong Lieng Teng³.

¹ School of Population and Public Health, University of British Columbia, Vancouver, Canada
² Department of Primary Care Medicine, University of Malaya, Kuala Lumpur, Malaysia
³ Department of Family Medicine, International Medical University Jalan Rasah, Seremban, Malaysia

**Abstract**

**Background:**
Mastitis can be caused by ineffective positioning of the baby at the breast or restricted feeding. Infective mastitis is commonly caused by *Staphylococcus aureus*. Incidence of mastitis in breastfeeding women may reach 33%. Effective milk removal, pain medication and antibiotic therapy have been the mainstays of treatment.

**Objectives:**
This review aims to examine the effectiveness of antibiotic therapies in relieving symptoms for breastfeeding women with mastitis with or without laboratory investigation.

**Search methods:**
We searched the Cochrane Pregnancy and Childbirth Group’s Trials Register (March 2010), contacted investigators and other content experts known to us for unpublished trials and scanned the reference lists of retrieved articles.

**Selection criteria:**
We selected randomised and quasi-randomised clinical trials (RCTs) comparing the effectiveness of various types of antibiotic therapies or antibiotic therapy versus alternative therapies for the treatment of mastitis.

**Data collection and analysis:**
Two authors independently assessed trial quality and extracted data. When in dispute, we consulted a third author.

**Main results:**
Two trials met the inclusion criteria. One small trial (n = 25) compared amoxicillin with cephradine and found no significant difference between the two antibiotics in terms of symptom relief and abscess formation. Another, older study compared breast emptying alone as 'supportive therapy' versus antibiotic therapy plus supportive therapy, and no therapy. The findings of the latter study suggested faster clearance of symptoms for women using antibiotics, although the study design was problematic.

**Authors’ conclusions:**
There is insufficient evidence to confirm or refute the effectiveness of antibiotic therapy for the treatment of lactational mastitis. There is an urgent need to conduct high-quality, double-blinded RCTs to determine whether antibiotics should be used in this common postpartum condition.
Prevalence of macrolide resistance and in vitro activities of six antimicrobial agents against clinical isolates of *Streptococcus pneumoniae* from a multicenter surveillance in Malaysia

Jayakayatri Jeewajothi Nathan¹, Niazlin Mohd Taib¹, Mohd Nasir Mohd Desa², Siti Norbaya Masri¹, Rohani Md Yasin³, Farida Jamal¹, Sreenivasa Rao Sagineedu⁴, Arunkumar Karunanidhi¹.

¹ Department of Medical Microbiology and Parasitology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor Darul Ehsan, Malaysia
² Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor Darul Ehsan, Malaysia
³ Bacteriology Division, Institute for Medical Research, Jalan Pahang, 50588 Kuala Lumpur, Malaysia
⁴ Department of Pharmaceutical Chemistry, School of Pharmacy, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract

The in vitro activities of 6 antimicrobial agents against clinical isolates of *Streptococcus pneumoniae* (pneumococci) were investigated and the erythromycin minimum inhibitory concentrations (MICs) were correlated with the two major macrolide resistance determinants, *mef*(A) and *erm*(B). MICs of commonly used antibiotics as well as the presence of macrolide resistance determinant genes in all isolates were tested. Seventy one pneumococcal isolates collected at Institute for Medical Research (IMR) were included in this study. Phenotypic characterization, MIC determination using E-test strips and polymerase chain reactions for antibiotic resistance determination were included. Among the isolates, 25 (35.2%) isolates were erythromycin susceptible, 3 (4.2%) were intermediate and 42 (60.6%) were resistant. Fifty three isolates (74.7%) were found with *mef*(A) alone, 15 (21.1%) isolates with *erm*(B) + *mef*(A) combination and 3 (4.2%) isolates with none of the two genes. The *in vitro* activity of penicillin, amoxicillin clavulanic acid, ceftriaxone and cefotaxime is superior to trimethoprim-sulfamethoxazole and erythromycin. In conclusion, pneumococcal isolates in this study were highly susceptible to penicillin with very low MICs. However, a very high prevalence rate of erythromycin resistance was observed. Erythromycin resistant *S. pneumoniae* isolates with both *mef*(A) and *erm*(B) showed very high MICs ≥256 μg/mL.

**Bioactive molecules: Current trends in discovery, synthesis, delivery and testing**

Yew Beng Kang1, Pichika R Mallikarjuna1, Davamani A Fabian4, Adinarayana Gorajana2, Chooi Ling Lim4, Eng Lai Tan3.

1 Department of Pharmaceutical Chemistry, International Medical University, Kuala Lumpur, Malaysia
2 Department of Pharmaceutical Technology, International Medical University, Kuala Lumpur, Malaysia
3 Department of Life Sciences, School of Pharmacy, International Medical University, Kuala Lumpur, Malaysia
4 Department of Human Biology, School of Medicine, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

Important bioactive molecules are molecules that are pharmacologically active derived from natural sources and through chemical synthesis. Over the years many of such molecules have been discovered through bioprospective endeavours. The discovery of taxol from the pacific yew tree bark that has the ability in stabilising cellular microtubules represents one of the hallmarks of success of such endeavours. In recent years, the discovery process has been aided by the rapid development of techniques and technologies in chemistry and biotechnology. The progress in advanced genetics and computational biology has also transformed the way hypotheses are formulated as well as the strategies for drug discovery. Of equal importance is the use of advanced drug delivery vehicles in enhancing the efficacy and bioavailability of bioactive molecules. The availability of suitable animal models for testing and validation is yet another major determinant in increasing the prospect for clinical trials of bioactive molecules.

**Keywords**: Bioactive molecules, compound libraries, surface plasmon resonance, drug delivery, Zebra fish.

**Removal of hazardous heavy metals from aqueous environment by low cost adsorption materials**

Pei-Sin Keng¹, Siew-Ling Lee², Sie-Tiong Ha³,⁴, Yung-Tse Hung⁵, Siew-Teng Ong³,⁴.

¹ Department of Pharmaceutical Chemistry, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
² Ibnu Sina Institute for Fundamental Science Studies, Universiti Teknologi Malaysia, 81310, Skudai, Johor, Malaysia
³ Faculty of Science, Universiti Tunku Abdul Rahman, Jalan Universiti, Bandar Barat, 31900, Kampar, Perak, Malaysia
⁴ Centre for Biodiversity Research, Universiti Tunku Abdul Rahman, Jalan Universiti, Bandar Barat, 31900, Kampar, Perak, Malaysia
⁵ Department of Civil and Environmental Engineering, Cleveland State University, Cleveland, OH, USA

**Abstract**

The rapid growth of the human population and industrialization in the world has indirectly increased environmental problems such as water, air and land pollution. Amongst all, heavy metals can be considered as the most problematic pollutants. Numerous efforts have been attempted to minimize the impact of heavy metals. This chapter discusses the recent developments and technical applicability of different treatment methods for heavy metal removal. The adsorption process using various low-cost materials as the potential alternative for heavy metal removal is being highlighted and summarized.

**Keywords:** Heavy metals, Chemical precipitation, Ion exchange, Membrane filtration, Adsorption, Low-cost adsorbents.
Kew ST. Third Decade of Health professional education at the International Medical University: Driven by the 3 I’s of IMU. *IeJSME*, 2013; 7(1): 24-28. (IF: 0.024; H-index: 1).

**Third Decade of Health professional education at the International Medical University: Driven by the 3 I’s of IMU**

Siang Tong Kew

School of Medicine, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

Building on two decades as a private health professional university, the International Medical University prepares for the third decade, taking stock of the challenges in changing epidemiology and pattern of disease, changing demography and healthcare, as well as explosion in knowledge and information technology. The Global Independent Commission1 provided a framework for instructional and institutional reforms, and the IMU will use its 3 I’s (insight, imagination & innovation) in adopting these measures. Some of the instructional reforms are already in place, others need to be further nurtured and promoted. In its third decade, competency based curriculum, inter-professional learning, IT, global collaboration, educational resources, new professionalism and emphasis on quality improvement will help ensure IMU train and produce competent, caring and ethical health professionals fit to tackle 21st century challenges.

**Keywords:** Health professional, education, 21st century, instructional reform.

**A case study of a chronic smoker with marijuana addiction**

Rumi Khajotia¹, Nalini Somaweera².

¹ Department of Internal Medicine, International Medical University, Clinical School and Consultant Pulmonologist, Department of Internal Medicine, Hospital Tuanku Ja’afar, Seremban, Negeri Sembilan, Malaysia.
² Department of Radiology, International Medical University Clinical School, Seremban, Negeri Sembilan, Malaysia.

**Abstract**

A man, 33 years of age, presented to his family physician with complaints of acute breathlessness and right-sided chest pain for the past 2 days. He had smoked 20 cigarettes daily for the past 15 years, and had also smoked 4–5 marijuana spliffs per week for the past 11 years. There was no history of cough, expectoration, blood in the sputum, fever or trauma to the chest wall. On examination, the patient appeared breathless with a respiratory rate of 32 breaths/min. On palpation, the trachea was shifted to the left side. The right hemithorax appeared hyperinflated and did not move with respiration, while the left hemithorax appeared to move normally with respiration. The apex beat was palpable in the fifth left intercostal space, 1 cm lateral to the mid-clavicular line. On percussion, a hyperresonant note was heard over the right upper and mid zones, while a dull note was heard at the right lung base. Normal resonance was present over the entire left side of the chest. On auscultation, air entry was absent over the entire right hemithorax, while normal vesicular breath sounds were heard over the left hemithorax. Vocal resonance was absent over the right upper and mid zones, and was decreased at the right lung base. Vocal resonance was normally heard over the entire left hemithorax. The patient was referred for urgent chest X-ray (*Figure 1*).

**Efavirenz does not cause false-positive urine cannabis test in HIV-infected patients on highly active anti-retroviral therapy**

Kwee Choy Koh, Wei-Yee Lee, Zhen Wei Eh, Nor Julaika Ismail, Pei Sen Tee, Azizon Othman, Thilageswary Murgaya.

International Medical University, Internal Medicine, Clinical School, Jalan Rasah, Seremban, Negeri Sembilan 70400, Malaysia

**Abstract**

Efavirenz is a non-nucleoside reverse transcriptase inhibitor used in combination with other drugs for the treatment of patients with HIV infection. Efavirenz has been reported to cause a positive urine cannabis test reaction which may create problems between HIV-infected patients on Efavirenz and law enforcement agencies. Doctors are at loss whether to issue documents certifying the potential false positive urine cannabis test with Efavirenz to patients. We investigated if the urine of HIV-infected patients on Efavirenz caused a positive urine cannabis test using the AxSYM Cannabinoids Assay®. Urine samples from 51 eligible patients on Efavirenz were tested for cannabis. All tested negative except for one who had used cannabis the day before. Efavirenz does not cause false positive urine cannabis test with the AxSYM Cannabinoids Assay®. Certification documents from doctors are therefore unnecessary.

**Keywords:** HIV, Efavirenz, Urine Cannabis test.

**Sexual practices and HIV prevalence amongst men-who-have-sex-with-men at a community-based voluntary counseling and testing centre in Malaysia**

K. C. Koh¹, K. Kanagalingam², F. T. Tai², A. Kamarulzaman³.

¹ Department of Medicine, Clinical School, International Medical University, Jalan Rasah, Negeri Sembilan, 70400 Seremban, Malaysia
² PT Foundation, 7C-1, Jalan Ipoh Kecil, Off Jalan Raja Laut, P.O. Box 11859, 50350 Kuala Lumpur, Malaysia
³ The Center of Excellence for Research in AIDS (CERiA), University of Malaya Infectious Diseases Unit, University of Malaya Medical Centre, Lembah Pantai, 59100 Kuala Lumpur, Malaysia

**Abstract**

We describe the sexual practices and condom usage of men who have sex with men (MSM) at a community-based anonymous voluntary counseling and testing centre in Kuala Lumpur, Malaysia. This study is a first for Malaysia in this context. 433 MSM clients disclosed their sexual practices and condom use in the preceding 6 months using a self-reported questionnaire during pre-HIV test counseling at the centre. The mean age was 29.7 years, and 356 were homosexuals while 77 were bisexuals. Forty tested HIV positive (9.2%). 387 (94.9%) of 408 clients had anal sex, 395 (97.8%) of 404 clients had oral sex, while 43 (18.4%) of 233 clients had vaginal sex which revealed that even men who identified themselves as homosexuals do practice vaginal sex. Having multiple sexual partners is common (mean 11.6 partners per client). 259 (59.8%) had unprotected sex within the last 6 months. Consistent condom use rates during vaginal, anal, and oral sex were 20%, 23.5%, and 1.3%, respectively. The odds ratio of testing HIV positive with inconsistent condom use during anal sex was 3.7 ($P = 0.024$). Clients who used condoms inconsistently during anal sex are more likely to be HIV positive.

**Frequent misconceptions and low-to-moderate knowledge of HIV and AIDS amongst high-school students in Malaysia**

Koh Kwee Choy¹, Aaron Lai Kuo Huo², Jeremy Edward Ratnasingam Lee³, Megala Ganaka Sabapathy⁴, Ong Jue Jing⁵, Ramesh Chandra Jutti⁶.

¹ Department of Medicine, Clinical School, International Medical University, Jalan Rasah, 70300 Seremban, Malaysia
² Sarawak General Hospital, Jalan Hospital, 93586 Kuching, Malaysia
³ Hospital Queen Elizabeth, Jalan Rumah Sakit, 88200 Kota Kinabalu, Sabah, Malaysia
⁴ Hospital Raja Permaisuri Bainun, Jalan Hospital, 30900 Ipoh, Malaysia
⁵ Hospital Pulau Pinang, Jalan Residen, 10900 Pulau Pinang, Malaysia
⁶ Department of Surgery, International Medical University, Plaza Komanwel, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

We describe the findings from a survey of 572 high-school students aged between 15 and 19 years in the city of Seremban, Negeri Sembilan state, Malaysia. Knowledge regarding HIV and AIDS is assessed using a self-administered validated 48-item questionnaire modified from the validated HIV Knowledge Questionnaire (HIV-K-Q). Our questionnaire was divided into 4 parts assessing different areas in HIV/AIDS, namely, general knowledge of risk factors; knowledge of modes of transmission of HIV; knowledge of HIV prevention; knowledge of HIV testing. The answers were divided into “correct”, “wrong”, and “I don’t know”. One mark was awarded for every “correct” answer; one mark was deducted for every “wrong” answer, while no mark was awarded for “I don’t know”. The total marks for each student were converted to percentage and used for analysis. The average total score percentage was 64.7%. The highest scores were in the area of knowledge of mode of HIV transmission, while the lowest scores were in the area of knowledge of HIV testing. The level of HIV knowledge was correlated with age of the students ($P < 0.05$) but not with gender and ethnicity. Our paper revealed frequent misconceptions and a general low-to-moderate level of knowledge amongst the high school students surveyed.

Beliefs and attitudes of medical students from public and private universities in Malaysia towards individuals with HIV/AIDS

Koh Kwee Choy¹, Teh Jae Rene², Saad Ahmed Khan³.

¹ Department of Medicine, Clinical School, International Medical University, Jalan Rasah, 70300 Seremban, Malaysia
² Department of Pharmacy, International Medical University, Plaza Komanwel, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

We describe the findings from a survey assessing the beliefs regarding testing, confidentiality, disclosure, and environment of care and attitudes towards care of people with HIV/AIDS (PLHWA), in 1020, 4th and 5th year medical students, from public and private medical universities in Malaysia. A self-administered validated questionnaire based on the UNAIDS Model Questionnaire with a 5-point Likert scale (5, strongly disagree; 4, disagree; 3, neutral; 2, agree; 1, strongly agree) was used as a survey tool. The survey included demographic data and data on undergraduate training received on HIV/AIDS. Statistical significance in the demographic data and training received by respondents was evaluated using the chi-square test while the independent Student’s *t*-test was used for comparison of means between public and private universities. A *P* value of <0.05 was considered statistically significant with 95% confidence interval. Our study revealed less than 20% of medical students received adequate training to care for PLHWA. They had prevalent negative beliefs regarding testing, confidentiality, disclosure and environment of care towards PLHWA although in giving care to PLHWA, their attitudes were largely positive and non-discriminatory.

**Prevalence of erectile dysfunction in men with ischemic heart disease in a tertiary hospital in Malaysia**

K C Koh

Department of Medicine, Clinical School, International Medical University, Seremban, Negeri Sembilan, Malaysia

**Abstract**

We report a study which defined the prevalence of erectile dysfunction (ED) among men with ischaemic heart disease. We recruited 510 men with established ischemic heart disease and interviewed these men using the International Index of Erectile Dysfunction (IIEF-5) questionnaire to determine the presence and severity of ED. Presence of ED was defined as IIEF-5 score of less than 22. The mean age was 60.5 years (range 36-92 years; SD: +9.58). 461 (90.4%) men reported some degree of ED of which two third of them had moderate to severe ED. The prevalence of ED increased significantly with age. Age above 60 years was the only significant risk factor. Non-statistically significant but important risk factors included diabetes, hypertension, diuretics and oral hypoglycemic agents. ED is very common among men with ischemic heart disease. The prevalence and severity increased significantly with age above 60 years old.

**Keywords**: erectile dysfunction, ischemic heart disease, epidemiology, Malaysia.
Enhancement of dissolution rate and formulation development of Efavirenz by solid dispersion systems

P. T. Koh¹, J. N. Chuah¹, Meghna Talekar², A. Gorajana², S. Garg².

¹ School of Pharmacy and Health Sciences, International Medical University, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
² AnQual Laboratories, School of Pharmacy, University of Auckland, Private Bag 92019, Auckland, New Zealand

Abstract
The aim of this study was to enhance the dissolution rate of efavirenz using solid dispersion systems (binary and ternary). A comparison between solvent and fusion method was also investigated. Solid dispersions of efavirenz were prepared using polyethylene glycol 8000, polyvinylpyrrolidone K30 alone and combination of both. Tween 80 was incorporated to obtain a ternary solid dispersion system. Dissolution tests were conducted and evaluated on the basis of cumulative percentage drug release and dissolution efficiency. Physicochemical characterizations of the solid dispersions were carried out using differential scanning calorimetric, powder X-ray diffraction, Fourier transform infrared spectroscopy, and scanning electron microscopy. Dissolution was remarkably improved in both systems compared to pure efavirenz (P<0.05). An optimum ratio was identified at a drug:polymer of 1:10. Incorporation of Tween 80 to 1:10 formulations formed using solvent method showed further improvement in the dissolution rate. Physicochemical characterization results suggested that efavirenz existed in the amorphous form in all the solid dispersion systems providing evidence of improvement in dissolution. No statistically significant difference (P>0.05) in dissolution was observed between the two methods. Binary and ternary solid dispersion systems both have showed a significant improvement in the dissolution rate of efavirenz. Formulations with only polyvinylpyrrolidone K30 showed best dissolution profile and 1:10 was identified as an optimum drug-polymer weight ratio.

Keywords: Solid dispersion, efavirenz, dissolution enhancement, polyethylene glycol, PVP K30, Tween 80.

**Comparison of free hand versus ultrasound guided fine needle aspiration of thyroid with histopathological correlation**

Purushotham Krishnappa¹, Sowmya Ramakrishnappa², Mohan H. Kulkarni³.

¹ Department of Pathology, International Medical University, Kuala Lumpur, Malaysia
² Department of Anatomy, Malaysian Academy of Allied Health Sciences, Kuala Lumpur, Malaysia
³ Department of Pathology, Karnataka Institute of Medical Sciences, Hubli, India

**Abstract**

Fine-needle aspiration (FNA) cytology of the thyroid is usually performed on an outpatient basis. The results of FNA are operator dependent and may be affected by the lesion characteristics and the aspiration technique. In current practice ultrasound (US) is widely used to guide the needle for aspiration of nondominant nodules. Our study aimed to compare the free-hand FNA with US-guided FNA in the evaluation of thyroid nodules. A total of 91 cases of thyroid lesions were studied at the Department of Pathology, Karnataka Institute of Medical Sciences, Hubli, India. All the cases underwent free-hand and US-guided FNA. The cytological samples from both procedures were analyzed for adequacy, cytological features, and possible diagnosis. The results were correlated with histopathological diagnosis whenever possible. Of 91 aspirates, 89 were satisfactory and 2 were unsatisfactory on US-guided FNA, whereas 85 were satisfactory and 6 were unsatisfactory in free-hand FNA. Of 91 cases 68 (74.7%) were nonneoplastic lesions and 21 (23.1%) were neoplastic lesions in US-guided FNA, whereas 67 cases (73.6%) were nonneoplastic and 18 cases (19.8%) were neoplastic in free-hand FNA. Histopathological study was possible in 25 patients, among whom 15 lesions were nonneoplastic and 10 were neoplastic. Sensitivity and specificity of US-guided FNA to detect neoplastic lesions were 81.81% and 92.85%, respectively, compared with free-hand FNA, for which the sensitivity and specificity were 54.54% and 92.85%, respectively. The diagnostic accuracy of guided FNA was 88% against the 76% accuracy rate of free-hand FNA. US-guided FNA provides a better representative sample and has a higher diagnostic rate in the evaluation of thyroid lesions.

**Keywords**: FNA, thyroid, ultrasound, cytology.

**Cytological features of non-neoplastic lesions of thyroid: An overview**

Dr Purushotham Krishnappa¹, Dr Sowmya Ramakrishnappa².

¹ Department of Pathology, International Medical University, Kuala Lumpur, Malaysia
² Department of Anatomy, Malaysian Allied Health Sciences Academy, Kuala Lumpur, Malaysia

**Abstract**

Thyroid disorders are one among the common clinical encounters, which range from congenital disorders to the malignant lesions. Fine needle aspiration (FNA) of thyroid is accepted globally as the best screening tool to differentiate neoplastic versus non neoplastic lesions.

The cytological features of the non-neoplastic disorders of thyroid have a good amount of overlap between them and with a few neoplastic lesions as well, thus leading to wrong interpretation and possible inappropriate management of the patient. Identification of these cytological features is the key element in diagnosing thyroid lesions by Fine needle aspiration procedure. The review attempts to give cytological details of non-neoplastic lesions which can be applied for evaluation of thyroid lesions and identifying this category will reduce the number of unnecessary surgeries of thyroid nodules.

**Keywords:** Thyroid, Fine needle aspiration cytology, Lesion.

**Case report: Left bundle branch block under general anaesthesia in an athlete’s heart**

D T Kumaravadivel¹, A Z Nor Azian¹, S Thiruselvi², J Abdul Aziz¹.

¹ Department of Anaesthesiology and Intensive care Unit, Hospital Teluk Intan, 36000 Teluk Intan, Perak, Malaysia
² International Medical University, 126 Jalan 19/155b, 57000 Kuala Lumpur

**Abstract**

Left bundle branch block (LBBB) during anaesthesia is uncommon. During general anaesthesia, LBBB may be related to hypertension or tachycardia and its acute onset makes the diagnosis of acute myocardial ischemia or infarction difficult. We would like to present a case report of a healthy patient who developed LBBB intra operatively. Acute LBBB should lead to suspicion of acute coronary syndrome until proven otherwise. Inability to exclude an acute cardiac event resulted in postponement of surgery twice after general anaesthesia was administered. Cardiological investigation of our patient showed physiological left ventricular hypertrophy (LVH), “athlete’s heart” which was the most likely cause of the LBBB under anaesthesia.

**Keywords**: Anaesthesia, arrhythmia, heart, conduction, athlete’s heart.

Neuroprotective effects of orientin on hydrogen peroxide induced apoptosis in SH SY5Y cells

Benjamin Ngee Tiing Law¹, Anna Pick Kiong Ling², Rhun Yian Koh², Soi Moi Chye², Ying Pei Wong².

¹ School of Medical Sciences, Faculty of Medicine and Health, International Medical University, Kuala Lumpur 57000, Malaysia
² Department of Human Biology, Faculty of Medicine and Health, International Medical University, Kuala Lumpur 57000, Malaysia

Abstract

Neurodegenerative diseases remain a global issue which affects the ageing population. Efforts towards determining their aetiologies to understand their pathogenic mechanisms are underway in order to identify a pathway through which therapeutic measures can be applied. One such pathogenic mechanism, oxidative stress (OS), is widely considered to be involved in neurodegenerative disease. Antioxidants, most notably flavonoids, have promising potential for therapeutic use as shown in in vitro and in vivo studies. In view of the importance of flavonoids for combating OS, this study investigated the neuroprotective effects of orientin, which has been reported to be capable of crossing the blood-brain barrier. The maximum non-toxic dose (MNTD) of orientin against SH-SY5Y neuroblastoma cells was determined using a 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. The effects of the MNTD and the half MNTD (½MNTD) of orientin on cell cycle progression and intracellular reactive oxygen species (ROS) levels, as well as the activity of caspases 3/7, 8 and 9 after exposure to 150 µM of hydrogen peroxide (H2O2) were also determined using flow cytometry, a 2’,7’-dichlorodihydrofluorescein-diacetate (DCFH-DA) assay and caspase assay kits, respectively. The results revealed that orientin at ≤20 µM was not cytotoxic to SH-SY5Y cells. After treatment with orientin at the MNTD, the percentage of apoptotic cells was significantly reduced compared with that in cells treated with 150 µM H2O2 alone. The results also showed that, although orientin at the MNTD and ½MNTD did not reduce intracellular ROS levels, it significantly inhibited the activity of caspases 3/7. Caspase 9 was significantly inactivated with orientin at the MNTD. Findings from this study suggest that the neuroprotection conferred by orientin was the result of the intracellular mediation of caspase activity.

**Radiofrequency-induced intradiscal nucleoplasty significantly reduces chronic low back pain secondary to lumbar disc herniation**

DW Lee, ESY Loh, CC Kueh, JH Poi, T Francis, KC Koh, NN Wazir, H Singh.

Clinical School, International Medical University, Seremban, Malaysia

**Abstract**

We set out to assess the efficacy of radiofrequency-induced intradiscal nucleoplasty in reducing pain in symptomatic patients with MRI-defined lumbar disc herniation and their satisfaction with the procedure. We compared the patients' pain intensity and severity of disability scores before and after undergoing the procedure in a retrospective questionnaire. These patients reported statistically significant reduction of pain intensity and disability level after the procedure. We conclude that radiofrequency induced intradiscal nucleoplasty is an acceptable alternative minimally invasive procedure in relieving the symptoms of patients with lumbar disc herniation.

**Keywords:** Radiofrequency-induced intradiscal nucleoplasty, coblation therapy, percutaneous lumbar disc decompression, intervertebral disc herniation, low back pain.

The adhesion properties of natural rubber pressure-sensitive adhesives using palm kernel oil-based alkyd resins as a tackifier

S.Y. Lee¹, S.N. Gan².

¹ Department of Pharmaceutical Chemistry, International Medical University, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
² Department of Chemistry, University of Malaya, 50603, Kuala Lumpur, Malaysia

Abstract

Alkyd resins, synthesized from palm kernel oil (PKO), were investigated as the tackifiers in the formulation of natural rubber (NR) based pressure-sensitive adhesives (PSA). PKO alkyd resins were prepared via a step-wise polymerization process where the esterification was completed with the presence of xylene (solvent cook). Two alkyds, namely Alk-26 and Alk-41, with respective short and medium oil lengths of 26 and 41, were synthesized in xylene. NR was isolated from latex, dried, milled and dissolved in xylene. The alkyd solutions were then blended with NR solution in various ratios. The blend solutions were coated onto strips of corona-treated polypropylene film and the solvent removed by evaporation. The peel and shear strengths of the PSA tapes were measured. Circular samples of the blends were cast onto release paper and tested for viscoelastic properties using dynamic mechanical analysis (DMA). It was found that Alk-26 increased the shear strength of NR while Alk-41 improved the peel strength of NR significantly. These adhesion properties were comparable to some of the commercial PSA tapes available on the market. DMA study revealed that both Alk-26 and Alk-41 were immiscible with NR and there was neither cross-linking nor entanglement present in the blends.

Keywords: viscoelastic properties, natural rubber, alkyd, pressure-sensitive adhesive, tackifier.

Isolation and identification of antioxidant compounds in methanolic extract of both female and male plants of *Ficus Deltoidea*

Siang Yin Lee¹, Jun Yan Sew², Kim Loong Chin², Eng Chun Tee², Ming Wai Tang², Chin Fei Chee¹, Rhun Yian Koh³, Swee Yee Chin¹, Anna Pick Kiong Ling³, Mohd Ambar Yarmo⁴.

¹ Department of Pharmaceutical Chemistry, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Pharmacy Practice, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ Department of Human Bio, Cell & Molecules, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
⁴ School of Chemical Sciences and Food Technology, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM, Bangi Selangor, Malaysia

Abstract

Antioxidants compounds that may present in the methanolic extract of the leaves and stems of female and male plants of *Ficus deltoidea* were isolated and characterised. The methanolic extracts of the plants were first fractionated by column chromatography. The fractions were then tested on their antioxidant activities by using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay. The fractions that exhibited highest antioxidant activities were then analysed by liquid chromatography-mass spectrometry (LC-MS), phytochemical screening and Fourier-transform infrared spectroscopy (FTIR) studies in order to identify their antioxidant compounds. The DPPH results revealed that crude extracts of each leaves and stems of each female and male plants of *F. deltoidea* exhibited significant antioxidant activities. It was found that fraction-51 of the female leaf extract expressed the highest antioxidant activity, followed by fraction-8 of the female stem extract, fraction-35 of male leaf extract and lastly fraction-10 of the male stem extract. Possible phytocentrists that might be in these fractions are terpenoids, lipids, carbonyl compounds, unsaturated hydrocarbons, tannins, phenols and alkaloids.

**Keywords:** *Ficus deltoidea* (Mas Cotek), antioxidants, methanolic extract, DPPH.
Metabonomic investigations of age- and batch-related variations in NMRI female outbred mice using 1H NMR spectroscopy

Jia V. Li¹, Jasmina Saric¹, Ivan K. S. Yap¹,², Jürg Utzinger³,⁴, Elaine Holmes¹.

¹ Section of Computational and Systems Medicine, Department of Surgery and Cancer, Faculty of Medicine, Imperial College London, Sir Alexander Fleming Building, South Kensington, London, UK
² Life Sciences Department, School of Pharmacy and Health Sciences, International Medical University (IMU), Kuala Lumpur, Malaysia
³ Department of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, CH-4002 Basel, Switzerland
⁴ University of Basel, CH-4003 Basel, Switzerland

Abstract

The NMRI outbred mouse model is widely used for studying metabolic disease, toxicity, and infection, yet information regarding baseline metabolism of this murine strain is relatively sparse. Using different batches of female NMRI mice, we assessed the stability of the metabolic phenotype with increasing age and weight, and determined the influence of acclimatization on the metabolic profile of biofluids (urine, plasma, and faecal water). Differences in urinary concentrations of 3-ureidopropionate, 2-oxoisocaproate, trimethylamine, and glycine were detected between three batches of 9-week-old female NMRI mice using proton nuclear magnetic resonance (¹H NMR) spectroscopy coupled with multivariate statistical analysis. An acclimatization period of 2 weeks was imposed after the mice entered the laboratory environment. Strong differences in the faecal metabolome pre- and post-acclimatization were found (reduction in amino acid concentrations), whilst the urine metabolome showed increased levels of trimethylamine-N-oxide, phenylacetyl glycine, and hippurate with decreased excretion of formate and betaine post-acclimatization. Temporal variation in the metabolite profiles over a 16-week study stabilized around 7-week-old animals. The results from this study strongly argue for inclusion of an acclimatization period prior to starting an investigative procedure, and suggest that the metabolic phenotypes of female NMRI mice are more stable at around 7 weeks of age. We have also identified a set of metabolites that are more susceptible to variation in concentration. This information can serve as a benchmark in order to establish confidence in systematic variation attributable to pathology or therapeutic intervention above the background metabolic variation in the NMRI mouse.
Telepathology - An update

Lim Chai Ling¹, Purushotham Krishnappa².

¹ International Medical University, Bukit Jalil 57000 Kuala Lumpur, Malaysia
² PhD; International Medical University, Bukit Jalil 57000 Kuala Lumpur, Malaysia

Abstract
Telepathology is a practice of pathology over a long distance. It has been first demonstrated in space by NASA (National Air and Space Administration) since 1960s. After few decades of development, the growth of telepathology is accelerating. Today, its technical development has matured, and it is used in multiple fields such as in clinical practice, intraoperative consultation and medical education. These functions can be performed with the use of all three types of telepathology system (static telepathology, dynamic telepathology and hybrid telepathology).

Telepathology brings advantages in terms of personnel, operational and quality of service. This brings it to be the solution for problems arise in the today’s medical field. However, its disadvantages and challenges have restricted it from being widely used. The main problems are the high cost fee of the software, set-up components and maintenance, high complexity of the system, security issues and inconvenient in slide selection.

Therefore, to integrate telepathology into the mainstream diagnostic, immediate finding of solutions are urgently needed.

Keywords: Digital imaging, Frozen section, Images, Internet, Pathology, Remote microscopy, Telemedicine, Telepathology, Virtual slide, Whole slide image.
Evaluation of four extracts from *Dillenia ovata* stem bark and leaves for antibacterial and antifungal activity

Lim Swee Hua Erin1, Poon Pui Mun2, Ng Siew Ling2, Oh Chai Ping2, Sin Xiao Jie2, Ng Shi Ying2, Loh Tyi Ying2, Ayuba Sunday Buru3, Mallikarjuna Rao Pichika4.

1 Department of Life Sciences, School of Pharmacy, International Medical University 126 Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
2 School of Pharmacy, International Medical University 126 Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
3 School of Postgraduate Studies, International Medical University 126 Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
4 Department of Pharmaceutical Chemistry, School of Pharmacy, International Medical University 126 Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract

**Background:**
*Dillenia* species are widely used by the indigenous people of Southeast Asia traditionally as it has many medicinal values. *Dillenia* sp. has been shown to possess antimicrobial and antioxidant properties but no studies have yet been carried out for *D. ovata*.

**Methods:**
In this study, the antimicrobial activity of n-hexane, ethyl acetate, methanol and water extracts of *Dillenia ovata* stem bark and leaf against twenty species of bacteria, fungi and yeasts was evaluated. The antimicrobial properties of *D. ovata* were evaluated through the disk diffusion method and the modified broth microdilution test using the resazurin assay.

**Results:**
In the disk diffusion assay, the most potent extract of *Dillenia* for both the stem bark and leaf was the n-hexane extract. A low concentration of the n-hexane extract was observed to be sufficient for the inhibition of bacterial growth compared to the methanol and ethyl acetate extracts. No antimicrobial activity was detected in the water extract for all strains tested and no inhibitory effects were observed for the fungal and yeast strains tested for all extracts.

**Conclusion:**
The compounds in the n-hexane extract will need to be elucidated further in order to investigate the efficacy of *D. ovata* as an antibacterial agent.

**Keywords:** *Dillenia ovata*, Resazurin, Antimicrobial activity.
Emerging and Re-emerging Infections

Victor K E Lim

International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract
An emerging infection is defined as an infection that has newly appeared in a population while a re-emerging infection would be one that has existed in the past but its incidence has increased in recent times. The reasons for the emergence or re-emergence of an infection are not completely understood but they are multifactorial and complex in the nature of their interactions. These factors may be related to the etiological organism, the host or the environment. Human activity appears to be a major driver. Malaysia had to deal with outbreaks of several emerging infections over the last two decades. They include Nipah virus infection, SARS and avian influenza. Infections like dengue, tuberculosis and leptospirosis are re-emerging in Malaysia. Both human activity and climatic changes appear to be key factors in the emergence and re-emergence of infections in Malaysia. Our country needs to put in place a comprehensive plan to meet the challenge of emerging diseases. A multidisciplinary approach is required and the strategies involved should not merely confined to medical and health strategies.

Keywords: Emerging infection, Nipah, SARS, dengue fever, avian influenza, climate change.

### Comparative effects of plant growth regulators on leaf and stem explants of *Labisia pumila* var.alata

Anna Pick Kiong Ling¹, Kinn Poay Tan², Sobri Hussein³.

¹ Division of Human Biology, International Medical University, 57000, Kuala Lumpur, Malaysia
² Department of Science, Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, 53300, Setapak, Kuala Lumpur, Malaysia
³ Agrotechnology and Bioscience Division, Malaysian Nuclear Agency, Bangi, 43000, Kajang, Selangor, Malaysia

**Abstract**

**Objective:** *Labisia pumila* var. *alata*, commonly known as ‘Kacip Fatimah’ or ‘Selusuh Fatimah’ in Southeast Asia, is traditionally used by members of the Malay community because of its post-partum medicinal properties. Its various pharmaceutical applications cause an excessive harvesting and lead to serious shortage in natural habitat. Thus, this in vitro propagation study investigated the effects of different plant growth regulators (PGRs) on in vitro leaf and stem explants of *L. pumila*.

**Methods:**
The capabilities of callus, shoot, and root formation were evaluated by culturing both explants on Murashige and Skoog (MS) medium supplemented with various PGRs at the concentrations of 0, 1, 3, 5, and 7 mg/L.

**Results:**
Medium supplemented with 3 mg/L indole-3-butyric acid (IBA) showed the optimal callogenesis from both leaf and stem explants with (72.34±19.55)% and (70.40±14.14)% efficacy, respectively. IBA was also found to be the most efficient PGR for root induction. A total of (50.00±7.07)% and (77.78±16.47)% of root formation were obtained from the in vitro stem and leaf explants after being cultured for (26.5±5.0) and (30.0±8.5) d in the medium supplemented with 1 and 3 mg/L of IBA, respectively. Shoot formation was only observed in stem explant, with the maximum percentage of formation ((100.00±0.00)% that was obtained in 1 mg/L zeatin after (11.0±2.8) d of culture.

**Conclusions:**
Callus, roots, and shoots can be induced from in vitro leaf and stem explants of *L. pumila* through the manipulation of types and concentrations of PGRs.

**Keywords:** Auxin, Cytokinin, *Labisia pumila*, In vitro propagation, Plant growth regulators, Q944.

Morphological and biochemical responses of Oryza sativa L. (cultivar MR219) to ion beam irradiation

Anna Pick Kiong Ling¹, Ying Chian Ung², Sobri Hussein³, Abdul Rahim Harun³, Atsushi Tanaka⁴, Hase Yoshihiro⁴.

¹ Division of Human Biology, International Medical University (IMU), 57000 Kuala Lumpur, Malaysia
² Department of Science, Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, 53300 Setapak, Kuala Lumpur, Malaysia
³ Agrotechnology and Bioscience Division, Malaysian Nuclear Agency, Bangi, 43000 Kajang, Selangor, Malaysia
⁴ Radiation-Applied Biology Division, Quantum Beam Science Directorate, Japan Atomic Energy Agency, 1233 Watanuki-machi, Takasaki, Gunma 370-1292, Japan

Abstract

Objective:
Heavy ion beam, which has emerged as a new mutagen in the mutation breeding of crops and ornamental plants, is expected to result in the induction of novel mutations. This study investigates the morphological and biochemical responses of Oryza sativa toward different doses of carbon ion beam irradiation.

Methods:
In this study, the dry seeds of O. sativa were irradiated at 0, 20, 40, 60, 80, 100, and 120 Gy, followed by in-vitro germination under controlled conditions. Morphological and biochemical studies were conducted to investigate the morphological and physiological responses of O. sativa towards ion beam irradiation.

Results:
The study demonstrated that low doses (10 Gy) of ion beam have a stimulating effect on the height, root length, and fresh weight of the plantlets but not on the number of leaves. Meanwhile, doses higher than 10 Gy caused reductions in all the morphological parameters studied as compared to the control samples. The highest total soluble protein content [(2.11±0.47) mg/g FW] was observed in plantlets irradiated at 20 Gy. All irradiated plantlets were found to have 0.85% to 58.32% higher specific activity of peroxidase as compared to the control samples. The present study also revealed that low doses of ion beam (10 and 20 Gy) had negligible effect on the total chlorophyll content of O. sativa plantlets while 40 Gy had a stimulating effect on the chlorophyll content. Plantlets irradiated between 40 to 120 Gy were shown to be 0.38% to 9.98% higher in total soluble nitrogen content which, however, was not significantly different from the control samples.

Conclusions:
Carbon ion beam irradiation administered at low to moderate doses of 10 to 40 Gy may induce O. sativa mutants with superior characteristics.

Keywords: In vitro mutagenesis, Ion beam irradiation, Total chlorophyll content, Total soluble protein content, Mutation breeding.

**Tocotrienols promote apoptosis in human breast cancer cells by inducing poly (ADP-ribose) polymerase cleavage and inhibiting nuclear factor kappa-B activity**

Loganathan, R¹,², Selvaduray, K. R.¹, Nesaretnam, K.¹, Radhakrishnan, A. K.².

¹ Malaysian Palm Oil Board, Selangor, 43000, Malaysia
² Pathology Division, Faculty of Medicine and Health, International Medical University, Kuala Lumpur, 57000, Malaysia

**Abstract**

**Objectives:**
Tocotrienols and tocopherols are members of the vitamin E family, with similar structures; however, only tocotrienols have been reported to achieve potent anti-cancer effects. The study described here has evaluated anti-cancer activity of vitamin E to elucidate mechanisms of cell death, using human breast cancer cells.

**Materials and methods:**
Anti-cancer activity of a tocotrienol-rich fraction (TRF) and a tocotrienol-enriched fraction (TEF) isolated from palm oil, as well as pure vitamin E analogues ([alpha]-tocopherol, [alpha], [delta]- and [gamma]-tocotrienols)) were studied using highly aggressive triple negative MDA-MB-231 cells and oestrogen-dependent MCF-7 cells, both of human breast cancer cell lines. Cell population growth was evaluated using a Coulter particle counter. Cell death mechanism, poly(ADP-ribose) polymerase cleavage and levels of NF-[kappa]B were determined using commercial ELISA kits.

**Results:**
Tocotrienols exerted potent anti-proliferative effects on both types of cell by inducing apoptosis, the underlying mechanism of cell death being ascertained using respective IC50 concentrations of all test compounds. There was marked induction of apoptosis in both cell lines by tocotrienols compared to treatment with Paclitaxel, which was used as positive control. This activity was found to be associated with cleavage of poly(ADP-ribose) polymerase (a DNA repair protein), demonstrating involvement of the apoptotic cell death signalling pathway. Tocotrienols also inhibited expression of nuclear factor kappa-B (NF-[kappa]B), which in turn can increase sensitivity of cancer cells to apoptosis.

**Conclusion:**
Tocotrienols induced anti-proliferative and apoptotic effects in association with DNA fragmentation, poly(ADP-ribose) polymerase cleavage and NF-[kappa]B inhibition in the two human breast cancer cell lines.

**Differential and antagonistic effects of palm tocotrienols and other phytonutrients (carotenoids, squalene, coenzyme Q10) on breast cancer cells in vitro**

Radhika Loganathan¹, Kanga Rani Selvaduray¹, Kalanithi Nesaretnam¹, Ammu Kutty Radhakrisnan².

¹ Malaysian Palm Oil Board, 6 Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor, Malaysia
² Pathology Division, Faculty of Medicine, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

Palm vitamin E, tocotrienols in particular, are known to exert great anti-cancer effects on a variety of cell types. In this study, the effects of palm vitamin E, carotenoids, squalene and coenzyme Q10 were studied on two human breast cancer cell lines. All compounds caused anti-proliferative effect in vitro but tocotrienols (compounds and isomers) were generally more potent. The results show that the anticancer effects of palm vitamin E were more pronounced when these were used on their own rather than in combination with other phytonutrients (carotenoids, squalene and coenzyme Q10). The palm phytonutrient complex, which contains all the tested phytonutrients did not appear to exert better antiproliferative effects compared to the individual compounds. Our results show that tocotrienols, as well as other phytonutrients (carotenoids, squalene and coenzyme Q10), have anti-proliferative effects on breast cancer cells but different and antagonistic mechanisms may be employed in combination.

**Keywords**: carotenoids, coenzyme Q10, palm phytonutrients, squalene, tocotrienols.

**Assessment of proliferative index and its association with Ki-67 antigen molecule expression in nodular hyperplasia of prostate**

Srikumar Chakravarthi¹, P. Thanikachalam¹, H.S. Nagaraja², David Low Wee Yang, Nadeem Irfan Bukhari³.

¹ Department of Pathology, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Physiology, Faculty of Medicine, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ Faculty of Pharmacy, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

The cytoplasmic expression of Ki-67, a nuclear protein that appears primarily during the proliferative phases of the cell cycle was studied in benign tumours of the prostate gland. Archival prostatic tissue from 39 patients with nodular hyperplasia and no prior or subsequent prostatic carcinoma that have been obtained through transurethral prostatectomy (TURP) procedure, were used in this study. The proliferative index was assessed by calculating the number of actively proliferating cells in the H&E sections in varied histologic patterns like hyperplastic epithelium, proliferating stroma, normal glands and normal stroma. The nuclear protein Ki-67 was analyzed by immunohistochemistry for determining the cytoplasmic positivity of the tumour cells. The proliferative index in the hyperplastic tissues was higher, indicating an increased activity of cellular proliferation, compared with the normal tissues, which was highly significant (p<0.01). Out of 39 cases of prostatic tissue, 25 (64 %) showed positivity for Ki-67 expression. Pearson’s correlation test was applied to and showed significant association (p<0.05) between the intensity of Ki-67 expression with proliferative index. Comparisons of proliferative indices between the normal cells and tumour cells showed significant correlation, strongly suggesting the higher cell proliferation in the benign lesions. Enhanced expression of Ki-67 by the tumour cells suggests a growth imbalance in favour of cell proliferation that might ultimately promote prostatic hyperplasia.

**Keywords**: prostate, mitosis, Ki-67, nodular hyperplasia.

Community-based Cardiovascular Risk Factors Intervention Strategies (CORFIS) in managing hypertension: A pragmatic non-randomised controlled trial

W H H Low¹, W Seet¹, A S Ramli², K K Ng², H Jamaiyah¹, S P Dan¹, C L Teng³, V K M Lee³, SS Chua³, M Y Faridah Aryani¹, T Karupaiah⁵, W S S Chee³, P P Goh¹, M Zaki³, TO Lim¹, the CORFIS Study Group

¹ Clinical Research Centre, Ministry of Health, Kuala Lumpur, Malaysia
² Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
³ International Medical University Malaysia, Bukit Jalil, Kuala Lumpur, Malaysia.
⁴ Universiti Malaya, Kuala Lumpur, Malaysia
⁵ Universiti Kebangsaan Malaysia, Cheras, Selangor, Malaysia

Abstract
Background:
Hypertension is the number one cardiovascular risk factor in Malaysia. This study aimed to evaluate the effectiveness of a Community-Based Cardiovascular Risk Factors Intervention Strategies (CORFIS) in the management of hypertension in primary care.

Methods:
This is a pragmatic, non-randomized controlled trial. Seventy general practitioners (GPs) were selected to provide either CORFIS (44 GPs) or conventional care (26 GPs) for 6 months. A total of 486 hypertensive patients were recruited; 309 were in the intervention and 177 in the control groups. Primary outcome was the proportion of hypertensive patients who achieved target blood pressure (BP) of <140/90mmHg (for those without diabetes mellitus) and <130/80mmHg (with diabetes mellitus). Secondary outcomes include change in the mean/median BP at 6-month as compared to baseline.

Results:
The proportion of hypertensive patients who achieved target BP at 6-month was significantly higher in the CORFIS arm (69.6%) as compared to the control arm (57.6%), P=0.008. Amongst those who had uncontrolled BP at baseline, the proportion who achieved target BP at 6-month was also significantly higher in the CORFIS arm (56.6%) as compared to the control arm (34.1%), p<0.001. There was no difference in the patients who had already achieved BP control at baseline. There were significant reductions in SBP in the CORFIS arm (median -9.0mmHg; -60 to 50) versus control (median -2mmHg; -50 to 48), p=0.003; as well as in DBP (CORFIS arm: median -6.0mmHg; ranged from -53 to 30 versus control arm: median 0.0mmHg; ranged from -42 to 30), p<0.001.

Conclusions:
Patients who received CORFIS care demonstrated significant improvements in achieving target BP.

Keywords: Chronic disease management, chronic care model, hypertension, multidisciplinary care, evidence-based practice, patient empowerment, information technology.
Lu KTE, Ng MSS, Siew WF. Patient perception about preoperative information to allay anxiety towards major surgery. *IeJSME*, 2013; 7(1): 29-32. (IF: 0.024; H-index: 1).

**Patient perception about preoperative information to allay anxiety towards major surgery**

Kelly Ee Lu Ting, Maria Sau Sim Ng, Wei Fern Siew.

Division of Nursing, School of Health Sciences, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

Surgeries are seen as stressors that trigger preoperative anxiety. Preparing the patients for surgery through preoperative teaching becomes crucial to allay anxiety level. In a cross sectional descriptive study conducted on eighty patients (age: 18–65 yr) who had undergone open abdominal surgery, 78.8% (n=63) stated that they experienced anxiety prior to surgery. Among these anxious respondents, 47.5% (n=38) experienced high state anxiety. Three of the top information that patients perceived as important to allay anxiety towards major surgery were: details of surgery, details of nursing care to surgery and information on anaesthesia. Nurses working in the surgical wards need to proactively address patients’ psychological concerns towards surgery and provide preoperative information based on patients’ needs to allay anxiety.

**Keywords:** anxiety, perception, preoperative information, preoperative nursing, preoperative teaching, major surgery.
Ethnic differences in the prognostic utility of rheumatoid factor isotypes and anti-cyclic citrullinated peptides in rheumatoid arthritis patients

E. L. Gomez¹, S. C. Gun², S. D. Somanath³, K. Chinna⁴, A. K. Radhakrishnan⁵.

¹ International Medical University, No: 126 Jalan Jalil Perkasa 19/155B, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Medicine, Hospital Tuanku Ja'afar, Jalan Rasah, 70300 Seremban, Negeri Sembilan, Malaysia
³ Pathology Division, Faculty of Medicine and Health, International Medical University, No. 126, Jalan 19/155B, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
⁴ Department of Social and Preventative Medicine, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia
⁵ Pathology Division, Faculty of Medicine and Health, International Medical University, No. 126, Jalan 19/155B, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract

Objectives:
The prognostic significance of rheumatoid factor (RF) and anticyclic citrullinated peptide antibody (anti-CCP) in rheumatoid arthritis (RA) remains contentious due to the conflicting lines of evidence. This study aims to determine the association between RF isotypes and anti-CCP with disease severity in RA patients from three ethnic groups.

Methods:
A total of 147 RA patients from three different ethnic groups (Malays, Chinese, and Indians) who fulfilled the 1987 American College of Rheumatology (ACR) revised criteria for RA were recruited into this study. The seroprevalence of RF isotypes immunoglobulin (Ig)A, IgG, and IgM, as well as anti-CCP was determined using commercial enzyme-linked immunosorbent assay (ELISA) kits. Multinomial regression analysis was performed to assess the independent effects of autoantibody status on the development of deforming and erosive RA and the presence of extra-articular manifestations (EAM).

Results:
In Chinese patients, we found a significant association (p<0.05) between IgG RF and anti-CCP and the presence of erosive disease, as well as IgM RF and IgG RF with the presence of joint deformities. In Indian patients, IgM RF was associated with deforming disease, whereas none of the antibodies were associated with disease severity in Malay patients. Multinomial regression analysis revealed that IgG RF was the most important predictor variable for erosive disease in Chinese patients, and IgM RF the only predictor variable associated with deforming disease in both Chinese and Indian RA patients.

Conclusions:
There is variability in the phenotypic association of RF isotypes and anti-CCP in relation to disease severity of RA in the three ethnic groups. RF, in particular, IgG and IgM, may be better prognosticators of severe disease in Chinese and Indian patients.
Keywords: Anticyclic citrullinated peptides, Autoantibodies, Rheumatoid arthritis, Rheumatoid factor, Rheumatoid factor isotypes.
Lum SK, Lee WR, Ch’ng SD, Balachandran NR, Tee CK. Opportunities for medical students to perform four common ward procedures in a Malaysian teaching hospital. IeJSME, 2013; 7(1): 10-14. (IF: 0.024; H-index: 1).

**Opportunities for medical students to perform four common ward procedures in a Malaysian teaching hospital**

Siew Kheong Lum¹, Wei Rong Lee², Syn Dee Ch’ng², Navin Raj a/l Balachandran², Chee Kit Tee².

¹ Department of Surgery, International Medical University, Seremban, Malaysia
² Medical students, International Medical University, Seremban, Malaysia

**Abstract**

*Introduction:* Undergraduate medical education should be broad-based, holistic, integrated and should promote a framework for the development of higher order cognitive skills like communication, professionalism and teamwork to prepare the student for a life-long challenging medical career. Recent calls for a competency-based medical education require, in addition, competency in clinical and procedural skills prior to graduation. This study investigates how often opportunities exist for medical students to perform four common ward procedures prior to graduation.

*Method:* A prospective cross-sectional study to assess the opportunities a medical student have in performing four common ward procedures, comprising intravenous cannulation, nasogastric tube insertion, urinary catheterisation and chest tube insertion, in a State General hospital in Malaysia was done.

*Results:* A medical student has sufficient opportunity to perform only intravenous cannulation prior to graduation. He has a remote chance to insert a urinary catheter and is unlikely to have the opportunity to insert a nasogastric tube or insert a chest tube prior to graduation.

*Conclusion:* Although competency in clinical skills and procedural skills prior to graduation are desirable, this is increasingly difficult to achieve due to shortage of clinical material, teachers to supervise, the large numbers of medical students and house officers, the short time spent on the main disciplines and the failure of many universities to invest heavily in skills laboratories staffed by full time clinicians. The calls to introduce competency-based medical education in undergraduate medical education, particularly in procedural competence, should take into account the challenges in delivery and the realities in the hospitals today. This is necessary to avoid demoralising students who are unable to achieve their quota of procedures through no fault of theirs.

**Keywords:** procedural competency, medical education, Malaysia.

**Evolving a common surgical curriculum for ASEAN nations with a public health approach**

Lum Siew Kheong\(^1,2\).

\(^1\) College of Surgeons, Academy of Medicine of Malaysia, Kuala Lumpur
\(^2\) Department of Surgery, International Medical University, Seremban, Malaysia

**Abstract**

The Association of Southeast Asian Nations (ASEAN) Mutual Recognition Arrangement (MRA) on medical practitioners' agreement will become a reality in the year 2015. Doctors registered in one ASEAN country will be given reciprocal recognition in another country under this agreement. Rapid and excessive movement of human resources between countries in a short span of time is undesirable and can be destabilizing. The surgical fraternity in the ASEAN countries should plan for a common surgical curriculum, a common examination and an ASEAN Board of Surgery so that standards of future trainees in different countries are comparable. The curriculum should take into consideration the diversity of the countries in socio-economic development. Ideally, it should be based on a public health approach to bring affordable quality surgical care to the masses in an efficient and effective manner.

**Keywords:** ASEAN, curriculum, public health, surgical.

**Rapid reversal of subclinical hyperthyroidism in patients with large multinodular goitres after thyroidectomy**

Siew Kheong Lum

International Medical University, Surgery, IMU Clinical School, Jalan Rasah, Seremban, Negeri Sembilan 70300, Malaysia

**Abstract**

A patient is said to have subclinical hyperthyroidism if he has a depressed thyroid stimulating hormone (TSH) level but is clinically euthyroid and has a normal thyroxine (T4) and triiodothyronine (T3) level. The aetiology of this condition is unknown, its progression is uncertain and the value of treatment is doubtful. These 2 cases show a rapid reversal of TSH suppression within a week after thyroidectomy. This suggest an unidentified potent but innocuous suppressor of TSH is produced by some large nodular goitres. Patients with multinodular goitres with subclinical hyperthyroidism can have their anxiety allayed with assurance that their condition is benign and that their TSH suppression is due to the presence of an innocuous substance which is protective in nature. This substance, when isolated, will find a useful place in the prevention and treatment of papillary carcinoma of the thyroid because of its potent effect on the pituitary-thyroid axis without causing any peripheral effects.

**Keywords**: Reversal of TSH suppression, Subclinical hyperthyroidism, Multinodular goitre, Thyroidectomy.

The management of defective resin composite restorations: Current trends in dental school teaching in Japan

Christopher D. Lynch¹, Mikako Hayashi², Liang Lin Seow³, Igor R. Blum⁴, Nairn H.F. Wilson⁵.

¹ Restorative Dentistry, Tissue Engineering and Reparative Dentistry, School of Dentistry, Cardiff, United Kingdom
² Department of Restorative Dentistry and Endodontology, Osaka University Graduate School of Dentistry, Suita, Japan
³ School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
⁴ University of Bristol Dental School and Hospital, Bristol, United Kingdom
⁵ Dentistry, King's College London Dental Institute, London, United Kingdom

Abstract

Aim:
The aim of this article is to investigate the contemporary teaching of the management of defective direct resin composite restorations in dental schools in Japan.

Methods:
A questionnaire relating to the teaching of the management of defective resin composite restorations was developed and e-mailed to 29 dental schools in Japan in 2010.

Results:
Completed responses were received from 19 of the 29 invited schools (response rate = 66%). Eighteen schools (95%) report that they included the teaching of repair of direct defective resin composite restorations in their dental school programs. Thirteen schools reported that they included both clinical and didactic instruction on the repair of direct resin composite restorations. Fourteen schools did not teach any mechanical roughening of the exposed resin composite restoration surface before undertaking a repair. The most commonly reported treatment was acid etching with phosphoric acid (12 schools). The most commonly taught material for completing repairs was a flowable resin composite (16 schools).

Conclusion:
The teaching of repair of defective resin composite restorations is well established within many Japanese dental schools, to a greater extent than in some other regions of the world. The impact of this teaching on subsequent clinical practices in Japan should be investigated. Furthermore, it is concluded that there is a need for much stronger leadership in operative and conservative dentistry, ideally at the global level, to resolve differences in key aspects of operative procedures such as repairs.

Rutin, a bioflavonoid antioxidant protects rat pheochromocytoma (PC-12) cells against 6-hydroxydopamine (6-OHDA)-induced neurotoxicity

Magalingam KB\(^1\), Radhakrishnan A\(^1\), Haleagrahara N\(^2\).

\(^1\) Department of Pathology, Faculty of Medicine, International Medical University, Kuala Lumpur 57000, Malaysia
\(^2\) Discipline of Physiology and Pharmacology, School of Veterinary and Biomedical Sciences, James Cook University, Townsville, Queensland 4811, Australia

Abstract
Free radicals are widely known to be the major cause of human diseases such as neurodegenerative diseases, cancer, allergy and autoimmune diseases. Human cells are equipped with a powerful natural antioxidant enzyme network. However, antioxidants, particularly those originating from natural sources such as fruits and vegetables, are still considered essential. Rutin, a quercetin glycoside, has been proven to possess antioxidant potential. However, the neuroprotective effect of rutin in pheochromocytoma (PC-12) cells has not been studied extensively. Therefore, the present study was designed to establish the neuroprotective role of rutin as well as to elucidate the antioxidant mechanism of rutin in 6-hydroxydopamine (6-OHDA)-induced toxicity in PC-12 neuronal cells. PC-12 cells were pretreated with different concentrations of rutin for 4, 8 and 12 h and subsequently incubated with 6-OHDA for 24 h to induce oxidative stress. A significant cytoprotective activity was observed in rutin pretreated cells in a dose-dependent manner. Furthermore, there was marked activation of antioxidant enzymes including superoxide dismutase (SOD), catalase, glutathione peroxidase (GPx), and total glutathione (GSH) in rutin pretreated cells compared to cells incubated with 6-OHDA alone. Rutin significantly reduced lipid peroxidation in 6-OHDA-induced PC-12 cells. On the basis of these observations, it was concluded that the bioflavonoid rutin inhibited 6-OHDA-induced neurotoxicity in PC-12 cells by improving antioxidant enzyme levels and inhibiting lipid peroxidation.

Keywords: oxidative stress, neurotoxicity, antioxidants, bioflavonoids, 6-hydroxydopamine.

**Should a Toll-like receptor 4 (TLR-4) agonist or antagonist be designed to treat cancer? TLR-4: Its expression and effects in ten most common cancers**

Chun Wai Mai, Yew Beng Kang, Mallikarjuna Rao Pichika.

Department of Pharmaceutical Chemistry, School of Pharmacy, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

Toll-like receptor 4 (TLR-4) is well known for its host innate immunity. Despite the fact that TLR-4 activation confers antitumor responses; emerging evidence suggests that TLR-4 is associated with tumor development and progression. It is now clear that overactivation of TLR-4, through various immune mediators, may cause immune response dysfunction, resulting in tumorigenesis. Different cancers could have different extents of TLR-4 involvement during tumorigenesis or tumor progression. In this review, we focus on infection- and inflammation-related TLR-4 activation in noncancer and cancer cells, as well as on the current evidence about the role of TLR-4 in ten of the most common cancers, viz, head and neck cancer, lung cancer, gastrointestinal cancer, liver cancer, pancreatic cancer, skin cancer, breast cancer, ovarian cancer, cervical cancer, and prostate cancer.

**Keywords:** drug design, cancer treatment, myeloid differentiation factor 2, MD-2, tumor progression, pathogen-associated molecular patterns, PAMPs.

**Providing a listening ear**

Vivienne Mak¹, Emeritus Professor Andrew Gilbert².

¹ Department of Pharmacy Practice, School of Pharmacy, International Medical University Kuala Lumpur, Malaysia.
² Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute for Health Research, School of Pharmacy and Medical Sciences, UniSA, Adelaide, Australia

**Abstract**

The excellent work carried out by the Pharmacists' Support Service (PSS) in providing a listening ear to pharmacists in distress has been widely recognised by the pharmacy profession and is reflected in the support it receives from many pharmacy organisation. *Vivienne Mak* and *Emeritus Professor Andrew Gilbert* have analysed de-identified data from call records to provide an informative assessment of the reasons pharmacists used the PSS.

**Usage of glucometer is associated with improved glycaemic control in type 2 diabetes mellitus patients in Malaysian public primary care clinics: An open-label, randomised controlled trial**

Mastura Ismail¹, Chong-Lieng Teng², Mimi Omar³, Bee Kiau Ho⁴, Zainab Kusiar⁵, Ruziaton Hasim⁶.

¹ Seremban 2 Health Clinic, Seremban
² Department of Family Medicine, International Medical University, Seremban, Negeri Sembilan
³ Kelana Jaya Health Clinic, Selangor
⁴ Shah Alam Health Clinic, Selangor
⁵ Nilai Health Clinic, Nilai, Negeri Sembilan
⁶ Teluk Datok Health Clinic, Selangor, Malaysia

**Abstract**

**Introduction:**
Self-monitoring of blood glucose (SMBG) has been underutilised. We conducted an open-label, randomised controlled trial to assess the feasibility of introducing SMBG in primary care clinics in Malaysia.

**Methods:**
This was an open-label, randomised controlled trial conducted in five public primary care clinics in Malaysia. Patients with type 2 diabetes mellitus (age range 35–65 years) not performing SMBG at the time of the study were randomised to receive either a glucometer for SMBG or usual care. Both groups of patients received similar diabetes care from the clinics.

**Results:**
A total of 105 patients with type 2 diabetes mellitus were enrolled. Of these, 58 and 47 were randomised to intervention and control groups, respectively. After six months, the glycated haemoglobin (HbA1c) level in the intervention group showed a statistically significant improvement of 1.3% (p = 0.001; 95% confidence interval 0.6–2.0), relative to the control group that underwent usual care. The percentages of patients that reached the HbA1c treatment target of ≤ 7% were 14.0% and 32.1% in the control and intervention groups (p = 0.036), respectively.

**Conclusion:**
The usage of a glucometer improved glycaemic control, possibly due to the encouragement of greater self-care in the intervention group.

**Keywords:** diabetes mellitus, Malaysia, primary care, randomised controlled trial, self-monitoring of blood glucose.

**Effects of a probiotic fermented milk on functional constipation – A randomized, double-blind, placebo-controlled study**

Mena Mustapha Mazlyn¹, Lee Hun-Leong Nagarajah², Arshad Fatimah¹, A Karim Norimah³ and Khean-Lee Goh⁴.

¹ Department of Nutrition and Dietetics, School of Pharmacy and Health Sciences, International Medical University,
² Vinayaka Mission International University College, Petaling Jaya, Selangor Darul Ehsan, Malaysia
³ School of Healthcare Sciences, Faculty of Health Sciences, National University of Malaysia
⁴ Department of Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur

**Abstract**

**Background and Aim:** Evidence suggests that probiotics reduce certain constipation-related symptoms. *Lactobacillus casei* strain Shirota has never been tested as treatment for functional constipation in otherwise-healthy subjects. To evaluate the efficacy of this probiotic among adults with functional constipation was aimed.

**Methods:** Subjects with functional constipation (Rome II-defined) were randomized to intake *L. casei* strain Shirota fermented milk or placebo once daily for 4 weeks under double-blind condition. Primary outcomes were constipation severity and stool frequency; secondary outcomes were stool consistency and quantity.

**Results:**

In intent-to-treat population, compared with baseline, constipation severity and stool frequency improved in both probiotic (n = 47) and control groups (n = 43), but improvements were comparable in both groups at week 4 (α = 5% level). In probiotic group, stool consistency and quantity at week 4 improved significantly versus baseline but not versus control. Considering that the study agent is non-pharmaceutical and the purpose of supplementation is for long-term effect, re-evaluation at α = 10% was conducted, which showed significant improvement in constipation severity at week 4 (P = 0.058). Magnitude of the probiotic effect on stool consistency was small but grew over time, d = 0.19, 95% confidence interval 0.00–0.35 (Week 4), d = 0.29, 95% confidence interval 0.11–0.52 (postintervention). Post-hoc exploratory analysis suggests incomplete evacuation may decrease with probiotic intake.

**Conclusions:** Four-week administration of *L. casei* strain Shirota did not alleviate constipation severity or stool frequency, consistency, and quantity when compared with control. With re-evaluation at α = 10% level, improvement in constipation severity was significant at week 4. To obtain conclusive results, further studies with longer intervention are warranted.

**Keywords:** constipation, *Lactobacillus casei*, probiotics.

**Design and evaluation of gastroretentive drug delivery system using synthetic and semi-synthetic polymers**

Meka VS¹, Gorajana A², Dharmanlingam SR², Kolapalli VR³.

¹ School of Pharmacy, International Medical University, Kuala Lumpur, Malaysia-57000.
² School of Pharmacy, International Medical University, Kuala Lumpur, Malaysia-57000.
³ A.U. College of Pharmaceutical Sciences, Andhra University, Visakhapatnam-530003, India.

**Abstract**

The aim of the present research was to prepare and evaluate a gastroretentive drug delivery system for metformin HCl, using synthetic and semi-synthetic polymers. The floating approach was applied for preparing gastroretentive tablets (GRT) and these tablets were manufactured by the direct compression method. The drug delivery system comprises of synthetic and semi-synthetic polymers such as polyethylene oxide and Carboxymethyl ethyl cellulose (CMEC) as release-retarding polymers. GRT were evaluated for physico-chemical properties like weight variation, hardness, assay friability, in vitro floating behaviour, swelling studies, in vitro dissolution studies and rate order kinetics. Based upon the drug release and floating properties, two formulations (MP04 & MC03) were selected as optimized formulations. The optimized formulations MP04 and MC03 followed zero order rate kinetics, with non-Fickian diffusion and first order rate kinetics with erosion mechanism, respectively. The optimized formulation was characterised with FTIR studies and it was observed that there was no interaction between the drug and polymers.

**Keywords**: gastroretentive, floating, carboxymethyl ethyl cellulose, *in vitro* dissolution, polyethylene oxide, metformin HCl.

**Effect of intra-cisternal application of kainic acid on the spinal cord and locomotor activity in rats**

Nilesh K Mitra¹, Tiffanie EW Goh², Thalisha Bala Krishnan², Vishna D Nadarajah³, Arun K Vasavaraj³, Tomoko Soga⁴.

¹ School of Medicine, Taylor's University, Subang Jaya, Selangor, Malaysia
² Postgraduate and Research Department, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
³ School of Medicine, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
⁴ Brain Research Institute, School of Medicine & Health Sciences, Monash University Sunway Campus, Selangor Darul Ehsan, Malaysia

**Abstract**

Amyotrophic Lateral Sclerosis (ALS) is a neurodegenerative disease of idiopathic etiology. Glutamate excitotoxicity is one of the proposed hypotheses causing progressive death of motor neurons. We aimed to develop an experimental animal model of this disease to enhance the knowledge of pathophysiological mechanism of ALS. Male Wistar rats were infused with Kainic acid (KA) intra-cisternally for 5 days at the dosage of 50 fmol/day and 150 fmol/day. Locomotor activity, sensory function and histological changes in cervical and lumbar sections of spinal cord were evaluated. Glial Fibrillary Acidic Protein (GFAP) and Neurofilament Protein (NFP) were used as immunohistochemical marker for reactive astrogliosis and neuronal damage respectively. Specific Superoxide Dismutase (SOD) activity of spinal cord was estimated. The locomotor activity in the parameter of observed mean action time remained reduced on 14th day after administration of KA. Spinal motor neurons under Nissl stain showed pyknosis of nucleus and vacuolation of neuropil. GFAP expression increased significantly in the lumbar section of the spinal cord with high dose of KA treatment (p<0.05). NFP was expressed in axonal fibres around the neurons in KA-treated rats. A significant increase in specific SOD activity in both cervical and lumbar sections of the spinal cord was found with low dose of KA treatment (p<0.05). This study concludes that spinal cord damage with some features similar to ALS can be produced by low dose intra-cisternal administration of KA.

**Keywords:** Amyotrophic lateral sclerosis, kainic acid, glial fibrillary acidic protein, neurofilament protein, superoxide dismutase, spinal cord.
Evaluation of the neurotoxic effects of ethanol on the cerebellar and cortical neurospheres isolated from E14 mouse embryo

Nilesh Kumar Mitra¹, Kanakeswary Krishnan², Chong Chung Hiong², Yen Nee Ding², Hsiao Lung Eddie², Archana Sikarwar¹.

¹ School of Medicine, International Medical University, Kuala Lumpur, Malaysia
² School of Pharmacy, International Medical University, Kuala Lumpur, Malaysia

Abstract

Objectives: Ethanol exposure during pregnancy has toxic effects on the neural stem cells of the developing brain. Differential effects of the alcohol on the neural precursor cells from different regions of the brain have not been established. This study was planned to find out the difference in the morphology of the neurosphere (NS) from the embryonic mouse cortex and cerebellum when exposed to ethanol. The dose of ethanol was comparable to blood alcohol concentration in binge drinking.

Materials and methods: The germinal tissues around the lateral ventricle and fourth ventricle of the embryo of pregnant albino mice (E14) were dissected out. Primary cultures were plated using adequate density of cells in media hormone mix (MHM) and growth factors. After 48 hours, ethanol was added to the cultures (low dose = 80 mg/dl; high dose = 400 mg/dl). NS from different groups were analyzed using phase-contrast microscopy, Trypan blue exclusion assay and immunostaining with 4'-6-Diamidino-2-phenylindol (DAPI).

Results: With low dose ethanol treatment, the mean area of cortical neurospheres was reduced by 6.9% whereas that of the cerebellar neurospheres was reduced by 51.2%. The mean count of pyknotic cells increased significantly (p<0.05) in both low and high dose ethanol treatment group compared to control in both cortical and cerebellar culture. Cerebellar culture showed 4-fold-increase in mean pyknotic cells compared to 2.5-fold-increase in cortical culture, when exposed to ethanol.

Conclusions: Cerebellar neural precursor cells from E14 mouse were more susceptible to the neurotoxic effects of ethanol compared to the cortical ones.

Keywords: Neural stem cell, alcohol ethyl, in vitro toxicity.

**Forensic genetics in post mortem identification**

Dr Vasudeva Murthy C R¹, Dr Hemanth S Naik², Dr Praveenkumar Devarbhavi³.

¹ Department of Pathology, International Medical University, Bukit Jalil, Kuala Lumpur
² INFOVALLEY group of companies, Malaysia
³ Department of medicine, S.S.Institute of Medical Sciences and Research Center Davangere

**Abstract**

In the last 20 the rapid developments in forensic has changed forensic Odontology. Identification in mass disaster by dental examination is one of the challenges in establishing the identity¹. Forensic identification by their nature is multidisciplinary team efforts relying on positive identification methodologies as well as exclusionary methodologies. DNA identification or DNA finger printing has become the core part of molecular biology in basic research and applied areas as well.

**Keywords:** Molecular techniques, DNA, genetics, Identification and Forensic.
Amelioration of collagen-induced arthritis in female Dark Agouti rats by glucosamine treatment

Nagaraja Haleagrahara¹, Dulanthi Tudawe², Srikumar Chakravarthi², Ammu Kutty Radhakrishnan².

¹ School of Veterinary and Biomedical Sciences, James Cook University, Townsville, QLD 4811, Australia
² Department of Pathology, International Medical University, 57000 Kuala Lumpur, Malaysia

Abstract
The present study assessed the therapeutic efficacy of glucosamine hydrochloride against collagen-induced arthritis in female Dark Agouti rats (DA). Arthritis was induced by intradermal injection of a collagen and complete Freund’s adjuvant suspension at multiple sites in the rat at a dose of 4mg/kg of body weight and thereafter followed by two more boosters of the same dose, after the 1st week and 2nd week of primary immunization. After 21 days from the day of primary immunization, the arthritic group rats were given oral supplementation of glucosamine hydrochloride at a dose of 300mg/kg of body weight until day 45. The arthritic group treated with glucosamine hydrochloride from day 21 to day 45 showed significant reduction in arthritic histopathological changes of the joints, reduction in paw thickness and also a significant decrease in C-reactive protein and TNF-alpha in the serum. Treatment with 300mg/kg of glucosamine hydrochloride was able to reverse the arthritic changes, hence suggesting that glucosamine has a therapeutic effect against collagen-induced arthritis.

**Post mortem angiography: Minimal invasive approach for vascular pathology**

Dr Hemanth S Naik¹, Dr Vasudeva Murthy C R².

¹ Senior Medical Scientist, INFOVALLEY group of companies, Malaysia
² Senior Lecturer, Department of Pathology, International Medical University, Bukit Jalil, Kuala Lumpur

**Abstract**

Post mortem forensic imaging has revolutionized the methodology of autopsy in the recent years. Newer techniques have been experimented to visualize the blood vessels by post mortem angiography. This manuscript focuses on the various methods, contrast dyes used in the current practice of post mortem angiography & the advantages of post mortem angiography.

**Keywords:** Forensic Radiology, Post Mortem Angiography, Angiofil, Contrast Agent.

The DNA binding site specificity and antiproliferative property of ternary Pt(II) and Zn(II) complexes of phenanthroline and N,N'-ethylenediaminediacetic acid

Yusuke Nakamura¹, Yoko Taruno¹, Masashi Sugimoto¹, Yusuke Kitamura², Hoi Ling Seng³, Siew Ming Kong⁴, Chew Hee Ng⁵, Makoto Chikira¹.

¹ Department of Applied Chemistry, Chuo University, 1-13-27, Kasuga, Bunkyo-ku, Tokyo, Japan
² Department of Applied Chemistry and Biochemistry, Kumamoto University, Kumamoto, Japan
³ Unit GL33, Malaysia University of Science and Technology, 47301 Petaling Jaya, Malaysia
⁴ Department of Chemical Science, Faculty of Science, Universiti Tunku Abdul Rahman, Jalan University, Bandar Barat, 31900 Kampar, Perak, Malaysia
⁵ Department of Pharmaceutical Chemistry, School of Pharmacy, International Medical University, 57000 Kuala Lumpur, Malaysia

Abstract

The binding site specificity of the ternary complexes, [M(II)(phen)(edda)] (M(II) = Pt²⁺ and Zn²⁺; phen = 1,10-phenanthroline; edda = N,N'-ethylenediaminediacetic acid), for the self-complementary oligonucleotides (ODNs), ds(C₁G₂C₃G₄A₅T₆T₇C₈G₉C₁₀G₁₁G₁₂)₂ (ODN1) and ds(C₁G₂C₃G₄T₅A₆T₇A₈C₉G₁₀C₁₁G₁₂)₂ (ODN2), was studied by NMR measurements. The results indicated that [Pt(II)(phen)(edda)] was partially intercalated between C₃/G₁₀ and G₄/C₉ base pairs of ODN1 and ODN2 in the major grooves, whereas [Zn(II)(phen)(edda)] was bound specifically to the TATA region of ODN2 in the minor groove and to the terminal G₂/C₁₁ base pair of ODN1 in the major groove. The preference for the TATA sequence over the AATT sequence in the binding of [Zn(phen)(edda)] was attributed to the wider minor groove width of the TATA sequence. The bindings of the complexes to ct-DNA were also studied by UV, CD, and fluorescence spectroscopy. Additionally, the antiproliferative property of [Pt(II)(phen)(edda)] towards MCF7 breast cancer cells and normal MCF10-A cells was compared with that of [Zn(II)(phen)(edda)].
Ng A, Ng E, Er HM. Anti-proliferative and mutagenic activities of aqueous and methanol extracts of *Elephantopus mollis*. *Journal of Science and Technology in the Tropics* 9, 2013; 157-167. (IF: N/A).

**Anti-proliferative and mutagenic activities of aqueous and methanol extracts of *Elephantopus mollis***

Angeline Ng, Esther Ng and Hui Meng Er.

School of Pharmacy, Faculty of Medicine and Health, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

The anti-proliferative and mutagenic effects of the crude aqueous and methanol extracts of *Elephantopus mollis* Kunth leaves were studied. The antiproliferative effects of the extracts were evaluated against the normal mouse fibroblast cell line (NIH/3T3), mouse mammary cancer cells (4T1) and human mammary cancer cells (MCF7) at various concentrations. The aqueous extract was considered noncytotoxic against the 4T1 cell line. Besides, it exhibited a higher anti-proliferative activity against the normal NIH/3T3 cells than the cancer cells. On the other hand, the methanol extract was considered cytotoxic against the MCF7 cancer cells. It was also less cytotoxic against the normal NIH/3T3 cells. The mutagenicity assay showed that the aqueous extract was not mutagenic in the absence of S9 metabolic activation. However, it was strongly mutagenic at 50 and 100 μg/mL in the presence of S9 metabolic activation. The methanol extract was not mutagenic at concentrations up to 100μg/mL in the absence and presence of S9 metabolic activation. The findings suggested that the aqueous extract might generate mutagenic metabolite(s) upon metabolism by liver enzymes and could be potentially mutagenic at high concentrations. The public should be cautioned on the poor selectivity of the aqueous extract towards cancer cells and its harmful mutagenic effect.

**Keywords**: *Elephantopus mollis*, aqueous extract, methanol extract, antiproliferative, mutagenic.

**Ternary copper(II)-polypyridyl enantiomers: Aldol-type condensation, characterization, DNA-binding recognition, BSA-binding and anticancer property**

Chew-Hee Ng, Wai-San Wang, Kok-Vei Chong, Yip-Foo Win, Kian-Eang Neo, Hong-Boon Lee, Swee-Lan San, Raja Noor Zaliha Raja Abd Rahman, Weng Kee Leong.

Department of Pharmaceutical Chemistry, School of Pharmacy, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

Chiral enantiomers [Cu(phen)(L-threo)(H2O)]NO3 1 and [Cu(phen)(D-threo)(H2O)]NO3 2 (threo = threoninate) underwent aldol-type condensation with formaldehyde, with retention of chirality, to yield their respective enantiomeric ternary copper(II) complexes, viz. L- and D-[Cu(phen)(5MeOCA)(H2O)]NO3·xH2O (3 and 4; phen = 1,10-phenanthroline; 5MeOCA = 5-methyloxazolidine-4-carboxylate; x = 0-3) respectively. These chiral complexes were characterized by FTIR, elemental analysis, circular dichroism, UV-Visible spectroscopy, fluorescence spectroscopy (FL), molar conductivity measurement, ESI-MS and X-ray crystallography. Analysis of restriction enzyme inhibition by these four complexes revealed modulation of DNA binding selectivity by the type of ligand, ligand modification and chirality. Their interaction with bovine serum albumin was investigated by FL and electronic spectroscopy. With the aid of the crystal structure of BSA, spectroscopic evidence suggested their binding at the cavity containing Trp134 with numerous Tyr residues in subdomain IA. The products were more antiproliferative than cisplatin against cancer cell lines HK-1, MCF-7, HCT116, HSC-2 and C666-1 except HL-60, and were selective towards nasopharyngeal cancer HK-1 cells over normal NP69 cells of the same organ type.

**Characterization of structural stability of palm oil esters-based nanocosmeceuticals loaded with tocotrienol**

Sook Han Ng¹, Pei Meng Woi², Mahiran Basri³,⁴ and Zahariah Ismail².

¹ School of Pharmacy, International Medical University, 57000, IMU Bukit Jalil, Kuala Lumpur, Malaysia ² Department of Chemistry, Faculty of Science, University of Malaya, 50603, Kuala Lumpur, Malaysia. ³ Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400, UPM Serdang, Selangor, Malaysia ⁴ Institute of Bioscience, Universiti Putra Malaysia, 43400, UPM Serdang, Selangor, Malaysia ⁵ Sime Darby Research Sdn. Bhd Carey Island, 42960, Pulau Carey, Selangor, Malaysia

**Abstract**

**Background:**

Palm oil esters (POEs) are esters derived from palm oil and oleyl alcohol have great potential in the cosmetic and pharmaceutical industries due to the excellent wetting behavior of the esters without the oily feel. The role of oil-in-water nanoemulsions loaded with tocotrienol sedimentation behavior was studied. LUMiFuge® 116 particle separation analyzer was used to investigate the sedimentation behavior of POEs/tocotrienol/xanthan gum nanoemulsion system during centrifugation. Analyzing the sedimentation kinetics of dispersions in a centrifugal field also yields information about the rheological behavior and structural stability.

**Methods:**

Experiments were performed in an analytical centrifuge at 11×g to 1140×g (LUMiFuge® 116 particle separation analyzer). The samples in the LUMiFuge® 116 particle separation analyzer were centrifuged at 3000 rpm for 15 h at 32°C. Sample volume of 2 cm3 was used. The rheological property of nanoemulsions was investigated using oscillatory measurements test. A rotational/oscillatory viscometer, Kinexus Rheometer (Malvern Instrument, UK) was used. All measurements were performed with a stainless steel cone-plate sensor at 25.0 ± 0.1°C with 4°/40 mm.

**Results:**

The stable nanoemulsions showed sedimentation rates at earth gravity of 5.2, 3.0 and 2.6 mm/month for 10%, 20% and 30% (w/w) oil phase, respectively. Rheological behavior is an important target during the design of palm oil esters-based nanocosmeceuticals. The presence of a network structure was indicated by measurements which showed G' to be greater than G". This result implied the predominant elastic response and high storage stability of the nanoemulsion. It was also observed that the increase in oil phase concentration led to the profile which strongly indicated that the solid like elastic property; where the values of phase angle, δ of these nanoemulsions was lower than 45°.

**Conclusions:**

The nanoemulsions with higher oil phase concentration (30% (w/w)) showed greater elasticity which implied strong dynamic rigidity of the nanoemulsion. It was the most stable with longest shelf-life.

**Keywords:** Palm oil esters, Tocotrienol, Nanoemulsion, Sedimentation, Rheological.
Nor Aini J, Poh BK, Chee WSS. Validity of a children’s physical activity questionnaire (cPAQ) for the study of bone health. *Pediatrics International*, 2013; 55: 223–228. (IF: 0.626); (SCI IF: 0.714; H-index: 36; Tier: Q2).

**Validity of a children’s physical activity questionnaire (cPAQ) for the study of bone health**

Nor Aini, Jamil¹, Poh, Bee Koon¹, Chee, Winnie Siew Swee².

¹ School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia,
² Department of Nutrition and Dietetics, Faculty of Medicine and Health, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

**Background:**
The aim of this cross-sectional study was to examine the ability of a children's physical activity questionnaire (cPAQ) to assess physical activity levels and bone health status of school children.

**Methods:**
Subjects consisted of 90 pre-pubertal and early pubertal children aged 9-10 years. Components of physical activity were assessed using metabolic intensity (METPA) scores and mechanical bone strain (MECHPA) scores. An Actical accelerometer was used to validate METPA scores among a sub-sample of 57 children. Reliability was assessed by test-retesting all children after a 7 day interval. Whole body bone mineral content (BMC) was measured using dual-energy X-ray absorptiometry.

**Results:**
The reliability of cPAQ for assessment of various categories of physical activity was moderate to high (r ranged from 0.55 to 0.68, P < 0.001). Agreement was fair for repeated use of the cPAQ (Cohen's kappa = 0.32, P < 0.001). Bland-Altman plots show cPAQ had fair agreement only for moderate activity (mean difference 35.4 min/week; 95% limits of agreement -434.0 to +504.9 min/week). Approximately 69.6% of children were correctly classified (into the same or adjacent quartiles) according to the quartiles of BMC for METPA score, and 58.7% were correctly classified according to MECHPA score. Only 10.9% and 12.0% of children were grossly misclassified as compared to METPA and MECHPA scores, respectively.

**Conclusions:**
The cPAQ has reasonable validity in assessing moderate physical activity, and it demonstrates good ability to accurately classify children according to BMC. It fails, however, to assess other activity levels, suggesting that objective measurement is still a better method of assessment of physical activity among primary school children.

**Keywords:** accelerometry, bone mineral content, children, physical activity questionnaire, validation studies.
Effects of sun exposure on 25(OH) vitamin D concentration in urban and rural women in Malaysia

Musa Nurbazlin¹, Winnie Siew Swee Chee², Pendek Rokiah¹, Alexander Tong Boon Tan¹, Yee Yean Chew¹, Abd Rahman Siti Nusaibah¹, Siew Pheng Chan¹.

¹ Department of Medicine, University of Malaya, Malaysia
² Department of Nutrition & Dietetics, International Medical University, Kuala Lumpur, Malaysia

Abstract
Ultraviolet B sunlight exposure is a primary source of vitamin D. There have been reports of low vitamin D status amongst the Malaysian population despite it being a tropical country. This study was conducted to determine the influence of sun exposure on 25(OH)D concentrations in urban and rural women in Malaysia and factors predicting 25(OH)D concentrations. Women aged above 45 years were recruited from urban (n=107) and rural areas (n=293). Subjects were interviewed regarding their outdoor activities and usual outdoor attire over the previous week. 25(OH)D concentrations were analyzed using the vitamin D3 (25-OH) electrochemiluminescence immunoassay. Median (Q1-Q3) age of the participants was 57 (53-61) years old. Median (Q1-Q3) 25(OH)D concentration of rural women was significantly higher [69.5 (59.0-79.1) nmol/L] compared to urban women [31.9 (26.1-45.5) nmol/L] (p<0.001). Rural women spent more time in the sun compared to urban women (7.83 (3.67-14.7) vs 2.92 (1.17-4.92) hours, p<0.001), although the fraction of body surface area (BSA) exposed to sunlight was significantly higher in the urban group [0.21 (0.21-0.43) vs 0.12 (0.07-0.17), p<0.001]. The calculated sun index (hours of sun exposure per week x fraction of BSA) was significantly higher in rural [0.89 (0.42-1.83)] compared to urban women [0.72 (0.26-1.28)], p=0.018. In the stepwise linear regression, rural dwelling increased the serum 25(OH)D by 31.74 nmol/L and 25(OH)D concentrations increased by 1.93 nmol/L for every unit increment in sun index. Urban women in Malaysia had significantly lower vitamin D status compared to rural women. Rural dwelling and sun index were key factors influencing vitamin D status in Malaysian women.

Keywords: 25(OH)D, sun exposure, body surface area, rural and urban women, Malaysia.

**The relationship between adjustment and negative emotional states among first year medical students**

Primrose C. Nyamayaro¹, Coumaravelou Saravanan².

Division of Psychology-Behavioural Sciences, International Medical University, Malaysia

**Abstract**

Adjustment problems and negative emotional states such as depression, anxiety and stress are prevalent among university students. Previous studies have not identified the relationship between academic, social, personal emotional and attachment to university adjustment problems with depression, anxiety and stress among first year medical students. This study explored gender differences and relationships between adjustment problems and negative emotional states. In this study, 42 male and 57 female medical students completed the Student Adaptation to College Questionnaire and the Depression Anxiety Stress Scale. Results indicated a moderate adjustment level and no significant gender differences among medical students. Significant gender differences were found in stress and anxiety but not in depression. There were significant negative correlations between various adjustment and depression, anxiety, and stress. Overall, in this study female students were more stressed and anxious compared to male students. Therefore, the university should carry out prevention programs to address these issues.

**Keywords:** Adjustment Problems, Medical Student, Negative Emotions.

**Structured student-generated videos for first-year students at a dental school in Malaysia**

Hanan Omar¹, Saad Ahmed Khan², Chooi Gait Toh³.

¹ School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
² School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
³ School of Dentistry, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

Student-generated videos provide an authentic learning experience for students, enhance motivation and engagement, improve communication skills, and improve collaborative learning skills. This article describes the development and implementation of a student-generated video activity as part of a knowledge, observation, simulation, and experience (KOSE) program at the School of Dentistry, International Medical University, Kuala Lumpur, Malaysia. It also reports the students’ perceptions of an activity that introduced first-year dental students (n=44) to clinical scenarios involving patients and dental team aiming to improve professional behavior and communication skills. The learning activity was divided into three phases: preparatory phase, video production phase, and video-watching. Students were organized into five groups and were instructed to generate videos addressing given clinical scenarios. Following the activity, students’ perceptions were assessed with a questionnaire. The results showed that 86 percent and 88 percent, respectively, of the students agreed that preparation of the activity enhanced their understanding of the role of dentists in provision of health care and the role of enhanced teamwork. In addition, 86 percent and 75 percent, respectively, agreed that the activity improved their communication and project management skills. Overall, the dental students perceived that the student-generated video activity was a positive experience and enabled them to play the major role in driving their learning process.

**Keywords:** Malaysia, communication skills, dental students, educational technologies, professionalism, video production.

In vitro approaches to investigate cytochrome P450 activities: Update on current status and their applicability

Chin Eng Ong¹, Yan Pan², Joon Wah Mak², Rusli Ismail³.

¹ Monash University Sunway Campus, Jeffrey Cheah School of Medicine and Health Sciences, Jalan Lagoon Selatan, 46150 Bandar Sunway, Selangor, Malaysia
² International Medical University, School of Medical Sciences, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ Universiti Sains Malaysia, Institute for Research in Molecular Medicine, Pharmacogenetics Research Group, 16150 Kubang Kerian, Kelantan, Malaysia

Abstract

Introduction:
Cytochromes P450 (CYPs) play a central role in the Phase I metabolism of drugs and other xenobiotics. It is estimated that CYPs can metabolize up to two-thirds of drugs present in humans. Over the past two decades, there have been numerous advances in in vitro methodologies to characterize drug metabolism and interaction involving CYPs.

Areas covered:
This review focuses on the use of in vitro methodologies to examine CYPs’ role in drug metabolism and interaction. There is an emphasis on their current development, applicability, advantages and limitations as well as the use of in silico approaches in complementing and supporting in vitro data. The article also highlights the challenges in extrapolating in vitro data to in vivo situations.

Expert opinion:
Advances in in vitro methodologies have been made such that data can be used for in vivo prediction with comfortable degree of confidence. Improved assay designs and analytical techniques have permitted development of miniaturized assay format and automated system with improved sensitivity and throughput capacity. High-quality experimental designs and scientifically rigorous assessment/validation protocols remain crucial in developing reliable and robust in vitro models. With continued progress made in the field, in vitro methodologies will continually be employed in evaluating CYP activities in pharmaceutical industries and laboratories.

Keywords: cytochromes P450, drug metabolism, drug–drug interaction, in silico modeling, in vitro methodologies, in vitro–in vivo extrapolation.

**Heterologous expression of human cytochrome P450 (CYP) 2C19 in \textit{Escherichia coli} and establishment of RP-HPLC method to serve as activity marker**

Yan Pan\textsuperscript{1}, Joon Wah Mak\textsuperscript{1}, Chin Eng Ong\textsuperscript{2}.

\textsuperscript{1} School of Medical Sciences, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
\textsuperscript{2} Jeffrey Cheah School of Medicine and Health Sciences, Monash University Sunway Campus, Bandar Sunway, Selangor Darul Ehsan, Malaysia

**Abstract**

In this study, a simple and reliable reverse-phase high-performance liquid chromatography (RP-HPLC) method was established and validated to analyze S-mephenytoin 4-hydroxylase activity of a recombinant CYP2C19 system. This system was obtained by co-expressing CYP2C19 and NADPH-CYP oxidoreductase (OxR) proteins in \textit{Escherichia coli} (\textit{E. coli}) cells. In addition to RP-HPLC, the expressed proteins were evaluated by immunoblotting and reduced CO difference spectral scanning. The RP-HPLC assay showed good linearity (\(r^2 = 1.00\)) with 4-hydroxymephenytoin concentration from 0.100 to 50.0 \(\mu\text{m}\) and the limit of detection was 5.00 \(\times\) 10\(^{-2}\) \(\mu\text{m}\). Intraday and interday precisions determined were from 1.90 to 8.19\% and from 2.20 to 14.9\%, respectively. Recovery and accuracy of the assay were from 83.5 to 85.8\% and from 95.0 to 105\%. Enzyme kinetic parameters (K\text{m}, V\text{max} and K\text{i}) were comparable to reported values. The presence of CYP2C19 in bacterial membranes was confirmed by immunoblotting and the characteristic absorbance peak at 450 nm was determined in the reduced CO difference spectral assay. Moreover, the activity level of co-expressed OxR was found to be comparable to that of the literature. As a conclusion, the procedures described here have generated catalytically active CYP2C19 and the RP-HPLC assay developed is able to serve as CYP2C19 activity marker for pharmacokinetic drug interaction study in vitro.

**Keywords:** HPLC, CYP2C19, in vitro, drug interaction.

Endo-perio lesion: A dilemma from 19th until 21st century

Abhishek Parolia¹, Toh Choo Gait², Isabel C. C.M. Porto³, Kundabala Mala⁴.

¹ Faculty of Dentistry, Division of Oral Clinical Sciences, International Medical University, Kuala Lumpur, Malaysia
² School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
³ Department of Restorative Dentistry, Cesmac University Center, Maceió, Alagoas, Brazil
⁴ Department of Conservative Dentistry and Endodontics, Manipal College of Dental Sciences, Manipal University, Mangalore, Karnataka, India

Abstract

The interrelationship between endodontic and periodontal diseases has been a subject of speculation, confusion and controversy for many years. Pulpal and periodontal problems are responsible for more than 50% of tooth mortality today. An endo-perio lesion can have a varied pathogenesis which ranges from quite simple to relatively complex one. These lesions often present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned. It is very essential to make a correct diagnosis so that the appropriate treatment can be provided. To make a correct diagnosis the clinician should have a thorough understanding and scientific knowledge of these lesions and may need to perform restorative, endodontic or periodontal therapy, either singly or in combination to treat them. Therefore, this presentation will highlight the diagnostic, clinical guidelines and decision-making in the treatment of these lesions from an Endodontist’s point of view to achieve the best outcome.

Keywords: Diagnosis, endo-perio lesions, management.

Basaloid squamous cell carcinoma of oral cavity with incongruent clinical course

Pratik Nalinbhai Patel¹, Vimi Sunil Mutalik², Shweta Rehani³, Raghu Radhakrishnan¹.

¹ Department of Oral Pathology and Microbiology, Manipal College of Dental Sciences, Manipal, Udupi, Karnataka, India
² Division of Oral Diagnostic Science, School of Dentistry, International Medical University, Kuala Lumpur, Malaysia
³ Department of Oral Pathology and Microbiology, Sudha Rastogi College of Dental Sciences and Research, Faridabad, India

Abstract

Basaloid squamous cell carcinoma (BSCC) is a rare variant of SCC having a marked predilection for the upper aerodigestive tract. It is regarded as a high-grade tumour with increased propensity for metastasis to distant sites. The histological hallmark of BSCC is its dimorphic pattern of presentation with a characteristic basal cell component associated with squamous component. We report two cases of BSCC on the buccal mucosa and gingiva, respectively, with the former presenting as a primary lesion in a patient without a positive history of tobacco and alcohol use and the latter present as a seemingly metachronous development from carcinoma lung. The proliferative index of the two diverse yet similar entities was assessed by Ki-67 labelling index (LI) and the association of human papillomavirus (HPV) was detected with p16 monoclonal antibody. The intrinsically aggressive behaviour of BSCC and its association with HPV is highlighted.

2-Mehtoxy-4-(prop-2-en-1-yl)phenylbenzoate

Mallikarjuna Rao Pichika¹, Yew Beng Kang¹, and Seik Weng Ng²,³.

¹ Department of Pharmaceutical Chemistry, International Medical University, 126 Jalan Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia
³ Chemistry Department, Faculty of Science, King Abdulaziz University, PO Box 80203 Jeddah, Saudi Arabia

Abstract

In the title compound, C₁₇H₁₆O₃, the benzene rings are twisted by 63.54 (5)°. The twist is similar to that found in the unsubstituted compound, phenyl benzoate. The crystal packing features C—H⋅⋅⋅O hydrogen bonds.

2-Methoxy-4-(prop-2-en-1-yl)phenylmethoxy benzoate

Mallikarjuna Rao Pichika¹, Beng Kang Yew¹, and Seik Weng Ng²,³.

¹ Department of Pharmaceutical Chemistry, International Medical University, 126 Jalan Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia
³ Chemistry Department, Faculty of Science, King Abdulaziz University, PO Box 80203 Jeddah, Saudi Arabia

Abstract

In the title compound, C₁₈H₁₈O₄, the planes of the benzene rings are twisted by 81.60 (5)°. In the crystal, weak C—H...O hydrogen bonds link the molecules into supramolecular chains extending along the a axis.

**Solitary adrenal metastasis from invasive infiltrating ductal carcinoma: A case report and review of literature**

Sangeetha Poovaneswaran¹, Justin Zon Ern Lee¹, Whei Ying Lim¹, Navarasi S Raja Gopal², Fauziah Mohd Dali², Ibtisam Mohamad².

¹ International Medical University Seremban Clinical School, Jalan Rasah, 70300 Seremban, Negeri Sembilan, Malaysia
² Hospital Tuanku Jaafar, Seremban, Malaysia

**Abstract**

Solitary adrenal metastasis is a rare presentation in breast cancer and it presents the clinician with a difficult therapeutic dilemma as there are no existing guidelines for optimal management. On literature review, we only found one published case report of solitary adrenal metastasis from infiltrating ductal carcinoma of the breast. Here we present a case of a 75 year-old lady who presented with a right breast lump which was subsequently confirmed to be infiltrating ductal carcinoma. She underwent a right mastectomy and axillary clearance. Computerised tomography (CT) staging revealed a solitary adrenal metastasis. She was treated with aromatase inhibitors and her tumour markers which were initially raised has now normalised.

**Keywords:** adrenal metastases, infiltrating ductal carcinoma, breast cancer.
Pran Kishore Deb, Ajay Rana, Mallikarjuna Rao Pichika, Upendra Kumar Jain. International Medical University, Kuala Lumpur, Malaysia

Abstract
In the present study, a ligand-based 3D-QSAR pharmacophore model have been developed by considering 73 structurally diverse classes of heterocyclic compounds (IC50 = 0.0077-100 μM) such as 2-phenylpyrroloquinolin-4-ones, 7-phenyl-3H-pyrrolo[3,2-f]quinolinones, 5,4′-diamino-6,8,3′-trifluoroflavones, plumbagin and N1-(flavon-7-yl)amidrazone derivatives which were found to have potent cytotoxic activity against MCF-7 cell lines (breast cancer cell lines) to understand the structural requirements for effective binding with the aromatase enzyme to design a series of new potent and selective aromatase inhibitors (AIs). The 3D-QSAR pharmacophore hypotheses AADRR.22 with survival score = 3.774 was found to be statistically most significant (SD = 0.4396, R2 = 0.8679, F = 60.4 RMSE = 0.5038, Q2 = 0.8042, Pearson-R = 0.9044) and could successfully identify known aromatase inhibitors and differentiate between active and inactive inhibitors. The potential of this model can be effectively used to design new potent aromatase inhibitors for breast cancer treatment.

Keywords: Aromatase inhibitors, MCF-7 cell lines, Breast cancer, 3D-QSAR, Pharmacophore modelling.
Antiinflammatory evaluation and docking studies of some new Thienopyrimidines


International Medical University, Bukit Jalil, Kuala Lumpur

Abstract
A series of some new 6-substituted-2,3,4-trihydropyrimido[1,2-c]9,10,11,12-tetrahydrobenzo[b]thieno[3,2-e]pyrimidines (1-6) have been evaluated in silico (docking studies) to recognize their hypothetical binding motif with the cyclooxygenase isoenzyme (COX-2) employing GLIDE software (Schrodinger Inc.) and in vivo (rat paw edema) for their antiinflammatory activities. The compound 6 with pyridyl substitution at the 6th position of the thienopyrimidine moiety was found to form significant H-bonding interaction with crucial amino acid residue Arg 120 at a distance of 3 Å and exhibited good antiinflammatory activity [around 87 % of the standard: indomethacin]. The binding mode of the thienopyrimidines compounds have been proposed based on the docking studies. Further, the predicted ADME properties of all the tested compounds were found to be in the ranges as predicted by QikProp for 95 % of known oral drugs and also satisfy the Lipinski's rule of five.

Keywords: Thienopyrimidines, Antiinflammatory activity, COX-2 docking studies, in silico ADME prediction.
Synthesis, anti-inflammatory evaluation, and docking studies of some new thiazole derivatives

Pran Kishore Deb¹, Rajwinder Kaur², Balakumar Chandrasekaran², Madhu Bala², Dilshad Gill², Venkat Rao Kaki², Raghuram Rao Akkinepalli³, Raghuprasad Mailavaram⁴.

¹ Pharmaceutical Chemistry Division, School of Pharmacy, International Medical University (IMU), No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
² Pharmaceutical Chemistry Division, University Institute of Pharmaceutical Sciences (UIPS) and Centre of Advanced Study in Pharmaceutical Sciences (UGC-CAS), Panjab University (PU), Chandigarh, 14, India
³ Medicinal Chemistry Division, University College of Pharmaceutical Sciences, Kakatiya University, Warangal, 506 009, Andhra Pradesh, India
⁴ Pharmaceutical Chemistry Division, Sri Vishnu College of Pharmacy, Bhimavaram-2, Vishnupur, Andhra Pradesh, India

Abstract

A series of new 2-substituted-N-(1,3-thiazole-2-yl)acetamide 3–7 and N-(benzo[d]thiazol-2-yl)-2-(substituted)acetamide 10–13 derivatives have been synthesized and evaluated in vivo (rat paw edema) for their anti-inflammatory activities and in silico(docking studies) to recognize the hypothetical binding motif of the title compounds with the cyclooxygenase isoenzyme (COX-2) employing GLIDE software (Schrodinger Inc.). The compounds, 10–13 were found to have good anti-inflammatory activities [around 84–93 % of the standard: indomethacin]. The binding mode of the title compounds has been proposed based on the docking studies. Further, the predicted ADME properties of all the tested compounds were found to be in the ranges as predicted by QikProp for 95 % of known oral drugs and also satisfy the Lipinski’s rule of five.

Keywords: Microwave-assisted synthesis, Thiazole derivatives, Anti-inflammatory activity, COX-2 docking studies, ADME prediction.
Fibrin Sealant as an alternative for sutures in periodontal surgery

Shaju Jacob Pulikkotil¹ and Sonia Nath².

¹ International Medical University, School of Dentistry, Kuala Lumpur, Malaysia
² Department of Periodontics and Oral Implantology, Chhattisgarh Dental College and Research Institute, Rajnandgaon, India

Abstract
The trial compared wound healing clinically, histologically and morphometrically after the use of fibrin sealant and sutures for periodontal flap closure. Ten patients were selected for this split-mouth randomized controlled clinical trial. On the test site fibrin sealant (F) was applied for flap closure after periodontal flap surgery (n = 10) and on the control site sutures (S) were used (n = 10). Clinically wound healing was observed at 7, 14 and 21 days and biopsy was taken on the 8th day. At seventh day better healing was observed in fibrin sealant site. Histologically mature epithelium and connective tissue formation was seen in fibrin sealant site with increased density of fibroblasts (F = 70.45 ± 7.22; S = 42.95 ± 4.34, p < 0.001) and mature collagen fibers. The suture site had more number of inflammatory cells (S = 32.58 ± 4.29; F = 20.91 ± 4.46, p < 0.001) and more number of blood vessels (S = 11.89 ± 3.64; F = 5.74 ± 2.41, p = 0.005). Fibrin sealant can form a better alternative to sutures for periodontal flap surgery.

Keywords: Fibrin sealant, Histology, Morphometry, Tissue adhesive, Wound healing.
Supplementation with natural forms of vitamin E augments antigen-specific TH1-type immune response to tetanus toxoid

Ammu Kutty Radhakrishnan¹, Dashayini Mahalingam¹,², Kanga Rani Selvaduray², and Kalanithi Nesaretnam².

¹ Pathology Division, Faculty of Medicine and Health, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Wilayah Persekutuan, Malaysia
² Department of Nutrition, Malaysian Palm Oil Board, 6, Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor Darul Ehsan, Malaysia

Abstract

This study compared the ability of three forms of vitamin E [tocotrienol-rich fraction (TRF), alpha-tocopherol (α-T), and deltaticotrienol (δ-T3)] to enhance immune response to tetanus toxoid (TT) immunisation in a mouse model. Twenty BALB/c mice were divided into four groups of five mice each. The mice were fed with the different forms of vitamin E (1mg) or vehicle daily for two weeks before they were given the TT vaccine [4 Lf] intramuscularly (i.m.). Booster vaccinations were given on days 28 and 42. Serum was collected (days 0, 28, and 56) to quantify anti-TT levels. At autopsy, splenocytes harvested were cultured with TT or mitogens. The production of anti-TT antibodies was augmented (P < 0.05) in mice that were fed with δ-T3 or TRF compared to controls. The production of IFN-γ and IL-4 by splenocytes from the vitamin E treated mice was significantly (P < 0.05) higher than that from controls. The IFN-γ production was the highest in animals supplemented with δ-T3 followed by TRF and finally α-T. Production of TNF-α was suppressed in the vitamin E treated group compared to vehicle-supplemented controls. Supplementation with δ-T3 or TRF can enhance immune response to TT immunisation and production of cytokines that promote cell-mediated (TH1) immune response.

**Single nucleotide polymorphisms in the promoter of the human interleukin-13 gene is associated with asthma in Malaysian adults**

Ammu Kutty Radhakrishnan¹, Vijaya Lechimi Raj², Lee-Keng Tan¹, and Chong-Kin Liam³.

¹ Pathology Division, Faculty of Medicine and Health, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Department of Pharmacology, Faculty of Medicine, MAHSA University, Jalan Elmu, Off Jalan University, 59100 Kuala Lumpur, Malaysia
³ Department of Medicine, Faculty of Medicine, University of Malaya, Lembah Pantai, 50603 Kuala Lumpur, Malaysia

**Abstract**

Asthma susceptibility genes are mapped to a region on human chromosome 5q31-q33, which contains a cluster of proinflammatory cytokine genes such as interleukin-13 (IL-13), which is associated with asthma. This study investigated the allele frequencies of two single nucleotide polymorphisms (SNPs) (-1111C>T and 4257C>A) in the IL-13 gene between asthmatics and healthy volunteers as well as the relationship between these SNPs and IL-13 production. DNA extracted from buffy coat of asthmatic and control subjects was genotyped using the PCR-RFLP method. Amount of IL-13 produced by mitogen-stimulated peripheral blood leucocytes PBLs (PBLs) was determined by ELISA. The frequencies of the -1111C and 4257G wild-type alleles were 0.52 and 0.55 in asthmatics and were 0.67 and 0.56 in controls. A significant (P < 0.05) association was found between genotype and allele frequencies of SNP at position -1111C>T between asthmatic and control groups (OR, 1.810; 95% CI = 1.184 to 2.767; P < 0.05). The mitogen-stimulated PBLs from asthmatics produced higher amounts of IL-13 production (P < 0.001). The 4257GA heterozygous and 4257AA homozygous mutant alleles were associated with higher IL-13 production in asthmatics (P < 0.05). Our results show that the -1111T mutant allele are associated with asthma and the 4257A mutant alleles are associated with elevated IL-13 production.

**Effect of plasticizers on in vitro release and ex vivo permeation of chlorpheniramine maleate from ethyl cellulose polyvinyl pyrrolidone based matrix patches**

Rajan Rajabalaya¹,2, Sheba Rani Nakka David¹,³, Jasmina Khanam², Arunabha Nanda².

¹ Department of Pharmaceutical Technology, School of Pharmacy, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil 57000, Kuala Lumpur, Malaysia
² Department of Pharmaceutical Technology, Jadavpur University, Kolkata-700032, India
³ School of Bioscience & Engineering, Jadavpur University, Kolkata-700032, India

**Abstract**

The present release and permeation studies were carried out for developing transdermal therapeutic systems with chlorpheniramine maleate (CPM). The matrix patches were prepared from ethyl cellulose (EC) with polyvinyl pyrrolidone (PVP) as the copolymer and plasticizers like dibutyl phthalate (DBP), dibutyl sebacate (DBS), triethyl citrate (TEC), acetyl triethyl citrate (ATEC), tributyl citrate (TBC) and acetyl tributyl citrate (ATBC) in different percentages. Thickness, tensile strength, elasticity, drug content, moisture content and water absorption studies of the matrix patches were measured. In vitro release/permeation of CPM was studied in a modified Keshary - Chien diffusion cell. Experimental release/permeation data (percent release and flux, µgm/cm² .hr) of different formulations of the matrix systems are reported. Also the drug-polymer interaction was investigated by ATR-FTIR studies. This study reports the effect of CPM in EC patch and suitable amount of plasticizer for better controlled release/permeation of CPM; hence this drug could be a potential candidate for transdermal antihistamine applications in film device industry.

**Keywords**: Matrix patch, Chlorpheniramine malaeeate, Ethyl cellulose, Polyvinyl pyrrolidone, Plasticizer.
Formulation and in vitro evaluation of ondansetron hydrochloride matrix transdermal systems using ethyl cellulose/polyvinyl pyrrolidone polymer blends

Rajan Rajabalaya, Li-Qun Tor, and Sheba David.
School of Pharmacy, International Medical University, 57000 Kuala Lumpur, Malaysia

Abstract
Transdermal delivery of ondansetron hydrochloride (OdHCl) can prevent the problems encountered with oral ondansetron. In previously conducted studies, effect of amount of polyvinyl pyrrolidone, permeation enhancer and casting solvent on the physicochemical properties on OdHCl were investigated. It is feasible to develop ondansetron transdermal patch by using ethyl cellulose and polyvinyl pyrrolidone with dibutyl pthalate as plasticizer, however, the desired flux is not achieved. The primary aim of this study is to use dimethyl succinate (DMS) and propylene glycol that are not incorporated in previous studies to determine their effect on the physicochemical properties of an OdHCl transdermal patch using ethyl cellulose and polyvinyl pyrrolidone. This study also investigates the effect of permeation enhancer (eugenol and phosphatidylcholine) on the release of OdHCl. The results showed that propylene glycol is a more suitable plasticizer compared to DMS in the fabrication of OdHCl transdermal patch using ethyl cellulose and polyvinyl pyrrolidone as polymers. Propylene glycol containing patch has optimum drug content, thickness, moisture content and water absorption, tensile strength, and a better release profile than DMS. Eugenol and phosphatidylcholine can increase release of OdHCl from the patches. From the physicochemical result and permeation profile, a combination of 350mg of ethyl cellulose, 150mg polyvinyl pyrrolidone, 3% of total polymer weight of eugenol, and 40% of total polymer weight of propylene glycol is the most suitable formulation to develop an OdHCl patch. OdHCl release did not increase with increasing the percentage of plasticiser. DMS 4, PG 4, DMS 9, PG 9, DMS 14, and PG 14 gave better release profiles where using 300mg: 0mg, 300mg: 100mg, and 350mg: 150mg of EC: PVP. Thus, 40% of PG or DMS appeared to be the optimum amount of plasticiser when the above combination where EC: PVP was used. It was concluded from the study that a patch formulation containing 350mg EC, 150mg PVP, 40% PG and 3% eugenol is the best transdermal matrix patch compositions for the uniform and continuous release/permeation of OdHCl over an extended period. This patch design can be used for further pharmacokinetic and pharmacodynamic studies in suitable animal models.

Keywords: Ondansetron hydrochloride, dimethyl succinate, eugenol.
Rathbone MJ. Collaboration at the departmental, school, national and international levels at the International Medical University, Kuala Lumpur. IeJSME, 2013; 7(Suppl1): S57. (IF: 0.024; H-index: 1).

Collaboration at the departmental, school, national and international levels at the International Medical University, Kuala Lumpur

Michael John Rathbone

Pharmaceutical Technology, School of Pharmacy, International Medical University, 126 Jalan Jalil Perkasa 19, 57000 Kuala Lumpur, Malaysia

Abstract
The nature, extent and definition of a collaboration varies between individuals, disciplines, departments and institutions. It depends upon such factors as the people involved, the nature of the research problem, the research environment, the institutional culture and demographic factors. This paper will examine the concept of collaborative research and discuss its place and position in an evolving university.

Keywords: Collaborative research, research collaborations, behavioural research, cooperative behaviour.

**Impact of mentoring on stress level among medical university students**

Sami Abdo Radman Al-Dubai, Mustafa Ahmed Alshagga, Mohd Rizal Abdul Manaf.

1 Department of Community Medicine, International Medical University, Kuala Lumpur, Malaysia
2 Newcastle University Medicine Malaysia (NUMed), Educity@Iskandar, Nusajaya, Johore, Malaysia
3 Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia

**Abstract**

This study aimed to assess the association between a mentoring program and self-perceived stress among 242 medical students from a private medical faculty in Malaysia. Stress was measured by a Perceived Stress Scale questionnaire. The mean stress level was 18.9 (+4.8). Younger students (< 21 years old) had higher stress levels than older students ($p=0.011$). Students who regularly attended mentoring activities and those who consulted their mentors had lower levels of stress than those who did not ($p<0.001$). Students who believed that mentoring helped them to manage their problems had lower levels of stress ($18.1±3.8$) than those who did not ($24.6±6.7$, $p<0.001$). Mentoring was seen to reduce stress levels among medical students.

**Keywords:** Mentoring, stress, medical students.
Exploration of risk taking behaviors and perceived susceptibility of colorectal cancer among Malaysian adults: A community based cross-sectional study

Sami AR Al-Dubai1, Kurubaran Ganasegeran2, Aied M Alabsi3, Shamsul A Shah4, Farid MM Razali5 and John T Arokiasamy1.

1 Department of Community Medicine, International Medical University (IMU), No. 126, Jln Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
2 International Medical School, Management and Science University (MSU), University Drive, Off Persiaran Olahraga, Section 13, 40100 Shah Alam, Selangor, Malaysia
3 Oral Cancer Research And Coordinating Center, Faculty of Dentistry, University of Malaya (UM), Kuala Lumpur 50603 Malaysia
4 Department of Community Health, UKM Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, Cheras, 56000 Kuala Lumpur, Malaysia
5 Perdana University Graduate School of Medicine, Perdana University, Maeps Building, Mardi Complex, 43400 Serdang, Selangor, Malaysia

Abstract

Background:
Perceived susceptibility to an illness has been shown to affect Health-risk behavior. The objective of the present study was to determine the risk taking behaviors and the demographic predictors of perceived susceptibility to colorectal cancer in a population-based sample.

Methods:
A cross-sectional study was carried out among 305 Malaysian adults in six major districts, selected from urban, semi-urban, and rural settings in one state in Malaysia. A self-administered questionnaire was used in this study. It was comprised of socio-demographics, risk-taking behaviors, and validated domains of the Health Belief Model (HBM).

Results:
The mean (± SD) age of the respondents was 34.5 (± 9.6) and the majority (59.0%) of them were 30 years or older. Almost 20.7% of the respondents felt they were susceptible to colorectal cancer. Self-reported perceived susceptibility mirrored unsatisfactory screening behaviors owing to the lack of doctors' recommendation, ignorance of screening modalities, procrastination, and the perception that screening was unnecessary. Factors significantly associated with perceived susceptibility to colorectal cancer were gender (OR = 1.8, 95% CI 1.0-3.3), age (OR = 2.2, 95% CI 1.2-4.0), ethnicity (OR = 0.3, 95% CI 0.2-0.6), family history of colorectal cancer (OR = 3.2, 95% CI 1.4-7.4) and alcohol intake (OR = 3.9, 95% CI 2.1-7.5).

Conclusion:
The present study revealed that screening behavior among respondents was unsatisfactory. Hence, awareness of the importance of screening to prevent colorectal cancers is imperative.
**Keywords:** Behaviors, Colorectal cancer, Health Belief Model, Malaysia, Perceived susceptibility.

Medical students’ experience of and reaction to stress: The role of depression and anxiety

Coumaravelou Saravanan and Ray Wilks.

Division of Psychology (& Behavioural Sciences), International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract

Background: Medical school is recognized as a stressful environment that often has a negative effect on students’ academic performance, physical health, and psychosocial well-being. Previous studies have not identified differences between depressed and nondepressed and anxious and nonanxious medical students’ experiences of stress or their reactions to stressors. The present study aimed to identify the prevalence of depression and anxiety among a sample of 358 medical students attending a private university in Malaysia and to examine differences according to participants’ gender, year of study, and stage of training (preclinical and clinical).

Additionally, this study examined the extent to which stress predicts depression and anxiety, differences between depressed and nondepressed medical students’ experiences of and reactions to stressors, and differences between anxious and nonanxious medical students’ experiences of and reactions to stressors.

Methods:

The Student Life Stress Inventory was used to measure stress and reaction to stressors and the Depression, Anxiety, and Stress Scale was used to measure depression and anxiety.

Results:

The results showed that 44% ($n = 158$) of the students were anxious and 34.9% ($n = 125$) were depressed. More female students exhibited anxiety compared to male students. Stress is a predictor for depression and anxiety. A significant difference was found between depressed and nondepressed and anxious and nonanxious students’ experience of stressors due to frustration, change, and their emotional reaction to stressors.

Conclusion:

Overall, depressed and anxious students were found to experience more stress and react differently to stressors compared to nondepressed and nonanxious students.

**Preparation and enhanced in-vitro diffusion profile of naproxen by EPAS technique in hydrogel formulation**

Senthil Rajan Dharmalingam, Kumarappan Chidambaran, Srinivasan Ramamurthy.

School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia

**Abstract**

The aim of the study was to evaluate the influence of EPAS technique on the in vitro diffusion characteristics of Naproxen in three different gel forming agents as poly(vinyl alcohol) (PVA), Carboxymethyl Cellulose (CMC) and Hydroxypropyl methyl cellulose (HPMC). All the formulations were evaluated for their appearance, homogeneity and % drug content and uniformity, pH, Grittiness and in-vitro release study through cellulose nitrate membrane in upright Franz diffusion cells. It was found that all the formulated gels were homogenous, smooth in texture and elegant in appearance. The results of the drug content were found in acceptable range indicating uniform distribution of drug throughout the base. The pH of the gel formulations was found in the normal pH range of the skin that would not produce any skin irritation. There was no significant change in pH values and drug content in accelerated stability studies for tested formulations. It is obvious that the EPAS technique adapted has significantly enhanced the dissolution profile of naproxen when compared with pure naproxen in PVA, HPMC and CMC Gel formulation studied. All the gel formulations were subjected to Peppas model kinetic analysis.

**Keywords:** naproxen, EPAS, gel.

**Wound healing activity of an herbal ointment containing the leaf extract of *Ziziphus Mauritiana* Lam**

D. Senthil Rajan¹, M. Rajkumar², C. T. Kumarappan¹ and K. L. Senthil Kumar².

¹ School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
² Department of Pharmacognosy, Padmavathi College of Pharmacy and Research Institute, India

**Abstract**

A large number of plants are used by folklore traditions in India for treatment of cuts, wounds and burns. Particularly, the leaves of *Ziziphus mauritiana* Lam. (Family: Rhamnaceae) have been practiced on wounds for healing. The aim of the present investigation was to assess the in vivo wound healing efficacy of prepared topical formulation of 5\% w/w ethanolic extract ointment and 5\% w/w of aqueous extract ointment and nitrofurazone ointment (0.2\% w/w) on excision wound model in Wistar albino rats. The effect produced by ointment, in terms of wound contracting ability, wound closure, decrease in surface area of wound, tissue regeneration at the wound site in treated Wistar albino rats shows that proliferation of epithelial tissue promotes angiogenesis, multiplication of fibrous connective tissue due to treatment with *Z. mauritiana*. Acute toxicity studies revealed the non-toxic nature of *Z. mauritiana*. Ethanolic extract ointment (5\% w/w) of *Z. mauritiana* manifested 99\% wound contraction on the 16th day. These results were also comparable to those of a standard drug, nitrofurazone. Topical formulation with 5\% w/w ethanolic extract promoted wound contraction and reduced the wound closure time, so increase in tensile strength and wound contraction shows the wound healing potential of *Z. mauritiana*. Thus, the present study supports the scientific rationale for the traditional use of this plant in the management of wounds.

**Keywords**: Herbal ointment, *Ziziphus mauritiana*, wound healing, wistar albino rats.

**Antitumour activity of *Sargassum wightii* (Greville) extracts against Dalton’s ascites lymphoma**

Rajan DS\(^1\), Rajkumar M\(^2\), Srinivasan R\(^1\), Harikumar RP\(^3\), Suresh S\(^1\), Kumar S\(^2\).

\(^1\) School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
\(^2\) Padmavathi College of Pharmacy and Research Institute, Tamilnadu, India
\(^3\) Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia

**Abstract**

Seaweeds have been used by mankind as medicine and food for more than 13,000 years. Marine algae are considered to produce a valuable phytoconstituents characterized by a broad spectrum of antitumor activities. The aim of the present study was to explore the effect of different solvent extracts of *Sargassum wightii*, Greville against Dalton's Ascitic Lymphoma (DAL) in Swiss male albino mice. DAL cells were injected intraperitoneally 1 x 10(6) cell to the mice. Two days after cells injection the animals were treated with different solvent extracts of *Sargassum wightii* at dose of 200 mg kg\(^{-1}\) for 14 days. 5-fluorouracil (20 mg kg\(^{-1}\)) was used as reference drug. On day 11, cancer cell number, packed cell volume, decrease in tumour weight of the mice, increase in life span and hematological parameters were evaluated and compared with the same parameters in control. A significant increase in the life span and a decrease in the cancer cell number and tumour weight were noted in the tumour-induced mice after treatment with the extract. The haematological parameters were also normalized by the ethanolic and chloroform extracts in tumour-induced mice. These observations are suggestive of the protective effect of ethanolic extract of *Sargassum wightii* is comparatively better than other two tested extracts against Dalton's Ascitic Lymphoma (DAL).

**Keywords**: *Sargassum wightii*, Dalton's ascitic lymphoma, fucoidan.

Investigation on antimicrobial activity of root extracts of Thespesia populnea Linn

Senthil-Rajan, D.¹, Rajkumar, M.², Srinivasan, R.¹, Kumarappan, C.¹, Arunkumar, K.³, Senthilkumar, K.L.² and Srikanth, M.V.¹.

¹ School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia
² Department of Pharmacognosy, Padmavathi College of Pharmacy and Research Institute, Tamilnadu, India
³ Department of Medical Microbiology and Parasitology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia

Abstract
Many medicinal plants have been used for centuries in daily life to treat microbial diseases all over the world. In this study, the in vitro antibacterial activity of aqueous and ethanol root extracts of Thespesia populnea Linn were investigated. Antimicrobial properties of T. populnea Linn was evaluated against five pathogenic bacteria and two fungi. Disc diffusion method and minimum inhibitory concentration (MIC) were determined by broth serial dilution method. The ciprofloxacin (5 μg/ml) and fluconazole (100 units/disc) were used as positive controls for bacteria and fungi respectively. Different concentrations (50, 100, 150 μg/ml) of ethanolic and aqueous root extracts of T. populnea were checked for the dose dependent antibacterial activity. Thespesia populnea showed broad spectrum antimicrobial activity against gram positive and gram negative bacteria and maximum inhibition by ethanolic extract was observed at higher dose (250 μg/ml) as 27±0.2mm. The MIC of the ethanol extract was 10 μg/ml for Staphylococcus aureus and 750 μg/ml for Candida albicans. The antifungal activity offered against S. aureus by the ethanolic extract is more than the aqueous extract. The results concluded that the anti-microbial activity of T. populnea was dose dependent. As the concentration increased the inhibition zone also increased. Flavonoids and tannins present in the extracts may be responsible for the antimicrobial activity.
Development and validation of UV spectrophotometric method for the estimation of naproxen in bulk and semi-solid formulation

Senthil Rajan Dharmalingam, Srinivasan Ramamurthy, Kumarappan Chidambaram, Shamala Nadaraju.

School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia

Abstract

A simple, accurate, precise and sensitive UV spectrophotometric method was developed for the determination of naproxen in bulk and semisolid formulation. The solvent used was methanol and the wavelength corresponding to maximum absorbance of the drug was found at 331 nm. Beers law was obeyed in the concentration range of 10 – 60 µg/mL with correlation coefficient 0.9984. The linear regression equation obtained by least square regression method was y = 0.0108 X - 0.028, where y is the absorbance and x is the concentration of the pure drug solution. The method was validated for several parameters like linearity, accuracy (recovery), precision, and specificity as per International Conference on Harmonization (ICH) guidelines. The values of relative standard deviation and % recovery were found to be satisfactory, indicating that the proposed method is precise and accurate and hence can be used for the routine analysis of naproxen in bulk and semi-solid formulation.

Keywords: UV Spectrophotometric, Naproxen, Semi-Solid Formulation, Analytical Method, Validation.
Neuroprotective potential of *Ocimum sanctum* (Linn) leaf extract in monosodium glutamate induced excitotoxicity

Shanmuga Sundaram Rajagopal¹, Gowtham Lakshminarayanan², Ramdass Rajesh³, Senthil Rajan Dharmalingam⁴, Srinivasan Ramamurthy⁴, Kumarappan Chidambaram⁴, Suresh Shanmugham⁴.

¹ Department of Pharmacology, J.S.S.College of Pharmacy, Ootacamund, Tamilnadu, India.  
² Department of Pharmacology, P.S.G. College of Pharmacy, Coimbatore, Tamilnadu, India.  
³ Bioequivalence Centre, Apotex Research Pvt. Ltd., Bangalore-560 099, Karnataka, India.  
⁴ School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia.

**Abstract**

The aim of this study was to investigate the potent neuroprotective property of ethanol extract of *Ocimum sanctum* (EEOS) leaf (Holy basil, Family: Labiataea) against excitotoxicity induced neurodegeneration by using monosodium-L-glutamate (MSG) in Sprague-Dawley rats. The animals received EEOS (50, 100 and 200 mg/kg) and memantine (MMT, 20 mg/kg) daily for 7 days. On all the 7 days, MSG (2g/kg, i.p.) was administered one hour before drug treatment. The animals were observed for neurobehavioral performance on 1st, 3rd, 5th and 7th day. Oxidative damage and histopathological analysis were also assessed. EEOS (100 and 200 mg/kg, p.o.) and MMT (20 mg/kg, i.p.) administration significantly improved body weight and attenuated locomotor activity, rotarod performance and foot-fault test as compared with MSG treated group. In addition, EEOS was found to restore reduced glutathione (GSH), glutathione peroxidase (GPx), glutathione reductase (GR), catalase (CAT), super oxide dismutase (SOD) and Na+-K+ ATPase. Conversely, the elevated level of lipid peroxidation and nitrite concentration in MSG treated group was attenuated significantly in EEOS group in comparison to MSG treated group. Histopathological evaluation showed that treatment with EEOS and MMT significantly attenuated neuronal death and increased the density of neurons after MSG treatment. Thus, these findings suggest that EEOS contains rosmarinic acid and ursolic acid in addition to other bioactive principles may have utility in the preventing and/or treating the neurodegenerative diseases and its protective effects may be due to the amelioration of excitotoxicity, oxidative stress, neurological and behavioral alterations. However, further studies are necessary to clearly define mechanism responsible.

**Keywords:** *Ocimum sanctum*, F Holy basil, sodium glutamate, neurological, neurodegeneration, rosmarinic acid.

**Biochemical evaluation of the supporting structure of pelvic organs in selected numbers of premenopausal and postmenopausal Malaysian women**

Sharifah Sulaiha Syed Aznal, Fong Guan Meng, Sivalingam Nalliah, Annie Tay, Kathires Chinniah, Mohd Faiz Jamli.

Department of Obstetrics and Gynaecology and Pathology, International Medical University, Malaysia

**Abstract**

**Context:**
Pelvic organ prolapse (POP) is associated with menopause and changes in the proteins of the pelvic supporting system, but there is scant data on the precise alterations in Malaysian women.

**Aim:**
The aim of this study is to determine the differences in the extracellular matrices (ECM) of uterosacral ligaments in premenopausal and postmenopausal Malaysian women with or without POP.

**Settings and Design:**
The observational study was conducted for 9 months in three general hospitals involving 30 women who underwent hysterectomies for various indications except for carcinoma of pelvic organs.

**Materials and Methods:**
Three groups were identified: Premenopausal women (Group 1), postmenopausal women without POP (Group 2), and postmenopausal women with POP (Group 3). Age, duration of menopause, body mass index (BMI), parity, and vaginal deliveries were documented. Only 21 samples of the uterosacral ligaments were stained immunohistochemically for collagen I and III, matrix metalloproteinases (MMPs) 1 and 2, elastin, and tenascin.

**Statistical Analysis Used:**
Image J software analysis was utilized for quantification, while non-parametric statistics (Kruskal-Wallis with post-hoc Dunns Multiple Comparison test) was used for result analysis.

**Results:**
The profile parameters were not significantly different except for mean age and duration of menopause in Group 3. Samples from Group 2 showed lower expression of almost all proteins except MMP1 and tenascin (higher) as compared to Group 1. The changes appeared to be exaggerated in Group 3, though statistically insignificant.

**Conclusion:**
A significant difference in the expression of ECM was apparent in postmenopausal subjects as compared to premenopausal (P = 0.05), compromising the uterosacral ligament tensile strength. The findings are proven similar as those changes in women from other studies.
Keywords: Elastin, matrix metalloproteinase, pelvic organ prolapse, tenascin, uterosacral ligaments.

**Development and anti-microbial potential of topical formulations containing *Cocos nucifera* Linn.**

Ravi Sheshala, Ling Teck Ying, Ling Shiau Hui, Ankur Barua, Kamal Dua.

Department of of Pharmaceutical Technology, School of Pharmacy, International Medical University, Bukit Jalil, 57000 KL, Malaysia

**Abstract**

In order to achieve a better treatment for local wounds and bacterial infections, topical formulations containing *Cocos nucifera* Linn. were developed and evaluated for their physicochemical properties and antimicrobial efficacy against various strains of microorganisms. Semisolid formulations containing 5% w/w of *Cocos nucifera* Linn. were prepared by employing different dermatological bases and evaluated for physical appearance, pH, rheological properties, FTIR-spectroscopic analysis, thermodynamic stability and stability studies. The antimicrobial activity of each prepared formulation against various strains of microorganisms was determined using disc-diffusion method. The resultant data was expressed as mean ± SD and statistical analysis performed using Shapiro-wilk and Pearson's correlation tests. All the prepared formulations were found to be stable and exhibited suitable physicochemical characteristics including pH, viscosity and spreadability which are necessary for an ideal topical preparation along with strong antimicrobial activity. Carbopol gel base was found to be the most suitable dermatological base for *Cocos nucifera* Linn. in comparison to other bases. *Cocos nucifera* Linn. formulations had shown great potential for wounds and local bacterial infections. Moreover, carbopol gel base with its aesthetic appeal was found to be suitable dermatological base for *Cocos nucifera* Linn. semisolid formulation as it had demonstrated significant physicochemical properties and greater diffusion when assessed using disk-diffusion method.

**Keywords:** Antimicrobial, *Cocos nucifera* Linn, carbopol, disk-diffusion method, physicochemical properties, topical.

**Comparative study on attitude and psychological problems of mothers towards their children with developmental disability**

Shobana M, Saravanan C.

International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia

**Abstract**

**Objective:**
Parents’ positive attitudes and psychological wellbeing play an important role in the development of the children with developmental disability. This study aimed to measure the prevalence of psychological problems among mothers of children with autism disorder, intellectual disability, and Down syndrome. The second aim was to assess the differences in mothers’ attitudes and psychological problems among their children with intellectual disability, autism disorder, and Down syndrome. The third aim was to identify whether negative attitude was a predictor of psychological problems in these mothers.

**Methods:**
In this study, 112 mothers of children having mild and moderate levels of autism disorder, Down syndrome, and intellectual disability were assessed using the Parental Attitude Scale and General Health Questionnaire–28.

**Results:**
Overall, mothers of children with intellectual disability were found to have the most negative attitude towards their child. Mothers of children with autism disorder exhibited higher scores on somatic symptoms, anxiety, and social dysfunction when compared with their counterparts with Down syndrome and intellectual disability. Negative attitude was a significant predictor of psychological problems.

**Conclusion:**
Parental attitudes and psychological problems would vary among mothers of children with different types of developmental disability.

**Keywords:** Autistic disorder, Down syndrome, Intellectual disability, Mothers.
Low glycaemic index diets improve glucose tolerance and body weight in women with previous history of gestational diabetes: A six months randomized trial

Sangeetha Shyam¹, Fatimah Arshad², Rohana Abdul Ghani³, Norasyikin A Wahab³, Nik Shanita Safii⁴, Mohd Yusof Barakatun Nisak⁵, Karuthan Chinna⁶, Nor Azmi Kamaruddin³.

¹ School of Post Graduate Studies and Research, International Medical University, Kuala Lumpur, Malaysia
² Department of Nutrition and Dietetics, International Medical University, Kuala Lumpur, Malaysia
³ Endocrine Unit, Department of Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia (National University of Malaysia), Kuala Lumpur, Malaysia
⁴ Dietetics Program, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia
⁵ Department of Nutrition & Dietetics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia
⁶ Epidemiology and Biostatistics Unit, Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

Abstract

Background:
Gestational Diabetes Mellitus (GDM) increases risks for type 2 diabetes and weight management is recommended to reduce the risk. Conventional dietary recommendations (energy-restricted, low fat) have limited success in women with previous GDM. The effect of lowering Glycaemic Index (GI) in managing glycaemic variables and body weight in women post-GDM is unknown.

Objective:
To evaluate the effects of conventional dietary recommendations administered with and without additional low-GI education, in the management of glucose tolerance and body weight in Asian women with previous GDM.

Method:
Seventy seven Asian, non-diabetic women with previous GDM, between 20-40y were randomised into Conventional healthy dietary recommendation (CHDR) and low GI (LGI) groups. CHDR received conventional dietary recommendations only (energy restricted, low in fat and refined sugars, high-fibre). LGI group received advice on lowering GI in addition. Fasting and 2-h post-load blood glucose after 75 g oral glucose tolerance test (2HPP) were measured at baseline and 6 months after intervention. Anthropometry and dietary intake were assessed at baseline, three and six months after intervention. The study is registered at the Malaysian National Medical Research Register (NMRR) with Research ID: 5183.

Results:
After 6 months, significant reductions in body weight, BMI and waist-to-hip ratio were observed only in LGI group (P<0.05). Mean BMI changes were significantly different between groups (LGI vs. CHDR: -0.6 vs. 0 kg/m², P= 0.03). More subjects achieved weight...
loss ≥5% in LGI compared to CHDR group (33% vs. 8%, P=0.01). Changes in 2HPP were significantly different between groups (LGI vs. CHDR: median (IQR): -0.2(2.8) vs. +0.8 (2.0) mmol/L, P=0.025). Subjects with baseline fasting insulin ≥2 μIU/ml had greater 2HPP reductions in LGI group compared to those in the CHDR group (-1.9±0.42 vs. +1.31±1.4 mmol/L, P<0.001). After 6 months, LGI group diets showed significantly lower GI (57±5 vs. 64±6, P<0.001), GL (122±33 vs. 142±35, P=0.04) and higher fibre content (17±4 vs.13±4 g, P<0.001). Caloric intakes were comparable between groups.

Conclusion:
In women post-GDM, lowering GI of healthy diets resulted in significant improvements in glucose tolerance and body weight reduction as compared to conventional low-fat diets with similar energy prescription.

Keywords: Gestational diabetes mellitus, Type 2 diabetes, Diabetes prevention, Glycaemic index, Glycaemic load, Diet, Randomized clinical trial, Carbohydrates.

**Lowering dietary glycaemic index through nutrition education among Malaysian women with a history of gestational diabetes mellitus**

Sangeetha-Shyam¹, Fatimah A², Rohana AG³, Norasyikin AW⁴, Karuthan C⁵, Nik Shanita S⁶, Mohd Yusof BN⁷ & Nor Azmi K⁸.

¹ Post Graduate Studies and Research, International Medical University, Kuala Lumpur, Malaysia 
² Department of Nutrition and Dietetics, International Medical University, Kuala Lumpur, Malaysia 
³, ⁴, ⁸ Endocrine Unit, Department of Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia 
⁵ Epidemiology and Biostatistics Unit, Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya 
⁶ Dietetics Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia 
⁷ Department of Nutrition & Dietetics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia

**Abstract**

**Introduction:**
Gestational diabetes mellitus (GDM) increases risks for type 2 diabetes and cardiovascular diseases. Low glycaemic index (GI) diets improve cardio-metabolic outcomes in insulin-resistant individuals. We examined the feasibility of lowering GI through GI-based-education among Asian post-GDM women.

**Methods:**
A 3-month investigation was carried out on 60 Malaysian women with a mean age of 31.0±4.5 years and a history of GDM. Subjects were randomised into two groups: LGIE and CHDR. The CHDR group received conventional healthy dietary recommendations only. The LGIE group received GI based-education in addition to conventional healthy dietary recommendations. At baseline and after 3-months, dietary intake of energy and macronutrient intakes including GI diet and glycaemic load was assessed using 3-day food records. Diabetes-Diet and GI-concept scores and physical activity levels were assessed using a questionnaire. Adherence to dietary instructions was measured at the end of 3 months.

**Results:**
At the end of 3 months, the LGIE group had significant reductions in energy intake (241.7±522.4Kcal, P=0.037, ES=0.463), total carbohydrate (48.7±83.5g, P=0.010, ES=0.583), GI (3.9±7.1, P=0.017, ES=0.549) and GL (39.0±55.3, P=0.003, ES=0.705) and significant increases in protein (3.7±5.4g, P=0.003, ES=0.685) and diet fibre (4.6±7.3g, P=0.06). The CHDR group had a significant reduction in fat only (5.7±9.4g, P=0.006, ES=0.606). There was a 30% increase in GI-concept scores in the LGIE group (p< 0.001). Changes in GI-concept scores correlated significantly to the reduction in dietary GI (r = -0.642, P=0.045). Dietary adherence was comparable in both groups.

**Conclusion:**
GI-education improves GI-concept knowledge and helps lower dietary glycaemic index among women with a history of GDM.
**Keywords:** Diet, gestational diabetes mellitus, glycaemic index, glycaemic load, prevention, type 2 diabetes.
Oral hyperpigmented lesions, a case study

Siew Kim Kwa¹, Esha Das Gupta².

¹ Department of Family Medicine, International Medical University, Seremban, Negri Sembilan, Malaysia
² Department of Internal Medicine, International Medical University, Seremban, Negri Sembilan, Malaysia

Abstract

An overweight woman, aged 58 years, presented for follow up of hypertension, diabetes and dyslipidaemia. She was noted to have hyperpigmented brown macules on the inner surface of the lower lip and buccal mucosa (Figure 1). She stated that she had first noticed these lesions when aged in her 40s. Her mother died at age 58 years from gastric cancer with extensive metastases, and her brother died at age 45 years from colon cancer with spread to the liver and lungs.

**Development of a dual target rapid diagnostic dot-elisa system for identification of cobra and viper snake venom antigen in snake bite cases**

Archana Singh Sikarwar¹, Teck Han Wong² and Stephen Ambu¹.

¹ Faculty of Medicine and Health Sciences, International Medical University, Kuala Lumpur, Malaysia  
² Postgraduate Studies and Research Department, International Medical University, Kuala Lumpur, Malaysia

**Abstract**

Dot-ELISA test is developed in mice models to identify cobra and viper snake species in snake bite cases. Simplicity and cost effective qualities of this test showed great promises to be utilized in the field which can be useful for farmers, plantation workers and fisherman who are working in field and become victim of snake bite cases. Dot-ELISA test can be an alternative solution to utilize for identification of snake species during the treatment of patient. Study was conducted in Malaysia, so we have considered local snake species commonly found in rain forest of Malaysia. Polyclonal antibodies were generated against *Calloselasma rhodostoma* and *Naja naja sumatrana* in mice model. Hyper immune sera was raised against specific snake venom antigen were collected followed by immunoglobulin (Ig) purification to improve the specificity and sensitivity of the test. Purified IgG were utilized as a primary antibody. This test showed positive hope for rapid identification of snake species in snake bite cases in future though test needs clinical trial before implementation in human.

**Keywords:** Dot-ELISA, Cobra, viper, snake venom.

**Shock in the neonate**

Davendralingam Sinniah¹, Thiruselvi Subramaniam², Myint Myint Soe-Hsiao¹.

¹ Department of Paediatrics, International Medical University Clinical School Seremban, Negeri Sembilan, 70300 Seremban, Negeri Sembilan, Malaysia
² Department of Anaesthesiology, International Medical University Clinical School Seremban, Negeri Sembilan, 70300 Seremban, Negeri Sembilan, Malaysia

**Abstract**

Shock is a clinical challenge to neonatal intensivists and pediatricians alike. It occurs in critically ill babies for many reasons, but the main cause is sepsis that kills more than a million newborn globally every year¹. This article is designed to help young doctors and trainees have a better understanding of shock in the neonatal period and its management. The paper reviews the basic pathophysiology, risk factors, clinical investigation, management, supportive care, and complications in the common types of shock seen in neonates. Treatment is governed largely by the underlying cause, with the ultimate goal of achieving adequate tissue perfusion with delivery of oxygen and substrates to the cells, and removal of toxic metabolic waste products. Intervention needs to be anticipatory and urgent to prevent progression to uncompensated and irreversible shock respectively. Early recognition and urgent effective management are crucial to successful outcomes.

**Keywords**: neonatal shock, pathophysiology, classification, investigation, management.

**Dissolution rate enhancement of bicalutamide by adsorption process**

M. V. Srikanth¹,², B. Janaki Ram², D. Senthil Rajan¹, G. Adinarayana¹, K. V. Ramana Murthy².

¹ School of Pharmacy, International Medical University, Kuala Lumpur, Malaysia-57000, Malaysia
² University College of Pharmaceutical Sciences, Andhra University, Visakhapatnam-530003, India

**Abstract**

The aim of the present research was to enhance the dissolution rate of poorly water soluble drug, bicalutamide by adsorption process. Bicalutamide is an antiandrogen agent used in the treatment of prostate cancer. To improve the dissolution rate of the drug, hydrophilic carrier like povidone K30 and adsorbent like magnesium aluminum silicate were used as dissolution rate enhancers. Granules of bicalutamide were prepared by wet granulation technique by using magnesium aluminum silicate and povidone K 30 either alone or in combination at different concentrations. The granules were evaluated for packing and compression properties. The granules were compressed into tablets, and different tableting parameters were investigated. The dissolution profile of the tablets was also evaluated and compared with the marketed product. From the dissolution profile, it was observed that the carrier ratio of 3:1 of magnesium aluminum silicate to povidone K 30 exhibited higher dissolution rate than the other formulations.

**Keywords:** Bicalutamide, magnesium aluminum silicate, adsorption, povidone K 30.
Dietary and urinary metabonomic factors possibly accounting for higher blood pressure of African-Americans compared to White Americans: The INTERMAP Study

Jeremiah Stamler\textsuperscript{1}, Ian J. Brown\textsuperscript{2}, Ivan K.S. Yap\textsuperscript{3,4}, Queenie Chan\textsuperscript{2}, Anisha Wijeyesekera\textsuperscript{3}, Isabel Garcia-Perez\textsuperscript{2}, Marc Chadeau-Hyam\textsuperscript{2}, Timothy M.D. Ebbels\textsuperscript{3}, Maria De Iorio\textsuperscript{2,5}, Joram Posma\textsuperscript{3}, Martha L. Daviglus\textsuperscript{1}, Mercedes Carnethon\textsuperscript{1}, Elaine Holmes\textsuperscript{3}, Jeremy K. Nicholson\textsuperscript{1}, Paul Elliott\textsuperscript{2}, for the INTERMAP Research Group.

\textsuperscript{1} Department of Preventive Medicine, Feinberg School of Medicine, Northwestern University, Chicago, IL
\textsuperscript{2} Department of Epidemiology and Biostatistics, School of Public Health, Faculty of Medicine, Imperial College London, United Kingdom
\textsuperscript{3} Section of Computational and Systems Medicine, Department of Surgery and Cancer, Faculty of Medicine, Imperial College London, United Kingdom
\textsuperscript{4} Department of Life Sciences, School of Pharmacy and Health Sciences, International Medical University, Kuala Lumpur, Malaysia
\textsuperscript{5} Department of Statistical Science, University College, London, United Kingdom and MRC-HPA Centre for Environment and Health, Imperial College London, United Kingdom

Abstract
Black compared with non-Hispanic white Americans have higher systolic and diastolic blood pressure and rates of prehypertension/hypertension. Reasons for these adverse findings remain obscure. Analyses here focused on relations of foods/nutrients/urinary metabolites and higher black blood pressure for 369 black compared with 1190 non-Hispanic white Americans aged 40 to 59 years from 8 population samples. Multiple linear regression, standardized data from four 24-hour dietary recalls per person, two 24-hour urine collections, and 8 blood pressure measurements were used to quantitate the role of foods, nutrients, and metabolites in higher black blood pressure. Compared with non-Hispanic white Americans, blacks’ average systolic/diastolic pressure was higher by 4.7/3.4 mm Hg (men) and 9.0/4.8 mm Hg (women). Control for higher body mass index of black women reduced excess black systolic/diastolic pressure to 6.8/3.8 mm Hg. Lesser intake of vegetables, fruits, grains, vegetable protein, glutamic acid, starch, fiber, minerals, and potassium, and higher intake of processed meats, pork, eggs, and sugar-sweetened beverages, along with higher cholesterol and higher Na/K ratio, related to in higher black blood pressure. Control for 11 nutrient and 10 non-nutrient correlates reduced higher black systolic/diastolic pressure to 2.3/2.3 mm Hg (52% and 33% reduction in men) and to 5.3/2.8 mm Hg (21% and 27% reduction in women). Control for foods/urinary metabolites had little further influence on higher black blood pressure. Less favorable multiple nutrient intake by blacks than non-Hispanic white Americans accounted, at least in part, for higher black blood pressure. Improved dietary patterns can contribute to prevention/control of more adverse black blood pressure levels.

Keywords: African American, blood pressure, eating, nutrients.
Subramaniam T, Loo RCN, Poovaneswaran S. The practice of PPE amongst fourth year medical students at A&E. Where are we? IeJSME, 2013; 7(2): 29-32. (IF: 0.024; H-index: 1).

The practice of PPE amongst fourth year medical students at A&E. Where are we?

Thiruselvi Subramaniam¹, Rosalind Chi Neo Loo², Sangeetha Poovaneswaran³.

¹ Department of Anaesthesia, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² Clinical Skills Unit, International Medical University, Kuala Lumpur, Malaysia
³ Department of Internal Medicine, International Medical University, Kuala Lumpur, Malaysia

Abstract

Background:
This cross sectional study was done to identify the areas of lack of knowledge, practice and awareness of students about the effective use of personal protective equipment (PPE).

Methods:
A total of 40 students were selected when they were posted to the accident and emergency unit (A&E) in Seremban Hospital; all of them answered a questionnaire and were observed unaware on the effective use of PPE in the A&E.

Results:
We found that 17.5% of students were unaware of the right technique of removing the gloves after a procedure and 25% of students were unaware of safety of hand washing. During invasive procedures, 12.5% of students did not wash their hands before invasive procedures, 65% did not wear aprons and 57.5% did not wear masks. During non-invasive procedures more than 25% of students did not wash hands before or after the procedures.

Conclusion:
There is still significant lack of knowledge in students about the effective use of PPE that needs to be addressed.

Keywords: PPE, Personal protective equipment, effective practice of PPE, A&E.
Evaluation of protective role of *Ocimum sanctum* leaf extract in excitotoxicity-induced neurobehavioral deficits based on specific changes in the structure of feeding behavior, diuretic and anxiety paradigms in female rats

R. Shanmuga Sundaram¹, L. Gowtham², R. Rajesh³, D. Senthil Rajan⁴, R. Srinivasan⁴, G. Gaurav⁴.

¹ Department of Pharmacology, J.K.K. Nattraja College of Pharmacy, Komarapalayam, Tamilnadu, India.
² Department of Pharmacology, P.S.G. College of Pharmacy, Coimbatore, Tamilnadu, India.
³ Bioequivalence Centre, Apotex Research Pvt. Ltd., Bangalore, Karnataka, India.
⁴ School of Pharmacy, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia.

Abstract

The aim of this study was to investigate the potent neuroprotective property of ethanol extract of *Ocimum sanctum* leaf (EEOS, Holy basil, Family: Labiatae) against excitotoxicity induced neurodegeneration by using Monosodium-l-glutamate (MSG) in Sprague-Dawley rats. The animals received EEOS (50, 100 and 200 mg kg⁻¹) and memantine (MMT, 20 mg kg⁻¹) daily for 7 days. On all the 7 days, MSG (2 g kg⁻¹, i.p.) was administered one hour before drug treatment. The animals were evaluated for the neurobehavioral performance studies, body weight, food intake, diuretic activity, natriuretic and chloruretic effect immediately after MSG administration from day 1 to day 7. On the day 7, the rats were sacrificed and the brain was removed for histopathological examination. Significant differences in behavioural performance between the control and MSG-treated rats were also found in all paradigms studied. Treatment with EEOS reversed the water-excretory-diuretic effect of MSG and caused a significant dose dependent enhancement in the volume of urine output. An interesting observation made during the study was an increased excretion of Na+ and Cl⁻ ions and reduced excretion of K+, in the urine samples of EEOS-treated rats. Therefore, it may be concluded that the decrease in body weight and hypophagia, along with enhanced water intake and diuresis observed in MSG-treated rats were found to be attenuated by treatment with EEOS. Histopathological evaluation showed that treatment with EEOS and MMT significantly protected the neurodegeneration of the CA1 neuronal cells.

Keywords: *Ocimum sanctum*, monosodium glutamate, diuretic, excitotoxicity, behaviour, neurodegeneration.

6-Shogaol inhibits breast and colon cancer cell proliferation through activation of peroxisomal proliferator activated receptor γ (PPARγ)

Boon Shing Tan¹, Owen Kang¹, Chun Wai Mai³, Kai Hung Tiong¹, Alan Soo-Beng Khoo⁴, Mallikarjuna Rao Pichika³, Tracey D. Bradshaw⁵, Chee-Onn Leong³.

¹ School of Postgraduate Studies and Research, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² School of Medicine, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ School of Pharmacy, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
⁴ Molecular Pathology Unit, Cancer Research Centre, Institute for Medical Research, Jalan Pahang, 50588 Kuala Lumpur, Malaysia
⁵ School of Pharmacy, University of Nottingham, University Park, Nottingham NG7 2RD, UK

**Abstract**

6-Shogaol has been shown to possess many antitumor properties including inhibition of cancer cell growth, inhibition of cancer metastasis, induction of apoptosis in cancer cells and induction of cancer cell differentiation. Despite its prominent antitumor effects, the direct molecular target of 6-shogaol has remained elusive. To identify the direct targets of 6-shogaol, a comprehensive antitumor profile of 6-shogaol (NSC752389) was tested in the NCI-60 cell line in an in vitro screen. The results show that 6-shogaol is COMPARE negative suggesting that it functions via a mechanism of action distinct from existing classes of therapeutic agents. Further analysis using microarray gene profiling and Connectivity Map analysis showed that MCF-7 cells treated with 6-shogaol display gene expression signatures characteristic of peroxisome proliferator activated receptor γ (PPARγ) agonists, suggesting that 6-shogaol may activate the PPARγ signaling pathway for its antitumor effects. Indeed, treatment of MCF-7 and HT29 cells with 6-shogaol induced PPARγ transcriptional activity, suppressed NFkB activity, and induced apoptosis in breast and colon cancer cells in a PPARγ-dependent manner. Furthermore, 6-shogaol is capable of binding to PPARγ with a binding affinity comparable to 15-delta prostaglandin J2, a natural ligand for PPARγ. Together, our findings suggest that the antitumor effects of 6-shogaol are mediated through activation of PPARγ and imply that activation of PPARγ might be beneficial for breast and colon cancer treatment.

**Keywords**: 6-Shogaol, PPARγ, NFkB, Breast cancer, Colon cancer.
Tan BS, Razak IA. Impact of water filters and consumption of bottled water on fluoride Intake. *Sains Malaysiana*, 2013; 42(1): 115–121. (JCR/SE IF: 0.268; Tier: Q3); (IF: 0.386, HI: 6; Tier Q3).

**Impact of water filters and consumption of bottled water on fluoride Intake**

BS Tan¹, IA Razak².

¹ School of Dentistry, International Medical University, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia.
² Vinayaka Missions International University College, Petaling Jaya, Selangor, Malaysia

**Abstract**

The objectives of this study were to assess the intake of fluoride among 4-5 year old children from drinking water (FH2O) and whether current practices of use of water filters and consumption of bottled water have any impact on fluoride intake. A questionnaire survey was conducted to elicit details of drinking water in 350 children aged 4-5 year old. The intake of fluoride from drinking water over a period of two days was biochemically determined in a subsample of 200 subjects. The majority of children (97.0%) had access to tap water, 23.1% to filtered tap water and 11.3% reported use of bottled water. The use of filters was found to be associated with ethnicity and socio-economic status (p<0.00). The mean fluoride concentration of unfiltered and filtered tap water were 0.541 ± 0.167 and 0.534 ± 0.192 ppm, respectively. The mean volume of water consumed was 1348.76 ± 482.70 mL/day while the mean FH2O was 726.7 ± 357.5 ug/day. The use of filters and consumption of bottled water were sparse with no significant impact on FH2O over a two-day study period.

**Keywords:** Bottled water, fluoride intake, water filter.
Potential protective effect of Sunitinib after administration of Diclofenac: Biochemical and histopathological drug-drug interaction assessment in a mouse model

Jian Ren Tan¹, Srikumar Chakravarthi², John Paul Judson¹, Nagaraja Haleagrahara¹,4, Ignacio Segarra³,5

¹ Department of Human Biology, School of Medicine, International Medical University, Jalan 19/155B, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
² Department of Pathology, School of Medicine, International Medical University, Jalan 19/155B, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
³ Department of Pharmaceutical Technology, School of Pharmacy and Health Sciences, International Medical University, Jalan 19/155B, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
⁴ Faculty of Medicine, Health and Molecular Sciences, James Cook University, Townsville, Queensland, Australia
⁵ Faculty of Medicine and Health Sciences, Universitat Internacional de Catalunya, C/ Sant Albert 4, Sant Cugat, 08197, Valldoreix, Barcelona, Spain

Abstract

Sunitinib is a tyrosine kinase inhibitor for GIST and advanced renal cell carcinoma. Diclofenac is used in cancer pain management. Coadministration may mediate P450 toxicity. We evaluate their interaction, assessing biomarkers ALT, AST, BUN, creatinine, and histopathological changes in the liver, kidney, heart, brain, and spleen. ICR mice (male, n = 6 per group/dose) were administered saline (group A) or 30 mg/kg diclofenac ip (group B), or sunitinib po at 25, 50, 80, 100, 140 mg/kg (group C) or combination of diclofenac (30 mg/kg, ip) and sunitinib (25, 50, 80, 100, 140 mg/kg po). Diclofenac was administered 15 min before sunitinib, mice were euthanized 4 h post-sunitinib dose, and biomarkers and tissue histopathology were assessed. AST was 92.2 ± 8.0 U/L in group A and 159.7 ± 14.6 U/L (p < 0.05); in group B, it the range was 105.1–152.6 U/L, and in group C, it was 156.0–209.5 U/L (p < 0.05). ALT was 48.9 ± 1.6 U/L (group A), 95.1 ± 4.5 U/L (p < 0.05) in group B, and 50.5–77.5 U/L in group C and 82.3–115.6 U/L after coadministration (p < 0.05). Renal function biomarker BUN was 16.3 ± 0.6 mg/dl (group A) and increased to 29.9 ± 2.6 mg/dl in group B (p < 0.05) and it the range was 19.1–33.3 mg/dl (p < 0.05) and 26.9–40.8 mg/dl in groups C and D, respectively. Creatinine was 5.9 pmol/ml in group A; 6.2 pmol/ml in group B, and the range was 6.0–6.2 and 6.2–6.4 pmol/ml in groups C and D, respectively (p < 0.05 for D). Histopathological assessment (vascular and inflammation damages) showed toxicity in group B (p < 0.05) and mild toxicity in group C. Damage was significantly lesser in group D than group B (p < 0.05). Spleen only showed toxicity after coadministration. These results suggest vascular and inflammation protective effects of sunitinib, not shown after biomarker analysis.

Keywords: Sunitinib, Diclofenac, Hepatoprotective effect, Histopathology, Biomarker.
Gek Choo Sarah Tan¹, Kar Mun Wong¹, Gui Qi Pearle-Wong¹, Siau Li Yeo¹, Beow Chin Yiap¹, Swee Keong Yeap², Hueh Zan Chong³.

¹ Department of Pharmacy, School of Pharmacy and Health Sciences, International Medical University, 57000 Kuala Lumpur, Malaysia
² Institute of Bioscience, University Putra Malaysia, 43400 Serdang, Selangor D.E., Malaysia
³ Department of Nutrition and Dietetics, School of Pharmacy and Health Sciences, International Medical University, 57000 Kuala Lumpur, Malaysia

Abstract
Portulaca oleracea is a ubiquitous garden weed that has been traditionally used as antidiabetic and anti-inflammation agent. However, the potential anti-proliferative and cytotoxic effects of Portulaca oleracea towards cancerous cells are still unclear. Human hormone dependent breast cancer MCF-7 cell, colon cancer HT-29, cervical cancer Hela cell and nasopharyngeal cancer CNE-1 cell were used in this study. P. oleracea was extracted using methanol and the cytotoxicity against various cancerous cell lines was evaluated using 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide solution (MTT) assay. The antiproliferation effect and cell cycle arrest were assessed using BrdU proliferation assay and flow cytometry cell cycle RNase/PI analysis, respectively. Portulaca oleracea methanol extract was able to reduce viability of all the tested cancerous cell lines. However, IC50 was only observed in CNE-1 cell (92 μg/mL). BrdU incorporation assay indicated anti-proliferation of Portulaca oleracea treated MCF-7 cells in a dose-dependent manner. A significant increase in the sub G0/G1 cell population phase observed by cell cycle analysis indicates the occurrence of apoptotic events. In conclusion, Portulaca oleracea showed anti-proliferative effect on CNE-1, HeLa and HT-29 and DNA fragmentation on MCF-7 cells.

Keywords: BrdU, cell cycle, MCF-7, Portulaca oleracea.
Patient satisfaction with nursing care: A descriptive study using interaction model of client health behaviour

Wai Mun Tang, Chi-Yang Soong, Wen Chieh Lim.

Nursing Division, International Medical University (IMU), Kuala Lumpur, 57000, Malaysia

Abstract
Patient satisfaction has been viewed as a valid outcome measure of a healthcare delivery system. Satisfaction evaluations reflect the expectations from the patients’ point of view and compare with the realities of the care received. Hence, the purpose of this study was to assess patients’ satisfaction with nursing care using Patient Satisfaction with Nursing Care Scale (PSNCS) which was developed based on Cox’s Interaction Model of Client Health Behavior. A convenience sampling was used in recruiting the sample of this study (n=100). The findings of this revealed that the patients rated their satisfaction of nursing care as being at moderate level of satisfaction. The majority of the patients were highly satisfied with the affective support showed by nurses which comprise of ‘respect’, ‘smile’ and ‘caring’. However, the patients were least satisfied with the aspect on ‘decisional control’ given to them such as ‘making own decision towards care’ and ‘family involvement with care’. There were no significant differences of patients’ satisfaction between age, gender and marital status. Interestingly, this study found a significant difference of patients’ satisfaction and ethnicity. Hence, determining the level of patient satisfaction and the contributing factors can assist nurses in improving nursing care.

Keywords: Patient Satisfaction, Nursing Care, Interaction Model of Client Health Behavior.

**Delay in diagnosis of upper gastrointestinal cancer: Whose fault is it?**

Mahadevan Deva Tata, Dharmendran Ratnasingam, Ramesh Gurunathan, Kandasami Palayan.

Tuanku Ja'afar Hospital Seremban, Dept Of Surgery, Jalan Dr. Muthu, Seremban, Negeri Sembilan 70300, Malaysia

**Abstract**

**Background:**
Stomach and esophageal cancers are both deadly and difficult to diagnose early. Stomach cancer is the second most common cancer in Asia. Both these are one of the most common causes of cancer related death in the world.

**Aim:**
To determine the mean time delay from appearance of the symptoms to the endoscope procedure [OGDS] and rationalized the reason for this delay in diagnosis.

**Method:**
This is a cross sectional study of stomach and esophageal cancer data from Jan 2004 - July 2008. All patients' records of histologically confirmed stomach or esophageal cancers during the study period were reviewed.

**Result:**
Total of 112 consecutive patients with stomach and esophageal cancer were analysed. 86 cases of stomach and 26 cases of esophageal cancer were reviewed. The average age for stomach and esophageal cancers are 60.8 years and 58.4 years respectively. The mean duration from the first appearance of cancer symptoms to endoscope procedure was 32.4 weeks for stomach cancer patient and 16.7 weeks for esophageal cancer patients. The reasons for the delays are due to 1) self-medication, 2) Empirical treatment for dyspepsia using antacid and H2 antagonist, 3) Delay in endoscope procedure for high risk patients.

**Conclusion:**
Reducing the delay in endoscope procedure may lead to early detection of cancer

**Keywords:** Stomach cancer, Delay in endoscope, Early Gastric cancer.

**MARK’s Quadrant scoring system: A symptom–based targeted screening tool for gastric cancer**

Mahadevan D. Tata¹, Ramesh Gurunathan², Kandasami Palayan³.

¹ Tuanku Ja’afar Hospital Seremban, Negeri Sembilan
² Sunway Medical Centre, Subang, Selangor
³ International Medical University, Malaysia

**Abstract**

**Background:**
Gastric cancer is notably one of the leading causes of cancer-related death in the world. In Malaysia, these patients present in the advanced stage, thus narrowing the treatment options and making the surgery nearly impossible for successful curative resection. Failure to identify high-risk patients and delay in diagnostic endoscope procedure contributed to the delay in diagnosis. The aim of the study was to develop and validate a scoring system (MARK’s Quadrant) which can identify symptomatic patients who are at risk for gastric cancer.

**Method:**
A 3-phase approach was undertaken: Phase 1: development of the weighted scoring system; Phase 2: estimating positive predicting value of MARK’s Quadrant; and Phase 3: a) testing the validity of MARK’s Quadrant in an open-access endoscope system; and b) comparing its usefulness compared to conventional referral system.

**Results:**
In phases 1 and 2, MARK’s Quadrant with weighted symptoms was developed. The sensitivity of MARK’s Quadrant is 88% and the specificity is 45.5% to detect cancerous and precancerous lesions of gastric. This was confirmed by the prospective data from phase 3 of this study where the diagnostic yield of MARK’s Quadrant to detect any pathological lesion was 95.2%. This score has a high accuracy efficiency of 75%, hence comparing to routine referral system it has an odds ratio (95%CI) of 10.98 (4.63-26.00), 6.71 (4.46-10.09) and 0.95 (0.06-0.15) (P<0.001 respectively) for cancer, precancerous lesion and benign lesion diagnosis respectively.

**Conclusion:**
MARK’s Quadrant is a useful tool to detect early gastric cancer among symptomatic patients in a low incidence region.

**Keywords:** Open-access endoscope, targeted screening, early gastric cancer.
Morphological study of bone marrow to assess the effects of lead acetate on haemopoiesis and aplasia and the ameliorating role of Carica papaya extract

Ching S. Tham¹, Srikumar Chakravarthi², Nagaraja Haleagrahara³, Ranjit De Alwis⁴.

¹ Faculty of Medicine, University of Queensland, Brisbane, Australia
² Department of Pathology, Faculty of Medicine, International Medical University, Kuala Lumpur, Malaysia
³ Faculty of Physiology, James Cook University, Townsville, Australia
⁴ Department of Community Medicine, Faculty of Medicine, International Medical University, Kuala Lumpur, Malaysia

Abstract

Lead causes damage to the body by inducing oxidative stress. The sites of damage include the bone marrow, where marrow hypoplasia and osteosclerosis may be observed. Leaves of Carica papaya, which have antioxidant and haemopoietic properties, were tested against the effect of lead acetate in experimental rats. The rats were divided into 8 groups; control, lead acetate only, Carica papaya (50 mg and 200 mg), post-treatment with Carica papaya (50 mg and 200 mg) following lead acetate administration and pre-treatment with Carica papaya (50 mg and 200 mg) followed by lead acetate administration. The substances were administered for 14 days. The effects were evaluated by measuring protein carbonyl content (PCC) and glutathione content (GC) in the bone marrow. Histological changes in the bone marrow were also observed. The results showed that Carica papaya induced a significant reduction in the PCC activity and significantly increased the GC in the bone marrow. Carica papaya also improved the histology of the bone marrow compared with that of the lead acetate-treated group. In summary, Carica papaya was effective against the oxidative damage caused by lead acetate in the bone marrow and had a stimulatory effect on haemopoiesis.

Keywords: lead acetate, Carica papaya, bone marrow, haemopoiesis, aplasia.

**Quality of life after colostomy**

P. Thamilselvam¹, S. Khairuzi², IM Fadzli³.

¹ Senior lecturer, IMU Clinical School Batu Pahat & Surgeon - Hospital Sultanah Nora Ismail.
² Head of Department of Surgery, Surgeon - Hospital Sultanah Nora Ismail.
³ Surgeon, Surgery Department, Hospital Sultanah Nora Ismail

**Abstract**

**Purpose:**
To assess and improve the quality of life in colostomy patients who underwent colostomy due to various causes.

**Materials and Methods:**
112 patients with colostomy were identified and subjected for this study for past 4 years in the Hospital Sultanah Nora Ismail, Batu Pahat, Johor. Some patients were identified from ward, some from surgical clinic and few patients were identified through hospital record. The questionnaires were prepared by us and the study was conducted. The patients who were identified from the record, were interviewed through telephone.

**Results:**
Following this study, we identified that most of the patients were depressed and stressed. They were also found to be isolated in the family and facing multiple problems. Some patients avoided certain type of food since the smell from the colostomy bag created most of social problems. This study also identified some family members and some people in the community who were also later counseled regarding the responsibility of giving care to the colostomy patients.

**Conclusion:**
This study finally identified some good solutions which will help others and new colostomy patients to improve their quality of life and minimize their mental stress and social problems.

**Keywords:** Colostomy, Hospital, Quality Of Life, Surgery, Carcinoma Colon and Patients.

Assessment of UVB-photoprotective and antioxidative activities of carrageenan in keratinocytes

Haema Thevanayagam, Shar Mariam Mohamed, Wan-Loy Chu.

International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000, Kuala Lumpur, Malaysia

Abstract

Ultraviolet B (UVB) (290–320 nm) is the foremost cause of photoaging, sunburn, wrinkles and skin cancer. Photoprotection against harmful UVB radiation is essential through various means including the use of skincare products. The seaweed polysaccharide carrageenan is widely used as an excipient in cosmetics and skincare products. However, its effects on normal skin keratinocytes or potential use as a photoprotective agent have yet to be established. The primary aim of this study was to assess the cytotoxic, photoprotective and antioxidative effects of carrageenan in UVB-induced immortalised normal human keratinocytes (HaCaT cells). Results showed that the percentage of cell viability decreased linearly with increasing UVB doses from 10, 50, 100, 222 to 1,000 mJ cm⁻². Four isomers of carrageenan, namely iota 2 [ι (ІІ)], iota 5 [ι (V)], lambda (λ) and kappa (κ) carrageenan were used in this study. Vitamin E was used as a positive control. In terms of cytotoxicity, the CD₅₀ of kappa carrageenan was ~200 μg mL⁻¹ while for the other isomers, the values ranged from 122 to 162 μg mL⁻¹. Carrageenan showed significant protection against detrimental effects of UVB-induced cell killing and reactive oxygen species (ROS) release based on 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) and 2′,7′-dichlorofluorescein-diacetate (DCFH-DA) assays, respectively. Carrageenan was also able to quench 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radicals. The ability to protect against UVB suggests that carrageenan has potential application as a photoprotective agent in addition to just being used as an excipient.

Keywords: UVB, Carrageenan, Photoprotection, Reactive Oxygen Species (ROS), Cytotoxicity, Antioxidant.

**The pre-employment medical: Ethical dilemmas for GPs**

Chandramani Thuraisingham1, Sivalingam Nalliah2.

1 Department of Family Medicine, Clinical School, International Medical University, Jalan Rasah, Seremban, Malaysia
2 Division of Human Development and Population Health, Clinical School, International Medical University, Jalan Rasah, Seremban, Malaysia

**Abstract**

**Background:**
In many workplaces, employment is conditional on a successful pre-employment medical examination. This examination is usually conducted by a general practitioner on the employers' panel of approved clinics or by an in-house company doctor.

**Objective:**
This article uses a case study to illustrate some of the ethical dilemmas that may be faced by GPs in the course of performing a pre-employment medical examination.

**Discussion:**
Ethical issues discussed in this article include: Is it ethical for employers (based on physicians’ reports) to select workers based on ‘absence of illness’ rather than ‘fitness for work’? Should physicians divulge the illness of potential workers to third parties? What are the boundaries of a clinician's duty of care in the preemployment medical examination setting?

**Keywords:** ethics, occupational medicine, doctor-patient relations, medicolegal.

**Dynamics of DNA damage induced pathways to cancer**

Kun Tian\(^1,2\), Ramkumar Rajendran\(^1,3\), Manjula Doddananjaiah\(^1\), Marija Krstic-Demonacos\(^1,2\), Jean-Marc Schwartz\(^1\).

\(^1\) Faculty of Life Sciences, University of Manchester, Manchester, United Kingdom
\(^2\) School of Environment and Life Sciences, University of Salford, Salford, United Kingdom
\(^3\) International Medical University, Kuala Lumpur, Malaysia

**Abstract**

Chemotherapy is commonly used in cancer treatments, however only 25% of cancers are responsive and a significant proportion develops resistance. The p53 tumour suppressor is crucial for cancer development and therapy, but has been less amenable to therapeutic applications due to the complexity of its action, reflected in 66,000 papers describing its function. Here we provide a systematic approach to integrate this information by constructing a large-scale logical model of the p53 interactome using extensive database and literature integration. The model contains 206 nodes representing genes or proteins, DNA damage input, apoptosis and cellular senescence outputs, connected by 738 logical interactions. Predictions from in silico knock-outs and steady state model analysis were validated using literature searches and in vitro based experiments. We identify an upregulation of Chk1, ATM and ATR pathways in p53 negative cells and 61 other predictions obtained by knockout tests mimicking mutations. The comparison of model simulations with microarray data demonstrated a significant rate of successful predictions ranging between 52% and 71% depending on the cancer type. Growth factors and receptors FGF2, IGF1R, PDGFRB and TGFA were identified as factors contributing selectively to the control of U2OS osteosarcoma and HCT116 colon cancer cell growth. In summary, we provide the proof of principle that this versatile and predictive model has vast potential for use in cancer treatment by identifying pathways in individual patients that contribute to tumour growth, defining a sub population of “high” responders and identification of shifts in pathways leading to chemotherapy resistance.

Dietary health behaviors of women living in high rise dwellings: A case study of an urban community in Malaysia

Tilakavati Karupaiah¹, Winnie Chee Siew Swee², Siew Ying Liew¹, Boon Koon Ng¹, Karuthan Chinna³.

¹ Faculty of Health Sciences, School of Healthcare Sciences, National University of Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia
² Department of Nutrition and Dietetics, International Medical University, Bukit Jalil, 57000, Kuala Lumpur, Malaysia
³ Department of Social and Preventive Medicine, University of Malaya, Lembah Pantai, 56750, Kuala Lumpur, Malaysia

Abstract
Diet-related non-communicable disease (DR-NCD) occurrence is a serious problem amongst Malaysian women and urbanization is probably a challenge to their achieving the nutritional environment conducive to healthy eating. This case study aimed to determine diet quality of an urban community using women respondents from high rise dwellings in Kuala Lumpur. The sample consisted of 135 households and a healthy eating index (HEI) scale was used to evaluate the women’s diet quality. A total of 128 women (Malays = 45, Chinese = 56, Indian = 27) participated. Total HEI score was significantly different (P < 0.05) within ethnicity (Indians = 75.7 ± 8.1 <Malays = 80.5 ± 7.4 <Chinese = 80.1 ± 8.1) and affected by component scores for fruit (range 3.8–6.2, P = 0.044), sodium (range 7.8–9.0, P = 0.006) and food variety (range 9.3–9.9, P = 0.001). Dairy foods rated poorly (range 2.0–3.9, P > 0.05) regardless of ethnicity. Income strata (ρ = 0.159, P = 0.048) and eating out frequency (ρ = −0.149, P = 0.046) also independently affected HEI scores. Income negatively correlated with sodium restriction score (ρ = −0.294, P = 0.001) but positively with cereals (ρ = 0.181; P = 0.025), fruits (ρ = 0.178; P = 0.022), dairy products (ρ = 0.198; P = 0.013) and food variety (ρ = 0.219, P = 0.007). Decreased vegetable intake (ρ = −0.320; P < 0.001) and sodium excess (ρ = −0.135, P = 0.065) were associated with eating out frequency and poor HEI scores. This case study suggests health promotion for DR-NCD prevention is needed at the community level to improve diet quality of urban women.

Keywords: Urban women, High rise dwelling, Ethnicity, Income, Diet quality, HEI.
The effects of cytokines on microRNA expression in TW01 nasopharyngeal carcinoma cells

Ting Wei Lee¹, Eng Lai Tan², Ching Ching Ng³ and Sook Yee Gan².

¹ Institute of Postgraduate Studies and Research, International Medical University, No. 126, Jalan 19/155B, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² School of Pharmacy, International Medical University, No. 126 Jalan 19/155B, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ Institute of Biological Sciences, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

Aims: To determine the effect of cytokines, namely transforming growth factor-beta one (TGF-β1), and interleukin-6 (IL-6) on the expression of 88 cancer-related microRNAs (miRNAs) in TW01 nasopharyngeal carcinoma (NPC) cells with or without the presence of Epstein-Barr virus latent membrane protein 1 (LMP1).

Methodology: TW01 and TW01-LMP1 cells were treated with cytokines. MicroRNAs were isolated from treated and untreated TW01/TW01-LMP1 cells and were subjected to RT-PCR array of 88 cancer-related microRNAs. The threshold cycle (Ct) data were analysed and fold-change in the level of gene expression was calculated based on ΔΔCt using two endogenous controls, SNORD 47 and SNORD 44. Data obtained from each treatment were compared with the data obtained from the respective control group (untreated TW01/ TW01-LMP1).

Results: TGF-β1 down-regulated miR-143 in TW01 NPC cells. In TW01 cells that expressed the EBV LMP1 gene (TW01-LMP1), approximately 97% of the 88 miRNAs were up-regulated by TGF-β1. Among them was miR-181c, a well-known repressor of NOTCH2/4 and KRAS and has important role in cell differentiation. IL-6 up-regulated approximately 65% of the miRNAs in TW01 cells but in less than four-fold. In TW0-LMP1 cells, eight miRNAs; namely, miR-15b, miR-155, miR-16, miR-215, miR-23b, miR-25, miR-9 and miR-98 were significantly up-regulated by IL-6. Among these, miR-15b, miR-155 and miR-25 had been reported to be elevated in NPC tissues.

Conclusion: This study provides a preliminary perspective on the effects of cytokines on the expression of miRNAs in TW01 NPC cells.

Keywords: microRNA, cytokines, nasopharyngeal carcinoma, Epstein-Barr, latent membrane protein one.

### Functional roles of fibroblast growth factor receptors (FGFRs) signalling in human cancers

Kai Hung Tiong\(^1\), Li Yen Mah\(^2,3\), Chee-Onn Leong\(^2,3\).

\(^1\) School of Postgraduate Studies and Research, International Medical University, Bukit Jalil, 57000, Kuala Lumpur, Malaysia  
\(^2\) School of Pharmacy, International Medical University, Bukit Jalil, 57000, Kuala Lumpur, Malaysia  
\(^3\) Center for Cancer and Stem Cell Research, International Medical University, 126 Jalan 19/155B, Bukit Jalil, 57000, Kuala Lumpur, Malaysia

**Abstract**

The fibroblast growth factor receptors (FGFRs) regulate important biological processes including cell proliferation and differentiation during development and tissue repair. Over the past decades, numerous pathological conditions and developmental syndromes have emerged as a consequence of deregulation in the FGFRs signaling network. This review aims to provide an overview of FGFR family, their complex signaling pathways in tumorigenesis, and the current development and application of therapeutics targeting the FGFRs signaling for treatment of refractory human cancers.

**Keywords**: Fibroblast growth factor receptors, Cancer, Signal transduction, Targeted therapy.

**Autologous bone marrow mesenchymal stromal cells can treat arthritic joints of rheumatoid arthritic patients: Report of two patients**

CY Wong¹, SP Chin²,³, NN Wazir⁴, DG Esha⁴, KY Then⁵, SK Cheong⁶.

¹ Cytopeutics, Selangor, Malaysia
² Mawar Hospital, Negeri Sembilan, Malaysia
³ Beverly Wilshire Medical Centre, Kuala Lumpur, Malaysia
⁴ International Medical University, Negeri Sembilan, Malaysia
⁵ Cryocord, Selangor, Malaysia
⁶ Tunku Abdul Rahman University, Selangor, Malaysia

**Abstract**

**Background:**
Adult human bone marrow (BM) contains a population of mesenchymal stromal cells (MSC) that contribute to tissue regeneration. Further interest in the clinical application of MSC has been generated by the observation that MSC can exert profound immunosuppression by inhibiting T-cell activities in vitro. Rheumatoid arthritis (RA) is a T-cell-mediated systemic autoimmune disease characterized by cartilage and bone destruction associated with local production of inflammatory mediators. Joint destruction renders RA a candidate disease for cartilage repair using MSC. However, the issue of whether MSC from patients with RA are functionally altered must be addressed before proceeding to clinical application. The aim of this study was to investigate the properties of BMMSC isolated from patients with active RA in vitro and the efficacy of treating arthritic joints of RA patients with autologous BMMSC by intra-articular injection.

**Methods:**
Two patients were recruited. BMMSC were isolated and characterized (including tri-differentiation immunosuppression assay) before implanting the cells back into patients.

**Results:**
BMMSC were successfully isolated from both patients. These BMMSC can differentiate into adipocytes, osteocytes and chondrocytes. Isolated MSC also showed immunosuppressive ability when co-cultured with activated autologous peripheral blood T-cells. Subsequently, successfully isolated and characterized MSC were injected back into patient A’s knee joints and patient B’s hips. At 1 month after autologous BMMSC implantation, significant reduction of rheumatoid factor was observed in both patients.

**Conclusion:**
This preliminary study showed the properties of BMMSC from RA patients were comparable to healthy MSC, and can be used for autologous transplantation.

The effects of *Euphorbia hirta* on the ultrastructure of the murine liver, kidney and aorta

JYR Wong¹, YS Chen¹, S Chakravarthi², JP Judson¹, Santhana Raj L³, and HM ER⁴.

¹ Division of Human Biology, International Medical University, Kuala Lumpur 57000
² Division of Pathology, International Medical University, Kuala Lumpur 57000
³ Electron Microscopy Unit, Institute for Medical Research, Kuala Lumpur 50588
⁴ Department of Pharmaceutical Chemistry, International Medical University, Kuala Lumpur 57000, Malaysia

Abstract

*Euphorbia hirta* is widely used in traditional remedies and has been used cross-culturally for generations against maladies such as asthma, skin ailments and hypertension. Previous studies have demonstrated that *Euphorbia hirta* has antibacterial activity, and have also indicated certain antimolluscidal, antimalarial and anti-inflammatory properties, the latter of which have been suggested to be more pronounced than those of the rheumatological drug, etanercept. To date, no studies have identified the anatomical effects of this herb on the organs of test animals. This study aimed to identify the effects of *Euphorbia hirta* on the ultrastructure of the murine liver, kidney and aorta. A total of 32 adult male Sprague-Dawley rats were divided into four groups; three groups were fed with aqueous extracts of *Euphorbia hirta* at doses of 1, 10 and 50 mg/kg, respectively, every alternate day for 50 days, while one group served as a control. The animals were later sacrificed and the liver, kidney and aorta harvested for examination by electron microscopy. The aorta showed no ultrastructural changes across the groups. Renal and hepatic tissue from the treated groups demonstrated dose-dependent injuries, which showed architectural damage beginning in the nuclei and spreading outwards. Taking into consideration the properties of *Euphorbia hirta* that have been described in previous studies, in addition to the results from the present study, it appears that the herb may exhibit similar effects to those of the quinolone group of antibiotics. Further in-depth investigations are required into the potential effects of *Euphorbia hirta*, deleterious and otherwise.

Keywords: *Euphorbia hirta*, ultrastructure, aorta, kidneys, liver.

**Factors influencing macrosomia in pregnant women in a tertiary care hospital in Malaysia**

Hematram Yadav¹, Nagarajah Lee².

¹ Division of Community Medicine, International Medical University, Kuala Lumpur, Malaysia
² Center for Graduate Studies, Open University Malaysia, Kuala Lumpur, Malaysia

**Abstract**

**Aim:**
To identify the risk factors influencing the development of macrosomia among pregnant women and to develop a regression model to predict macrosomia.

**Methods:**
A cross-sectional study was conducted in a tertiary hospital in Malaysia involving 2332 pregnant women. The data was retrospectively collected from the obstetrics and gynecology department. The factors that influence fetal weight were collected from the antenatal cards and any additional information was collected by face-to-face interview using a questionnaire. A multiple regression model was developed to predict macrosomia using SPSS ver. 18.

**Results:**
The significant variables that influence macrosomia in this study were mother's age, mother’s body mass index (BMI), weight gain, parity, mother’s ethnicity, father's BMI, gestational week, diabetes during pregnancy and neonatal sex. Diabetes during pregnancy is an important risk factor for macrosomia; by using this parameter alone the risk of macrosomia can be predicted with a sensitivity rate of 70% and specificity of 70%. By including other maternal factors such as maternal age, pre-pregnancy BMI, weight gain, parity, ethnicity, as well as father’s BMI, gestational weeks and neonate sex, the sensitivity and specificity were improved to 80% and 75%, respectively.

**Conclusion:**
A regression model was developed and this could be used in health centers to predict macrosomia for purpose of referral to higher centers.

**Keywords:** large baby, maternal factors, predictors of birth weight.

**Maternal factors in predicting low birth weight babies**

Hematram Yadav¹, Nagarajah Lee².

¹ Division of Community Medicine, International Medical University, Malaysia
² Open University Malaysia, Kuala Lumpur

**Abstract**

This study examines the association between maternal factors and low birth weight among newborns at a tertiary hospital in Malaysia. This was a cross-sectional study where mothers were followed through from first booking till delivery. There were 666 mothers who delivered from May 2007 to March 2008. Infants’ birth weight were compared with maternal age, pre-pregnancy BMI, fathers BMI, parity, ethnicity, per capita monthly income, and maternal blood pressure during pregnancy. A multiple logistic regressions was used to determine the relationship of maternal factors and low birth weight, while the ROC curve was constructed to assess the sensitivity and specificity of the predictive model. Among the significant risk factors of low birth weight were older age (35 years and above), low pre-pregnancy BMI (<20 kg/m²), parity of 4 and above, Indian origin, economically under privileged, and low and high blood pressure. Blood pressure during pregnancy was an important risk factor for LBW, by using this parameter alone the risk of LBW could be predicted with a sensitivity rate of 70% and a specificity rate of 70%. The sensitivity and specificity was further improved to 80% and 75% percent respectively when other factors like maternal factors such as maternal age, pre-pregnancy BMI, ethnicity, and per capita monthly income were included in the analysis.

**Keywords:** Low birth weight, blood pressure, maternal factors, newborns.
Evaluation of the Community and Family Case Study (CFCS): A community based training of medical students in International Medical University

H Yadav.

126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract

The International Medical University has a Community and Family Case Study (CFCS) programme as part of the training for medical students. The aim of the programme is to emphasize the family and community perspective of patient care in the home environment. A cross-sectional descriptive study was done among 66 final year medical students using a questionnaire. The students were in the 10th Semester and had completed their Community and Family Case Studies (CFCS) programme. Majority (54.5%) of the students who were interviewed were Malays, 34.8% Chinese and 9.1% Indians. Majority of the students (87.9%) liked the programme because it was a good opportunity to understand the patient in their home environment; it improved their communication skills and made them understand the patient better in the community setting. The perceived problem in this programme by the students were mainly choosing an index patient initially (32.8%), patient cooperation (19.0%) and transportation to the patients’ house (13.8%). They said that this programme was useful because they learnt more about the disease (45%) and understood the patient management better (15%). The programme also provided the students a wider exposure to medicine (37.9%) and the opportunity to practice clinical skills. Overall the CFCS programme in IMU was well liked by the students as it gave them an opportunity to practice some of the clinical skills in the patients’ home environment and it provided an opportunity to manage the patient better. The major problem the students faced was in selecting the index patient.

Keywords: Community medicine, rural health, medical training, medical curriculum.

**Transfected human mesenchymal stem cells do not lose their surface markers and differentiation properties**

Fei-Ling Yap¹, Soon-Keng Cheong², Radhakrishnan Ammu³, Chooi-Fun Leong³.

¹ Faculty of Medicine, International Medical University, Kuala Lumpur
² Faculty of Medicine & Health Sciences, Universiti Tunku Abdul Rahman, Kajang, Selangor
³ Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

**Abstract**

In this study, we evaluated the biological properties of human mesenchymal stem cells transfected (hMSC) with a plasmid vector expressing human cytokine interleukin-12 (IL-12). Surface markers were analysed by immnophenotyping using flow cytometry. Differentiation capability was evaluated towards adipogenesis and osteogenesis. We demonstrated that successfully transfected hMSC retained their surface immunophenotypes and differentiation potential into adipocytes and osteocytes. These results indicate that hMSC may be a suitable vehicle for gene transduction.

**Keywords:** Mesenchymal stem cells, transfection, differentiation, immunophenotyping.

**Current concepts in cancer research**

Ivan Kok Seng Yap¹², Ammu Kutty Radhakrishnan¹³, Chee Onn Leong¹².

¹ Centre for Cancer and Stem Cell Research, Institute for Research, Development and Innovation, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² School of Pharmacy, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ School of Medicine, International Medical University, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

Cancer research is an extremely broad topic covering many scientific disciplines including biology (e.g. biochemistry and signal transduction), chemistry (e.g. drug discovery and development), physics (e.g. diagnostic devices) and even computer science (e.g. bioinformatics). Some would argue that cancer research will continue in much the same way as it is by adding further layers of complexity to the scientific knowledge that is already complex and almost beyond measure. But we anticipate that cancer research will undergo a dramatic paradigm shift due to the recent explosion of new discoveries in cancer biology. This review article focuses on the latest horizons in cancer research concerning cancer epigenetics, cancer stem cells, cancer immunology and cancer metabolism.

**Keywords**: cancer biology, signal transduction, epigenetics, cancer stem cell.

Antibacterial and antifungal testing of the different extracts of *Dillenia obovata* (Blume) Hoogl

Polly Soo Xi Yap¹, Yik Tse Esther Chong², Yin Yau Wong², Xin Yee Lim², Jia Hui Ang², Heather Su Ling Goh², Mei Xuan Stephanie Lai², Chun Wai Mai³, Ayuba Sunday Buru¹, Mallikarjuna Rao Pichika³, Swee Hua Erin Lim⁴.

¹ School of Postgraduate Studies and Research, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² School of Pharmacy, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ School of Pharmacy, Department of Pharmaceutical Chemistry, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
⁴ School of Pharmacy, Department of Life Sciences, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

Abstract

In the past decades, plants have been exploited as traditional therapeutic agents. This has led to recent studies which had been carried out on plants for investigations of their medicinal uses. The objective of this study was to evaluate and determine antimicrobial activity of different extracts from the stem bark and leaves of *Dillenia obovata* against five Gram-positive and six Gram-negative bacteria, seven yeasts and three fungi. Using disc diffusion method followed by broth microdilution, the results highlighted the most potent activity of hexane, ethyl acetate and methanol extracts of leaves were against *Bacillus cereus* with a minimum inhibition concentration of 0.0625mg/mL. Hexane, methanol, ethyl acetate and water extracts of stem bark and leaves exhibited broadest spectrum of antimicrobial activity against Gram-positive bacteria: *Staphylococcus aureus*, *Bacillus cereus* and *Bacillus subtilis*. Our findings suggest that *D. obovata* has the potential to be a good alternative to the conventional antimicrobial drugs which are usually associated with high toxicity and multiple side effects.

Keywords: *Dillenia*; antimicrobial activity, disc diffusion, minimum inhibitory concentration, resazurin.

**Combination of essential oils and antibiotics reduce antibiotic resistance in plasmid-conferred multidrug resistant bacteria**

Polly Soo Xi Yap¹, Swee Hua Erin Lim², Cai Ping Hu³, Beow Chin Yiap².

¹ School of Postgraduate Studies and Research, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
² School of Pharmacy, Department of Life Sciences, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
³ School of Health Sciences, Department of Chinese Medicine, International Medical University, No. 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Malaysia

**Abstract**

In this study we investigated the relationship between several selected commercially available essential oils and beta-lactam antibiotics on their antibacterial effect against multidrug resistant bacteria. The antibacterial activity of essential oils and antibiotics was assessed using broth microdilution. The combined effects between essential oils of cinnamon bark, lavender, marjoram, tea tree, peppermint and ampicillin, piperacillin, cefazolin, cefuroxime, carbenicillin, ceftazidime, meropenem, were evaluated by means of the checkerboard method against beta-lactamase-producing *Escherichia coli*. In the latter assays, fractional inhibitory concentration (FIC) values were calculated to characterize interaction between the combinations. Substantial susceptibility of the bacteria toward natural antibiotics and a considerable reduction in the minimum inhibitory concentrations (MIC) of the antibiotics were noted in some paired combinations of antibiotics and essential oils. Out of 35 antibiotic-essential oil pairs tested, four of them showed synergistic effect (FIC ≤ 0.5) and 31 pairs showed no interaction (FIC > 0.5–4.0). The preliminary results obtained highlighted the occurrence of a pronounced synergistic relationship between piperacillin/cinnamon bark oil, piperacillin/lavender oil, piperacillin/peppermint oil as well as meropenem/peppermint oil against two of the three bacteria under study with a FIC index in the range 0.26–0.5. The finding highlighted the potential of peppermint, cinnamon bark and lavender essential oils being as antibiotic resistance modifying agent. Reduced usage of antibiotics could be employed as a treatment strategy to decrease the adverse effects and possibly to reverse the beta-lactam antibiotic resistance.

**Keywords:** Essential oil, Antibiotic, Checkerboard assay, Combination, Synergism, Resistance.

**Development and optimization of gastroretentive drug delivery system of Oseltamivir**

Yong Tze Teen¹, Adinarayana Gorajana¹, PS Rajinikanth¹, Sreenivas Patro Sisinthy², Nalamolu Koteswara Rao³.

¹ Department of Pharmaceutics, School of Pharmacy and Health Sciences, International medical University, Kuala Lumpur, Malaysia.
² School of Pharmacy, Taylor’s University, 47500 Subang Jaya, Selangor, Malaysia
³ School of Medicine, Taylor’s University, 47500 Subang Jaya, Selangor, Malaysia

**Abstract**

The objective of this research work was to formulate and optimize a floating drug delivery system of Oseltamivir using simple lattice design. Floating tablets were prepared by melt granulation method. In this design xanthan gum as matrix forming agent, sodium bicarbonate as gas generating agent and ethyl cellulose as floating enhancer were used as independent variables and floating lag time, t50 and t80 as responses. The optimization study reveals that optimum amounts of xanthan gum, sodium bicarbonate and ethyl cellulose is required to develop a gastroretentive drug delivery system of oseltamivir with a desired release profile. Moreover, the studies indicate that the proper balance between floating enhancer and release rate retardant can produce formulations with desirable release and floating properties. Kinetics of the drug release from tablets followed Krosmeyer Peppas model by anomalous non-Fickian diffusion. It was concluded that the gastroretentive drug delivery system can be developed for Oseltamivir to increase the residence time of drug in the stomach and thereby increasing its absorption. The present study demonstrates the use of Simple lattice design in the development of floating tablets with minimum experimentation.

**Keywords**: Oseltamivir, Xanthan Gum, Gastroretentive drug delivery, In vitro buoyancy study.