

## JOSTT Special Issue Supplement

### Abstracts of the 2<sup>nd</sup> International Postgraduate Conference on Pharmaceutical Sciences (iPoPS) 2013

#### Editorial

In line with the government policy to encourage the development of Science and Technology in the country, we are glad to be able to assist the organising committee of the 2<sup>nd</sup> International Postgraduate Conference on Pharmaceutical Sciences 2013 to publish a special supplement of the conference book of abstract under JOSTT. The purpose is to help to disseminate the research findings of the young authors and also to encourage more researchers, both local and abroad, to publish their research findings in the JOSTT.

The conference was held from 2<sup>nd</sup> to 7<sup>th</sup> September 2013 and attracted more than 150 research papers. The selection of papers for the conference has been solely the responsibility of the paper review committee comprising of eminent researchers who are experienced reviewers of International Journals in the field. It is also hoped that some of the papers when they are fully written and reviewed will be submitted to JOSTT for publication either in the regular issues or in a Special Issue.

*Dr Eng Long Ong*  
*Co-chairman, JOSTT Steering Committee)*

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Pharmaceutical Chemistry (CM)

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CM-P- 10: ANTIPLATELET AGGREGATION ACTIVITY IN HUMAN WHOLE BLOOD  
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**CM-O- 1: DIFFERENT SAMPLE CLEAN UP PROCEDURE OF MEFENAMIC ACID IN HUMAN PLASMA USING HPLC WITH UV VIS DETECTOR**

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Mefenamic acid a non-steroidal anti-inflammatory drug (NSAIDS) is a class of drug that provide analgesic and antipyretic (fever reducing effect) and in higher doses, anti-inflammatory effects. This study is focused to develop a rapid and sensitive method for the detection of mefenamic acid in human plasma. A reversed-phase high performance liquid chromatography (HPLC) method is developed for detection of mefenamic acid in human plasma. The compound of interest was analyzed using Eclipse XDB-C18 (4.6 x 150) column. The mefenamic acid peak response was monitored at 280 nm using a variable wavelength detector. Several combination of mobile phase was evaluated and acn:2% triethylamine solution was selected due to its capability of detection at lower concentration 500 ng/ml of mefenamic acid in plasma. pH was studied for the mobile phase and optimum pH for separation was 4.2. Sample clean-up process was performed following two different method namely protein precipitation and liquid extraction. Protein precipitation of the plasma sample was performed using acetonitrile which results in good recovery i.e. 99%. For Liquid-liquid extraction, several parameters were evaluated. For buffer, among several buffer (ammonium acetate buffer, potassium phosphate buffer as well as phosphoric acid buffer) 20 mM of ammonium acetate buffer with pH 3.5 was found suitable for the isolation of the analyte. For extraction combination of dichloromethane:isopropylpropanol (80:20) provides a better recovery compared to ethyl acetate. It was found that even though the solvent extraction provides a cleaner samples but the recovery was lower than the protein precipitation. Diclofenac sodium was used as internal standard for this study.

**Keywords:** Mefenamic acid, HPLC, UV detection, Protein precipitation, Liquid-liquid extraction

CM-O- 2: THE ISOLATION OF GLYCOSIDES FROM *MYRMECODIA* SPECIES

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Current biochemical investigation of *Myrmecodiaplatytyrea* (plant family: Rubiaceae) reveals that the ethyl acetate (EtOAc) extract was potent in the 2, 2-diphenyl-1-picrylhydrazyl (DPPH) modified method ( $EC_{50} = 32.91 \pm 2.23 \mu\text{g/mL}$ ). Subsequently, the EtOAc extract was fractionated using medium pressure liquid chromatography, giving eight fractions (F1-F8). Those fractions were also evaluated using DPPH assay and F5 was recorded as potent ( $EC_{50} = 21.57 \pm 1.40 \mu\text{g/mL}$ ). Then, F5 was purified by using column chromatography (CC) (mobile phase = chloroform: EtOAc). From the CC, ten fractions (F5F1-F5F10) were obtained and compound (**1**) (5.1 mg) was isolated from F5F3. The <sup>1</sup>H-Nuclear Magnetic Resonance (NMR) spectroscopy (500 MHz, CDCl<sub>3</sub>) was performed to determine the chemical structure of (**1**). According to the NMR spectra, a glycoside could be determined. Meanwhile, the NMR data of a glycoside (**2**) from *M. pendens* was also reviewed. However, the signals for sugar moiety in (**2**) ( $\delta_{\text{H}}$  3.3 - 3.9 ppm, 500 MHz, CD<sub>3</sub>OD) did not appear in the <sup>1</sup>H-NMR spectrum of (**1**). Instead, the proton signals of (**1**) were recorded at  $\delta_{\text{H}}$  4.3 – 4.4 ppm. Furthermore, the <sup>13</sup>C-NMR spectroscopy (125 MHz, CDCl<sub>3</sub>) suggested that (**1**) is a glycoside, according to the presence of <sup>13</sup>C-NMR chemical shifts at  $\delta_{\text{C}}$  61 and 68 ppm, assignable to a sugar molecule. This data was nearly equivalent with the <sup>13</sup>C-NMR signals of (**2**) ( $\delta_{\text{C}}$  63-102 ppm). It is noted that compound (**2**) was the most potent in a cytotoxicity study ( $LC_{50} = 10.00 \mu\text{g/mL}$ ) and active in an antioxidant test ( $IC_{50} = 51.31 \mu\text{g/mL}$ ). It is hoped that this work would gather information of the isolation of (**2**) as glycoside, from *M. pendens* and three compounds [(**1**), stigmasterol, plus a biphenyl] from *M. platytyrea*. Successive efforts will include the extensive two dimensional NMR experiments for compound (**1**).

**CM-O- 3: THE ANTIOXIDANT ACTIVITY OF *PANDANUS PYGMAEUS*  
EXTRACTS**

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In this study, the crude extracts of *Pandanus pygmaeus* (plant family: *Pandanaceae*) were examined for their antioxidant activity. These extracts were obtained following the hexane, dichloromethane and methanol (MeOH) extractions of the dried leaves. The antioxidant activity was determined by using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity with ascorbic acid (AA) and Trolox as the positive controls. The objective of this research is to investigate the DPPH scavenging activity of *P. pygmaeus* extracts and fractions, plus, to isolate the chemical constituents of the potent fractions by means of chromatographic techniques. From this assay, it was found that only MeOH extract exhibited the scavenging activity with IC<sub>50</sub> value =  $735.82 \pm 19.71$  µg/ml, while IC<sub>50</sub> values of AA and Trolox were  $4.01 \pm 0.10$  µg/ml and  $6.21 \pm 0.05$  µg/ml, respectively. The smaller of IC<sub>50</sub> value, the higher of scavenging activity. These results revealed that the MeOH extract has a weaker radical scavenging activity, as compared to AA and Trolox. Later, the MeOH extract was partitioned by using chloroform, aqueous MeOH and butanol. Both aqueous MeOH and butanol partitions showed higher antioxidant activities as compared to their extracts with IC<sub>50</sub> =  $407.67 \pm 18.77$  µg/ml and  $404.36 \pm 10.83$  µg/ml, respectively. On the other hand, the chloroform partition, hexane and dichloromethane extracts do not show any scavenging activities as they do not have the IC<sub>50</sub> values. The aqueous MeOH and butanol partitions were also analyzed via high performance liquid chromatography (HPLC). The screening analysis showed that both partitions possibly have similar chemical constituents. Further extracts purification on the HPLC semi preparative column is in progress. It is anticipated that the chemical components of these *Pandanus* fractions would include phenolics.

Keywords: DPPH, HPLC, *Pandanus*

**CM-O- 4: THE BIOACTIVE COMPOUNDS FROM *PANDANUS* SPECIES**

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The aim of the present study is to isolate the bioactive compounds from two *Pandanus* species, namely *P. pygmaeus* and *P. leram* (plant family: Pandanaceae). The purifications of the leaf extracts from both species were performed by using a flash column chromatography, with silica gel 60 (0.0015 - 0.040 mm) as the stationary phase. Mixtures of hexane and chloroform were selected as the mobile phase. The structural elucidations of the purified compounds were established based on their spectroscopic data, including 1D & 2D Nuclear Magnetic Resonance (NMR) spectroscopy, and comparison with the published reports. The isolation of the hexanoic fractions of *P. pygmaeus* yielded a fatty acid, a diterpene and  $\beta$ -sitosterol. The fatty acid was later identified as linoleic acid. The MTT assay of the hexanoic fraction containing the isolated linoleic acid showed a moderate antibacterial activity against *Staphylococcus aureus* ATTC 25953 with concentration ranging from 0.015 to 1.0 mg/ml, compared with vancomycin as the positive control. In addition, the purification of the dichloromethane fraction of *P. pygmaeus* led to the isolation of one triterpenoid, which resembles the structure of the antitubercular triterpene from *P. tectorius*. Meanwhile, the chloroform fraction of *P. leram* yielded a sesquiterpene which was recognized as vomifoliol.

Keywords: Bioactivity, *Pandanus*, Terpenes



**CM-O- 5: THE ALKALOIDS FROM TWO *PANDANUS* SPECIES**

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This presentation deals with the phytochemical investigation of two *Pandanus* species, namely *Pandanuspygmaeus* and *Pandanusleram*. Both of these Pandanaceae plants possess non-fragrant leaves, unlike *P. amaryllifolius* (the scented screwpine or *pandan wangi*). The former is a dwarf species (average height = 0.3 meters), as compared to the latter, which can grows more than 3 meters. Scientific reports mentioned the identification of alkaloids in this family, owing to their structural distinctiveness. From literature review, it is anticipated that a specific *Pandanus* plant would consist of a particular alkaloidal skeleton. The carbon arrangement of the natural alkaloidal molecules might be constructed, following the enzymatic cyclisation of the biogenetic precursor, pandanamine. In this methodology, the purification of alkaloids involves the non acid-base extraction and separation by using various chromatographic techniques, such as column chromatography and centrifugal radial thin layer chromatography. The structures of isolated compounds were characterized using 1D and 2D Nuclear Magnetic Resonance (NMR) spectroscopy and by comparison with literature data. From the result, the dichloromethane leaves extract of *P. pygmaeus* contained an alkaloid called pygmaeusamine, as the major component. It possesses the octahydroindolizine pyrrolidinyl- $\alpha$ ,  $\beta$ -unsaturated  $\gamma$ -lactone moiety. Along with this compound, its isomer was discovered, and was arbitrarily labelled as pygmaeusamine B. The NOESY spectral data revealed that both alkaloids differ at the proton position H-11 and H-14 which are alpha ( $\alpha$ ) and beta ( $\beta$ ). Respectively, it is suggested that these compounds might have therapeutic potentials for a number of diseases, such as viral infection, cancer and diabetes, due to the presence of the indolizidine group. Meanwhile, the chemical examination on *Pandanus leram* chloroform leaves extract yielded a steroidal type of alkaloid. In short, this is the first documented occurrence of novel *Pandanus* isomers, or pandamarilactonines, and the steroid alkaloid, respectively from *Pandanus pygmaeus* and *Pandanus leram*.

Keywords: Alkaloid, Isomer, *Pandanus*

**CM-O- 6: BIOSYNTHETIC STUDY OF MICROBIAL NATURAL PRODUCTS**

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Microbial secondary metabolites show various activities ranging from antimicrobial to immunosuppressive due to their structural diversity. The understanding of biosynthetic mechanism is important to utilize microbial metabolites efficiently. Thioviridamide is a unique thioamide-containing peptide from *Streptomyces olivoviridis* NA05001 and induces apoptosis selectively in E1A-transformed cells. Hatomarubigins are multidrug-resistance reversal substances from *Streptomyces* sp. 2238-SVT4. Among them, hatomarubigin D is a unique dimeric angucycline with a methylene linkage. To elucidate the biosynthetic mechanisms of thioviridamide and hatomarubigins, we attempted to heterologously express their biosynthetic gene clusters. The draft genome sequencing of *S. olivoviridis* NA05001 revealed a gene encoding the thioviridamide precursor peptide (*tvaA*). HPLC analysis indicated the production of thioviridamide by *Streptomyces lividans* expressing a gene cluster including *tvaA* to *tvaO*. The function of hatomarubigin biosynthesis genes was analyzed by heterologous expression of the *hrb* gene cluster. In addition to all the known hatomarubigins, 5-hydroxyhatomarubigin E was detected in the fermented broth of *S. lividans* expressing the *hrb* genes lacking *hrbF*, a gene with no homology to any known angucycline biosynthesis genes. Heterologous production of thioviridamide in *S. lividans* identified the thioviridamide biosynthetic gene cluster from *S. olivoviridis* NA05001 and thioviridamide was classified into ribosomally synthesized and posttranslationally modified peptides (RiPPs). Disruption of *hrbF* caused oxygenation at abnormal position C-5, suggesting that HrbF controls regiospecificity of oxygenating enzymes.

Keywords: Natural products, Biosynthesis, Heterologous production

**CM-O- 7: SOLUBILIZATION EFFECT OF FORMING AMORPHOUS COMPLEX  
BETWEEN INDOMETHACIN AND LIDOCAINE**

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The solubility of indomethacin (IM), which is hardly soluble in water, is known to be improved by preparation of its amorphous form. Interestingly, mechanical mixing and heat treatment of the solid mixture of IM and the local anesthetic lidocaine (LC) caused the formation of an amorphous complex. We studied temperature-dependent phase changes of the mixture of IM with LC in various molar ratios, mainly by differential scanning calorimetry (DSC). The solubility of IM with or without LC was determined by HPLC at 4°C and 25°C. Each of IM and LC showed a clear endothermic peak due to the melting of their crystalline forms in the thermograms of DSC. Although liquid state of LC was crystallized, heat-treated IM showed a glass transition by cooling. Hence, IM was concluded to take the amorphous state below its glass transition temperature. Results of DSC of the fused mixture of IM and LC showed the eutectic binary and amorphous states were formed in the mixtures between molar ratios of IM: LC = 3:7 and 9:1 in heating/cooling/heating cycle. HPLC study revealed that solubilities of both IM and LC at 4°C in the mixtures of IM: LC = 1:1, 1:1.5, and 1:2 were greater than those of pure IM and LC due to formation of amorphous complex. In conclusion, melted mixture of IM and LC formed amorphous complex, and this complex was aggregated like micelles of surfactants in water.

**Keywords:** Indomethacin, Lidocaine, Amorphous, Thermal analysis, Solubility

**CM-O- 8: THE ADVANTAGES OF USING THE NMR-FEATURES APPROACH TO  
DEREPLICATION: FURTHER LASIODIPLODINS FROM *LASIODIPLODIA*  
*THEOBROMAE***

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As part of a continuing drug discovery programme, our attention has focused on the isolation of new bioactive metabolites from fungal endophytes of the Malaysian tropical rain-forest. Such efforts have been greatly facilitated by the development of a fast and efficient dereplication methodology based on the use of a capillary NMR probe and systematic recourse to spectroscopic-oriented databases such as AntiMarin and MarinLit that are coded for the relative numbers of NMR-recognisable structural features. This research on the constituents from *Lasiodiplodia theobromae* highlights the advantages of using the NMR-features approach to dereplication. In this case three of the compounds (**2**, **4**, **5**) were identified as known compounds following inspection of the <sup>1</sup>H NMR spectra and checking against the original literature. The remaining two components isolated in high enough yield (**6**, **7**) were identified as new lasiodiplodin derivatives, 2D NMR data obtained and structures proposed. Also highlighted was the scale of the dereplication exercise. In the process just 3.7 mg of extract generated from four agar plates was used. By being able to work at the µg/mg level rather than at the mg/g level represents a major saving in cost and man-power.

**CM-O- 9: NMR IN MICROBIAL METABOLOMICS AND NATURAL PRODUCTS  
RESEARCH**

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Microbial Metabolomics enables the study of the analysis of biogenic small molecules (BSMs) and strengthening the understanding of the basic processes of the microorganisms. Biogenic small molecules (BSMs) have an important role in biological systems and represent attractive candidates to understand disease phenotypes. NMR Metabolomics offers evident advantages over the knowledge-guided search of metabolites and can predict *in vivo* mechanisms of action of drug through NMR metabolomics data. It is evolving as a significant component of the drug discovery process and offers an inexpensive route to help overcome the multiple challenges faced by researchers. Data obtained from this kind of analysis are very complex and can be interpreted by using a multivariate statistical approach. Some human pathogenic fungi such as *Candida Albicans* and *Cryptococcus neoformans* were treated with some known antifungal drugs. NMR analysis of drug induced changes to the fungal metabolome resulted in distinct clustering patterns correlating with *in vivo* drug activity. NMR is also extremely powerful and very widely used method for structure elucidation by natural product researchers. Improvement in sensitivity of NMR spectrometers, methodologies and gradient pulse sequence, it is now almost always possible to determine the skeletal structure of an unknown natural product even with 1 mg of sample or less.

**Keywords:** NMR Metabolomics, Biogenic small molecules, Multivariate statistical analysis, Gradient pulse sequence, Natural products.

**CM-O- 10: A NEW PHELLANDRENE DERIVATIVE FROM THE ROOTS OF  
*GONIOTHALAMUS MACROPHYLLUS***

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*Goniothalamus macrophyllus* is a medicinal plant commonly found in Peninsular Malaysia and known locally as “pokok gajah beranak”. It is one of the species from the Annonaceae family widely distributed throughout the tropics and subtropics. Phytochemical studies on *Goniothalamus* genus have led to the isolation and characterization of large number of styryl lactones, acetogenins, alkaloids and flavanoids. The objective of the study is to identify compounds from the roots of *G. macrophyllus*. Dried roots of *G. macrophyllus* were ground into fine powder using a cutter mill. The ground roots were soaked in 80 % aqueous methanol at room temperature, filtered and the solvent were removed under reduced pressure at 40 °C to afford crude methanolic extract. The crude extract was further suspended in aqueous methanol and sequentially partitioned with *n*-hexane, chloroform and *n*-butanol. Unknown compounds were isolated and purified from the nonpolar fraction, namely the hexane soluble fraction, through a combination of preparative HPLC and TLC. The structures were elucidated through a combination of one (1D) and two - dimensional (2D) NMR, MS and IR spectroscopy. In conclusion, new phellandrene derivatives, goniolandrene B, with a known compound, linderatone, were reported from *G. macrophyllus*.

Keyword: *Goniothalamus macrophyllus*, Annonaceae, Goniolandrene

**CM-P- 1: DESIGN AND SYNTHESIS OF ARTIFICIAL DIMETALLIC CATALYSTS  
INSPIRED BY AN ACTIVE CENTER OF ALKALINE PHOSPHATASE**

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Alkaline phosphatase (AP) is an enzyme that has two  $\text{Zn}^{2+}$  ions in its active center and hydrolyzes monophosphate dianions. We previously reported a supramolecular complex that is formed by 2:2:2 self-assembly of dinuclear zinc complex having 2,2'-bipyridyl (2,2'-bpy) linker, barbital, and  $\text{Cu}^{2+}$  in aqueous solution (Zulkefeli, M. et al, Inorg. Chem., **2011**, 50, 10113-10123.). This supramolecule has  $\text{Cu}_2(\mu\text{-OH})_2$  core in its center, which is crucial for the hydrolysis of mono(p-nitrophenyl)phosphate (MNP). However, it has been revealed that this supramolecule is somewhat unstable under the reaction conditions, possibly because of reversible non-covalent bondings such as several  $\text{Zn}^{2+}$ -imide-anion coordination bonds,  $\pi$ - $\pi$  stacking interaction and hydrogen bondings. This background prompted us to design and synthesize new macrocyclic ligands formed by covalent bonds for the formation of robust dimetallic complexes. In this work, we designed new ligands **(1)**-**(4)**, that include two 2,2'-bpy parts connected through linkers such as m-xylene **(1)**, p-xylene **(2)**, naphthalene **(3)**, and acridine **(4)**. At first, the macrocyclic ligands **(1)** and **(2)** were synthesized, but these ligands formed only monomeric metal complexes with  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$  and so on, and had negligible MNP hydrolysis activity. Indeed, X-ray crystal structure analysis of **(1)** revealed that the distance between two 2,2'-bpy parts are too short to accommodate two  $\text{Cu}^{2+}$  ions. Next, we designed new ligands **(3)** and **(4)**, in which two 2,2'-bpy parts are kept away from the other wider than those of **(1)** and **(2)**, as predicted by Gaussian calculation. In this paper, synthesis of **(1)**-**(4)**, UV/Vis titration with metals, and AP activity will be reported.

Keywords: Alkaline phosphatase, Macrocycles, Phosphate hydrolysis, Supramolecular complex

**CM-P- 2: DESIGN AND SYNTHESIS OF CHIRAL ZINC (II) COMPLEXES  
FOR CATALYTIC ASYMMETRIC ALDOL REACTIONS**

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Naturally-occurring aldolases catalyze stereospecific aldol reactions and they are classified into class I aldolases, which catalyze aldol reactions via enamine intermediates, and class II aldolases, in which  $\text{Zn}^{2+}$ -enolates of substrates react with acceptor aldehydes. We previously reported  $\text{Zn}^{2+}$  complexes of macrocyclic [12]aneN<sub>4</sub> having amino acid side chain (ZnL) inspired by these two aldolases were designed and synthesized for use as chiral catalysts for enantioselective aldol reactions of acetone and some aldehydes in aqueous. However, the drawbacks of this reaction are that an excess amount of ketone is required and stereoselectivity is rather low when cyclic ketones are used as substrates. The objective of this study is to fine tune the chiral ZnL complexes to improve the aldol reactions of acetone or cyclic ketone with benzaldehyde derivatives. In this work, we synthesized various ZnL complexes containing aliphatic, aromatic, anionic and cationic side chains, dipeptide side chains, and *N*-alkyl macrocyclic [12]aneN<sub>4</sub> and examined their effect on the chemical and optical yields on aldol reaction of acetone with 2-chlorobenzaldehyde. It was disclosed that ZnL<sup>1</sup> having a decyl group afforded 1,2-adducts in high chemical and optical yields in single-phase and two-phase systems (Itoh, S.; et al, *Chem. Asian J.*, in press). In addition, the preliminary experiments of the aldol reactions of 2,2-dimethyl-1,3-dioxan-5-one and 4-nitrobenzaldehyde in the presence of ZnL<sup>1</sup> suggested that stereochemistry of the 1,2-adducts can be switched by appropriate selection of the solvent systems.

Keywords: Asymmetric catalyst, Aldol reaction, Zinc ion, Enzyme model



**CM-P- 3: EVALUATION OF DIFFERENT EXTRACTION METHOD FOR THE ISOLATION OF CETIRIZINE FROM HUMAN PLASMA FOR HPLC ANALYSIS**

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Cetirizine is a second generation anti-histamin H1-receptor antagonist, used to treat cold or allergy. This drug is a white, crystalline powder, freely soluble in water, practically insoluble in acetone and in methylene chloride. Cetirizine is a non-sedating antihistamin because it crossed blood brain barrier slightly, reduces sedative side effect. In allergic inflammatory process, this drug influences the activities of eosinophils, neutrophils and platelets. It inhibits eosinophils in allergen-induced type I skin reaction and eosinophil chemotaxis in vitro by reducing the expression of ICAM-1 and soluble ICAM-1 in epithelial cells. Malaysian government has implemented bioequivalence study for the registration of generic products and our study is in line with the regulatory requirement. Besides so far there is no report of such study on cetirizine in Malaysia. The study focused on the preliminary chromatographic detection and determination of cetirizine in human plasma. Different sample extraction process were evaluated namely protein precipitation and liquid-liquid extraction. In protein precipitation, two solvents were used; acetonitrile and chloroform and for liquid liquid extraction, dichloromethane and ethyl acetate with the various buffers were used. It was found protein precipitation using acetonitrile showed a better recovery (86%) compared to chloroform. For the liquid liquid extraction using dichloromethane the recovery was 80% while with the addition of buffer it did not show a good result. Liquid liquid extraction using dichloromethane with addition of sodium chloride showed 52% recovery. High Performance Liquid Chromatography (HPLC) was used for the analysis of the spiked plasma samples. The column used was a C18 column and mobile phase was combination of triethylamine and acetonitrile with the ratio of 65 : 35. Elution of cetirizine was detected with a UV-Vis detector at 232 nm wavelength.

**Keywords:** Cetirizine, Liquid-liquid extraction, Protein precipitation, HPLC

**CM-P- 4: THE EFFECT OF METHYL JASMONATE ON THE DEVELOPMENT OF  
*IN VITRO* VANILLA PLANIFOLIA**

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*Vanilla planifolia* or simply known as vanilla is a tropical climbing orchid from the family Orchidaceae. It is a primary producer of vanillin, extracted from the cured vanilla bean that is widely used in the food, cosmetics and perfumery industries. *V. planifolia* is propagated by using stem cutting; however this method is labor intensive and time consuming. Several studies have been made on the in vitro propagation of *V. planifolia* by using plant growth regulator such as kinetin, BAP, NAA and zeatin but very few information is available on the effect of methyl jasmonate (MeJa) on the induction in vitro growth of the species. Thus, this study was designed primarily to determine the effect of MeJa on the growth development of *V. planifolia*. MS medium supplemented with four different MeJa concentrations of 10  $\mu$ M, 20  $\mu$ M, 40  $\mu$ M and 80  $\mu$ M were used in this study. 10  $\mu$ M MeJa enhanced the shoot ( $4.23 \pm 0.13$  cm) and root ( $4.61 \pm 0.28$  cm) elongation after 6 weeks of incubation while 80  $\mu$ M halted the shoot and root growth with only  $1.1 \pm 0.04$  cm and  $0.18 \pm 0.08$  cm respectively. The control showed a slightly slower development in comparison to 10  $\mu$ M MeJa where the shoot and root growth were  $3.45 \pm 0.16$  cm and  $3.42 \pm 0.27$  cm respectively. The number of leaves ( $1.71 \pm 0.11$ ) and roots ( $2 \pm 0.11$ ) produced also highest in 10  $\mu$ M meanwhile 80  $\mu$ M showed less number of leaf and root produced. In control, the number of leaf and root produced was  $1.18 \pm 0.07$  and  $1.21 \pm 0.07$  respectively. In conclusion, lower concentration of MeJa help to promote shoot and root growth while higher concentration halted the growth development of shoot and root of *V. planifolia*.

**CM-P- 5: PERVASIVENESS OF TOXIC METALS IN TRADITIONAL MEDICINE PRODUCTS**

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Traditional medicine products (TMPs) are synonym in these days intended for treating ailments and maintaining wellness. Nonetheless, the users are actually exposed to unwanted risks insentience. Therefore, in order to protect the safety and health of the public, the Drug Control Authority (DCA) under the Ministry of Health (MOH) has taken the legitimate initiative by conducting tests on TMPs before allowed to be sold in markets as well as continuous monitoring of marketed TMPs. One of the tests that has been carried out by the DCA is the detection of heavy metals namely arsenic, cadmium, mercury and lead. This retrospective study was carried out to determine the pervasiveness of toxic metals detected in TMPs of pre- and post- registration from 2005 until 2012. The data were extracted from Quality, Efficacy and Safety Test (QUEST) system in National Pharmaceutical Control Bureau (NPCB). The collected data were transferred to Microsoft Office Excel 2007 and analysed descriptively. Overall, there were 6978 pre-registered TMPs and 7002 post-registered TMPs have been tested for toxic metals in these 8 consecutive years. The results showed that 328 (4.7%) and 84 (1.2%) pre- and post- registered TMPs failed in toxic metal tests, respectively. The pre-registered TMPs were highly contaminated with arsenic (n = 156; 47.6%), pursued by mercury (n = 89; 27.1%), lead (n = 74, 22.6%) and cadmium (n = 32; 9.8%). On the contrary, the post-registered TMPs were substantially contaminated with mercury (n = 45; 53.6%), followed by cadmium (n = 27; 32.1), lead (n = 8; 9.5%) and arsenic (n = 5; 6.0%). These findings suggested that in general the failure rate of detected toxic metals in pre-registered TMPs was higher than post-registered TMPs. This evidence is concurring with the actions taken by the DCA to analyse all pre-registered TMPs before can be marketed in Malaysia as well as incessant surveillance of marketed TMPs for the sake of safety and health of respective consumers.

**Keywords:** Traditional medicine products, Toxic metals, Pre-registration, Post-registration

**CM-P- 6: A FACILE SYNTHESIS OF BIOLOGICALLY ACTIVE THIOPHENE  
HYDRAZONES**

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Thiophene is a heterocyclic compounds that is widely distributed in nature. The design, preparation and synthesis of new derivatives of thiophene arguably offer some of the greatest hope for success in present and future studies. Previously, it has been reported that thiophene derivatives exhibit antimicrobial activity, antidiabetic activity and cytotoxicity. Hence, a library of derivatives compounds of 2-chlorothiophene carbohydrazone had been synthesized. Thirty different derivatives have been synthesized where it involves arylaldehyde as well as heterocyclic aldehyde that consist of various substituents such as chloro, fluoro, furan, hydroxyl, methyl, methoxy, nitro and pyridine. The process of synthesizing the derivatives involves imine formation and nucleophilic substitution which are simple condensation of hydrazide and aldehyde. The compounds which have been synthesized were identified using NMR and LCMS. Thiophene derivatives gave a pattern where most compounds having substituent attached at carbon-2 of benzaldehyde form crystal.

**Keywords:** Thiophene, Imine, Cytotoxicity, Arylaldehyde

**CM-P- 7: PREPARATION OF BENZOYL HYDRAZONE & EVALUATION OF  
THEIR THERAPEUTIC PROPERTIES**

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Nowadays, research field dealing with compound from Schiff base chemistry has expanded enormously. This research was aim to synthesize novel derivatives of 4-isopropyl benzoylhydrazone. The starting material which is an ester was reacted with hydrazine hydrate to form hydrazide then further reacted with selected aldehydes to form novel hydrazones through Schiff base reaction. The substituent of arylaldehydes used containing hydroxy, methoxy, methyl, chloro, nitro and fluoro, as well as heterocyclic aldehyde like pyridine, fural and thiophene. The structures of products were characterized using <sup>1</sup>H NMR and LC-MS techniques.

Keywords: Schiff bases, Benzoyl hydrazone, Arylaldehyde, Heterocyclic aldehyde

**CM-P- 8: SYNTHESIS OF FLUORESCENT CARBON DOTS FROM DIFFERENT CARBON SOURCES**

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Inorganic nanoparticles such as gold, semiconductor fluorescent quantum dots, carbon nanotubes, magnetic, and ceramic nanoparticles have demonstrated successes in imaging and treatment of tumors in vivo, with some promise towards clinical trials. Nonetheless, there are some major concerns that limit their application such as toxicity of cadmium in quantum dots and high rates of carbon nanotubes accumulation in liver and kidney. Carbon dots (CDs), a new class of carbon-based fluorescence nanoparticles, have been reported to demonstrate high potential in biological imaging and labeling. Recently, they have gained numerous attentions due to their remarkable fluorescence emission property, high stability over time, non-photobleaching and low toxicity. Our research is focused on synthesis of CDs from different sources i.e. watermelon peels, sago starch, carbon soot and activated charcoal. The carbon nanoparticles were synthesized using different techniques and analyzed using UV-visible and fluorescence spectroscopy. All synthesized CDs produced broad UV absorption peak and shown to be capable of emitting fluorescent signals with different blue or green colour, thus providing a promising fluorescent imaging agent with convenient synthesis strategy.

CM-P- 9: CHEMICAL CONSTITUENTS OF *SYZYGium FILIFORME* VAR.  
*FILIFORME*

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*Syzygium filiforme* var. *filiforme* belongs to the genus *Syzygium* from Myrtaceae family. This family consists of approximately 133 genera and more than 3800 species whereas many of them are important edible fruits, spices, ornamental or medicinal plants. Many fruits of Myrtaceae family have a rich history of use both as edibles and as traditional medicines in divergent ethnobotanical practices throughout the tropical and subtropical world. The plants of this family are used as an analgesic, anti-inflammatory, and antipyretic remedies for the symptoms of respiratory infections, such as cold, flue, and sinus congestion. It seems that the bioactivity is associated with the presence of phenolic compounds or with a high level of oxygenated terpenes. Betulinic acid, a triterpenoid isolated from the methanolic extract of the leaves of *Syzygium claviflorum*, has potent inhibitory activity against human immunodeficiency virus type 1 (HIV-1). The objective of the present study is to isolate bioactive compounds from the stems of *Syzygium filiforme* var. *filiforme*. Dried stems of the plant were ground into fine powder using a cutter mill. The powder was successively extracted with hexane, dichloromethane and methanol. The dichloromethane extract was fractionated by using vacuum liquid chromatography and three triterpenes were successfully isolated from fractions number 7a, 7d and 11 by using radial chromatography technique. The structures of compounds were elucidated as betullinic acid (7a), alphetolic acid (7d) and arjulonic acid (11) by using spectroscopic techniques including NMR and LC-MS and comparison with literature.

**CM-P- 10: ANTIPLATELET AGGREGATION ACTIVITY IN HUMAN WHOLE BLOOD BY 5-HYDROXYFLAVANE, 2'-HYDROXYFLAVANONE, PINHOLE AND BERGENIN ISOLATED FROM STEM BARK OF *GARCINIA MALACCENSIS***

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The plant *Garcinia malaccensi*, (family *Guttiferae*) is used for medicinal purpose in Malaysia. The objectives of this study were 1) to screen the bioactivities of the crude extract from the selected plants, 2) to purify and elucidate the structures of its components 3) to determine the bioactivities of the isolated compounds. Stem bark of *Garcinia malaccensi* was collected from Pasoh, Negeri Sembilan, Malaysia, and was extracted. The extract was evaluated for its ability to inhibit platelet aggregation in human whole blood induced by arachidonic acid (AA), collagen, and adenosinediphosphate (ADP). Four isolated compounds inhibited platelet aggregation in a dose-dependent manner. Among the compounds tested, 5-hydroxyflavane, 2'-hydroxyflavanone, pinole and bergenin were shown to inhibit platelet aggregation. The compound bergenin showed inhibitory activity against aggregation caused by the three inducers, and was the most effective antiplatelet compound against collagen-induced platelet aggregation with an IC<sub>50</sub> value of 46.0 μM. 5-hydroxyflavane, 2'-hydroxyflavanone and pinole showed selective inhibitory activity on platelet aggregation induced by ADP and AA.

Keywords: Antiplatelet aggregation, 5-hydroxyflavane, 2'-hydroxyflavanone, Whole blood, *Garcinia malaccensis*



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**CP-O- 1: A SIMPLE MODEL OF PHARMACY SERVICE CHOICE MEDIATED BY  
BOUNDED RATIONALITY AND RISK ATTITUDES**

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Pharmacy value added services (VAS) were recently introduced to provide an improved delivery of pharmacy dispensing services for patients receiving their medications at major Malaysian public hospitals. Despite much effort from the Malaysian government, patient response has been poor. While, pharmacy VAS promises to deliver to the patient a higher quality of service and experience, most patients still prefer collecting their medication traditionally over the counter at the hospital pharmacy. In this paper, we draw inspiration from cognitive, psychological and behavioral economics theories and propose a simple model of patient choice where the patient has a choice between two pharmacy services of choice. We contribute to the literature by studying the behavioral foundations of patient choice within a behavioral utility framework mediated by risk attitudes of risk or loss aversion and cognitive biases. We contribute by incorporating internal mental biases with external contextual factors in a theoretical framework that is consistent with the latest research in psychology and behavioral economics. We conclude that our framework provides a simple workable methodology for testing. We can then derive policy implications that may explain why patients may prefer the traditional service instead of the innovation and thus assist in shedding light on how to improve the participation rate of patients in pharmacy VAS. Our model implies that it is possible for patients to prefer the older but more tedious service due to negative biases that lead them to perceive that any new services will not be of a better quality. This is mediated by their attitudes of risk or loss aversion where patients fear losing the option of their current service if they adopt the new service which they deem to be no more beneficial. We show that risk attitudes and cognitive biases prevent the adoption of VAS.

**Keywords:** Pharmacy value added services, Patient choice, Consumer behavior, Consumer choice

**CP-O- 2: DETERMINANTS OF MEDICAL APPS ADOPTION IN PHARMACY  
PRACTICE: AN EXPLORATORY STUDY**

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With the recent blooming and revolutionizing effect of mobile technologies and its related applications (apps), it is not uncommon that medical apps have seen to play a role in decision support within the health system including pharmacy practice. It is of great importance to learn about pharmacists' views towards the adoption of this new health information technology (HIT) in their practices prior to any mandatory implementation of the system. To investigate pharmacists' perception towards mobile medical apps use in pharmacy practice and to explore the acceptance factors and barriers that governs the adoption of this new Health Information Technology (HIT). Four moderator guided focus groups were conducted to collect substantial qualitative data. A total of 21 participants who were pharmacists from various fields took part in the focus groups. For each session, structured interview guide was used and discussion was audio recorded along with detailed field notes taken by assistant moderator. Electronic transcripts were then produced to ease data analysis using scissor-and-cut technique. The results revealed that medical apps were widely accepted by pharmacists and they were benefited from its use. Several acceptance factors were identified in endorsing medical apps: perceived usefulness, perceived ease of use, image/status quo, result demonstrability, facilitating conditions and subjective norm. Notwithstanding advantages of this HIT, participants have shown concerns over certain issues such as security over sensitive patient related data which might render a slow adoption of the system. Other potential barriers discovered include resistance to change and device/apps compatibility to integrate into existing health care system. Pharmacy is one of the crucial health care professions that must adopt informatics to embrace benefits delivered by technologies in improving health care quality. Hence, it is crucial to understand the way pharmacists react to and adopt the new emergence of technologies.

**Keywords:** Medical apps, Adoption, Pharmacy practice, Focus groups, Health information technology

**CP-O- 3: ESTIMATION OF AMIKACIN PHARMACOKINETICS IN  
HOSPITALIZED PEDIATRIC PATIENTS**

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This study was conducted to analyse the effectiveness of pharmacokinetics monitoring and to establish a population pharmacokinetics in hospitalized pediatric patients who have been treated with amikacin. The data consists of 104 pediatric patients which includes 77 male patients and 27 female patients. Population pharmacokinetics was calculated by using one-compartment model. The patients' parameters such as body weight, gender, age as well as creatinine clearance (CrCl) were analyzed to identify their potential influence on amikacin pharmacokinetics. Analysis of the data showed the mean and standard deviation of  $K_e$  ( $0.119 \pm 0.066$ ),  $t_{1/2}$  ( $8.026 \pm 6.239$ ) and  $V_d$  ( $0.630 \pm 0.993$ ). This study revealed that this population has a wide inter-patient variability with the coefficient of variation showed (COV) for  $K_e = 54\%$ ,  $t_{1/2} = 72\%$  and  $V_d = 157\%$ . Therefore, individualized pharmacokinetics is very crucial among pediatric patients treated with amikacin in order to achieve therapeutic effect and ensuring minimal adverse effect.

Keyword: Pharmacokinetics, Pediatric, Amikacin

**CP-O- 4: DRUG UTILIZATION REVIEW AT COMMUNITY PHARMACY**

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Drug utilization review has been used to monitor the changing pattern in drug usage in a community. The pattern of drug usage, especially drugs that can be purchased without a prescription, for instance non-steroidal anti-inflammatory, is influence by the location of the pharmacy, the patron of the pharmacy and how active the pharmacist plays his or her role to educate the patient. The purpose of this study is to see the pattern in drug usage in the community pharmacy at three centers. Drug usage information for selected drugs from four group of treatment class was collected from three centers. The centers were selected based on convenience and have different patrons as well as different locality. The data collected is calculated using the daily defined dose formulation. A general evaluation of the data was also done to determine the difference in dispensing pattern and drug of choice. A statistical analysis was done to determine if there was any significant difference in the drug usage in each center. From the data collected we can conclude that the locality and how active the pharmacy promote the drug used will determine the drug use pattern in the specific area.

Keywords: Community pharmacy, Define daily dose, Drug utilization review

**CP-O- 5: AN ASSESSMENT OF HEALTH AND SOCIOECONOMIC STATUS OF  
ORANG ASLI (INDIGENOUS PEOPLES) FROM KAMPUNG AIR BAH VILLAGE,  
LENGGONG, STATE OF PERAK, MALAYSIA**

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‘Orang Asli’ are the indigenous minority peoples of Peninsular Malaysia who are still behind the mainstream development. To assess the health and socioeconomic status of the Lanoh ethnic of Orang Asli population in Kampung Air Bah village, state of Perak. A health screening and survey were conducted on 13th April 2013. Thirty subjects were recruited via convenient sampling. Of the screened subjects, approximately 37% had high percentage body fat and 20% were obese and had high waist-to-hip ratio respectively. New cases of high blood pressure (n = 4), high blood sugar (n = 5), high uric acid (n = 12), high total cholesterol (n = 4) and poor lung function (n = 11) were discovered and referred for further diagnostic investigations. Regarding the socioeconomic status, 50% were uneducated and 89% of the working subjects were rubber tappers with median monthly household income of RM 300. The average children per family were 3.6. When assessing the home sanitary conditions, approximately 37% had no flush toilet while 27% had no toilet. They obtained drinking water supply from the hill. Assessment of health seeking behaviour found 13% of the subjects never had medical checkup and around 53% obtained treatments from government facilities. Around 27% still utilized herbal medications but majority (66.7%) agreed that modern medications were more effective and safe. Thirty percent kept their medications in refrigerator and exposed places and 36.7% shared medications with others. Approximately 87% had no difficulty in identifying their medications when prescribed more than one. Majority (76.7%) of the subjects were willing to pay for their medical expenses. However, the median monthly household medical expenses were only RM 15. Orang Asli are still under the poverty group and their health status remains low. Education should be emphasized to improve their quality of life.

**Keywords:** Health screening, Socioeconomic status, Indigenous peoples, Malaysia, Orang Asli



**CP-O- 6: RELIABILITY AND VALIDITY FOR THE MALAYSIAN VERSION OF  
CHILDREN HEALTH SURVEY FOR ASTHMA USING A MODERN  
PSYCHOMETRIC PERSPECTIVE**

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In recent years, health-related quality of life (HRQOL) has become an imperative outcome measure in epidemiologic studies and clinical trials. As for patients with asthma, there are numerous HRQOL instruments but most of them have been developed in English. With the increase in research projects, researchers working in other languages have two options of either to develop a new instrument or to translate an already developed instrument. Children Health Survey for Asthma was developed by American Academy of Paediatrics which available in two versions of parents (CHSA) and child (CHSA-C). However, there is no Malay version of the CHSA and the CHSA-C. The aim of this study was to translate and determine the validity and reliability of the Malaysian versions of CHSA and CHSA-C. Both questionnaires were translated to Bahasa Melayu using previously established international translation guidelines. Data from 32 pairs of asthmatic children and their parents were analysed using Rasch-Model; as, it is an approach that has been increasingly used in health field and it also explores the performance of each item rather than total set score. The internal consistency was high for the CHSA (reliability score for persons = 0.92 and for items = 0.88), and good for CHSA-C (reliability score for persons = 0.83 and for items = 0.78). Moreover, this study showed that all item measures for both questionnaires (CHSA and CHSA-C) were fitted to Rasch-Model. This study produced questionnaires that are conceptually equivalent to the original, easy to understand for the children and their parents, and good in terms of internal consistency.

**Keywords:** CHSA, CHSA-C, Rasch-Model, Reliability, Validity

**CP-O- 7: VALIDATION OF THE KNOWLEDGE, ATTITUDE AND PRACTICE OF  
ASTHMA INSTRUMENT AMONG COMMUNITY PHARMACISTS USING RASCH  
ANALYSIS**

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The most common problem with asthma patients is suboptimal drug use. The better compliance to asthma treatment can be achieved by fulfilling the needs of the patients and improving the communication between the health care professionals and patients. There is no instrument which collectively assesses the knowledge, attitude and practice of asthma among community pharmacists. This study aimed to validate the questionnaire which measures the knowledge, attitude and practice of asthma among community pharmacists. Thirty three community pharmacists in Penang, Malaysia, were randomly selected and recruited for this baseline study. Self-administered questionnaires were directly distributed and collected by the investigator himself. The extracted data from the completed questionnaires were analysed using Rasch model (Bond & Fox (2007) software). The results showed that all PTMEA Corr were in positive values, where an item was able to distinguish between the ability of respondents. Based on the MNSQ infit and outfit range (0.60 - 1.4), 6 out of 82 items were suggested to be reviewed. The findings indicated that the instrument fits Rasch measurement model and shows the acceptable reliability values. The questionnaire seemed to be useful tool for research purposes to assess the knowledge, attitude and practice of asthma among community pharmacists.

**Keywords:** Rasch analysis, Asthma questionnaire, Validation

**CP-O- 8: EFFECT OF ANTENATAL CORTICOSTEROIDS ON RESPIRATORY MORBIDITY IN LATE PRETERM INFANTS**

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Late preterm infants (LPI) have higher incidence of respiratory disorders like, transient tachypnea of the newborn, respiratory distress syndrome, pneumothorax, and pneumonia compared to term infants. Antenatal corticosteroids (ANCS) enhance fetal lung maturation which has beneficial effects on infants born before 34 weeks of gestational age (GA). We do not clearly know whether LPI born to mothers who received ANCS before 34 weeks benefit from them. To compare respiratory morbidity between LPI born to mothers who received ANCS and LPI born to mothers who did not receive ANCS. In a case-control study, LPI who were born to mothers who receive ANCS at 24-34 weeks of GA were matched with LPI whose mothers did not receive ANCS (control) by GA, birth weight and year of birth. (1:1 match). Respiratory morbidities were evaluated in each group. Three hundred and fifty-four LPI GA  $34 \pm 0.74$  wks met the criteria for inclusion. ANCS was not decrease risk of overall respiratory morbidity. RDS trends to be lower in antenatal corticosteroids group

Keywords: Antenatal corticosteroid, Late preterm infant, Respiratory morbidity

**CP-P- 1: CHARACTERISTICS, RISK AND OUTCOME OF NEONATES  
PRESCRIBED WITH EMPIRIC ANTIBIOTIC THERAPY IN THE PREVENTION  
OF EARLY ONSET SEPSIS IN HOSPITAL RAJA PERMAISURI BAINUN IPOH  
PERAK**

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Neonatal sepsis currently causes 1.6 million deaths annually in developing countries and it is also the main reason for hospitalization in Neonatal Intensive Care Unit. Early onset sepsis still remains the significant risk factor for mortality and morbidity in neonatal period. To describe the characteristics and outcome of neonates treated with empiric antibiotic for suspected early onset sepsis (EOS). This is a retrospective study conducted in Hospital Raja Permaisuri Bainun. Records of neonatal patients admitted within 72 hours of life and prescribed with empirical antibiotic therapy for suspected EOS were reviewed. 274 cases meet the inclusion criteria and divided into gestational age (premature = < 36 weeks; term =  $\geq 37$  weeks) and birth weight (Low birth weight (LBW), < 2.5 kg; normal body weight (NBW),  $\geq 2.5$  kg) groups. Premature and LBW (n = 172) neonates have significantly higher incidence of prolonged rupture of membrane > 18 hours and required higher antibiotic during pregnancy, perinatal steroid, surfactant, ventilator support and longer hospital stay (p > 0.05). More than 90% of premature and LBW neonates were diagnosed with congenital pneumonia and presumed sepsis. Term and NBW (n = 102) neonates have significantly higher incidence of meconium stained amniotic fluid (p < 0.05) which are consistent with higher diagnosis of meconium aspiration syndrome. More than 80% of both gestational age and birth weight groups presented with at least one respiratory symptom. Incidence of proven EOS was (14) 5%. C-penicillin plus gentamicin regimen is the standard therapy for all groups and started within 24 hours of life with median treatment duration of 3 days. 78 (77%) of term and NBW neonates discharge well while 74 (43%) of premature and LBW neonates required referral. Both gestational age and birth weight groups presented mainly with respiratory symptoms. The standard empiric antibiotic regimen prescribed showed good coverage for EOS with 260 (95%) treatment success rates.

**Keywords:** Early onset sepsis, Neonates, Empiric antibiotics

**CP-P- 2: PUBLIC AWARENESS OF ADVERSE DRUG REACTIONS REPORTING  
IN KOTA KINABALU**

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There is a lack of awareness in adverse drug reactions (ADRs) reporting in the public despite Malaysian Adverse Drug Reaction Advisory Committee (MADRAC) has established the system for more than decades. Provided if there is greater awareness of ADRs reporting by patients, unnecessary treatment and cost, as well as hospitalisation could be avoided. To investigate the awareness and its association with gender and age group among general population of Kota Kinabalu in reporting ADRs. 300 questionnaires were distributed randomly in Kota Kinabalu area and 254 participated, with respond rate of 84.7%. The questionnaire was divided into sections of demographic, public awareness of patient reporting to MADRAC, and importance of patient reporting. The data was presented in descriptive statistics and chi-squared tests was used to study the significance correlation between awareness and demographic variables, accepting the  $P$ -value  $< 0.05$  as significant value. The awareness of the public about patient reporting system was very low. However, 81.3% perceived that it was essential to report adverse drug reactions. Out of 254 respondents, only 124 (49.8%) respondents asked their doctors or pharmacists about side effects of the medicines that were prescribed to them and 91 (36.7%) respondents had side effects due to medicines. Only 63 (70.8%) had reported to their doctors/pharmacists/other health care professionals on their side effects. Whether or not their doctors or pharmacists made report to MADRAC was unknown. None of the respondents had ever reported directly to MADRAC. There was no significant association between awareness of patient reporting and demographic factors such as gender and age group. The public should learn the importance of ADRs reporting. The Ministry of Health Malaysia can work with The National Pharmaceutical Control Bureau in executing planning strategies to improve awareness in the country.

**Keywords:** Pharmacovigilance, Adverse drug reactions, Adverse drug reactions reporting, Public awareness, Madrac

**CP-P- 3: PATTERN OF ADRs ASSOCIATED WITH VARIOUS  
CHEMOTHERAPEUTIC REGIMENS AT ONCOLOGY DEPARTMENT OF  
TERTIARY CARE TEACHING HOSPITAL**

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Adverse Drug Reactions (ADRs) are the undesirable effects of the drug /medicinal product beyond its intended therapeutic effect when used for clinical purpose. A prospective observational study was aimed to evaluate the pattern of ADRs in hospitalised cancer patients at Mahatma Gandhi Memorial hospital, Warangal. Total 116 patients associated with hospitalizations were interviewed from March to August 2012 about symptoms related to drug therapy. Detected and suspected ADRs were analyzed for causality, severity, preventability and predictability using appropriate validated scales and were reported. A total of 439 ADRs were detected, documented, assessed for causality, severity, preventability and predictability using appropriate validated scales and were reported. The prevalence of ADRs mostly occurred in the age group between 41-50 years (30.75%) & most of the ADRs were seen in females (67.42%). Gastrointestinal system was the most commonly affected (54.44%); multiple drug therapy was identified as the major predisposing factor (39.65%). The possible ADRs according to WHO scale were 57.4% and according to Naranjo were 50.34%. The ADRs that are 58.08% were mild, 87% were preventable and 91.57% were predictable. During the study period, the incidence was found to be 88.79%. The study was its kind provided a baseline data regarding the safety profile of chemotherapeutic drugs in South Indian population. So, similar studies from different regions are needed to validate the findings of this study.

**Keywords:** Adverse Drug Reaction, Cancer, Chemotherapeutic drugs, Incidence, Prevalence.

**CP-P- 4: OVERALL SURVIVAL OF BREAST CANCER PATIENTS IN HOSPITAL  
KUALA LUMPUR**

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Breast cancer is the number one cancer afflicting women in Malaysia. However, no information is available about the prognostic factors of breast cancer in Malaysian patients. The objectives of this study were to determine the 5-year overall survival and prognostic factors in a cohort of breast cancer patients treated in Hospital Kuala Lumpur (HKL). This study retrospectively analyzed 317 female breast cancer patients who were diagnosed and underwent treatment in HKL between January 2002 and December 2003. Demographic data, treatment profiles, and tumor characteristics were collected from medical records and analyzed. Overall survival (OS) was analyzed using the Kaplan-Meier method and univariate analysis was performed using the log-rank test. The results showed that female breast cancer patients in HKL between 2002 and 2003 had 5-year overall survival of 92.4%. In addition, patients' age ( $p < 0.05$ ), lymph node status ( $p < 0.001$ ), tumor size ( $p < 0.001$ ), histologic grade ( $p < 0.001$ ), estrogen receptor status ( $p < 0.05$ ), operation ( $p < 0.001$ ) and hormonal therapy ( $p < 0.05$ ) were significant prognostic factors for patients' overall survival. A reduced OS was associated with increased tumor size, number of lymph node involved, negative ER expression, higher grade and younger age. In conclusion, the 5-year OS for female breast cancer patients in HKL between 2002 and 2003 was 92.4%. Age, tumor size, lymph node status, histologic grade, estrogen receptor status, operation, and hormonal therapy were significant prognostic factors.

**CP-P- 5: A PROPOSAL ON MEDICATION THERAPY MANAGEMENT  
PROGRAMME AT COMMUNITY PHARMACY IN MALAYSIA**

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Patient care is becoming increasingly complex with an ever increasing range of medicines and other interventions available to the healthcare team. Pharmacists have particular skills and expertise about medicines and their use. Community Pharmacy is one of primary healthcare provider that closely bonding to customer/patients and the outlet always located near to housing area. As a result they should also involve actively in providing pharmaceutical care and advising the patients relatedly. To review the implementation and practising of Medication Therapy Adherence Clinic (MTAC) in government setting in Malaysia and Medication Therapy Management (MTM) in Community Pharmacy in other countries. This is a descriptive study of reviewing the MTM in community pharmacy throughout the world. The information has been search from the articles in the internet and databases. The studies or articles that have been selected were involving MTAC/MTM in all countries. Study selected in English and Malay language. Data from the Connecticut Medicaid transformation project demonstrated, among other things, a 50% increase in the number of Medicaid patients who achieved their therapeutic goals, as a result of face-to-face pharmacist MTM services. Pharmacist interventions resulted in drug therapy that was of higher quality than before. Drug costs were substantially lower in a group that received pharmacist intervention versus a control group that did not. MTM services can improve patient's adherence, improve health outcomes as well as reduce medical cost especially in chronic disease. However, there are some barriers to implement MTM services and more aspect should be considered wisely before designing and implementing this programme at community pharmacy in Malaysia.



**CP-P- 6: CASE REPORT OF LAMOTRIGINE INDUCED STEVEN JOHNSON  
SYNDROME**

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A 39-year-old pregnant woman with a medical history of epilepsy arrived at the emergency department with a severe generalized skin reaction. About one day prior she had noticed lesion on her lips that had spread to her oral mucosa. She had also developed painful blisters at face, neck, chest abdomen, arms and legs. Ulcers over the lip and tongue worsened and she had difficulty to speak and eat. Her last fitting was about 2 months ago. She was admitted and discharged from the ward with Lamotrigine 25mg once daily about 3 weeks before she started experiencing the symptoms. Therefore, Lamotrigine was suspected to be the culprit and was discontinued immediately. The case was referred to dermatologist and the patient was given IV Hydrocortisone and hydrated with fluid. Sodium Bicarbonate gargle was prescribed to treat mouth ulcers, Triamcinolone Acetonide Dental Paste to reduce the pain in oral mucosa and Lignocaine gel was applied to her swelling lip. Calamine lotion and Fucidic cream were given to treat skin rashes and the blisters on all over the body. IV Ceftriaxone and Oral Erythromycin were prescribed due to the increased WCC and high grade fever during admission. Lamotrigine was substituted to Levetiracetam (Keppra) 500mg per oral bd. On day 4 hospital admission, IV Tramadol was given to treat pain in the mouth. After 5 days, the patient had improved substantially and was discharged. Dosing, prompt recognition, and patient education are crucial for preventing morbidity and mortality associated with the development of serious cutaneous reactions.

Keywords: Lamotrigine, Steven Johnson Syndrome

**CP-P- 7: PHENYTOIN INDUCED SEVERE CUTANEOUS ADVERSE DRUG  
REACTIONS (SCADRs) IN MALAYSIA**

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HLA-B\*1502 is associated with increased risk of Steven Johnson Syndrome (SJS)/ TEN on exposure to aromatic antiepileptic drugs, including phenytoin (PHT). Furthermore, there are link with phenytoin induce SJS with patient who had positive for HLA-B\*1502 in Hong Kong, Taiwan, and Thailand but lack evidence about this association in Malaysia. To determine the differences in the demographic and clinical features (i.e., age, gender, and dosages) between the SCADRs that may help to predict the severity of SCADRs induced by PHT and prevent life-threatening drug reactions and to analyze the frequencies of the SCADRs in multi-ethnic Malaysian population. Data was collected on April 2013 using Quest 2 databases. PHT adverse drug reaction reports received by MADRAC from 2000 to 2012 were extracted from the database and analyzed. Simple descriptive analyses, logistic and multiple regressions test was performed and the odd ratios (OR) and 95% confidence interval (95% CI) were calculated using Statistical Package for Social Sciences (SPSS version 20.0). From 2000 to 2012, 489 phenytoin ADRs received. Only 447 reports were analyzed. Of this, 99 reports were classified as severe cutaneous adverse drug reaction including SJS, TEN or HSS/DRESS. From 447 reports, 48% were male and 52% were female patients. From the Chi Square test, there is no association between ethnicity and the SCADRs of PHT ( $p > 0.05$ ). Multiple regression showed that age was the only variables was that statistically significant ( $p < 0.05$ ) OR 1.017(1.006, 1.029).

**CP-P- 8: ADVERSE DRUG REACTION REPORTING SYSTEM  
IN SELECTED SOUTH-EAST ASIAN COUNTRIES**

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Adverse drug reactions (ADRs) are one of the leading causes of morbidity and mortality, adding to overall healthcare cost. The impact of ADRs on patient safety, health cost and improved public health has led to the emergence of pharmacovigilance (PV). ADR reporting system should be efficient for evaluation, assessment, processing of the ADR report and establishing causal relationship between the suspected drug and the adverse reaction. To review the ADR reporting system that is currently practiced in South-east Asian countries and to find out the challenges faced in ADR reporting systems. This is a descriptive study of reviewing the ADR system in Malaysia, Thailand, Singapore, Philippines and Vietnam from each country's website of pharmacovigilance system. The information also has been search from the article in the internet and database. In Malaysia ADR reports were managed by the National ADR centre and submitted to Malaysian Adverse Drug Reactions Advisory Committee (MADRAC), whereas in Thailand Adverse Product Reaction Monitoring Centre (APRMC) operated under Technical Division, Food and Drug Administration (FDA) of Thailand. In Philippines, The Department of Health (DOH) Philippines has developed the Adverse Drug Online Reporting System (ADORS) to strengthen the reporting of ADR as required by the National Pharmacovigilance Center of the Food and Drugs Administration (NPC-FDA). While in Vietnam, the National Centre of Drug Information and Adverse Drug Reactions Monitoring were established by Ministry of Health and in Singapore the Pharmacovigilance (PV) Unit at Health Sciences Authority (HAS) is responsible for monitoring the safety of marketed drugs and related health products. Only three countries had online reporting system which is Malaysia, Philippines and Singapore. ADR reporting system in these countries is developing towards the pharmacovigilance requirements. There are some limitations and challenges, however these five countries have been struggled to ensure the drugs are safe to be used.

**Keywords:** Adverse drug reaction reporting system, Pharmacovigilance, Malaysia, Thailand, Singapore, Philippines, Vietnam

**CP-P- 9: A STUDY ON CLOPIDOGREL ADVERSE DRUG REACTIONS IN  
MALAYSIA**

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Genetic, clinical and pharmacokinetic factors may contribute to the variation in clopidogrel response. To date, there is no study specifically analyzing the data in all reported clopidogrel adverse drug reactions (ADRs) since the drug has been used in Malaysia; the data may be useful for better management and may lead to reduction of ADRs. To examine clopidogrel ADR categories, severity of the ADRs and demographic characteristics of the patients; and to identify the association between demographic characteristics and ADRs. This retrospective, cross-sectional study was conducted in the National Centre for ADR Monitoring in April 2013. The ADR data was collected from 2003 to 2012 and was analyzed using the Microsoft Excel and SPSS for Windows version 19. There were 99 ADR reports associated with clopidogrel from 2003 till 2012 in Malaysia. The total ADRs was 153 as each report may consists of more than one reaction. Skin and appendages disorder (n = 35) was the highest ADR category followed by gastro-intestinal disorder (n = 32). Most of the ADRs were reported as moderate in terms of severity (48.5%). Majority of the patients were male (55%), Malay (44.4%) and aged 61 years old and over (47.5%), mean age = 60. However, there were no significant associations of either racial or gender proportion with the type of ADR ( $p > 0.05$ ). Monitoring of clopidogrel ADRs is vital. No evidence to suggest that clopidogrel ADRs were associated with gender and ethnicity. Nevertheless, further research with a larger data and longer duration is needed as well as complete information of ADR report.

**CP-P- 10: VANCOMYCIN ADVERSE DRUG REACTIONS RELATED TO SKIN  
REACTIONS AND NEPHROTOXICITY IN MALAYSIA**

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Vancomycin is known to be safe in normal dose, but somehow Vancomycin adverse drug reaction (ADR) do not related to Vancomycin level. To identify ADR related to Vancomycin particularly skin reactions and nephrotoxicity, the association of ADR with socio-demographic factors and identify causing factor for both reactions. This retrospective, cross-sectional study was conducted in the National Centre for ADR Monitoring in April 2013. The data were collected from 2000 to 2012 and were analyzed using the Microsoft Excel and SPSS for Windows version 21. 249 reports that consist of 476 reactions were included. 75.5% were skin reactions and 10.4% was nephrotoxicity. Skin reactions occurred in 42.6 % male. Patients aged 30-59 years old ( $p = 0.039$ ) were the highest aged group reported to get skin reactions. Malay ethnicity was the highest reported having skin reactions (49.4%) and also was the majority in nephrotoxicity. Most of the reported skin reactions occurred rapidly ( $< 60$  minutes) after administration ( $p = 0.149$ ) but for nephrotoxicity has late onset ( $> 24$  hours) after administration. Indians and Malays have been associated with nephrotoxicity ( $p < 0.005$ ). Paediatrics ( $\leq 12$  years old) and elderly ( $\geq 60$  years old) have higher risk to get nephrotoxicity; ( $p = 0.035$  and  $p = 0.030$  respectively). As the conclusion, Vancomycin associated with skin reaction is the major ADR reported in Malaysia. Ethnicity and age have association with skin and nephrotoxicity risk. It was found that there is no association between infusion time and skin reactions.

**Keywords:** Vancomycin, Adverse drug reaction, Adverse drug event, Skin reaction, Nephrotoxicity, Infusion time

**CP-P- 11: A STUDY ON WARFARIN ADVERSE DRUG REACTIONS IN  
MALAYSIA**

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Warfarin maintenance dose has been associated with numerous genetic and clinical factors including age, race, weight, height, smoking status, medications and polymorphisms of the CYP2C9. There is no study specifically analyzing the data in all reported warfarin adverse drug reactions (ADRs) since the drug has been used in Malaysia so far. To determine warfarin ADR categories, severity of the ADRs and demographic characteristics of the patients; and to identify the association between demographic characteristics and ADRs or doses that cause the ADRs. This retrospective, cross-sectional study was conducted in the National Centre for ADR Monitoring in April 2013. The ADRs data were collected from 2003 to 2012 and were analyzed using the Microsoft Excel and SPSS for Windows version 19. 200 warfarin ADR reports were received from 2003 until 2012 in Malaysia (total ADRs = 351). Skin and appendages disorder (n = 61) was the highest ADR category followed by gastro-intestinal disorder (n = 50). In terms of severity, majority of the ADRs were reported as 'unknown' (49.5%). Most of the patients were female (55%), Malay (43%) and aged 61 years old and above (47.5%), mean age = 58. Mean warfarin dose that causing ADRs was lower in female ( $3.3 \pm 1.6$ ) and Chinese ( $2.9 \pm 1.7$ ) but not statistically significant ( $p > 0.05$ ). Furthermore, there were no significant associations of either racial or gender with the type of ADR and age with warfarin dose ( $p > 0.05$ ). Monitoring of warfarin ADRs other than bleeding is quite important. No evidence to suggest that warfarin ADRs was associated with gender, ethnicity and age. However, complete information of ADR report with larger data and longer duration is required for further research in the future.

**Keywords:** Warfarin, Adverse drug reaction, Adverse drug event

**CP-P- 12: A REVIEW ON PHARMACIST-CONDUCTED MEDICATION  
RECONCILIATION IN THE PREVENTION AND REDUCTION OF MORTALITY  
AND MORBIDITY**

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Medication reconciliation involves the process of avoiding such inadvertent inconsistencies by reviewing the patient's complete medication regimen at the time of admission, transfer, and discharge. Medication reconciliation is a part of medication safety initiative towards improving patient safety; which is one of the major concerns in pharmacoepidemiological study. Pharmacist as a healthcare professional plays a major role in managing this activity. Thus, it is essential to assess whether pharmacist-conducted medication reconciliation contributes in the prevention or reduction of mortality and morbidity. The aim of this study is to evaluate the current evidence regarding pharmacist-conducted medication reconciliation. A comprehensive literature search were conducted in computerized databases using key words and standard vocabulary in the PubMed, CINALH, Science Direct, Ovid-Medline and Google Scholar databases that were published from January 2000 up to the most recent publications. Studies were selected regardless of publication status. The patient outcomes explored included mortality, hospital re-admissions, Emergency Department (ED) or unplanned general practitioner (GP) visits/ attendances, hospital re-admission, adverse drug event (ADE) and unintentional medication discrepancies or medication errors. This study showed uncertain results in each outcome. This review could only reveal that pharmacist-conducted medication reconciliations discovered clinically significant unintentional medication discrepancies. Generally, this review found insufficient evidence to prove that pharmacist-conducted medication reconciliations have an impact in preventing and reducing mortality and morbidity. Future studies are needed to focus on specific populations, use well described methods when conducting the medication reconciliation, have long-term follow-up, could preferably also assess the effect of the various co-interventions and identify patient features that more consistently.

Keyword: Pharmacist, Medication Reconciliation, Mortality, Morbidity

**CP-P- 13: THE IMPACT OF GARLIC ON LIPID PARAMETERS: A SYSTEMATIC  
REVIEW AND META-ANALYSIS**

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Evidence from numerous studies suggested regular intake of garlic has reduced blood cholesterol level. However, the inconsistency results have been shown from the studies. In order to determine the impact of garlic in reducing lipid level and any variables that also contribute to the impact, this study was conducted. To determine the impact of garlic effects on lipid parameters level i.e. total cholesterol (TC), Triglyceride (TAG) levels, as well as LDL and HDL and establish if any other variables have an impact on the magnitude of the effect, this meta-analysis was conducted. A systematic literature search using PubMed, ProQuest, Springer Link, Science Direct and Ovid databases that published in January 1966 until December 2013 were done. The studies identify randomised, placebo-controlled trials of garlic in the form garlic powder tablets involving human subjects that examined the effect of garlic (*Allium sativum*) on blood cholesterol that reported effects on TC, TAG concentrations, LDL or HDL. Overall, garlic was found not significantly reduce the levels of TC by 0.00 (95% CI - 0.09, 0.09) mmol/l compared with placebo. There was a moderate amount of statistical heterogeneity among the studies and one study reported 95% CI that did not cross the pooled effect. Garlic significantly lowered Triglyceride (TG) levels by 0.19 (95% CI 0.13, 0.25) mmol/l compared with placebo. There was a moderate degree of statistical heterogeneity among the studies. Garlic did not exhibit significant effects on either LDL or HDL concentrations. Garlic's effect on TC was found to be greater in studies of 12 weeks or longer and with. No large differences in effects on LDL or HDL were noted for any subgroup analyses. Future studies with larger samples should be conducted evaluating the impact of garlic therapy on blood lipid parameters.

Keyword: Garlic, *Allium sativum*, Blood lipid parameters



**CP-P- 14: EFFECT OF EXTENDED VERSUS STANDARD INFUSION OF BETA LACTAMS ON CLINICAL CURE: A META ANALYSIS**

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Multi drug resistant pathogens pose dangerous threats in treatment of serious bacterial infection. New dosing strategies of beta lactams by utilising the pharmacodynamic and pharmacokinetic properties had been used in order to achieve the maximum therapeutic effect of the antibiotics. Prolonging beta lactams infusion may be able to increase the time above the minimum inhibitory concentration thus leading to a more effective treatment with better clinical outcome. A meta analysis was done by including results of clinical trials from the year of 2000 till 2012 comparing standard and prolonged infusion of beta lactams in order to determine whether the strategies will have an effect on clinical cure of the patients. Searches were made from MEDLINE, PUBMED, and EMBASE to identify relevant studies to be concluded in the meta analysis. Only studies published from 2000 were included in the analysis. Twelve randomized controlled trials were included in the study. Choice of dosing strategies were not found to be significant in improving clinical outcome of the patients (n = 927; pooled OR 0.802; 95% CI; 0.579 - 1.111). There is no clinical advantage in adapting prolonged infusion of beta lactams compared to standard infusion in improving clinical cure of patient with serious bacterial infection. However, the limited data on the sensitivity of the responsible pathogens making it impossible to run an analysis on the effect of the infusion strategies on multi drug resistant pathogens and also to a specific target group of patient. A bigger multi centered study is required in the future.

Keywords: Beta Lactams, Infusion, Extended, Prolonged, Intermittent

**CP-P- 15: NEVIRAPINE INDUCED RASH IN PATIENT NEWLY STARTED ON  
HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART)**

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Lead-in Nevirapine dosing is recommended for the first 2 weeks with starting Nevirapine 200 mg once daily (OD) for the first 14 days. If there is no rash and no signs of hepatic toxicity, dose may be increased to 200 mg twice daily (BD). Lead-in dose is recommended because Nevirapine induces its own metabolism and decreases the risk of rash and hepatitis. The aim of this communication is to report a case of Nevirapine induced rash in a patient newly started on Highly Active Antiretroviral Therapy (HAART). A 30 year old male newly diagnosed HIV positive just started on HAART regimen Tablet Combivir 1 tablet BD plus Tablet Nevirapine 1 tablet OD for the first 2 week which later was to be increased to Tablet Nevirapine 1 tablet BD. However patient started developing rash, fever, chills and rigors after 9 days of Nevirapine. Tablet Nevirapine was discontinued and patient continued with Tablet Combivir 1 tablet BD alone to complete for 1 week. During hospitalization, patient continued with Tablet Combivir 1 tablet BD to complete for 1 week from date of Nevirapine discontinuation and tablet Paracetamol 1 gm for the fever. Paracetamol was later discontinued due to increasing liver enzymes. Seven days after Nevirapine discontinuation, temperature settled and the rashes improved. Patient requested At Own Risk (AOR) discharge and was discharged with appointment for liver function monitoring as outpatient. Patient to restart HAART the next week with Tablet Combivir 1 tablet BD and Tablet Efavirenz 600 mg ON. In conclusion, Nevirapine induced rash is common and advise patient to monitor skin hypersensitivity reaction during the early stage of Nevirapine initiation is important to avoid progression of a more severe skin reaction such as Steven Johnson Syndrome.

Keywords: Nevirapine, HAART, Rash

**CP-P- 16: EFFICACY OF INJECTION PARACETAMOL VERSUS MORPHINE IN  
ACUTE PAIN MANAGEMENT: A SYSTEMATIC REVIEW OF RANDOMIZED  
CONTROLLED TRIALS**

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Pain is always a major concern in medical emergency setting especially in managing acute pain. Two studies have shown that more than 50% of emergency visit were due to pain. Method: We did the meta-analysis of randomized controlled trials (RCTs) comparing IV Paracetamol with Morphine in acute pain management. Nine RCTs which fits into the inclusion criteria were included. Pertaining to the pain reduction assessment using VAS scale and TOTPAR score, both analysis favouring IV Paracetamol with mean score of -2.49 (95% CI -6.69 to 1.71) and -4.85 (95% CI -6.39 to -3.30) respectively. However, only result based on TOTPAR score was statistically significant in pain reduction between IV Paracetamol and placebo. From this study, we can conclude that effectiveness of injection Paracetamol is as effective as morphine in reduction of pain with rapid onset. However, injection Paracetamol is proven safer as fewer side effect reported as compared to injection morphine.

Keywords: IV Paracetamol, IV Morphine, Pain, Adults

**CP-P- 17: IS SINGLE DOSE AZITHROMYCIN MORE EFFECTIVE THAN STANDARD TREATMENT OR PLACEBO IN THE RESOLUTION OF DIARRHEA AND BACTERIOLOGICAL SUCCESS AMONG PATIENTS WITH CHOLERA?**

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Cholera is an acute intestinal infection caused by ingestion of food or water contaminated with the bacterium *Vibrio cholera*. It causes watery diarrhea that may lead to severe dehydration and death if not treated promptly. The Malaysia National Antibiotic Guidelines recommends Doxycycline, Erythromycin or Ciprofloxacin in cholera for adults. Oral Trimethoprim/ Sulfamethoxazole, Erythromycin and Doxycycline are recommended in paediatrics. However since there are increasing reports of resistance with current standard antibiotics in Malaysia, we would like to search for other antibiotic options in treating cholera. The aim of this study is to identify the possible effectiveness of single dose Azithromycin as an alternative antibiotic in treating cholera. The effectiveness was measured by clinical success -cessation of watery stool, and bacteriological success (defined by absence of *V.cholerae* from stool or rectal swab). Four randomized control trials were included after articles screening. Two papers involved paediatrics and two involved adult men. Analysis on paediatrics and adults were conducted separately. Clinical and bacteriological outcomes were expressed as odds ratio (OR) with 95% confidence intervals (CI). Mantel-Haenszel (M-H) fixed effects model was used to calculate the odds ratio. In paediatrics, single dose Azithromycin produced better clinical success compared to control group (Odds ratio 3.371, 95%, confident interval 1.749 - 5.740). However, there was no difference in bacteriological success between both groups. (Odds ratio 0.816, 95% Confidence interval 0.382 -1.739). Azithromycin also produced better clinical success among adults, when compared to control group (odds ratio (OR) 3.525 with 95% confidence interval (95% CI) 2.389 to 5.202). Single dose Azithromycin also produced better bacteriological success (Odds ratio 5.871, 95% Confidence interval 1.3908- 8.818). In conclusion, this review showed that single dose Azithromycin is more effective in cessation of diarrhea in both paediatrics and adults as effective as standard antibiotics in cessation of *Vibrio Cholerae* shedding.

Keywords: Cholera, *Vibrio cholerae*, Single dose Azithromycin

**CP-P- 18: DRUG UTILIZATION REVIEW OF CEFEPIME AND  
PIPERACILIN/TAZOBACTAM FOR NOSOCOMIAL INFECTION IN MEDICAL  
WARDS OF A TERTIARY HOSPITAL**

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In view of high prevalence of the nosocomial infection (NI) in Malaysia which lead to increase in mortality, morbidity and great financial burden. Thus, drug utilization review on the usage of Cefepime and Piperacilin/Tazobactam as a treatment for NI particularly hospital acquired pneumonia (HAP) provide a data regarding the pattern of drug usage for evaluation of rational drug therapy. The aims of this study were to identify the pattern of antibiotic usage between Cefepime and Piperacilin/Tazobactam, to compare the calculated hospital Defined Daily Dose (DDD) with World Health Organization (WHO) DDD of that antibiotic and to evaluate the total drug cost per day and drug cost acquisition for each antibiotic. This study was performed in 3 medical wards of tertiary hospital from January – December 2012. Data on the usage were retrieved from the in-patient pharmacy record. The data were analysed and calculated for DDD and drug acquisition cost. The total usage of Cefepime injection is 2110 vials and Piperacillin/Tazobactam injection is 1215 vials and both antibiotics have highest usage in July to September 2012. The calculated DDD for Cefepime is 2.9 (WHO DDD: 2 but prescribed daily dose (PDD): 4), while Piperacillin/Tazobactam DDD is 1 (WHO DDD: 14). The treatment for one course of 7 days treatment for Piperacillin/Tazobactam 4.5g four times daily (RM1307.32) is equal to 1.8 times cost of Cefepime 2g twice daily (RM736.40). In overall, Cefepime was preferred due to the equal efficacy and cheaper drug acquisition cost compared to Piperacillin/Tazobactam and the antibiotics usage was rational and not overused.

**Keywords:** Drug utilization, Cefepime, Piperacillin/Tazobactam, Nosocomial infection, Hospital acquired pneumonia

**CP-P- 19: ADVERSE DRUG REACTIONS ASSESSMENT IN INTRAVENOUS  
ANTICOAGULANTS**

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Pharmacovigilance is the process of monitoring products as being used in everyday practice to identify previously unrecognised adverse reactions during clinical trials or changes in the patterns of their adverse effects due to larger and varied ethnic and population usage. The type of ADR that caused by intravenous anticoagulant group was examined by retrospective study at a single setting center. Data were collected at Pusat Pasca Pendaftaran Produk – Seksyen Farmakovigilans (Unit Pengendalian ADR), Bahagian Perkhidmatan Farmasi, Kementerian Kesihatan Malaysia, Petaling Jaya. Data on reported ADR from year 2000 to 2012 of heparin, enoxaparin, and fondaparinux were collected from a database system called Quest 2 System and transferred to Microsoft Excel 2010. Any incomplete data were excluded from the analysis. Anticoagulants and protamine is categorized as Cardiovascular System in Drug Formulary Ministry of Health (MOH). A number of cases reported per year keep increasing since 2004 to 2011. There is no significant difference in mean of age between male and female ( $p > 0.05$ ). The common of ADR reporting by System Organ Class (SOC) for these three anticoagulants are platelet, bleeding and clotting disorders, gastro-intestinal system disorders, skin & appendages disorders, body as a whole-general disorders, and respiratory system disorders. Overall the findings show that a group of Intravenous Anticoagulant has a similar in number of ADR report by System Organ Class. This study has many limitations especially for incomplete ADR form. Therefore, further research using appropriate study design should be conducted in the future.

Keywords; Adverse drug reactions, Pharmacovigilance, Intravenous anticoagulants

**CP-P- 20: PHARMACOVIGILANCE: A WORLDWIDE MASTER KEY FOR DRUG  
SAFETY MONITORING**

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Pharmacovigilance is like a sunshade to describe the processes for monitoring and evaluating ADRs and it is a key component of effective drug regulation systems, clinical practice and public health programmes. The number of Adverse Drug Reactions (ADRs) reported resulted in an increase in the volume of data handled, and to understand the pharmacovigilance, a high level of expertise is required to rapidly detect drug risks as well as to defend the product against an inappropriate removal. The current global network of pharmacovigilance centers, coordinated by the Uppsala Monitoring Centre, would be strengthened by an independent system of review. This would consider litigious and important drug safety issues that have the potential to affect public health adversely beyond national boundaries. Recently, pharmacovigilance has been confined, mainly to detect adverse drug events that were previously either unknown or poorly understood. Pharmacovigilance is an important and integral part of clinical research and these days it is growing in many countries. Today many pharmacovigilance centers are working for drug safety monitoring in this global pitch, however, at the turn of the millennium pharmacovigilance faces major challenges in aspect of better safety and monitoring of drugs. In this review we will discuss about drug safety, worldwide pharmacovigilance centers and their role, benefits and challenges of pharmacovigilance and its future consideration in healthcare sectors.

**CP-P- 21: A STUDY ON PRESCRIBING PATTERN OF ANTIHYPERTENSIVES**

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Hypertension is one of the major chronic diseases resulting in high mortality and morbidity. The present prospective study was carried out for six months with the aim to assess the prevalence and demographic profile of the hypertensive patients and also to study the prescribing pattern of antihypertensive drugs. A total of 263 prescriptions for essential hypertension were studied and data was obtained by scrutinizing the out-patients cards and laboratory reports attending the medicine out-patient department of the hospital. Out of 263 patients, 156 (59%) were males and 108 (41%) were females and maximum number of patients were in the age group of 50-59 years 116 (32.2 %). The study revealed that 149 (56.7%) of the patients belonged to Stage 1 (140- 159/90-99), followed by 94 (35.7%) of patients in Stage 2 (>160/ >100) and 20 (7.6%) of the patients belonged to the Pre-hypertension stage. The results of pharmacotherapy revealed that dual therapy was the most preferred choice of treatment in reducing systolic blood pressure with ARBs +  $\beta$ -blockers ( $p < 0.0011$ ) than ARBs alone whereas in diastolic blood pressure there is a higher percentage of reduction with ACEI + CCBs ( $p < 0.001$ ) compared to ACEI alone. Hence, the study concluded that day to day management, treatment adjustment and constant follow up is necessary for the management of hypertension and also to treat further complications associated with hypertension.

**Keywords:** Hypertension, Prescribing patterns, Antihypertensive drugs.



**CP-P- 22: PROSPECTIVE STUDY ON ASSESSING PATIENT'S AWARENESS ON  
DIABETES MELLITUS**

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Diabetes is a metabolic syndrome characterized by high blood glucose resulting in either low level of insulin or abnormal resistance to insulin. The present study was carried out for six months in 5 diabetic clinics and obtained a group of 153 diabetic patients. The study indicated that the male diabetic population (85) was predominantly higher than females (68). The Questionnaire was developed, validated based on various aspects to assess patient's knowledge on diabetes which included basic aspects, symptoms, diagnosis, blood glucose levels, complications, emergency conditions, insulin usage, diet, physical activities, etc. The collected data was analyzed and each positive answer given by the patient was awarded one mark and the percentage of awareness was estimated. Our study revealed that 86% (n = 153) had known the term 'diabetes'. Out of 30 type I patients 33 % and out of 123 type II patients 34 % knew the type of diabetes they were suffering from. The study also shown that 86% knew that increased thirst, appetite, frequent urination, loss of weight, and prolonged wound healing are the major symptoms of diabetes and 100% told that they experienced loss of sensation peripherally. 100 % patients knew about the diagnostic tests and blood sampling time, but only 16% about HbA<sub>1C</sub>. The study concluded that the pharmacist, physician and also government play a major role in creating awareness about diabetes among the people.

**Keywords:** Diabetes Mellitus, Patient's awareness.

**CP-P- 23: THE USE OF ORAL ETHANOL IN METHANOL POISONING: A  
REPORT OF TWO CASES**

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Methanol is cheaper than ethanol and may be used to fortify illicit spirits. There are case reports of methanol toxicity from ingestion of these tainted spirits. Antidotes are IV Fomepizole, IV Ethanol and oral ethanol. IV Fomepizole has higher affinity to alcohol dehydrogenase with less adverse effects but is very costly and not widely available. IV Ethanol has better bioavailability than oral ethanol but requires a central line and close monitoring. The aim of this paper is to report two cases of acute methanol toxicity treated with oral ethanol. Differential diagnosis was made as possible Methanol poisoning considering the severe metabolic acidosis, with recent outbreak of 13 methanol poisoning among the same nationality foreign workers. Two foreign workers were admitted after ingestion of alcohol beverages suspected tainted with methanol. Patient 1 showed enteric symptoms and seizure while Patient 2 showed sudden visual inability. Both patients deteriorated in the Emergency Department and were intubated. Both patients had severe metabolic acidosis with wide anion gap and acute renal failure. Oral ethanol was initiated with loading dose of 120ml in patient 1 and 125 ml in patient 2 followed by maintenance dose of 35ml/hour and 40ml/hour respectively for 48 hours. None of the patients experienced hypoglycemia during the oral ethanol therapy. Patients also underwent Continuous Renal Replacement Therapy (CRRT). Other treatment modalities include IV Sodium bicarbonate for the severe acidosis, Folic Acid and Thiamine. Both patients were extubated on Day 3. Metabolic acidosis and clinical symptoms were resolved and both patients discharged well after a week of hospitalization. In conclusion, oral ethanol may be considered as a cheaper and more available option as an antidote for methanol toxicity where resources are limited.

**Keywords:** Methanol toxicity, Oral ethanol

**CP-P- 24: A REVIEW OF DRUG INFORMATION AND ITS SYSTEM IN  
COMMUNITY PHARMACY**

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This study aimed to identify the types of drug information resources used by community pharmacists in daily practice in 4 selected pharmacies in Malaysia. A cross-sectional based survey and face to face interview was conducted in 4 selected community pharmacies in (Selangor and Kuala Lumpur). Tertiary drug resources were used by the majority. Other sources used to provide drug information were leaflets provided by company representatives, professional peers and drug seminar/CME. The fastest source of information is by log in into MIMS Malaysia Online or other trusted website. The use of tertiary sources of drug information was more common among community pharmacists in the pharmacies despite the benefits of using primary information.

**CP-P- 25: MANAGEMENT OF DYSLIPIDEMIA IN HIV PATIENT WITH HAART**

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Survival of HIV positive patients have increased dramatically since the introduction of antiretroviral therapy (ART). However, as people with HIV live longer, non-HIV medical conditions become more important and relevant, particularly coronary heart disease. Dyslipidemia has been linked to HIV infection and also its treatment. Among all classes of ART, protease inhibitors have been the most associated with dyslipidemia CASE. This is a case report of HIV positive patient diagnosed since 2001 with dyslipidemia. He has been receiving intermittent pravastatin and gemfibrozil. This patient had also been diagnosed with chronic renal impairment and under follow up at Hospital Selayang. Calculated Framingham risk score was 16%. It is highly suggested for the anti-dyslipidemia to be prescribed continuously for this patient. Risk of dyslipidemia and subsequent development of cardiovascular disease is different in every patient, suggesting for involvement of host factors too. Treatment must be monitored cautiously and deployment of non-pharmacological intervention should be done first before the introduction of pharmacological intervention. Aggressive treatment of dyslipidemia is crucial in managing and preventing cardiovascular disease similarly in patients with or without HIV infection. Side effects may affect patient's adherence to treatment, thus continuous monitoring is warranted and dedicated counselling is needed to instil confidence to the patients.

Keywords: Dyslipidemia, HIV positive, Antiretroviral therapy (ART), Cardiovascular disease

**CP-P- 26: DRUG UTILIZATION REVIEW OF IMIPENEM AND MEROPENEM  
INJECTION**

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Ministry of Health has come out with Malaysian National Medicines Policy (MNMP) in 2009 to promote equitable access, rational use of safe, effective, affordable and good quality of essential drugs to improve health outcomes. Imipenem and Meropenem are broad spectrum antibiotics and widely used in hospitals. However, the consumption may cause collateral damage which linked to other colonization or infection and inappropriate use of it may cause antibiotic resistance. Drug utilization review is useful in providing information on drug utilization patterns and cost. The outcome is beneficial in developing hospital drug policies and initiating studies related to the drugs. The objective of this study is to evaluate drug utilization pattern of Imipenem and Meropenem Injection. Data were collected from January 2012 to March 2013 (quarterly per year) for all wards except paediatric wards. Defined Daily Dose (DDD) for 100 admission and 1000 bed days were used in this study. Data showed that DDD for Imipenem and Meropenem were the highest in January – March 2013, with 6 DDD/100 admission and 14.3 DDD/1000 bed days for Imipenem and 18.2 DDD/100 admissions and 43.6 DDD/1000 bed days for Meropenem. The highest DDD/100 admissions in 2012 and January - March 2013 for Imipenem were anaesthesiology department and neurosurgery department for Meropenem. Highest DDD/1000 bed days in 2012 and January-March 2013 for Imipenem and Meropenem was anaesthesiology department. Imipenem and Meropenem usages were in escalating trend, thus further evaluation need to be done to ensure the appropriateness of the usage. In conclusion, drug utilization review can provide valuable data of drug usage and provide an early signal for further action to ensure the appropriate use of drug.

**Keywords:** Drug utilization review, Imipenem, Meropenem, Defined daily dose

**CP-P- 27: CARBIMAZOLE INDUCED AGRANULOCYTOSIS COMPLICATED  
WITH NEUTROPENIA SEPSIS IN THYROTOXICOSIS PATIENT: A CASE  
REPORT**

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Antithyroid drug (ATD) induced agranulocytosis is a rare complication but it may lead to mortality, mainly due to severe systemic infection, if appropriate medical intervention is not given immediately. The incidence occurs most frequently in first 3 months or delayed after long term treatment. The use of empirical antimicrobial therapy with anti pseudomonal activity is recommended. The recovery time ranged from 3 to 25 days and may be prolonged if there is granulocyte precursor aplasia. A 48 years old lady presented with high grade fever associated with chills and rigor and heat intolerance after 5 weeks of treatment for hyperthyroidism. Her full blood count showed agranulocytosis with a total white blood cell count (TWBC) of  $0.6 \times 10^9/L$ , neutrophils of 1.5 and absolute neutrophil count of 0.01. The septic workout did not reveal any infecting organism and she was treated empirically with broad spectrum antibiotics, IV Tazocin 4.5g TDS. All of her antithyroid drugs were stopped. Tab lithium started in view of her elevated thyroid hormone. After 1 week of antibiotic treatment her temperature was still persistently spiking with no improvement in her neutrophil count, IV Meropenem, antifungals and IV Vancomycin were commenced. After completing 14 days of combination antimicrobial, her TWBC and neutrophil improved and normalized and she made an uneventful recovery. Upon recovery, she subsequently was planned for radioiodine therapy in almost next 2 weeks after discharge in HKL. In conclusion, conducting a routine complete FBC is beneficial in alerting caregivers and the physician to the possibility of agranulocytosis, educating patients about the common symptoms of agranulocytosis may contribute to an early diagnosis, providing GCSF therapy to patient results in a faster recovery and good prognosis and monitoring for cross-reactions between drugs should be performed to prevent further episodes of agranulocytosis.

**CP-P- 28: DO DEXMEDETOMIDINE HAVE A ROLE AS POST-OPERATIVE  
ANALGESIC AGENT? : A SYSTEMATIC REVIEW**

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Dexmedetomidine (DEX) is a novel alpha2-adrenergic receptor agonist. DEX possesses more selective affinity for alpha2- adrenergic receptor which is approximately eight times more specific than clonidine. In addition to that, DEX has been proved to exert mild analgesic properties. Due to its properties on sedation, lack of respiratory depression and analgesia effect, DEX is useful and safe in many clinical applications. One of it is in the postoperative period for patients having major surgical procedures that are associated with significant pain. The objective of this review is to evaluate and critically appraise the available evidence to determine the role of DEX as postoperative pain control agent and in controlling post-surgical pain in postoperative patients. Randomized controlled trials (RCT) that comparing DEX with placebo or any other analgesic in postoperative adult patients were identified through searches of PUBMED. Full text was obtained from SCIENCE DIRECT, OVID, or SPRINGER LINK. The search combined terms of 'DEXMEDETOMIDINE' with 'postoperative pain', 'postoperative analgesia', or 'postoperative analgesic'. All bibliographies of articles identified through the search strategy were screened for additional articles that were relevant to this review. This literature review included 7 trials where 6 was conducted as RCT while 1 as pseudo-RCT. This literature review found inconsistent effect of DEX on the intensity of the pain score but consistent result in significantly reducing the amount of rescue analgesia required in addition to DEX compared to the comparator group. In view of too few studies that have been done to effectively evaluate the analgesic effect of DEX in postoperative pain relief, further work is necessary to clarify its role in postoperative pain management. The development of a prospective, randomized, controlled multicenter trial with an adequate number of patients is necessary to further elucidate the potentially beneficial effects of DEX for management of acute postoperative pain.

**CP-P- 29: DETERMINANTS OF SMOKING STATUS IN COPD: A STUDY FROM  
ADHERENCE CLINIC AT HOSPITAL MELAKA**

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Smoking is the most important risk factor, and about 50% of smokers develop Chronic Obstructive Pulmonary Disease (COPD). When diagnosed with COPD, many stop smoking, while some continue to smoke. Little is known of characteristics of smokers related to clinical features. We examined the predictive relationships between the medical variables and whether patients to be continue as smokers during their visiting to adherence clinic. We conducted a retrospective, observational study in Chest Clinic, Hospital Melaka. A total of 117 participants with COPD from moderate to severe were included in the analysis. Smoking status was assessed by using the Fagerstrom Test of Nicotine Dependence (FTND) while medical characteristics were collected from patient record. All participants (n = 117) were elderly, more of them were men, married, low educational level and retire or not working, had a history of cigarette smoking of at least 33 sticks per day and began smoking at least 15 years old. In this study, five expected predictors to COPD among smokers were number of medications, methylxantines, co-morbidities, cardiovascular disease and previous hospital admission. Multivariate analysis showed COPD is predictor to previous hospital admissions ( $p < 0.05$ ). Frequency of hospital admission (more than once) on smokers who were still continuously smoking was 2.99 times more likely (range 1.34 to 6.67 and CI 95%), when adjusted for others confounder. The finding showed, more frequently of hospital admissions is predictors to continuously smoking in COPD smokers in advance stages. Thus this finding showed the benefit of the early cessation of smoking. .



**CP-P- 30: EVALUATION OF BARRIERS TO MEDICATION ADHERENCE  
AMONG ADULT ASTHMATICS AT THE MEDICATION THERAPY ADHERENCE  
CLINIC (MTAC) ASTHMA IN HOSPITAL SELAYANG**

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Medication non-adherence is a serious problem in healthcare sector. Asthmatics were reported to have high rate of non-adherence toward long-term asthma medications. The study investigated the barriers which lead to lack of medication adherence among adult asthmatics attending Medication Therapy Adherence Clinic (MTAC) of asthma at Hospital Selayang, Selangor. This cross-sectional study was conducted using validated structured self-administered 30-item questionnaire. Forty five adult participants aged above 21 years old from MTAC of asthma were recruited in the study. Analyses of collected data were carried out using Statistical Package of Social Sciences (SPSS) version 17.0. Majority of participants were female (51.0%). More than half of the participants (55.6%) showed good adherence towards their medications. There was a significant difference between level of medication adherence and complexity of regimen ( $p < 0.05$ ). The results showed that 21 participants (46.7%) demonstrated poor level of medication adherence due to high complexity of the regimen. Meanwhile, 12 participants (26.6%) experienced unwanted side effects which led to lack of adherence towards their medications. Nonetheless, other barriers such as general knowledge, patient-prescriber trust, cognitive functions, and social support contributed to good level of medication adherence. The study concluded that identified barriers affected the level of medication adherence among adult asthmatics. Effective measures if taken to overcome the identified barriers of medication adherence can improve the patients' adherence to the medication and thus achievement of desired therapeutic outcomes.

**Keywords:** Medication adherence, Barriers, Asthma

**CP-P- 31: CARBAMAZEPINE INDUCED SEVERE CUTANEOUS ADVERSE DRUG REACTIONS (SCADRs) IN MALAYSIA**

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Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are severe cutaneous adverse drug reactions, which can be caused by a certain number of specific drugs such as antiepileptic drugs (AEDs). Strong association of Carbamazepine (CBZ) induced SJS with HLA-B\*1502 has recently been described in the Han Chinese population but little is known about this association in Malaysia. To determine whether there are differences in the demographic and clinical features (i.e., age, gender, and dosages) between the severe cutaneous adverse drug reactions (SCADRs) that may help to predict the severity of SCADRs induced by CBZ. CBZ adverse drug reaction reports received by MADRAC from 2000 to 2012 were extracted from *Quest 2* databases on April 2013. Simple descriptive analyses, logistic and multiple regressions test was performed and the odd ratios (OR) and 95% confidence interval (95% CI) were calculated using Statistical Package for Social Sciences (SPSS version 20.0). From 2000 to 2012, 569 adverse drug reaction reports due to CBZ were received by MADRAC. Only 459 complete reports were analyzed. These include SJS, TEN or DRESS. 459 reports have been analyzed, 43% were male and 56.8% were female patients. Analysis from multiple regressions shows that only Malay ethnicity made a unique significant statistically with p value < 0.05 (OR 1.955 95% CI 1.148, 3.330). Thus, Malays have almost two times higher risk in getting the SCADRs as compared to Chinese. Age and gender was not statistically significant (p > 0.05). However, more genotyping studies should be done especially in Malay patients to confirm the association between HLA-B\*1502 allele and SCADRs in the Malaysian population. Screening patients for this genetic marker may help prevent the occurrence of SCADRs.

**CP-P- 32: AMOXYCILLIN INDUCED STEVEN-JOHNSON SYNDROME AND  
TOXIC EPIDERMAL NECROLYSIS: A CASE REPORT**

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Steven-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) are variations in a spectrum of the same disease that is characterized by erythematous macules evolving to epidermal detachment and mucous membrane erosions (Ho HHF, 2008), generally induced by drugs (Kumar et al, 2006). The patient was previously admitted to hospital for five days, treated for severe esophageal candidiasis (AIDS defining illness) and discharged with nystatin syrup and amoxycillin. Four days later, patient developed rashes starting in the extremities. After going through a series of investigation process, it can be concluded that the most possible agent that actually causes this acute but life-threatening condition is amoxycillin. Thus, an allergic card was issued to the patient and all his medications were stopped immediately including the vitamin supplements. During physical examination in ward, his body presented with painful maculopapular rashes that started on the extremities; involving the face, the mucosal area and the eye but no fluid filled vesicles were seen. SJS and TEN are life-threatening conditions increasingly being seen as a result of the HIV pandemic. Management requires early identification and withdrawal of the offending drug or possible drug(s), transfer to a specialized centre and supportive care employing a multidisciplinary approach. If there is a need for re-introduction of any of the possible medications, it has to be done by experienced clinicians in a hospital setting.

**CP-P- 33: ANTIMICROBIAL THERAPY IN MANAGEMENT OF HOSPITAL  
ACQUIRED PNEUMONIA: A CASE REPORT**

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Hospital-acquired (or nosocomial) pneumonia (HAP) is defined as an inflammatory condition of the lung parenchyma caused by infectious agents not present or incubating at the time of hospital admission; that is, conditions that develop more than 48 hours after admission (Rotstein C et al, 2008). In this case, patient presented with elevated temperature for three days and increasing trend of white blood cell (WBC) count and C-reactive protein (CRP) level for at least three consecutive readings in a week with purulent tracheal secretions. Patient had an initial diagnosis of hypoxic encephalopathy due to amphetamine abuse and systemic inflammatory response syndrome (SIRS) resolved after being treated with IV. Ceftriaxone 2g OD for two weeks. During his hospitalization, he acquired HAP and was treated empirically with IV Meropenem 2g TDS. After two days, blood culture and sensitivity (C&S) results showed no growth for all cultures except for the sputum culture that showed mixed types of three organisms isolated. He was then switched from IV. Meropenem to IV. Tazocin 4.5g TDS for seven days. Optimal outcome in patients with HAP can best be achieved with the combination of appropriate initial therapy (the etiologic organism is sensitive to the therapeutic agent) and an adequate therapy regimen. To achieve adequate therapy, it is necessary not only to use the correct antibiotic, but also the optimal dose and the correct route of administration (oral, intravenous, or aerosol) to ensure that the antibiotic penetrates to the site of infection, and to use combination therapy if necessary.

**CP-P- 34: EVALUATION OF EFFICACY AND TOLERABILITY OF  
TRANSDERMAL FENTANYL AS A TREATMENT OPTION FOR PAIN  
MANAGEMENT IN PATIENTS WITH OSTEOARTHRITIS AND RHEUMATOID**

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According to European guidelines, osteoarthritis (OA) refers to a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life. Meanwhile, rheumatoid arthritis (RA) is an inflammatory disease and often associated with pain affecting functionality (Gabriel *et al*, 2004). The use of opioids in musculoskeletal diseases such as OA and RA has been established in various management guidelines. However, one of the primary concerns is the inability to identify patients who will respond to opioid management (Berliner *et al*, 2007) and which opioid tailors them best in improving outcome without jeopardizing their health status and risk of intolerable adverse events. A search strategy using electronic databases (MEDLINE, Science Direct, Ovid Medline and PubMed) were explored under advanced search, utilizing keywords \*randomized controlled trials \*opioids\* transdermal fentanyl (TDF)\* efficacy \* tolerability \* adverse events \* osteoarthritis \* chronic pain \*rheumatoid arthritis\* to examine relevant international literatures for the period from January 2000 until Mac 2013. Based on the literatures reviewed, current evidences do support the use of TDF as useful in improving pain control, functionality and health-related quality of life in patients with OA and RA. The results clearly revealed that TDF demonstrates an effective and reasonable alternative to the standard therapeutic approach in the treatment of OA and RA. Nausea and vomiting remain the most common adverse events associated with TDF treatment as these are likely the most often reported and involved most of the patients under studied. Patients with OA and RA could gain benefit from initial treatment with TDF and the treatment benefit should be evaluated after a month.

**CP-P- 35: TMP-SMX Induced Rash in HIV Positive Patient: A Case Report**

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In HIV infected patients, drug reactions are frequently occurring clinical problems. Drug reactions to TMP-SMX were reported to occur in 40 - 80% of this population. The rate is 5.4 times higher than the rate reported for HIV- negative patients. The incidence of ADR in this population may be manifested particularly by rash, fever, leukopenia and elevated aminotransferase (transaminase) values. Life-threatening adverse reactions include neutropenia, exfoliative dermatitis and toxic epidermal necrolysis. A case of 32 years old Chinese male patient with advanced stage RVD presented to the hospital with a complained of generalized macular popular rash after 7 days taking TMP-SMX for PCP prophylaxis. Investigation was done to identify the causative drugs as patient was also started on new HAART regimen the same time he was prescribed with TMP-SMX. On admission to the ward, all drugs the patient's was taking were discontinued to rule out the causative drugs. It was later discovered that TMP-SMX was the causative drugs. After discontinuation of the TMP-SMX, the rash improved and patient feels better. He was discharged home after 8 days hospitalization. There was no PCP prophylaxis for this patient at discharged. The physician planned to desensitize him with TMP-SMX during his next visit to infectious disease clinic in 2 weeks time. In conclusion, the use of TMP-SMX in HIV infected population requires strict monitoring. Pharmacist may play a role by counselling this group of population on any sign and symptoms related to the ADR of this drug. They also must be advised to report the development of any TMP-SMX induced ADR to their care-givers and to seek immediate medical attention for the reaction. The use of TMP-SMX warrant greater attention in this group of population.

**Key words:** TMP-SMX, Rash, ADR, Desensitization

**CP-P- 36: RETROSPECTIVE EVALUATION OF ADVERSE DRUG REACTIONS  
RELATED TO NON-STEROIDAL ANTI-INFLAMMATORY DRUGS**

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Adverse drug reactions are a major clinical problem, accounting for 6.5% of all hospital admissions. As increasing use of NSAIDs in healthcare practice, the number of adverse events related to it also increasing. It was estimated of 5-7% of it were hospitalized. The 2010 MADRAC report also showed that NSAIDs/analgesic fall in no. 4 of ADR reporting. The aim of this study is to identify and quantify the reported risks associated with the use of NSAIDs. This study is retrospective study that evaluates the NSAIDs induced cardiovascular effect from the Quest 2 database from year 2000 to July 2012 in the national voluntary ADR monitoring. Eleven NSAIDs namely Celecoxib, Entoricoxib, Mefenamic Acid, Diclofenac Sodium, Diclofenac Potassium, Ibuprofen, Indomethacin, Ketorolac, Meloxicam, Naproxen, Parecoxib and Piroxicam was extracted to excel by the four types of cardiovascular effect according to system organ class build by WHO. The adverse event extracted was matched with various parameters which include demographics, drug and reaction characteristics and also reporter's details. Highest adverse cardiovascular events (ACE) effect reported were within heart rate and rhythm disorder which Etoricoxib contributed to 11% of total ACE. In general, Diclofenac sodium was the most drugs reported of ACE which include condition like blood pressure increased, cyanosis, collapse circulatory, ECG abnormal, electrocardiogram T wave peaked, hypertension and hypotension. The cardiovascular events of NSAIDs must be kept under close review by the ADR Handling Unit, Pharmacovigilance Section, Centre for Post Registration of Products to ensure the safety to the patients. Health professional should play active roles in the activities relating to the detection, assessment, understanding and prevention of adverse effects or any other possible drug-related problem.

**Keywords:** NSAIDS, Non-steroidal anti-inflammatory drugs, Adverse drug reaction, Pharmacovigilance in Malaysia.

**CP-P- 37: CINNAMON REDUCES BLOOD GLUCOSE IN TYPE 2 DIABETES  
MELLITUS: A SYSTEMATIC REVIEW AND META ANALYSIS**

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The purpose of this study is determined based on the available literature, whether cinnamon can be used to control diabetes mellitus. Diabetes mellitus (DM) is an important public health concern. It is a serious, complicated and overwhelming chronic disease affecting people of all ages, ethnic group all over the world. The general public has a concern about its control and treatment. People with diabetes will not only take the conventional treatment prescribed by a physician, but they also take an alternative treatment to control their diabetes. The alternative treatment that is being evaluated here is the use on Cinnamon to reduce blood glucose in type 2 diabetes. Electronic literature search was carried out to identify and analyze all relevant literature providing information regarding the glucose lowering effect of cinnamon. The literatures that have human intervention studies using RCTs method and T2DM conducted from earliest possible date to the year of 2013 were included. The literature was evaluated by five authors. The results from the literatures were consolidated and forest plot was used to examine the final outcome. From the literature reviewed, there is no significant difference in using Cinnamon to control diabetes compare to placebo.



**CP-P- 38: ANTIFUNGAL OPTIONS IN THE MANAGEMENT OF  
DISSEMINATED LEISHMANIASIS AND PENICILLOSIS: A CASE REPORT**

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Penicilliosis *marneffei* (penicilliosis) is caused by the dimorphic fungus *Penicillium marneffei*. The majority of cases of penicilliosis are observed in patients who have CD4<sup>+</sup> counts of < 100 cells/ $\mu$ L. Meanwhile, leishmaniasis is caused by obligate intracellular protozoa, which visceral leishmaniasis is the most common clinical presentation of leishmaniasis among HIV infected patient. This is a case of 34 old Burmese man, presented with complained of lethargy for 4 months, odynophagia and skin lesion at face area for two weeks. He was detected as HIV positive since 7 years ago but not on any antiviral. In the ward, he was diagnosed as systemic penicilloles and highly suspected infected by leishmaniasis species based on finding in bone marrow sample. His full blood profile showed bicytopenia and his creatinine clearance of 38.78 ml/min during admission. Rehydration help improve patient' renal function, but for blood profile it's remain bicytopenia despite multiple packed cell transfusion. He was given conventional Amphotericin B and Itraconazole concomitantly in the ward. Unfortunately, patient was died on day 8 of hospitalization and cause of death was identified as disseminated leishmaniasis and penicilloles. Amphotericin B is the recommended treatment for penicilloles and leishmaniasis as suggested by Centers for Disease Control and Prevention Guideline 2009. However in this case, patient was given a lowered dose of amphotericin B due to concern of patient's deteriorated renal function. Other drugs, which recommended by CDC, are pentavalent antimony and pentamidine isethionate. Pentavalent antimony has a same efficacy as amphotericin B to treat visceral leishmaniasis, but was not available in national formulary. Leishmaniasis and penicilloles both HIV defining illnesses; are highly recommended to be treated by amphotericin B.

**CP-P- 39: STEVENS-JOHNSON SYNDROME SUSPECTED DUE TO  
TRIMETHOPRIM-SULFAMETHOXAZOLE IN RVD POSITIVE PATIENT: A  
CASE REPORT**

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HIV-infected individuals experience more adverse reactions associated with trimethoprim sulfamethoxazole (TMP-SMX), compared to general population. One of adverse reaction associated with TMP-SMX is Steven–Johnson syndrome (SJS). SJS is an acute, self-limited disease, with high morbidity, that is potentially life threatening. Mr RMA is a 35 years old Malay man; was presented at emergency department with complained of fever, chills, rigors, chest pain, purulent eye discharge with eyes itchiness and itchiness on hands and body for one week. He had also shortness of breath, cough and hoarseness of voice for two weeks. He just discharges from hospital two weeks ago with fluconazole, TMP-SMX and dapsons. He was active intravenous drug user and has underlying RVD positive with hepatitis co-infection, disseminated tuberculosis (TB) with TB abdomen and cerebral toxoplasmosis. During this admission, he was treated as SJS secondary to most likely to TMP-SMX. All his previous medication was withheld. He was given antibiotic for unsettled fever and itraconazole based on positive fungal growth result. He was given a thorough wound management as well. Due to dropped BP and metabolic acidosis, he was started on IV Noradrenaline on day 5. His condition is improving; with inotrope support was planned to be off and his fever become mild. When SJS is suspected or confirmed, withdrawal of causative drugs should be done promptly. Selection of which drugs need to be withheld must be base on the incidence of the drugs can cause SJS, time between first administration of the drugs to SJS appearance and severity of the disease/condition currently treated by the suspected drugs. Supportive care is part of SJS management that included supplement of fluid and electrolyte and wound management.

**CP-P- 40: A REVIEW OF COMMUNITY PHARMACY IN MALAYSIA**

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The current practices of community pharmacy in Malaysia in regards to standard practice and necessary requirements in meeting the ever changing customers' demand are important agenda at the current development of pharmacy practice. To review the current setting of community pharmacies in regards of organization structures, personnel management, location, premise setting, equipment usage, inventory management, provision of services and trend of dispensing. Observational studies were conducted over selected community pharmacies at urban and rural areas. The Ministry of Health's Pharmacy Division, Community Pharmacy Benchmarking Guidelines 2011 were used to measure the standard level of practice among pharmacies. Most pharmacies met the standard and achieved high acceptance among the public as an important health care provider. The settings and the standard of practice of community pharmacies are dependent of location, ownership, settings of equipments/premises, personnel and provision of services to the public.

Keywords: Community Pharmacy, Pharmacy Practice, Benchmarking.

**CP-P- 41: CASE REPORT OF CARBAMAZEPINE INDUCED STEVEN JOHNSON  
SYNDROME**

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A 42 years old Malay lady presented to A&E on 5/8/12. She was a psychiatric patient for more than 26 years and on regular follow-up at Klinik Kesihatan Meru. Last follow-up was on 17/7/12. According to the medication record patient was on: 1.Tab CPZ 200 mg tds. 2. Tab Artane 2 mg bd. She was started on CBZ (carbamazepine) instead of CPZ (Chlorpromazine). Patient claims that medication is different than her previous medicine but continue taking and feels very hot after taking carbamazepine. Three days prior to admission she developed generalized pruritus rash and subsequently after 2 days develop generalized weakness and 1 day after that was presented to A&E at 1940 with Generalized rash with ruptured bullae, three ulcer affecting face, conjunctiva, oral mucosa, trunk, upper lower limb with edematous, foul swelling. Impression: 1.Steven Johnson Syndrome 2. Super infection of skin. She was given: 1. IV piriton 10 mg 2. IV Hydrocortisone 200 mg 3. IV Adrenalin 1 mg 4. IV Rocephine 2 gm 5. IV Azithromycin 500 mg 6. IVD 50 NS/2hr. In ward at 0000hr BP reading was 50/49 and PR 68 (given 1 pint Normal saline) and BP reading repeated was 96/66 PR70. At 0635H noted patient asystole and Cardiopulmonary resuscitation was commenced for 40 min but patient was unable to revive. Suspected medication error occurred. Abbreviation used maybe contributes to the medication error. Patient newly prescribed with carbamazepine should test for genetic HLA-B\*1502.

Keywords: Carbamazepine, Steven Johnson Syndrome

**CP-P- 42: COMPREHENSIVE ADE MONITORING & REPORTING PROGRAM IN  
HOSPITAL SETTING**

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A comprehensive, ongoing adverse drug event (ADE) program should include mechanism for monitoring, detecting, evaluating, documenting, and reporting ADEs. An effective approach in improving ADE programmes is by introducing computerized or automatic detecting alert system in hospital information systems or data bases. Pharmacist should lead in the development of comprehensive, ongoing programs for monitoring and reporting ADE. An early detection of possible ADE by pharmacists and other healthcare providers may enhance medical safety of the patients by preventing ADE. This study aims to gain an insight on comprehensive ADE monitoring and reporting programs and to evaluate the effect of computerized automatic detection system in monitoring ADEs in hospital setting. This is retrospective study involving review on pharmacoepidemiology studies on ADE monitoring system published from 1990 until June 2013. Comprehensive literature search was done by using UiTM electronic databases. Full text articles were retrieved from tertiary sources like Ebsco host, Wiley Library, Science Direct and Scopus. Reviews from 10 full text articles related to automatic detection of ADEs in hospital showed that the computerized monitoring system capable to provide a good alert system for healthcare providers. Development of signals for detection of ADEs should integrate patient database from various sources like pharmacy, laboratory, surgery and radiology into patient electronic medical record. Computerized detecting systems were able to detect possible ADEs that has been recognized and unrecognized by physicians. Sensitivity and specificity are important factors in determining the effectiveness of the system. Information technologies have been shown to improve the safety of the patients in hospitals. It represents a highly efficient strategy for identifying ADEs, and possibly become the primary strategy for tracking and preventing serious and costly events.

**Keywords:** Adverse drug event, Computerized automatic detection system, Hospital

**CP-P- 43: THE EFFECTIVENESS OF GINGER FOR PREGNANCY-INDUCED  
NAUSEA AND VOMITING: A SYSTEMATIC REVIEW AND META-ANALYSIS**

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Ginger has been used throughout the world as a therapeutic agent for centuries. The herb is increasingly used in Western society; with one of the most common indications being pregnancy-induced nausea and vomiting (PINV). To examine the evidence of the effectiveness of ginger for PINV. Randomised controlled trials (RCTs) of ginger and PINV were searched from MEDLINE, EBSCO host, Science Direct, Google Scholar and Ovid. The methodological quality of RCTs was assessed using the Critical Appraisal Skills Programme (CASP) tool. Eight RCTs met the inclusion criteria. All trials found orally administered ginger to be significantly more effective than comparator in reducing the frequency of vomiting and intensity of nausea. The best available evidence suggests that ginger is effective treatment for PINV. However, more studies with larger sample size and standardize measurement tools are needed to confirm the effectiveness of the ginger.

Keywords: Ginger, *Zingiber officinale*, Pregnancy-induced nausea and vomiting, Systematic review

**CP-P- 44: A MINI REVIEW ON HEALTH PROMOTION ACTIVITIES AT  
COMMUNITY PHARMACY IN MALAYSIA**

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This mini review on health promotion services published articles is to propose implementation of pharmacoepidemiology surveillance component of the health promotion services that also as a part of pharmaceutical care services provided by the community pharmacies in Malaysia. A search conducted using SAGE, Springer Link, Science Direct and Scopus from Universiti Teknologi MARA (UiTM) online library databases and also through Google Scholar from May until June 2013. From the searched done there were 201 hits of the keyword search term. There only 8 articles were included in this study. The chosen studies matched the review selection criteria. Health promotion in community pharmacy is not well established and uniform. The health promotion was organized and monitor by each participating community pharmacy individually. No data linkage between all healthcare providers (general practitioner, pharmacist, hospital) makes health promotion activity and the monitoring of effectiveness of the program impossible. More pilot studies on health promotion activities in community pharmacy need to be done and serve as evidence to all community pharmacists that they can contribute to pharmacoepidemiology field.

Keywords: Health Promotion, Community Pharmacy Malaysia

**CP-P- 45: CHARACTERISTICS AND OUTCOMES OF PARENTERAL NUTRITION  
RECIPIENTS RECEIVING FISH OIL LIPID EMULSION (SMOF) IN HOSPITAL  
AMPANG**

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The latest generation of lipid emulsion, SMOF contains soybean-long chain tryglyceride, medium chain tryglyceride, olive oil and fish oil. This new lipid emulsion is relatively new in Malaysia and there are no standard guidelines in which clinical situation this lipid emulsion should be used. The purpose of this study was to explore the characteristics of patients who were started with parenteral nutrition supplemented with fish oil during the hospital stay and to observe the outcomes. Data were obtained from patient medical records. A total of 276 PN cases were evaluated. Of the PN cases, 57 patients were started with PN enriched with fish oil lipid emulsion. Demographic data of the patients were reviewed and assessed 52.6% were male patient and 47.4% were female. Majority of the patient on fish oil were from surgical (45.6%) and haematology unit (40.3%) where 38.6% of them were admitted to the intensive care unit. 29.8% of the patient had underwent surgical procedures of GIT and 35.1% were post-chemo and post-transplant patient. 64.9% patients were in sepsis/SIRS. The mean duration of fish oil supplemented PN was 7.13 days. A total of 62.7% of cases tolerated feeding after PN and discharged home, 3.5% discharged at own risk or transferred to another hospital, and 21.1% passed away. We concluded that the practice of administering fish oil in Hospital Ampang to certain disease condition such as neutropenic sepsis or/and SIRS potentially influence the patient outcomes.



**CP-P- 46: RETROPSECTIVE DRUG UTILIZATION EVALUATION:  
PALIPERIDONE PALIMATE EXTENDED-RELEASE INJECTION AND  
ZIPRASIDONE INJECTION**

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Drug utilization evaluation DUE is one of mechanisms can indicate if there is over or under-consumption of drugs. This study aimed to assess the utilization of selected second generation antipsychotics which are newly listed in hospital list in a hospital in Malaysia. To identify the usage pattern of selected antipsychotics in its first year used, to attain the calculated Defined Daily Dose (DDD) for the selected drugs and finally to identify the association in pattern of use with demographic characteristics, patients' criteria for prescribing and the cost of medications in relation to total allocation. Retrospective study to review the usage of Paliperidone Palmitate Extended Release Injection and Ziprasidone Injection in adult who admitted in the hospital and visited specialist clinic in 2012. The relevant data was collected from admission registry, green bin card and medication purchased system. Total use in 2012 for Paliperidone was 3,250 mg and Ziprasidone was 1,460 mg. DDD calculated showed the usage of both drugs were still low in Malaysia, with 0.5 DDD/1000 psychiatric patient visit for Paliperidone and 7 DDD/100 admissions and 14.2 DDD/1000 bed days for Ziprasidone. Both were not prescribed as first line treatment, and pattern of use observed in more men, mean age of 35 years old and mostly were working for Paliperidone and no significant differences between genders for Ziprasidone. Paliperidone incurred only 11.4% of drug budget received by Department of Psychiatry whereas Ziprasidone was only 0.4%. Overall usage of Paliperidone and Ziprasidone were low and well controlled. This retrospective study can be done as the prospective DUE to get better information in trending and the appropriateness use of both drugs.

**Keywords:** Drug utilization evaluation, Drug utilization review, DUR, Antipsychotics

**CP-P- 47: COMFORT LEVEL AND PERCEPTIONS OF COMMUNITY  
PHARMACISTS IN KEDAH TOWARDS POTENTIALLY INAPPROPRIATE  
MEDICATIONS**

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The elderly population is increasing worldwide. In the year 2000, 1.4 million Malaysians are elderly and this figure is expected to increase to 3.3 million in 2020. Prescribing of the potentially inappropriate medications (PIMs) to the elderly is prevalent. PIMs may include: i) drugs with risks that could outweigh the benefits; ii) prescription of drugs for longer periods than indicated; iii) use of drugs that could interact with other drugs and diseases and iv) prescription of medications with unclear indication. The objectives of the present study were to investigate the comfort level of community pharmacists and their perceptions about the prescribing of PIMs in the elderly. In the cross-sectional study, a questionnaire developed to investigate the study objectives was distributed to 117 Kedah community pharmacists. PIMs in the study were defined by the Beers criteria. Sixty-three community pharmacists returned the questionnaire which gave a response rate of 54%. The percentage of female respondents was higher (58.7%). Majority of the respondents are Malay in race (71.4%). The mean age of the respondents was  $39.87 \pm 8.12$ . In general the respondents were comfortable in providing common group C (of Malaysian classification) PIMs such as *chlorpheniramine* (69.8%), *loratadine* (68.2%) and *diphenhydramine* (58.7%). In regards to factors associated with reception of PIMs by the elderly, the respondents rated *Lack of knowledge in PIMs* as the most important (mean:  $3.97 \pm 0.59$ ). The *Internet and website* and *Continuous professional development program* were rated as the preferred sources of information by the respondents (mean:  $4.13 \pm 0.61$  and  $4.03 \pm 0.65$ ). Majority of the respondents agreed that *Medication review* (mean:  $4.09 \pm 0.53$ ) is a good measure to reduce reception of PIMs by the elderly. More education about PIMs should be provided to community pharmacists so that they could reduce the incidence at the community settings.

Keywords: Potentially inappropriate medications, Elderly, Community pharmacist

**CP-P- 48: REVIEW ON STIGMATIZATION OF CHRONIC ILLNESSES**

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Stigma is considered as one of the major obstacles to public health and a barrier to the provision of healthcare services. Health-related stigma affects the life chances of individuals by increasing their vulnerability to risks and limiting access to protective factors hence enhancing their burden of disease or disability. Measurement levels of stigma are very imperative as these lead to guiding policies; designing and evaluating interventions, advocacy works and further implementation. Research is required to clarify the nature of the stigma burden and to develop and test strategies for mitigating problematic stigma. Therefore, research on health related stigma has increased substantially over past decade. Based on nature of the disease, illness specific tools and scales are employed to measure health related stigma. The purpose of the study was to review measures of stigma, its impact on patients and its consequences across different health problems. A systematic literature review was conducted using various databases of ScienceDirect, Pubmed (Medline), Sage Pub, PsychInfo and through relevant bibliographies within the period of 2003 - 2013. Fifty-five papers were selected mainly on stigma of following chronic ailments including HIV/AIDS, tuberculosis, hepatitis, leprosy, mental health, epilepsy, asthma, COPD, psoriasis and obesity. Multiple psychological and behavioural processes are strongly disrupted by stigma. Stigma affects badly, not only the quality of life of patients but also community ridden health programmes. Several scales of stigma have been designed depending upon the nature of the diseases, respondents and type of stigma attached. Majority of the stigma instruments need further testing for better psychometric properties. This review suggested that promising psychometric properties of stigma scales should be strengthened and greater attention to be paid on instruments used for stigma to obtain specific chronic disease-related stigma levels. Stigma reduction strategies should be introduced and practiced to deal with consequences of stigma.

**Keywords:** Health-related stigma, Stigma of chronic illnesses

**CP-P- 49: KNOWLEDGE AND AWARENESS ON CONTRACEPTION AMONG  
UITM PUNCAK ALAM STAFF**

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Knowledge and awareness concerning contraception is important for family planning. Strong family planning reduces maternal deaths rate towards achieving Millennium Development Goal 5 (MDG5), which aims to reduce by three quarters the maternal mortality ratio by 2015 and to universalize the access to sexual and reproductive health. This cross sectional study was assessed the level of knowledge and awareness; identify the most frequent contraceptive methods and type of contraceptives, regarding contraception among academic and non academic staffs in UiTM Puncak Alam. 400 self-administered questionnaires were disseminated among UiTM Puncak Alam staffs, which consist of four different faculties (Faculty of Pharmacy, Faculty of Health Science, Faculty of Hotel and Tourism Management and Faculty of Business Management & Technology). The questionnaires were adapted from Freitas (2007) which consists of Part A: Demographic Data (8 items) and Part B: Knowledge and awareness on contraception (38 items). Data were analyzed by using Microsoft Excel and Statistical Package of Social Sciences (SPSS) version 17.0, including Pearson Chi-square test, independent t-test and frequency analysis where applicable. Distribution of questionnaire were fair for both profession (academic = 49%) and (non academic = 51%). Majority of respondents were female (academic = 51.5%) and (non academic = 48.5%). Most of the respondents heard of contraception (academic = 49.8%) and (non academic = 50.2%). Total score of knowledge among academic staffs (M SD = 22.73 10.7) shown significance difference ( $p = 0.0001$ ) with non academic staffs (M SD = 16.69 11.07). Awareness towards contraception, academic staffs were more aware on contraception purpose compared to non academic staffs ( $p = 0.027$ ) and ( $p = 0.047$ ). There was a positive correlation ( $r = 0.334$ ) for both groups in knowledge and awareness on contraception. Male condom (43.5%) and pill (34.9%) were the two most contraceptive used by both groups and implant (0.7%) and vaginal ring (2.7%) were the two least methods used. For the most contraceptive known, male condom (94.7%) and pill (93.4%) were the most contraceptive known by both groups while vaginal ring (36.5%) was the least known contraceptive. Academic staffs were more knowledgeable and aware of contraception than non academic staffs due to several factors such as knowledge, exposure, preferences, beliefs, availability and accessibility.

**Keywords:** Knowledge, Awareness, Contraceptive

**CP-P- 50: KNOWLEDGE AND PERCEPTION ON GENERIC MEDICINE AMONG UNDERGRADUATE PHARMACY STUDENTS OF UiTM PUNCAK ALAM**

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Generic medicine is a pharmaceutical product usually intended to be interchangeable with the originator brand product, manufactured without a licence from the originator manufacture and marketed after the expiry of patent or other exclusivity rights. This cross-sectional study assessed the level of knowledge and perception of generic medicine among undergraduate pharmacy students. Self-administered questionnaires (n = 400) were disseminated among pharmacy students from different academic years (first until fourth year). The questionnaire that adapted from Sharrad and Hassali (2011) consisted of 4 parts: Part A - Demographic data (3 items); Part B: Knowledge on bioequivalence (3 items); Part C - Understanding of brand name versus generic medicine (7 items); Part D - Perception on generic medicine (5 items). Data were analyzed using Statistical Package of Social Sciences (SPSS) version 17 including one-way ANOVA test and frequency analysis, where applicable. The study response rate was 92.8%. Majority of the respondents were female (89.0%). There was a significant difference ( $p < 0.05$ ) between knowledge on bioequivalence and years of study. About 80.0% of the fourth-year students answered correctly compared to first-year students (10.0%). There were significant differences ( $p = 0.0001$ ) between knowledge level and years of study, with highest mean score (8.01) from fourth-year and the lowest mean score (1.46) from first-year pharmacy students. Respondents understood about the concepts of bioequivalence, cost, efficacy and safety. There were misconceptions among the respondents regarding manufacturing standard of generic medicine. There was no significant difference between perception and years of study ( $p > 0.05$ ). This study suggested students' knowledge on generic medicine progressively increases throughout academic years.

**Keywords:** Knowledge, Perception, Generic medicine

**CP-P- 51: KNOWLEDGE AND ATTITUDE TOWARD INFECTIOUS  
RESPIRATORY DISEASES AMONG UNDERGRADUATE STUDENTS IN UiTM  
PUNCAK ALAM**

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Infectious respiratory diseases are pandemic diseases that have affected world population and cause major mortality and morbidity. The study determined the level of knowledge and attitude among undergraduate students in Universiti Teknologi MARA (UiTM) Puncak Alam campus regarding infectious respiratory diseases. This cross-sectional study recruited 307 business and pharmacy undergraduate students in various academic years (year 1 till year 4). Data were collected using self-administered questionnaires of 'knowledge and attitude toward infectious respiratory diseases'. Data were analysed using Statistical Package of Social Sciences (SPSS) version 20. The overall knowledge level of infectious respiratory diseases was moderate [ $16.99 \pm 5.04$  (range: 0 – 25)]. The attitude of business and pharmacy students towards infectious respiratory diseases was generally positive. The pharmacy students possessed higher level of knowledge and more positive attitude toward infectious respiratory diseases than the business students. This study concluded that the knowledge level of infectious respiratory diseases among respective undergraduates was moderate, hence health education programmes are needed to increase the knowledge as well as to enhance positive attitude toward the infectious respiratory diseases.

**Keywords:** Infectious respiratory diseases, Knowledge, Attitude

**CP-P- 52: LINGUISTIC VALIDATION OF MALAYSIAN VERSION OF BRISTOL  
COPD KNOWLEDGE QUESTIONNAIRE**

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Chronic obstructive pulmonary disease (COPD) is one of the main causes of morbidity and mortality around the country. COPD was ranked fourth top of hospital admission causes in Malaysia. By 2020, COPD is expected at the third ranked causes of death and fifth ranked causes of loss disability adjusted life years (DALYs). The main aim of this pilot study was to fulfill the linguistic validation of the Malaysian version of Bristol COPD Knowledge Questionnaire (M-BCKQ) which is the instrument to assess knowledge of COPD among COPD patients. This questionnaire was translated to Bahasa Melayu using previously established international translation guidelines comprising of forward (phase 1) and backward (phase 2) translation followed by pilot testing including on COPD patients (phase 3) with proof-reading and finalization process. For patient's field test phase, the inclusion criteria were patients of both genders (age  $\geq 40$  years old) clinically diagnosed as COPD that attend scheduled follow-up appointment at Chest Clinic, Hospital Melaka. The exclusion criteria were recently diagnosed of COPD with no record attending any COPD education program, unable to safely partake in pulmonary rehabilitation (e.g. unstable angina, some musculoskeletal conditions), diagnosed with or other respiratory diseases (e.g. tuberculosis, bronchiectasis, cystic fibrosis, asbestosis) and unable to comprehend or follow instructions (e.g. dementia, Alzheimer). This study recruited 20 COPD patients. Majority were male ( $n = 18$ ; 90%) and Chinese ( $n = 12$ , 60%; Malay,  $n = 8$ , 40%) with mean age of 68 years old. Most of them were ex-smoker with the mean history of smoking of 28 years and mean years diagnosed with COPD of 12. More than half of the respondents (60%) believed chemicals are the main cause of COPD while only 20% of them chose smoking as the main cause of COPD. Salbutamol (95%) was highly prescribed followed by Seretide<sup>®</sup> (60%) and Spiriva<sup>®</sup> (60%). The baseline mean M-BCKQ score was 39%. This study produced translated questionnaire that is conceptually equivalent to the original validated English version and easy to understand for the COPD patients. Due to age factor, the mode of administration of the instrument was changed from self-administration to structured interview. Further in-depth psychometric validity and reliability of the M-BCKQ using Rasch-Model are suggested.

**Keywords:** Chronic obstructive pulmonary disease (COPD), Bristol COPD Knowledge Questionnaire (BCKQ)

**Life Sciences (LS)**

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**LS-O- 1: CHARACTERISTICS OF STEM AND ANCHOR REGION OF DENV  
ENVELOPE PROTEIN: AN INSIGHT FROM MOLECULAR DYNAMICS  
SIMULATION STUDY**

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The envelope (E) protein of dengue virus (DENV) is a major determinant of tropism and virulence. It is the major target of neutralizing and enhancing antibodies. These proteins are anchored into cellular and viral membranes by their C-terminal domain. The stem and anchor region at the C-terminal of the E protein consist of amphipathic  $\alpha$ -helices and transmembrane domain (TMD) which crosses the two leaflets of the lipid bilayer. Many studies suggest that this C-terminal of the E protein play a major role in the virus assembly and entry but the mechanism is remain unknown. Here, we present the molecular dynamics simulation performed on the amphipathic  $\alpha$ -helices and transmembrane domain in a bilayer composed of dipalmitoylphosphatidylcholine (DPPC) lipids. In this study, homology modeling and molecular dynamics simulation were carried out to explore structural features and stability the E protein from Malaysia strain (MY-DENV). The system studied contained about 100 amino acids and was simulated for 100 ns. Two different orientation of the amphipathic  $\alpha$ -helices were carried out in two different simulations. In one of the simulations, the amphipathic  $\alpha$ -helices were placed in the water level and located above the phosphate groups. Meanwhile, in another simulation, the amphipathic  $\alpha$ -helices were placed at the lipid-water interface. The anchor region or TMD was embedded in the middle of DPPC bilayer for both simulations. The differences of the structural stability and conformation of the stem and anchor region for both simulations were studied and compared. The two amphipathic  $\alpha$ -helices are stable to be located in the water level due to the interaction of charge residues; arginine, lysine and asparagine with the water. This simulation shows that the structure can be stable in a membrane environment and provides invaluable insights into the structural relationships between the protein and its surrounding lipids.

**LS-O- 2: METABOLITE PROFILES OF THE ORANG ASLI IN PENINSULAR  
MALAYSIA FOR PREDICTION OF CHRONIC DISEASE**

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A total of 219 samples, including 83 Orang Asli, 50 healthy controls, 22 breast cancer patients and 64 cardiovascular patients were selected as the subject for this study. The objectives of this project are to determine the metabotypes of Orang Asli and to predict the risk of diseases including chronic disease among the Orang Asli through the global and targeted metabolomics approaches. Blood samples were collected and biochemistry profiles of each subject were determined. Each sample was extracted and analyzed using the LC-MS-QTOF (Agilent Technologies, Inc.) to profile the metabolites. For the data analysis, univariate and multivariate analysis were done. The metabolite profiling of Orang Asli showed that the classification of metabolites identified in all comparisons (patients vs Orang Asli vs control) were fatty acids derivatives, cholesterol, sphingolipids, glycerolipids, glycerophospholipids, vitamins, carbohydrates, amino acids and other endogenous metabolites. Preliminary result for the biomarker identification showed that the 15S-HpEDE and stearyl carnitine were the potential metabolites for ischemic heart disease, with AUC value 0.99271 and 0.98536 respectively. While for the myocardial infarction, the potential metabolites that can be the biomarker were 15S-HpEDE (AUC = 0.99632), phosphorylcholine (AUC = 0.99476), salicylic acid (AUC = 0.96535). For cancer, Sphinganine 1-phosphate was selected as the biomarker with AUC value 0.92708. The prediction of disease of the Orang Asli was done using the Partial Least Square-Discriminant Analysis based on the metabolite profiles and potential biomarkers. The accuracy of model was tested using ROC curve analysis. Based on the current result, the average accuracy to predict the risk of IHD and MI among the Orang Asli based on 100 cross validations is 0.999 and 0.95, respectively. For cancer, the average accuracy is 0.96, where the accuracy of prediction for the Orang Asli subjects is 0.834. This also indicates that about 16.6% of the Orang Asli subjects have the potential to get cancer. As the conclusion, metabolomics is one of the approaches that can be used to determine the metabotypes of Orang Asli and to predict the occurrence of disease for clinical diagnosis.

**Keywords:** Orang Asli, Metabotypes, Biomarker identification

**LS-O- 3: GROUP-BASED QUANTITATIVE STRUCTURE-ACTIVITY  
RELATIONSHIP (G-QSAR) ANALYSIS AND MOLECULAR DOCKING OF B-  
CELL LYMPHOMA TWO (BCL-2) INHIBITORS**

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Bcl-2 is the founding protein of Bcl-2 family and it is one of the inner mitochondrial membrane protein which acts as inhibitor of apoptosis, prolong cell survivals and regulate cell death negatively. Bcl-2 has been reported by previous study that it has significant percentage to be presented in many cancer cases. Classes of small molecules have been used successfully to targets Bcl-2 and in order to improve the biological activities of these anti-Bcl-2 agents various QSAR methods have been employed. In this study, an advanced method in computational drug design Group-based Quantity Structural Activity Relationship (G-QSAR) were performed using V-LIFE® on dataset of non-congeneric compounds with binding activity (IC<sub>50</sub> range 0.003 to 400µM) available in BindingDatabase from various literatures to generate potential Bcl-2 inhibitors. The compounds were filtered based on the size which is less than 500Da where training and test set were generated using sphere exclusion approach. Simulated annealing method was used for variables selection and 616 two dimensional descriptors were calculated. Multiple regression model building was used and the best model obtained has the value of r<sup>2</sup>: 0.8345, q<sup>2</sup>: 0.7455, predictive r<sup>2</sup>: 0.8164 and best rand r<sup>2</sup>: 0.2181 which then used to generate new compounds candidates virtually. Newly generated compounds were analysed through activity predictions and docking into the available Bcl-2 crystal structures from PDB using Glide® and Prime®. All results would be presented and discussed.

**LS-O- 4: THE CHE WONG TRION: DEEP HUMAN WHOLE GENOME  
SEQUENCING**

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The Che Wong is one of the many communities of Orang Asli categorized under the Senoi, an admixture of the Negrito and Proto-Malay. The Senoi are the largest communities of the Orang Asli where the least number comprised of the Che Wong (456 people from a total of 79,156 Senoi). Challenged by natural selection, their genomic make-up would provide a strong foundation for further investigations of the genotype-phenotype relationship especially in diseases where the South East Asians are at highest risks. Here, we provide a deeper and systemic characterization of the genomic variations in this unique population and present the first comprehensive draft of the genomic sequence of the Che Wong Trio. The whole genome sequences of a family of three were obtained using GAIIX, a second generation sequencing platform. The draft genomes were assembled and annotated using in house bioinformatics pipeline. A Gene-based as well as functional annotation was also carried out using ANNOVAR. The depths of whole genome sequences were of 39.51X, 41.25X, and 42.28X for sample CW0021, CW0022, and CW0024, respectively. A total of  $4.58 \times 10^6$ ,  $4.45 \times 10^6$ , and  $4.44 \times 10^6$  SNPs were identified for each sample, respectively. Out of these  $5.43 \times 10^5$ ,  $5.25 \times 10^5$ , and  $5.20 \times 10^5$  SNPs respectively were identified as potentially novel. Other variants that have been identified include insertions, deletions, inversions, inter- and intra-chromosomal translocations. The genome length as well as the effective genome length of all three trio genomes was estimated to be ~3.14GB. A total of 207,969 accumulative as well as 68,683 *de novo* variants were identified through Trio analysis. Deep sequencing of the Trio genomes had enabled the accurate discovery of multiple variant types across most of the genomes with Mendelian transmission. This aids in estimation of genotypes, inference of haplotypes and quality control; and understanding the effects of the Orang Asli's genomic make-up in disease risks. In long term, these have substantial effects in predicting mutations that could help in presymptomatic counselling and prevention.

**LS-O- 5: GENE EXPRESSION PROFILING OF PERIPHERAL BLOOD  
IDENTIFIES MEST, RASSF3, GLYAT, UCP3, IQSEC3 AND CKAP4 AS  
POTENTIAL BIOMARKERS FOR ALZHEIMER'S DISEASE**

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As the current trend of improved life expectancy is sustained, Malaysia is expected to have a significant aging society in 2020. An ageing population results in susceptibility to diseases that commonly affect elderly people such as Alzheimer's disease (AD). The underlying pathogenesis of AD remains poorly understood. In addition to usual methods such as brain imaging and cerebrospinal fluid, recent data have shown that peripheral blood may be a potential source for the identification of AD-related biomarkers. As such, this study was undertaken to identify unique blood-based biomarkers amongst Malaysian AD patients through a transcriptomics approach. Transcriptomic profiling was conducted on peripheral blood samples of patients with probable AD ( $n = 92$ ) and age matched non-demented controls ( $n = 92$ ) by oligonucleotide microarray. Differentially expressed genes of interest were selected by pathway-based functional enrichment. These genes were found to be related to AD pathogenesis and significantly correlated with Mini Mental State Examination (MMSE) scores ( $p < 0.0001$ ). Multivariate analyses showed good separation between probable AD and control with sensitivity and specificity of 80% and 78%, respectively. Thirteen differentially expressed genes at a fold change of  $\geq 1.5$  and false discovery rate 0.01 between AD and control were identified. Six new genes (MEST, GLYAT, UCP3, RASSF3, IQSEC3, CKAP4) were enriched in pathways related to inflammatory response, apoptosis, lipid metabolism and neuron disturbance pathways. The cutoff between probable AD and healthy subjects was validated by subsequent ROC curve analysis which yielded an area of 0.99 ( $p < 0.05$ ). Our findings provide potential biomarkers for AD that must be further validated in larger samples of clinical AD.

**Keywords:** Alzheimer's disease, Biomarker, Transcriptomic, Microarray, Mini Mental State Examination

**LS-O- 6: BLOOD-BASED CYTOKINE PROFILING OF MALAYSIAN  
ALZHEIMER'S DISEASE PATIENTS**

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Growing evidence indicates that release of cytokines from chronically-activated microglia results in neuroinflammation, a phenomenon strongly associated with progression of Alzheimer's disease (AD). Capitalizing on the relationship between cytokines and AD pathogenesis, the patterns of these inflammatory mediators in AD patients can be profiled to allow identification of reliable biomarkers for early detection. To date, several cytokine profiling studies have been undertaken but only amongst AD patients of Western communities. As such, this study was conducted to identify targeted pro- and anti-inflammatory cytokines from blood samples of AD patients in Malaysia. A total of 39 AD patients and 39 healthy subjects were recruited. Whilst 52.6% and 47.4% of the total recruitment were males and females, respectively, subjects of Chinese origin (61.5%) made up the largest ethnic group. Further to peripheral blood withdrawal and serum extraction, the respective concentration of 13 cytokines was measured using Multiplex Procarta Cytokine Assay Kits. Data from patients' medical records were extracted for correlative studies. Except for TNF- $\alpha$ , all classical pro-inflammatory cytokines (IL-1 $\beta$ , IL-6, IL-12 and IFN- $\gamma$ ) were up-regulated (5 - 12 folds) in AD patients. Three of the five non-classical pro-inflammatory cytokines (IP-10, MCP-1 and MIP-1 $\alpha$ ) also exhibited a similar pattern (3 - 4 folds). Conversely, both the classical IL-10 and non-classical IL-13 anti-inflammatory cytokines were down-regulated in AD patients as opposed to the healthy subjects (18-48 folds). Generally, the up-regulated pro- and down-regulated anti-inflammatory cytokines were moderately to strongly correlated to the subjects' Mini Mental State Examination score ( $r$  -0.4493 and  $r$  0.7715, respectively). Subsequent ROC curve analysis indicated strong evidence of diagnostic accuracy (AUC between 0.7991-1). Nevertheless, no correlation was found between cytokine profiles of AD patients and co-morbidities like hypertension, diabetes mellitus, dyslipidemia, arthritis and depression. Our first reported cytokine profiles of Malaysian AD patients could serve as important insights for the identification of potential blood-based biomarkers.

**Keywords:** Pro-inflammatory cytokines, Anti-inflammatory cytokines, Alzheimer's disease, MMSE

**LS-O- 7: STABILITY OF TRANSIENT AND INTRINSIC RESISTANCE IN  
SEVERAL LABORATORY CHALLENGED VARIANTS OF A CLINICALLY  
ACQUIRED *ACINETOBACTER BAUMANNII***

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The age-long race between resistant bacteria and antimicrobials has recently resulted in a stalemate, leaving us with fewer options of therapy. Understanding the key components that gives rise to both intrinsic and transient resistance is thus important in the prevention and treatment of diseases due to resistant bacteria. *A. baumannii*, a hardy pathogenic species that have been reported in various studies as "highly evolutionarily active" is therefore a prime candidate for the study of such resistance. A local clinical strain of *A. baumannii* was screened for susceptibility against a battery of antimicrobials. The sample was then challenged with four antimicrobials from three different classes which include ciprofloxacin, erythromycin, meropenem and imipenem. The stability of change in acquired resistance was tested in different conditions upon storage with and without drugs at 4°C, -80°C. Daily passages at 37°C without drugs were also conducted. The genome of the susceptible strain was also sequenced and the resistance determinants were annotated. The genome analysis revealed seven biofilm-associated genes, 35 efflux genes, 27 transposon-associated genes, 27 pili and/or secretion associated genes, eight putative fluoroquinolone resistance genes, and 53 putative resistance genes. The transient MDR acquired by *A. baumannii* was short lived, especially against ciprofloxacin, with a complete loss of resistance in all stability tests. Observations in the phenotypes of the resistant variants revealed an apparent slime formation and reduced growth rates in both meropenem and imipenem-challenged variants. Phenotypic resistance is most apparent in carbapenem-challenged variants. The reduced growth rate (drug indifference and/or persistence) and high biofilm production expressed in these variants may be a crucial component in the rise of transient multidrug-resistant clinical strains.

**Keywords:** *Acinetobacter baumannii*, Resistance, Antibiotic resistance, Transient, Intrinsic



**LS-P- 1: DOCKING AND SEMI EMPIRICAL CALCULATION STUDIES ON THE  
INCLUSION COMPLEXES**

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Herein the study of inclusion complex of methyl red and cyclodextrins ( $\alpha$ ,  $\beta$  and  $\gamma$ -CDs), were investigated using molecular modeling calculation. The molecular docking study adopted using Autodock 4.2 software and quantum mechanics calculation using Gaussian 03 software. The quantum mechanics calculations performed using the semiempirical method PM3 showed  $\beta$ -CD is the best host among the studied CD compounds in the following order: MR- $\beta$ -CD » MR- $\gamma$ -CD » MR- $\alpha$ -CD. The simulation of the interaction between methyl red and CDs differs from  $\alpha$  to  $\beta$  to  $\gamma$  in terms of power and less docking energy. The binding energy between  $\beta$ -CD and MR was found to be less than  $\alpha$  and  $\gamma$ -cyclodextrins in the sense that it has higher stability at various stages and angles. The strength of docking between  $\beta$ -CD and MR was also found to be that stronger than of  $\alpha$  and  $\gamma$ -CDs. Computational calculations for the MR-CDs inclusion complexes show that differences in the stability of these complexes lead to different orientation for MR and ways approaching the cavity. Therefore, the theoretical study shows that an inclusion complex can be formed between CD's and MR. It also shows that  $\beta$ -CD is the best host among the studied CD compounds based on it forms the most stable conformation of the inclusion complex.

Keywords: Inclusion complex,  $\alpha$ ,  $\beta$  and  $\gamma$ -cyclodextrins, Methyl red

**LS-P- 2: GENOME SEQUENCE OF *PROTEUS MIRABILIS* ISOLATED FROM  
LOCAL HOSPITAL IN MALAYSIA**

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*Proteus mirabilis* is a common Gram-negative bacterium which causes upper urinary tract infection and re-current infection. With cutting-edge technology such as whole genome sequencing, the genome sequence could be fully explored to understand its pathogenic and virulence genes. This study aims to provide better understanding on its mechanisms to invade, infect, colonize host epithelial cells and evade host immune system. DNA of local clinical isolate of *Proteus mirabilis* strain PR03 was extracted and subjected to whole genome sequencing using Illumina second generation sequencer, Genome Analyzer II (Illumina, California, USA). The genomic data was trimmed, analyzed, assembled and annotated using bioinformatics pipeline to identify genes that contribute pathogenicity and virulence of the strain. The genome was compared with *P. mirabilis* strain HI4320 to identify genes similarities and differences. The genome size of *P.mirabilis* strain PR03 is 3.9 Mbp with G+C content is 38.6%. This strain has 3 465 genes and 53 RNA. Flagella, fimbriae, capsule, cell membrane, cell wall, urease, invasion proteins and stress respond genes were identified that contribute to pathogenic and virulence factors of this strain. Genomes comparison showed this species has 56.25% of essential genes, 39.25% of dispensable genes and 4.47% of strain specific genes. *P. mirabilis* strain PR03 was successfully sequenced, assembled, annotated and. The genome sequences were deposited in NCBI genomic database. Using whole genome sequencing and bioinformatics pipeline composed of genes that account for pathogenicity and virulence of *P. mirabilis* strain PR03 are 23.39% of its genome.

**LS-P- 3: MICROSCOPIC OBSERVATION ON APOPTOTIC ACTIVITY OF MCF-7  
CANCER CELL LINES TREATED WITH SELECTED HONEY**

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Apoptosis refers to programmed cell death. It can be induced by several mechanisms including by antioxidant agents. Honey, one of the natural antioxidant agents, has been revealed to induce apoptosis in cancer cells. However, microscopic observations on cancer treated with honey have yet to be discovered. In this study, induction of apoptosis by selected Malaysian honeys (Gelam and Acacia honey) were observed on human breast adenocarcinoma (MCF-7) cell line. The effect was first observed live through a confocal microscope where the observation was conducted in a duration of 72 hours on a cell population treated with honey. Pictures of treated cells population were captured in 30 minutes time intervals. At this step, the treated cells were observed to be degraded after 24 hours of treatment with honey. This was then followed by terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) assay to confirm the apoptosis event. TUNEL assay principally tagged fragmented DNA of apoptotic cells by catalytically incorporating fluorescein-12-dUTP at 3'-OH DNA ends. Through TUNEL assay we confirm the degradation of MCF-7 was due to the inducement of apoptosis by honey. Finally, the morphology of apoptotic cells was then observed through the transmission electron microscope (TEM) in which the formation of membrane blebbing, indicating apoptosis was observed. By using the microscopic approaches, apoptotic activity of MCF-7 treated with Gelam and Acacia honey can be investigated in detail.

**LS-P- 4: RELEVANCE OF GENETIC POLYMORPHISM OF *HLA-B\*1502* AND CARBAMAZEPINE-INDUCED CUTANEOUS ADVERSE DRUG REACTION**

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Adverse drug reaction (ADR), commonly termed as unwanted reaction is a long-standing and a major medical problem that comes with many clinically important drugs. ADRs are broadly categorized into predictable (type A) and unpredictable (type B) reactions. Predictable reaction is usually dose dependent, related to the known pharmacologic actions of drugs, and occurs in healthy individuals. Unpredictable reactions are generally dose independent, are not related to the pharmacologic actions of drugs, and only occur in susceptible individuals. Stevens Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) are two fatal ADR encountered in some patients prescribed carbamazepine or phenytoin. US FDA had published a medical alert with a recommendation of HLA-B\*1502 screening before these two (2) drugs were prescribed to patients with Asian ancestry as the likelihood of SJS/TEN were highly associated with HLA-B\*1502. Eighty (80) healthy unrelated individuals and eighty six (86) patients attending clinics at Department of Neurology of a local hospital were recruited. DNA was extracted from blood samples obtained from each patient. HLA-B\*1502 genotype was determined by AS-PCR developed in house. All statistically analysis was performed using SPSS software version 20. P values  $\leq 0.05$  were considered statistically significant. The strength of association between HLA-B\*1502 with CBZ-induced SJS-TEN was estimated by calculating the odd ratio. Among the 86 patients, 40 were newly registered patients and genotype screening was conducted before patients were prescribed with CBZ. Among this group, 20.0% were positive for HLA-B\*1502. In another cohort in which CBZ had been withdrawn due to SJS/ TEN; all of them (15) were positive for HLA-B\*1502. One patient with positive HLA-B\*1502 however did not develop SJS/TEN and is therefore tolerant. The frequency of HLA-B\*1502 allele in CBZ-SJS/TEN after CBZ prescribed was 32.6%. The calculated ratio of patients at risk of developing SJS/TEN based on this small samples size is 120.2727 (95% CI : 6.1202 – 2363.5775; p = 0.0016). The screening patients for the HLA-B\*1502 allele before the initiation of carbamazepine treatment and withholding carbamazepine from HLA-B\*1502-positive patients can reduce the incidence of carbamazepine-induced SJS-TEN among the Malaysia. This study conclude that the implementation of HLA-B\*1502 screening is necessary to avoid patients at risk of SJS/TEN from being prescribed CBZ due to the high odd ratio observed in this study.

Key words: HLA-B\*1502, ADR, CBZ, SJS-TEN

**LS-P- 5: IDENTIFICATION OF GENE ENCODING SURFACE PROTEIN  
RESPONSIBLE FOR MENINGEAL TROPISM IN GROUP B STREPTOCOCCUS**

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*Streptococcus agalactiae* (Group B Streptococcus; GBS) an extracellular Gram-positive encapsulated bacterium is one of the leading cause of neonatal invasive infections such as septicemia and meningitis. Two GBS-associated syndromes have been recognized in neonates, the early-onset disease (EOD) and the late-onset disease (LOD). These two syndromes differ in their pathophysiology and clinical manifestations but LOD is more likely associated with meningitis. Adhesion to epithelial and endothelial cells constitutes a key step of the infection process and surface proteins are obvious potential adhesion mediators of barrier crossing and determinant of meningeal tropism in GBS. Hence, this study aims to identify genetic determinants responsible for meningeal tropism in GBS using complete genome sequence data. Complete genome sequences of *S.agalactiae* PR06 were annotated using two annotation tools; Rapid Annotation using Subsystem Technology (RAST) and Bacterial Annotation System (BASys). Manual comparison for genes encoding the surface proteins was done and was classified under three groups; adhesion to epithelial cell, interactions with human extracellular matrix or plasma proteins and escape from host immunity. Based on the genome analysis, GBS encodes for cell wall surface anchor family protein, LPXTG, serine-rich-repeats (Srr) proteins, surface-exposed pili proteins, alpha-C-protein (ACP), and fibronectin-binding and laminin-binding proteins (scpB and lmb). Gene-encoding surface proteins were identified and this information provides insights in the involvement of GBS surface proteins crossing the brain blood barrier that displays meningeal tropism.

**Keywords:** Group B Streptococcus, Meningitis, Gene encoding protein, Surface protein

**LS-P- 6: SYNTHESIS OF STARCH/HYALURONIC ACID FILMS AND  
ANTIMICROBIAL EVALUATION AGAINST *P. AERUGINOSA*, *E. COLI*, *S.*  
*TYPHIMURIUM* AND *S. AUREUS***

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Wound healing is an important yet complex process initiated in response to an injury. Nevertheless, bacterial infection remains one of the key factors that are detrimental to this phenomenon. As such, both artificial and natural polymers have been used as wound dressing materials for reconstitution of dermis. The wound dressing materials should inhibit bacterial infection and ensure no non-adherence areas are left for bacterial proliferation. The present study synthesised starch/hyaluronic acid films as wound dressing materials. The films, which composed of starch, sodium hyaluronic acid (SHA) and sorbitol, were prepared by solvent casting method with three different concentrations: 25 mg (SHA1), 50 mg (SHA2) and 100 mg (SHA3) hyaluronic acid. The films were cut into disk shape and sterilized in an autoclave before being subjected to disc diffusion assay for 24h. For this purpose, three gram-negative bacteria (*Escherichia coli*, *Salmonella typhimurium* and *Pseudomonas aeruginosa*) and the gram-positive *Staphylococcus aureus* were utilized. Besides, penicillin (P10, 10units), chloramphenicol (C10, 10 ug), ciprofloxacin (CIP10, 10 ug) and ampicillin (AMP2, 2 ug), all of which were established antimicrobial agents served as positive controls. As expected, all positive controls demonstrated antimicrobial activity against all test bacteria. Conversely, blank film did not result in bacterial kill. Amongst the four test bacteria, only petri dishes seeded with the gram-negative *P. aeruginosa* exhibited inhibition zones when tested with SHA1, 2 and 3. The inhibition zones resulted by the three composite films were  $23.33 \pm 1.89$ ,  $31.17 \pm 0.71$  and  $30.17 \pm 0.24$ mm, respectively. The antimicrobial effect of both SHA2 and SHA3, particularly, were comparable to that of C10 and CIP10 (inhibition zone =  $28.50 \pm 0.71$  and  $28 \pm 0.94$ mm, respectively). Altogether, the findings suggest the possible use of SHA2 and SHA3 as ideal wound dressing materials against chronic wounds which are highly susceptible to *P. aeruginosa*. Further work should be undertaken to improve the antimicrobial activity of our composite films against other bacteria types.

Keywords: Starch, Sodium hyaluronic acid, Sorbitol, *Escherichia coli*, *Salmonella typhimurium*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*

**LS-P- 7: DOCKING OF CASPASE 8 AND 9 WITH ENDOPHYTIC PYRONES  
NF00659A1 AND NF00659A2**

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The genetically programmed cell death or apoptosis is important for establishing the homeostasis and integrity of multicellular organisms. This program is initiated through the activation of cascade signaling and one of the key features is the caspase enzymes activation. Disregulations of this pathway may lead to the uncontrolled proliferation of cells. Preliminary studies showed that endophytic pyrones have cytotoxic properties to restrain the proliferation of tumor cells. The objectives of this study are to illuminate the interactions between both pyrones and the caspases and to identify the specific residues that lies between the interactions. The docking procedure was carried out using Autodock Vina. Two caspase, caspase 8 (PDB ID: 3KJQ) and caspase 9 (PDB ID: 2AR9) were docked with two compounds; endophytic pyrones NF00659A1 and NF00659A2. The results show that there are specific residues of caspases form interaction with the pyrones. Both NF00659A1 and NF00659A2 show interaction with Arg-413 for caspase 8; and Arg-355 for caspase 9. Therefore, this study reveals endophytic pyrones NF00659A1 and NF00659A2 bind to caspases. However, further studies should be conducted to have clearer understanding upon the mechanisms of actions between these compounds and caspase enzymes.

**LS-P- 8: ASSESSING THE APPROPRIATENESS OF *CYP3A4* AND *CYP3A5* mRNA  
QUANTIFICATION USING PERIPHERAL BLOOD CELL (PBC) AS A  
SURROGATE DRUG METABOLIZING ENZYMES BIOMARKER**

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The field of pharmacogenomics has expanded exponentially with the emergence of functional genomics. Due to scarcity of protein quantity in peripheral blood cell, most of the studies alternatively focus on the measurement of the expression of CYP P450 *mRNA* transcripts using total RNA extracted from lymphocytes or mononuclear cells of peripheral blood. Easily accessed, non-invasive, inexpensive and requiring low amount of samples, the use of peripheral blood cell could be a simple and suitable tool in achieving the objectives. In this study, the expression of *CYP3A4* and *CYP3A5* were quantitated to assess the appropriateness of using PBC as a surrogate drug metabolizing enzymes biomarker in kidney transplant patients treated with tacrolimus. The relationship of *CYP3A4* and *CYP3A5mRNA* copy number with the *CYP3A4*\*18 and *CYP3A5*\*3 genotypes would be investigated. A total of 80 kidney transplant patients treated with tacrolimus were recruited according to inclusion and exclusion criteria. The total RNA was extracted from five ml of blood and used for the synthesis of cDNA. Twenty samples were excluded because RNA integrity number was less than 7.0. The PCR was conducted using cDNA as template together with specifically designed exon-exon spanned primers and the amplified products were cloned into competent cells. Absolute quantification approach was employed where the serial dilution of plasmid from harvested cloned bacteria was done to generate a standard curve prior to commencement of real time PCR method using SYBR Green I Mastermix. The analysis showed that there was no significant difference in the number of transcripts between *CYP3A4*\*1/\*18 and *CYP3A4*\*1/\*1 group with  $21.32 \pm 5.90$  and  $21.22 \pm 3.99$ , respectively. Similarly, no significant correlation was demonstrated in *CYP3A5*\*3 genotypes and the transcript numbers whereby patients with heterozygous *CYP3A5*\*1/\*3 have the highest transcript number of  $6.33 \pm 3.68$  followed by patients with *CYP3A5*\*3/\*3 and *CYP3A5*\*1/\*1 genotypes with transcript numbers of  $5.55 \pm 3.96$  and  $3.84 \pm 2.48$ , respectively. *CYP3A* mRNA expression in blood lacks the consistency and reliability as predictive tool for monitoring the pharmacokinetic variation of tacrolimus. This is due to the low expression of CYP3A in the blood. Alternative tools should be sought to allow better prediction for the metabolic capability of patients.



**LS-P- 9: THE INFLUENCE OF SEX STEROID HORMONES IN LEAN AND OBESE SUBJECTS**

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Obesity is the preliminary point of a significant numbers of adulthood diseases such as cardiovascular disease, hypertension, gall bladder disease, stroke, insulin resistance, several cancers and other related diseases. Obesity may influence the cardiovascular risk factors such as metabolic syndrome and diabetes via alterations in sex steroid hormone concentrations. Previous cross-sectional studies have suggested that central obesity is associated with low concentrations of plasma testosterone, sex hormone-binding globulin (SHBG) and dehydroepiandrosterone sulphate (DHEAS). Nevertheless, prior studies have not consistently demonstrated whether sex steroids are associated specifically to body mass index (BMI) or to measures of central obesity. This study was aim to examine the relation of obesity ( $BMI \geq 27.5 \text{ kg/m}^2$ ), and of central obesity (waist circumference (WC) and waist to hip ratio (WHR)) to changes in sex steroid hormones. BMI was included as a general index of obesity, and the WC and WHR measures were incorporated to reflect the central adiposity. A total of 225 individuals in Kuala Selangor and Sungai Buloh areas in Selangor were selected as respondents. Physical activity and medical history were obtained using structured interview, adapted from The Cancer Council Victoria 2005 and International Physical Activity Questionnaire (IPAQ) 2002. Testosterone, DHEAS, and SHBG were assessed using standardized method (Elecys E 170, Roche). The results suggested that there were significance differences of SHBG and DHEAS level in obese subjects with  $p = 0.000$  and  $p = 0.002$ , respectively, but not for testosterone ( $p = 0.055$ ). A longitudinal study is recommended in line with postulation that obesity may predict a greater decline in SHBG and testosterone levels with age.

Keywords: BMI, Testosterone, DHEAS, SHBG

**LS-P- 10: THE GENOTYPE AND ALLELE FREQUENCY OF *UGT1A6* (A541G and A522C) GENE AMONG THE THREE MAJOR ETHNIC GROUPS IN MALAYSIAN POPULATION**

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UDP-glucuronosyltransferase 1A6 (UGT1A6) is a major enzyme involved in glucuronidation of small phenolic drugs. *UGT1A6* gene which encodes UGT1A6 is polymorphic. The single nucleotide polymorphisms (SNPs) of *UGT1A6* gene includes *UGT1A6*\*2 (A541G, rs2070959) and *UGT1A6*\*3 (A522C, rs1105879). The aim of this study is to determine the genotype and allelic frequency of *UGT1A6* gene in three ethnic groups of Malaysian population. The project was approved by relevant Research Ethics Committee. A total of 300 subjects which consist of 100 subjects for each ethnic group were recruited. DNA was extracted from blood samples and were genotyped for single nucleotide polymorphisms (SNPs) using polymerase chain reaction (PCR). Analysis of *UGT1A6* genotypes revealed that 61 Malays, 64 Chinese and Indian were homozygous *UGT1A6*\*1/\*1. Four subjects were heterozygous *UGT1A6*\*1/\*2 which only found in Chinese population. One tenth (10.33%) of the subjects were heterozygous *UGT1A6*\*1/\*3 which include 11 Malays, 8 Chinese and 12 Indians. The percentage of subjects with heterozygous *UGT1A6*\*2/\*3 was higher with 24.35 % Malays, 20.87 % Chinese and 54.78 % Indian. No homozygous *UGT1A6*\*2/\*2 and *UGT1A6*\*3/\*3 was detected. The allele frequencies of *UGT1A6*\*1, *UGT1A6*\*2 and *UGT1A6*\*3 were 0.56 (95% CI 0.07 – 0.96), 0.20 (95% CI 0.01 – 0.87) and 0.24 (95% CI 0.01 – 0.88), respectively. Allele frequencies of *UGT1A6*\*1 were 0.67 (Malays), 0.70 (Chinese) and 0.31 (Indians). The frequency of *UGT1A6*\*2 is 0.33 for Indians and 0.14 for Malays and Chinese. The Indians have the highest frequency of *UGT1A6*\*3(37 %; 95% 28.18 – 46.78) compared to the Malays (20 %) and Chinese (16 %). Both variants were found 95 %, 81 % and 100 % in complete linkage disequilibrium in Malays, Chinese and Indian population respectively. *UGT1A6* is highly polymorphic in Malaysia and therefore may have important implication in personalised medicine to ensure safe and cost effective therapy.

Keywords: *UGT1A*, Malaysian population (Malays, Chinese and Indian), Genotype frequency, Allele frequency, Linkage disequilibrium

**LS-P- 11: METABOLITES PROFILING AND BIOMARKER DISCOVERY OF ASPIRIN-RESISTANT IN CARDIOVASCULAR DISEASE (CVD) PATIENTS**

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Cardiovascular disease (CVD) is the main cause of death worldwide. Aspirin is widely used in reducing the risk of ischaemic events in CVD patients. However, some patients failed to response to aspirin and are known as 'aspirin resistance'. However, there is lack of accurate tool in diagnosis of these patients. The use of high-throughput metabolomics is therefore of great potential in investigating the occurrence of aspirin resistance. Current study aims are to profile endogenous metabolites and to determine potential biomarkers in aspirin-resistant and aspirin-sensitive patients and its relation with platelet aggregation. Ethics approval from Research Ethics Committee of Universiti Teknologi MARA (UiTM) and HUKM were obtained. Metabolomics analysis was done using two groups of CVD patients in comparison to healthy volunteers. Further biomarker discovery was done using advanced metabolomics analysis. Patients were recruited from HUKM and five ml of blood sample was collected. Blood serum was protein precipitated using cold acetonitrile. Processed serum samples were reconstituted with mobile phase and were injected into LC-MS QTOF positive mode. Agilent's software and web-based tool were used for metabolites profiling and biomarker discovery. A total of 187 metabolites were detected in fold change analysis cut-off 2.0 with corrected p-value ( $p < 0.005$ ). PLSDA prediction model shows 100 percent accuracy. A15 compounds model separating aspirin sensitive versus healthy group give 100 percent predictive accuracy ; 20 features was used in diagnosis of aspirin sensitive vs. resistant patients. However, further validation is required for diagnosis of aspirin resistance using larger sample size.

**Keywords:** Cardiovascular disease (CVD), Metabolomics, Aspirin resistance, Biomarkers, Serum

**LS-P- 12: IDENTIFICATION OF VIRULENCE, PATHOGENECITY AND DEFENSE  
SUBSYSTEMS IN *MYCOBACTERIUM TUBERCULOSIS* USING WHOLE GENOME  
SEQUENCING TECHNOLOGIES**

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*Mycobacterium tuberculosis* continues to threaten public health in the developing countries despite the intensive health care program. An analysis of five *Mycobacterium tuberculosis* strains was performed in order to identify the virulence factors and its mechanism in causing infectious diseases. This helps to find potential drugs targets against pathogenicity. The virulence factors were sought through a bioinformatics analysis of five *M. Tuberculosis* strain, PR05, H37rv, CDCC5079, CDC1551 and EA15. Extraction of the coding sequence and assignments of the initial function were performed using the automated annotation server RAST (Rapid Annotation using Subsystem Technology). This approach successfully identified the subsystems causing the virulence, and defense among the five strains. The subsystems consists of three subcategories: bacteriocins, ribosomally synthesized antibacterial peptides, resistance to antibiotics and toxic compounds, and invasion and intracellular resistance. A total of 112 protein encoding genes (*peg*) were assigned in the subsystem; while 89 *peg* were found in invasion and intracellular resistance subsystem; 1 *peg* was encoded in bacteriocins, ribosomally synthesized antibacterial peptides subsystem and 22 *peg* was found in the resistance to antibiotics and subsystem of toxic compounds. This analysis identified 10 mycobacterium virulence operon that are involved in Jag Protein and YidC and YidD, Esx-1 secretion system, quinolinate biosynthesis, DNA transcription, SSU ribosomal protein, LSU ribosomal protein, fatty acid biosynthesis, Esat-6 like protein, cell invasion and superoxide dismutase. Most of these mycobacterium operons are essential for cell invasion, prolonged existence in host macrophages and could be a potential source of antigenic variation in *M. tuberculosis*. As a conclusion, we summarized the advanced on the virulence, disease and defense subsystem which might help to reveal new insight into the mycobacterium pathogenesis.

Keywords: *M. tuberculosi*, virulence, pathogenesis

**LS-P- 13: UNDERSTANDING THE METABOLIC REGULATORY DIFFERENCES  
OF BREAST CANCER PATIENTS**

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Breast cancer is the most common cancer among women worldwide with an estimated 1,300,000 new cases and 465,000 deaths annually. The biological state of breast cancer patients were much different from the healthy individuals that urge many studies to understand the regulation and mechanism of the disease as well as responses towards breast cancer treatment. Genomics, transcriptomics and proteomics are important “omic” fields with great potential to understand the mechanism of diseases and cancers, in particular. One of the new emerging approaches which could be of significant contribution is metabolomics for biomarker discovery of breast cancer disease. This study aims to investigate the differential expression between breast cancer patients and healthy individuals via metabolomic approach and to determine the potential biomarkers for diagnosis of cancer. Metabolites were extracted from plasma of patients and healthy volunteers recruited using optimized extraction protocol. Extracted metabolites were run analysed using LC/MS QTOF. The data was mined using a range of pattern recognition techniques, including hierarchical cluster analysis, principal component analysis, and partial least squares. Profile of the metabolites for breast cancer patients is a good database for subsequent targeted metabolomic analysis. It provides clues and insight of other pathways or mechanisms involved in breast cancer. Valuable biomarker can be identified and validated for clinical use. The results showed perturbation in the metabolism fatty acids, lipid and several amino acid derivatives are involved in the regulation of breast cancer.

**Keywords:** Breast cancer, Biomarker, LC/MS QTOF, Fatty acid, Lipid metabolism, Metabolomics

**LS-P- 14: A COMPUTATIONAL MODELLING APPROACH TOWARDS  
PERSONALIZED MEDICINE: VIRTUAL SCREENING DRUG INDUCED  
HYPERSENSITIVITY THROUGH CHEMICAL-PROTEIN INTERACTION**

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Recent studies have shown that HLA alleles are the major genetic determinants of drug hypersensitivity that lead to Stevens–Johnson syndrome and Toxic Epidermal Necrolysis among individuals from Southeast Asian countries and Han Chinese. There is a strong association between the human leukocyte antigen HLA–B\*1502 and carbamazepine (CBZ) which causes Stevens–Johnson syndrome. However, the underlying molecular mechanism remains unclear. A recent molecular modeling study has predicted the mechanism and molecular interaction pattern between HLA-B\*1502 protein and carbamazepine. We have standardized various protocols and designed a computational modeling approach that allows interaction pattern of drug molecule with HLA-B\*1502 to be determined. Molecular dynamics simulations were performed on selected drugs are also useful for in-depth understanding of the molecular interaction pattern of drug induced hypersensitivity. This model is useful to virtually screen all possible drug candidates or molecules that may cause drug induced hypersensitivity due to HLA-B\*1502 alleles. The molecule-protein interaction pattern for hypersensitivities inducing drug molecule could be analysed using this modeling approach. We believed this computational approach would be an initiative towards personalized medicine.

**Keywords:** Hypersensitivity, HLA–B\*1502, Modeling, Carbamazepine

**LS-P- 15: ENDOPHYTIC SECONDARY METABOLITES AS AGENTS TO  
REVERSE RESISTANCE TO ANTIMICROBIAL DRUGS**

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Increasing number of publications have recently not only stressed out on the development of antibacterial resistance, but also the development of more aggressive and pathogenic bacterial strains, causing a serious problem in the health care sector. Therefore, the urge for development of new drugs with anti-superbug resistance activity. This will make possible to reuse the existing antibiotics that became ineffective because of the emergence of resistance in microorganisms and will save the cost and effort required for the discovery of new antibiotics for which microorganism may develop a resistance upon used. In the literature many studies suggest that “endophytes do produce medicinally important secondary metabolites (e.g. antimicrobial compounds) which plants are known to produce”. Therefore, plant colonizing endophytes might be a great source for new metabolites with anti-drug resistance in superbugs. The aim of this project is to identify the compounds able to inhibit and reverse resistance to antibiotics in pathogenic microorganisms. Bacterial and/or fungal endophytes from selected plant species from Botanical Garden of Melaka have been isolated. These Endophytic cultures are to be screened for antimicrobial or anti-drug resistance properties. A cytotoxicity test of the extracts from the leads (endophytes showing positive results in screening of endophytes for antimicrobial or anti-drug resistance) is carried out and further characterisation and purification of the compounds with biological activity is carried out using different techniques (e.g. HPLC, LC-MS<sup>2</sup>, NMR and MS techniques). A total of 213 bacterial and fungal endophytes have been isolated from plants collected from Melaka botanical garden. These plants include *Calophyllum inophyllum* (Bintangor Laut), *Calophyllum spp.* (Bintangor), *Calophyllum spp.* (Geronggang), *Garcinia spp.* (Kandis) and *Mimusopselengi* (Bunga Tanjung). Crude extracts have been prepared for the endophytic isolates, and currently being tested for antimicrobial activity.

**Keywords:** Antimicrobial, Bioactivity, Crude extracts, Cytotoxicity, Endophytes

**LS-P- 16: IDENTIFICATION OF NOVEL LUNG  
CANCER mRNA TRANSCRIPTS BY *ALU*-PCR**

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Lung cancer is the leading cause of cancer-related death worldwide where tobacco smoking is considered as the main cause of the disease. It can be divided into two major subtypes which are small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC). The carcinogenesis of lung cancer is yet to be fully elucidated. Therefore, *Alu* profiling is one of the methods that can be used to identify novel genomic alterations without the knowledge of the sequences. *Alu* elements are the most abundant repetitive elements, making up ~11% of human genome. They are 300 bp long and ancestrally derived from 7SL RNA gene. As the *Alu* elements are widely dispersed in human genome, they can be used as universal primer for the detection of insertion or deletions of sequences. The aim of this study is to clone novel expressed transcripts that are involved in lung cancer. Total RNA was extracted from A549 cell lines and was reverse transcribed. The cDNA was amplified by using *Alu*-PCR where *Alu* sequence was used as universal primer. Multiple nonspecific bands were observed and cloned into TOP10 vector by using TA cloning method. We managed to clone 3 fragments of different sizes which are 260, 280 and 791 bp respectively. BLAST search revealed no significant match to Ref\_Seq mRNA database, indicating they are novel transcripts. *Alu* profiling is a useful method in identifying novel genes that may cause genomic alteration in lung cancer A549 cell lines. Work is currently in progress to validate the expression of these sequences by using qPCR between lung cancer and normal lung cell lines.

**Keywords:** Lung cancer, A549 cell lines, *Alu* elements, *Alu*-PCR



**LS-P- 17: CARBAMAZEPINE INDUCED OXIDATIVE STRESS AND POTENTIAL  
ROLE OF TOCOTRIENOL RICH FRACTION (TRF) TREATMENTS USING  
METABOLOMICS ANALYSIS**

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Metabolism of carbamazepine (CBZ) produces reactive metabolites (o-quinone, arene oxide, epoxide, carbocation) which are associated with severe adverse reactions (ADR). Several studies have shown that antioxidant such as Tocotrienol Rich Fraction (TRF) is useful to prevent the production of reactive metabolites (e.g. reactive oxygen species) and therefore CBZ-induced ADR. This study aims to determine the role of TRF in manipulating the pertubated host metabolism due to CBZ treatment. Three groups of SD rats were administered different regimen of CBZ, CBZ+TRF and controls. Sera and organs were collected after day 7 of treatment. All samples were stored at -80°C until analysis. Sera was protein precipitated with 2:1 acetonitrile/water (pH 10); while the organs were extracted using six (6) series of extraction solvents which include ethyl acetate, hexane, ethanol, methanol, dichloromethane and distilled water. All supernatant were dried, reconstituted with mobile phase and injected to the LC-MS QTOF for analysis. Ten (10) metabolites that could be used as predictive biomarkers for CBZ treatment include pyroglutamic acid, spermidine, 5-aminopentanoic acid, glycerophosphocholine, 18-oxo-nonadecanoic acid, ornithine, creatine, 4-hydroxy-L-threonine, inosine and hypoxanthine. Ornithine was identified as essential metabolite in classifying the role of TRF treatment after an extensive biomarker validation. In conclusion, metabolomics are useful approach that one shall adopt for research and hypothesis driven study.

**Keywords:** Carbamazepine, Oxidative stress, Predictive bioamarkers

**LS-P- 18: *LACTOBACILLUS* SP. ISOLATED FROM MALAYSIAN FERMENTED  
FOOD INDUCED APOPTOSIS AGAINST HUMAN COLORECTAL CANCER  
CELLS *IN VITRO***

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In spite of being one of the most treatable malignancies, colorectal cancer (CRC) remains a major threat to public health in Malaysia. Chemotherapy plays a crucial role in treatment of this cancer type. However, the effectiveness of this approach is often hampered by toxicity-limiting therapeutic effect and development of drug resistance. Probiotics is thought to be able to prevent CRC through changing of colonic microbiota. As such, we have isolated 12 unique *Lactobacillus* sp. (LAB) from locally fermented food. The present study aimed to examine the cytotoxicity and apoptotic properties of *Lactobacillus* sp. LAB12 against HCT116, a human colorectal cancer cell line. The inhibitory effects of LAB12 against proliferation of HCT116 was measured using the MTT assay. Apoptotic effect of LAB12 was analyzed using flow cytometry. Morphological changes of cells underwent apoptosis were confirmed using acridine orange (AO)-propidium iodide (PI) double-staining and confocal microscopy. *L. casei* strain Shirota (LABPC), a commercial strain initially isolated from Yakult, was used as a reference strain. Exposure of HCT116 to LAB12 and LABPC for 72 h exhibited comparable antiproliferative activity, with IC<sub>50</sub> values of 56.93 ± 1.72% and 51.43 ± 5.00%, respectively. Increased percentage of cells in the early apoptosis and late apoptosis (indicative of apoptosis) was observed after 24, 48 and 72 h treatment with LAB12 (4.59%-46.46%) and LABPC (6.72%-51.45%), respectively when compared to untreated cells. Confocal microscopy of LAB12- and LABPC-induced apoptosis in HCT116 cells confirmed the presence of apoptotic bodies and chromatin condensation as well as membrane blebbing. The probiotic lactobacilli LAB12 and LABPC elicited anticancer activity through induction of apoptosis of cancer cells could serve as a promising approach in cancer treatment. These findings warrant further investigations using animal models to validate the use of probiotics as part of cancer therapy in clinical practice.

Keywords: Probiotics, Colorectal cancer, Anticancer, Apoptosis, Antiproliferative

**LS-P- 19: SERUM METABOLIC PROFILING OF ALZHEIMER'S DISEASE FOR  
EARLY DETECTION**

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Alzheimer's disease (AD) is a progressive neurodegenerative disease characterized by loss of memory and deterioration of cognitive function. To date, treatment of AD remains a great challenge as the pathogenesis of this disease is still poorly understood. As such, identification of AD biomarkers would be of high relevance not only to assist early detection but also to slow disease progression and uncover potential drug targets. This present study aimed to map potential blood-based biomarkers for AD using metabolomics approach. Written informed consent was collected from all subjects and the protocol was approved by research committees of Universiti Teknologi MARA (UiTM) and University of Malaya Medical Centre (UMMC). Blood serum samples from both Malaysian healthy subjects (n = 60) and probable AD patients (n = 42) were investigated for metabolic change using liquid chromatography/ mass spectrometry quadrupole time of flight (LC/MSQTOF). Data was analysed using Agilent MassHunter Mass Profiler Professional. Generally, multivariate statistical tools [Principle Component Analysis (PCA) and Partial Least Square Discriminant Analysis (PLSDA)] enabled clustering of metabolites in the score plot discriminating the AD from the healthy group with sensitivity of 84.52% and specificity of 76.25%. In total, 375 analytes were identified, of which 32 exhibited a 2 fold change ( $p < 0.05$ ) between groups. Several metabolites that have Variable Important of Projection (VIP) value  $>1$ , contributed in discriminating metabolic profiles between the AD patients and healthy subjects were highlighted. Elevated levels of s-(p-Azidophenacyl)glutathione and pyroglutamic acid were found in AD patients samples. On the other hand, 2-Hydroxy-3-(4-methoxyethylphenoxy)-propanoic acid, 20 $\alpha$ -Dihydroprogesterone glucuronide, 4,7,10,13,16-docosapentaenoic acid and 2E,5Z,8Z,11Z,14Z-eicosapentaenoic acid were down-regulated in AD subjects. Pathway analysis showed glutathione metabolism as the most significant pathway. This implied a strongly correlation of this pathway with disease pathogenesis. The findings of a number of potential biomarkers warrant further investigations in larger sample size.

**Keywords:** Alzheimer's disease, Biomarkers, Diagnosis, Metabolomics, Serum

**LS-P- 20: HONEY FRUCTOOLIGOSACCHARIDES SUPPORT GROWTH AND ORGANIC ACIDS PRODUCED BY *BIFIDOBACTERIUM LONGUM* ATCC 15707**

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Honey contains fructooligosaccharides (FOS) is a prebiotic which potentially affects the health of consumers by stimulating the growth of probiotics in the human gut. The content of FOS in honey depends largely on the source of nectar and geographical location. Therefore, this research was carried out to determine the ability of selected Malaysian honey namely gelam, tualang, acacia and nenas to enhance the growth and activity of *Bifidobacterium longum* ATCC 15707 a probiotic in the modified De Man Rogosa Sharpe (mMRS) medium. The growth-promoting and prebiotic effects of the honey were compared with commercially available FOS. Changes in acidity, mean doubling time ( $T_d$ ), viability and levels of fermentation end products (lactic and acetic acids) in mMRS during fermentation were examined. The levels of lactic and acetic acids produced by *B. longum* in the presence of different types of honey were measured by high-pressure liquid chromatography (HPLC). During the 24-48 h, fermentation of honey and FOS with *B. longum*, the pH in media and mean doubling time ( $T_d$ ) decreased, while the viability of bacteria and the levels of lactic and acetic acid increased. Gelam honey exhibited the lowest pH ( $4.27 \pm 0.02$ ) with an increased viability of *B. longum* at  $9.87 \pm 0.60$  cfu/mL in comparison with the other local honey. All the four local honey enhanced the growth and activity of *B. longum*. The results obtained showed that our local honey supports the growth and activity of the *B. longum* better than FOS.

Keywords: Honey, Fructooligosaccharides, *Bifidobacterium longum*, probiotic

**LS-P- 21: LACTIC ACID BACTERIA DOWN-REGULATING PRO-INFLAMMATORY CYTOKINES IN DSS-INDUCED COLITIS MICE MODEL**

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Ulcerative colitis (UC), a form of inflammatory bowel disease (IBD), is characterized by chronic inflammation of the colon. Its pathogenesis is associated with abnormal composition of the gut microflora. The use of probiotics, especially lactic acid bacteria (LAB), to improve gut microflora could thus serve as a good strategy in modulating inflammatory response during treatment of UC. As such, the aim of this study was to evaluate the inhibitory effects of LAB against pro-inflammatory cytokines produced in mice with dextran sulfate sodium (DSS)-induced colitis. The LAB used in this study were *Pediococcus pentosaceus* (LAB8) and *Lactobacillus* sp. (LAB12) isolated from Malaysian local fermented food. *Lactobacillus casei* (LABPC) and sulfasalazine were used as reference strain and positive control, respectively. Colitis was induced in BALB/c mice (n = 6/group) by administering 3% DSS to drinking water for 7 days together with the LAB ( $10^9$  cfu). After 28 days of pre-treatment with LAB, colons were removed for morphological examination and later homogenized with PBS before being subjected to detection of various cytokines using the multiplex Procarta<sup>®</sup> Immunoassays Kit. Cytokines measured in this study include pro-inflammatory cytokines TNF- $\alpha$ , IFN- $\gamma$ , IL-17A, IL-6, and the IL-12. When compared to controls, severity of the colitis was modestly reduced in mice pre-treated with LAB (disease activity index ranged 1.35 to 1.4). In addition, all three LAB strains resulted in significant ( $p < 0.001$ ) down-regulation of all cytokines. LAB 12, in particular, showed the most potent inhibitory effect with inhibition percentage between 92 - 97% against TNF- $\alpha$ , IFN- $\gamma$ , IL-17A, IL-6, and 49% inhibition against IL-12. Furthermore, LAB12 showed greater inhibitory effect against IFN- $\gamma$  (+2%) and IL-6 (+0.8%), compared to sulfasalazine. These results indicated the potential LAB-induced inhibition of pro-inflammatory cytokines. This warrants further investigation into the underlying mechanisms.

**Keywords:** Colitis, Lactic acid bacteria, Pro-inflammatory cytokine

**Pharmacology/ Toxicology (PG)**

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**PG-O- 1: THE STUDY OF CYTOTOXIC EFFECT OF PEGYLATED RAPAMYCIN MICELLES AGAINST CRL 1739 GASTRIC CANCER CELL LINES**

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Rapamycin (RP) is highly lipophilic drug. It has been conjugated by ester bond with hydroxyl group of RP and hydrophilic block of poly (ethylene glycol) carboxylic acid. The PEGylated RP was obtained and prepared in micelles in presence of polyvinyl alcohol. In this research work, the micelles were characterized by using zeta sizer, field emission scanning electron microscopy, differential scanning calorimetry, chromatographic analyses, RP release studies and cytotoxicity studies on specific CRL 1739 gastric cancer cell lines. The results were shown with particle size distribution of 120 nm approximately with narrow size distribution. The surface charge was found to be -12.3 mV. We have investigated an anticancer activity of these PEGylated RP micelles against the CRL 1739 Gastric cancer cell lines with an IC<sub>50</sub> value of 1 µg/ml. PEGylated RP micelles are more active compared to free RP.

**PG-O- 2: SENSITIVITY OF BRINBD11 CELLS TO A FRACTION OF *OCTOMELES SUMATRANA* EXTRACT (*DATISCACEAE*)**

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Our previous work showed aqueous extract of *Octomeles sumatrana* to normalise elevated glucose levels of streptozotocin-diabetic rats. To clarify its mechanism of action, this study investigated the insulin secretion activity of *Octomeles sumatrana* aqueous extract and 4 fractions with high antioxidant activity isolated from butanol extract in BRINBD11, an insulin secreting pancreatic beta cell lines. The results showed *Octomeles sumatrana* aqueous extract and 4 fractions (Fraction 9, fraction 29, fraction 55 and fraction 59) isolated from butanol extract significantly increased ( $p < 0.05$ ) insulin level compared to control. In summary, *Octomeles sumatrana* has the potential of being an insulintrophic agent. Further studies are on-going to elucidate the mechanisms which underlie this insulin secretion activity of *Octomeles sumatrana*.

**Keywords:** *Octomeles sumatrana*, BRIN BD11, Insulin secretion activity

**PG-O- 3: FRACTION 7, FAMILY POLYGONACEAE PREVENTED  
HEPATOCELLULAR CARCINOMA IN ORTHOTOPIC XENOGRAFT MODEL**

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Hepatocellular carcinoma (HCC) is primary liver cancer caused by many factors including Hepatitis B and C, contamination of aflatoxins in food, excessive alcohol intake and smoking habits. The aim of this study was to look on effect of F7, family Polygonaceae, in prevention of HCC in orthotopic xenograft model of severe combination immunodeficiency (SCID) mice. Healthy SCID male mice (4 to 6 weeks old) were randomized into 6 groups of 6 mice per group. Three groups served as control while the other 3 were treated with F7 (50, 100 and 200 mg/kg, daily, i.p.) for 2 weeks prior to cancer induction. Following cancer induction, mice were rested for 1 week to allow recovery. Treatment with F7 was continued for another 4 weeks. Blood was withdrawn from orbital sinus every week to monitor liver enzymes using ILAB 3000. There were no significant changes in body weight, water and food intake in all groups throughout the study. There was no formation of cancer in all 6 mice in the group treated with 200 mg/kg F7. Only 2 mice from 50 and 100 mg/kg-treated groups developed HCC. Serum levels of AST, ALT and ALP were significantly elevated one week after surgery in all groups and begin to normalize after another 3 weeks of treatment when compared to untreated control. Glucose level was significantly lowered after 2 weeks of induction but rose to normal range 2 weeks after that. Serum albumin stayed at normal range in all groups except for control group which showed significant reduction. Serum protein was elevated after cancer induction and began to normalize in groups treated with F7 but stayed high in control groups. Based on the evidence from this experiment, F7, family Polygonaceae has the potential to prevent HCC in orthotopic xenograft model.

**PG-O- 4: ANTIPROLIFERATIVE EFFECT OF ETHYL ACETATE FRACTION  
ISOLATED FROM *CASSIA AURICULATA* AND ITS MOLECULAR MECHANISMS**

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*Cassia auriculata* is a common south Asian medicinal plant that widely used in traditional medicine. Therapeutic potential is well documented. This study aimed to investigate the *in vitro* anti-proliferative potential activity of *C. auriculata* flowers extract. The cytotoxicity was measured by MTS assay. Different stages of apoptotic programmed cell death were confirmed using flowcytometry. The molecular mechanisms of cell death were analyzed by real-time RT-PCR. Cell cycle disruption was determined by cell cycle analysis using flowcytometry. The results showed that the crude extract exhibited selective inhibitory effect against HepG2 cells with IC<sub>50</sub> value of  $63 \pm 2.2 \mu\text{g/ml}$  as compared to MCF-7 ( $125 \pm 2.6 \mu\text{g/ml}$ ) and HCT116 cells ( $199 \pm 5.8 \mu\text{g/ml}$ ). However the treatment showed minimal cytotoxic effect against normal cells WRL-68 ( $251 \pm 4.1 \mu\text{g/ml}$ ) after 24, 48 and 72h of incubation. Consequently, crude extract is subjected to partition and fractionation process. Fraction F1 (ethyl acetate fraction) exerted the most potent cytotoxic effect among the six fractions that has been obtained with an IC<sub>50</sub> value of  $12.5 \pm 2.3 \mu\text{g/ml}$ . Analysis of cell-death mechanism demonstrated that apoptosis was the main mode of the cell death and it was significantly induced in a dose dependent manner in HepG2 cells treated with F1 using three different concentrations (IC<sub>20</sub>, IC<sub>50</sub> and IC<sub>70</sub>). These effects were attributed to the up-regulation of tumor suppressor gene, - (p53), a pro apoptotic gene, - (Bax) and a major apoptotic gene, - (caspase-3) by 5.7, 7 and 2.6 fold respectively and suppression of anti-apoptotic gene, - (Bcl-2) by 70%. The cell cycle analysis revealed that there was a markedly accumulation of the cells at G2/M phase caused by arrested the cells at this phase along with a corresponding decrease in G0/G1 and S phase. These results suggest that F1 isolated from *C. auriculata* flowers extract inhibit HepG2 cells growth by inducing apoptosis and arresting the cell cycle at G2/M phase. Thus, it could be concluded that *C. auriculata* plant is a promising anticancer agent for hepatocellular carcinoma.

Keywords: Anti-proliferative, *Cassia auriculata*, Flow cytometry, HepG2, RT-PCR

**PG-O- 5: CORRELATION ANALYSIS AND ENZYME INHIBITION OF  
CYTOCHROME P450-MEDIATED STEREOSELECTIVE METABOLISM OF  
3,4-METHYLENEDIOXYMETHAMPHETAMINE IN HUMAN LIVER  
MICROSOMES**

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3,4-methylenedioxymethamphetamine (MDMA) is a neurotoxic drug of abuse with stimulant and hallucinogenic properties. MDMA is a racemic compound that is stereoselectively metabolised by cytochrome P450 (CYP) enzymes with (*S*)-MDMA preferred over (*R*)-MDMA. Since MDMA stereoisomers possess different pharmacokinetic, pharmacodynamic and toxicological properties, stereoselectivity plays an important role in the acute and chronic effects of MDMA. There is a lack of data regarding the influence of CYP enzymes on the stereoselectivity of MDMA metabolism as well as the factors that may alter stereoselectivity. We aim to elucidate the role of individual CYP enzymes in the stereoselectivity of MDMA metabolism as well as to identify influencing factors such as inter-individual variations in CYP enzyme activity, *CYP* polymorphisms or inhibition of CYP enzymes. This *in vitro* study was divided into two parts: i) a correlation analysis study using human liver microsomes to determine the effect of inter-individual variations in CYP activities and *CYP* polymorphisms on stereoselectivity, and ii) enzyme inhibition experiments to study the effect of CYP enzyme inhibition on stereoselectivity. The results indicated that several previously unknown correlations between CYP enzyme activities and MDMA stereoselective metabolism were identified. The formation of metabolite was positively correlated with CYP2D6 activity while metabolite enantiomer ratios were negatively correlated with CYP2D6 activity, MDMA substrate concentration and age. Inhibition of CYP enzymes decreased metabolite formation. These experiments indicated that CYP2D6, CYP1A2, CYP2C19 and CYP2B6 play a significant role in the observed stereoselectivity. On the other hand, inhibition of CYP enzymes did not have any effect on stereoselectivity. The findings of this study indicate that stereoselectivity is influenced CYP enzyme activity, age and concentration of MDMA. As a result, certain individuals may be more susceptible to the enantiomer-dependant acute and chronic toxic effects of MDMA. 3,4-methylenedioxymethamphetamine, cytochrome P450, stereoselective metabolism, human liver microsomes

**PG-O- 6: WHITE TEA (*CAMELLIA SINENSIS*) INHIBITS PROLIFERATION OF THE COLON CANCER CELL LINE, HT-29, ACTIVATES CASPASES AND PROTECTS DNA OF NORMAL CELLS AGAINST OXIDATIVE DAMAGE**

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Second only to water, tea (*Camellia sinensis*) is one of the most consumed beverages in the world. It contains a number of chemical constituents possessing medicinal and pharmacological properties. White tea is made from the buds and young leaves of the tea plant which are steamed and dried, whilst undergoing minimal oxidation. The antioxidant activity of white tea aqueous extract was investigated. The extract was tested on the colorectal cancer cell line, HT-29, for its effect on proliferation by the MTT assay. Caspases 3/7, 8 and 9 were assayed on treatment of the cells with the extract. DNA damage in 3T3-L1 normal cells was detected by using the comet assay. The extract showed high antioxidant activity in various assays. The extract inhibited the proliferation of HT-29 cells and increased expression levels of caspase-3, -8 and -9. The extract also protected 3T3-L1 cells against H<sub>2</sub>O<sub>2</sub>-induced DNA damage. The results from this study show that white tea has antioxidant and antiproliferative effects against cancer cells, but protect normal cells against DNA damage. Regular intake of white tea could maintain good health and protect the body against disease.

**PG-O- 7: AN INDOLE-3 DERIVATIVE (I3D.1) IS GASTROPROTECTION IN  
ETHANOL-INDUCED GASTRIC ULCER AND HAS NO ACUTE TOXICITY  
EFFECT**

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Peptic ulcer is common in clinical practice and had been a major cause of morbidity and some mortality. The present study was carried out to investigate the acute toxicity and anti-ulcer effect of a newly synthesized indole-3 derivative (I3D.1). The rats were administered with a single dose of 2000 mg/kg body weight and were observed for 14 days. There were no deaths and the animals did not show any signs or symptoms of toxicity during the experimental period. I3D.1 did not affect the general behaviour, body weight, food and water intake, relative organ weight, haematology and clinical biochemistry of the rats. Acute oral LD<sub>50</sub> of I3D.1 was estimated to be between 2000 to 5000 mg/kg. For gastroprotective effect study, 24 h - fasted rats were pretreated with 4 different doses of I3D.1 (25, 50, 100 and 200 mg/kg). Each group consisted of 6 rats. After an hour, gastric ulcer in rats was induced by oral administration of absolute ethanol (5 ml/kg). One hour later, rats were killed for gross examination of stomach which was then processed for histology. Negative control group received the vehicle, 10% Tween 80 while the positive control group received omeprazole, a reference antiulcer drug. Control group with ulcer exhibited severe mucosal injury, whereas groups pre-treated with I3D.1 (dose 100 mg/kg – 88% of inhibition and dose 200 mg/kg – 97% of inhibition) exhibited significant protection against gastric mucosal injury. These results suggest that I3D.1 promoted ulcer protection as shown by significant reduction of ulcer area, and histologically, by decrease in ulcer areas, reduction or absence of edema and reduced leucocytes infiltration of submucosal layer compared to ulcer control group.

**Keywords:** Acute toxicity, Anti-ulcer, Ethanol-induced gastric ulcer, Gastroprotection, Indole-3 derivative

**PG-O- 8: ASSESSMENT OF ETHANOL WITHDRAWAL INDUCED ANXIETY IN  
THE AUTOMATED ELEVATED PLUS MAZE USING HOTSPOTS™ GRAPHIC  
SOFTWARE ANALYSIS**

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Cessation or diminution in ethanol consumption following a prolonged period of excessive drinking results in manifestation of ethanol withdrawal induced anxiety which, in rats, can be assessed by using the elevated plus maze (EPM). However, most of these EPM studies used a quantitative approach to investigate ethanol withdrawal induced anxiety by reporting results confined to only open or closed arms time or entries. The present study used the HotSpots™ graphic analysis feature of the Motor Monitor™ Host Application software of the automated EPM as an additional tool along with traditional quantitative assessment of anxiety in EPM to assess ethanol withdrawal induced anxiety. 16 Male Wistar rats were fed with a Modified Liquid Diet containing low fat cow's milk, sucrose, and maltodextrin with gradual introduction of 2.4%, 4.8% and 7.2% ethanol for 20 days. At the 7<sup>th</sup> hour from the last ethanol intake, rats were tested for withdrawal anxiety in the EPM. Quantitative assessment of anxiety was obtained by recording data such as total time and entries in the open and closed arms of the EPM. Significant reduction in open arm time and entries but increase in closed arm time was recorded in ethanol withdrawn rats. A significant reduction in locomotion shown in closed arm entries was noticed among ethanol withdrawn rats. The qualitative assessment of behavioural data was obtained by using HotSpots™ graphic analysis. HotSpots™ analysis shows ethanol withdrawn rats spent significant time in the corner of the closed arms and explored less of the open arms of the maze. Assessment of withdrawal anxiety using HotSpots™ graphic analysis along with the quantitative approach provides greater specificity and accuracy in the interpretation and evaluation of ethanol withdrawal induced anxiety behaviour of rats in the EPM.

**Keywords:** HotSpots, Withdrawal anxiety



**PG-O- 9: INHIBITION OF REACTIVE OXYGEN SPECIES (ROS) BY  
NICOTINAMIDE IS MEDIATED BY THE DOWN REGULATION OF HYDROXY  
ACID OXIDASE 1 GENE (HAO1) IN GESTATIONAL DIABETIC RAT MODEL**

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Risk of treating Gestational diabetes mellitus (GDM) requires consideration of potential harm equally to mother and fetus. It is difficult to attain normoglycemia in gestational diabetes, due to the co-morbid conditions of immune system and hormonal levels. An excessive reactive oxygen species produced in GDM causes oxidative stress which may also lead to DNA damages of fetus and mother. In the present study we have investigated the effect of nicotinamide (NA) on regulating reactive oxygen species (ROS) and the mechanisms underlying it in gestational diabetic rat model. ROS produced from neutrophils were measured through phagoburst assay, antioxidant genes *Super oxide dismutase* and *catalase* (SOD & CAT), stress response-related gene *Hydroxyacid oxidase 1* gene (Hao1) were measured by RT-PCR and genotoxicity of DNA measured through comet assay. Supplementation of NA to GDM rats from day 6 to 20 of gestation upregulated the expressions of antioxidant genes indicating amelioration of oxidative stress. Stress response-related gene (Hao 1) was down regulated; this involves in the mechanism to prevent free radical in liver and responsible in reducing ROS-producing enzymes thus controlling oxidative stress. NA was protective to DNA as shown by comet assay. Results of this study provide evidence for use of NA against oxidative damage in Gestational diabetes.

**Keywords:** Nicotinamide, Gestational diabetes mellitus, Oxidative stress, Reactive oxygen species, Genoprotection

**PG-O- 10: *LACTOBACILLUS* PROBIOTIC-INDUCED ANTI-  
NEUROINFLAMMATION IN TRANSGENIC MICE WITH ALZHEIMER'S  
DISEASE WAS ASSOCIATED WITH CHANGES OF PRO-AND ANTI-  
INFLAMMATORY CYTOKINE LEVELS**

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Alzheimer's disease (AD), a neurodegenerative disorder characterised by increased oxidative stress and neuroinflammation, poses vicious threats to health and well-being of our aging nation. Current existing therapeutic strategies have all failed to result in cure. The recent development of the gut-brain axis concept has uncovered the use of probiotic as a new viable alternative in treating AD patients. The underlying mechanism of this approach hitherto remains poorly understood. The present study investigated the mechanisms of potential neuroprotection-induced by a Malaysian *Lactobacillus* sp., LAB12, in a transgenic (APP) mouse model. The transgenic mice were treated with LAB12 for 12 weeks (109 cfu/ml, p.o) and thereafter subjected to Morris water maze test for assessment of memory. Subsequently, the mice were sacrificed and brain homogenates examined for oxidative and anti-inflammatory activity. When compared to the control group, probiotic-treated group showed enhanced memory and learning ability ( $p < 0.05$ ). Brain homogenates of transgenic mice treated with LAB12 showed increased level of antioxidants ( $p < 0.05$ ). Conversely, oxidative stress level of the treated samples, which was reflected by nitric oxide (NO) concentration, was significantly reduced by 49% when compared to the control group. Whilst the anti-inflammatory cytokine IL-10 was significantly up-regulated (+22%) in brain homogenates of the treated group, the pro-inflammatory cytokines, IFN- $\gamma$ , IL-1 $\beta$  and IL-6, were significantly down-regulated by 24%, 16% and 29% , respectively. Altogether, our findings implied the potential neuroprotective effect of probiotic through oral administration. This anti-neuroinflammation effect was associated with up-regulation of anti-inflammatory cytokines and down-regulation of pro-inflammatory regulators.

**Keywords:** *Lactobacillus*-probiotic, APP transgenic mice, Morris water maze, Antioxidant, Oxidative stress, Cytokines

**PG-P- 1: SYNTHESIS AND CHARACTERIZATION OF POLYMERIC  
CONJUGATED SIROLIMUS ON MCF-7 (ESTROGEN POSITIVE) AND MDA MB  
231 (ESTROGEN NEGATIVE) BREAST CANCER CELL LINES**

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Sirolimus (SR) is used as an immunosuppressant drug to prevent organ rejection in kidney transplants. It is chemically a macrolide and isolated from the bacterium *Streptomyces hygroscopicus* in a soil sample. It has potent antiproliferative properties and useful in the treatment of certain types of cancer. In our current study, SR is chemically conjugated with Methoxy-polyethylene glycolic acid (mPEG COOH). The polymeric SR conjugate (mPEG-SR) was characterized by UV-spectra, infrared (IR) spectra, <sup>1</sup>H NMR spectra, matrix-assisted laser desorption/ionization time of flight (MALDI-TOF) and HPLC analyses. It was found to be structurally correlated among the chemical structures of SR, mPEG COOH-SR conjugate and m-PEG COOH polymer. The anti-cancer activity assay (MTT assay) of mPEG-SR conjugate was carried out on specific breast cancer cell lines. All results were showing the positive effects of mPEG-SR and with IC<sub>50</sub> values of 15 µg/ml and 1.5 µg/ml on MDA-MB 231 (estrogen negative) and MCF-7 (estrogen positive) breast cancer cell lines *in vitro*, respectively. ThemPEG-SR conjugate was not shown any significant cytotoxicity activity on 3T3 fibroblast normal cell lines. These results indicate that mPEG-SR conjugate may provide highly potent cytotoxicity activity and better therapeutic treatment against breast cancer types.

**Keywords:** Sirolimus, Polymeric conjugates, Cytotoxicity, Breast cancer, MDA-MB 231 and MCF-7 breast cancer cell lines

**PG-P- 2: POTENTIAL NEURAMINIDASE INFLUENZA A (H1N1) INHIBITOR OF  
PSIDIUM GUAJAVA**

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The new influenza A virus H1N1 strain of swine origin is spreading from person-to-person and the recent outbreak of the influenza has raised a global concern on the future risk of a pandemic. The current neuraminidase inhibitor, oseltamivir, could not meet the demand if there was a major outbreak even the pandemic. Thus, finding an alternative treatment for influenza A is a necessary. Our molecular docking work on neuraminidase has led to the selection of *Psidium guajava* as a plant to be studied. Therefore, the objective of this study is to determine potential neuraminidase H1N1 inhibitors from *Psidium guajava*. The fruit of guava was dried, powdered and then extracted using the soxhlet method with methanol as a solvent. The methanol extract was partitioned into different solvents. Compounds were also isolated and purified from these extracts. Four *Psidium guajava* fractions (n-hexane, chloroform, ethyl acetate and butanol) and compounds were tested for bioassay against clostridium neuraminidase using the MUNANA method. The results showed that more than 50% inhibition for all the fractions and compounds. In conclusion, *Psidium guajava* fruit fractions were active against MUNANA Neuraminidase enzyme, thus making up important potential sources of neuraminidase inhibitors.

Keywords: *Psidium guajava*, Soxhlet extraction, Neuraminidase inhibitor

**PG-P- 3: EFFECTS OF *CASSIA ALATA* LEAVES EXTRACT TOWARDS RENAL AND LIVER MICROSOMAL OXIDATIVE STRESS IN HYPERGLYCEMIC RATS**

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An aqueous extract of *Cassia alata* leaves, a traditional medicinal herb was assessed liver microsomal and renal STZ induced hyperglycemic rats. During diabetes persistent, hyperglycemia causes increased production of free radicals and simultaneous decline of antioxidant defense mechanism that lead to the damage of cellular organelles and enzymes, increase in lipid peroxidation and development of insulin resistance. *Cassia alata* leaves extract was administered orally (200 mg/kg) for 20 days. The effect of *Cassia alata* leaves extract in liver and renal microsomal were studied the levels of lipid peroxidation (MDA), antioxidant enzymes catalase (CAT) and total antioxidant assay (DPPH) were also estimated and compared to the control group. Treatment group with *Cassia alata*, has significantly decreased lipid peroxidation in the liver microsomal and renal as compared to the control group [liver microsomal: treatment ( $0.32 \pm 0.10$ ), control ( $2.07 \pm 0.93$ )] and [renal: treatment ( $0.36 \pm 0.14$ ), control ( $2.88 \pm 1.98$ )], and increased in total antioxidant assay [liver microsomal: treatment ( $86.98 \pm 3.46$ ), control ( $69.23 \pm 8.35$ )] and [renal: treatment ( $86.98 \pm 4.51$ ), control ( $66.95 \pm 6.06$ )]. The treated group showed significant increase in the enzyme catalase of the liver and renal microsomal when compared to control group [liver microsomal: treatment ( $121.17 \pm 7.49$ ), control (40.20%)] and [renal: treatment ( $115.57 \pm 7.03$ ), control ( $64.14 \pm 15.28$ )]. The results showed that *Cassia alata* extract has suppressed the oxidative stress in hyperglycemic induced rat and the same time increased the enzymatic and non-enzymatic antioxidant.

**Keywords:** Oxidative stress, Hyperglycemic, *Cassia alata*, Liver microsomal, Renal

**PG-P- 4: EFFECTS OF *CASSIA AURICULATA* POLYPHENOL AGAINST  
GENTAMICIN-INDUCED NEPHROPATHY IN RATS**

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Kidney is an important target of the toxicity of drugs, xenobiotics, and oxidative stress due to its unique metabolism. Gentamicin (GM) is an effective aminoglycoside antibiotic against severe gram-negative infections. However, nephrotoxicity is a major side effect of gentamicin that restricts its clinical applications. The present study was designed to investigate the effect of the polyphenol derived from of *Cassia auriculata* (CA) flowers against gentamicin-induced nephrotoxicity in rats. To examine the protective effect of CA, male Sprague-Dawley rats were pre-treated with different doses of CA polyphenol (50,100,300 mg/kg/day orally) for 2 weeks, followed by 8 days intraperitoneal injection of GM (cotreated with CA extract). Rats were randomly assigned to one of the following groups of six rats: control group, GM group (100 mg/kg/day i.p.), CA + GM group (50 mg/kg orally + 100 mg/kg i.p.), CA + GM group (100 mg/kg orally + 100 mg/kg i.p.), and CA + GM group (300 mg/kg orally + 100 mg/kg i.p.). On day 21 all the rats were placed individually in metabolic cages and 24 hour urine samples were collected. On day 22 all rats were sacrificed and blood samples were collected. Renal function was assessed using serum biochemical markers including serum urea, creatinine, albumin and total protein. The kidneys were removed and used for pathologic examination. The expression level of antioxidant genes (CAT, SOD, GPX1) were measured by RT-PCR. The results obtained showed that the extract significantly reduced the Gentamicin-induced elevated serum creatinine, serum urea, and urine total protein. The decreased serum total protein, serum albumin and urine creatinine levels were significantly replenished by CA polyphenol when compared to gentamicin treated group. Histopathological evaluation showed CA treated group have protective effect against tubular necrosis, infiltration of inflammatory cells and thickening of basement membrane. The result obtained from RT-PCR analysis showed that the antioxidant genes were significantly up-regulated. The experimental results suggest that CA polyphenol protected Gentamicin-induced nephrotoxicity possibly by enhancing renal antioxidant system.

**Keywords:** Gentamicin-nephropathy, *Cassia auriculata* polyphenols, Nephroprotection

**PG-P- 5: FLAVONOID AND PHENOLIC COMPOUNDS OF *DICRANOPTERIS LINEARIS* (GLEICHENIACEAE): STRUCTURE ELUCIDATION, ANTIOXIDANT AND ANTIBACTERIAL PROPERTIES**

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*Dicranopteris linearis*, locally known as “resam” is a type of fern widely found in hill slopes and forests in Malaysia. It is used traditionally to cure boils, ulcers, wounds, abscesses, sores, fever and intestinal worm infections<sup>1</sup>. Several studies have shown that the plant is rich in antioxidants and the extract of the plant is biologically active against *Staphylococcus aureus*, *Bacillus cereus* and *Micrococcus luteus*<sup>2,3</sup>. To further evaluate the chemical constituents and antibacterial potential of *D. linearis*, a bioactivity guided approach was used in this study to isolate the compounds from the plant. The methanol extract which was found to have antibacterial effect against *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa* was chromatographed into seven fractions. One of the fractions exhibited significant antioxidant and antibacterial effect. Purification of this fraction yielded several phenolic and flavonoid compounds and one of these was structurally unique. In this presentation, structure elucidation of the compounds by various spectroscopic techniques will be discussed. The antioxidant and antibacterial effects against several Gram-positive and Gram-negative bacteria will also be shown.

Keywords: *Dicranopteris linearis*, Bioactivity-guided isolation, Flavonoids, Phenolic compounds, Antibacterial, Antioxidant

**PG-P- 6: ANTICHOLESTEROL ACTIVITY OF *MYRMECODIA PLATYTYRAE* IN  
HYPERCHOLESTEROL-INDUCED SPRAGUE DAWLEY RATS**

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*Myrmecodia platytyrae* (MyP) is a native plant of South East Asia including Malaysia. People in Papua New Guinea and Vietnam use this plant to treat many diseases including reducing fat and cholesterol. In this study, thirty six male Sprague–Dawley (SD) rats (8 weeks old) were housed separately (1 animal/cage). The rats were kept on a temperature-controlled ( $25 \pm 2$  °C) room with a regular 12 h light : 12 h dark cycle. After acclimatization period for a week in the laboratory environment, all the rats were randomly assigned to six experimental groups ( $n = 6$ ). The first group (1) was the Normal Control group (Norm C) that was fed with the standard normal rat chow with protein (~14%), cholesterol (~5%) and carbohydrate (~76%). The second group (2) was the Negative Control group (NC), which was fed high cholesterol diet (HCD). They were fed with the mixture of standard rat chow supplemented with 60% pure cholesterol, 1% cholic acid and 5% oil. Next, was the third group (3) or the Positive Control group (PC). The rats were fed with HCD and 5 g/kg Simvastatin. The following group (4) was labelled as the 100 mg MyP group (MyP 100). The rats were fed with HCD and treated orally with MyP (100 mg/kg/day). For group (5) and (6), the treatment of MyP was 200 mg/kg and 400 mg/kg, respectively. All animals were given free access to water and their corresponding diet throughout the experimental period. The food intake and body weight were monitored every week. At the end of week 4, the animals were sacrificed. Blood samples were collected by cardiac puncture to determine lipid profile; total cholesterol (TCHOL), high density lipoprotein (HDL), triglyceride (TRIGL) and toxicity tests; alkaline transaminase (ALT), alkaline phosphatase (ALP) and creatinine kinase (CK). Results showed that MyP effectively increased the HDL level in a concentration dependent manner. The extract also significantly ( $p < 0.05$ ) lowered the TRIGL compared to NC. The administration of MyP did not significantly increase the ALT, ALP and CK level, compared to Norm C group which indicated that MyP was not toxic. The body weight of MyP treated groups were significantly decreased compared to Norm C and NC. In conclusion, *Myrmecodia platytyrae* may potentially have anticholesterol properties and may be able to reduce fat effectively.



**PG-P- 7: HISTOLOGICAL EVALUATION OF PANCREATIC ISLETS AND  
POTENTIAL ANTIDIABETIC EFFECTS OF AQUEOUS SEED AND ENDOCARP  
EXTRACTS OF *SWIETENIA MACROPHYLLA* KING COMBINED WITH  
GLIBENCLAMIDE IN RATS**

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Plants and plant products with antihyperglycemic capacity are often combined with oral hypoglycemic drug for diabetes therapy. The subsequent plant–drug interaction may affect the pharmacology and toxicology profiles of either component leading to a number of categorizing effects. This study investigated the antidiabetic effects of *Swietenia*'s seed and endocarp aqueous extracts in streptozotocin (STZ)-induced diabetic rats and assessed possible plant–drug interactions with glibenclamide. The experimental groups were rendered diabetic by injection of STZ-NA in adult rats. Diabetic rats were orally fed with glibenclamide (5 mg/kg), extract (250 mg/kg bwt) and a combination of full strength extract with half the previous glibenclamide dosage, daily for three weeks. Body weight (g) and fast blood glucose (FBG) levels (mg/dl) were determined at treatment intervals of day 0, 7, 14 and 21. Both glibenclamide and plant extract showed hypoglycemic effect. Significant antidiabetic results were found in combined treatment of plant extract–drug group demonstrated by FBG reduction ( $P < 0.001$ ) and body weight increment ( $P < 0.05$ ) thus signifying the existence of plant-drug interaction. Subsequently, Langerhans' islets were examined by Haematoxylin and eosin (H&E) staining. Photomicrographs of pancreatic islet revealed that administration of extracts showed improve in cellular density that suggesting the extracts were capable of inducing  $\beta$ -cells recovery and/or regeneration following destructive effects of STZ. Findings imply that *Swietenia macrophylla* Kingseed and endocarp aqueous extracts in combination with glibenclamide exhibit a potent additive effect against diabetes. Hence, further evaluation is needed to be explored to propose the plant as an added supplementation concurrently with reduced dosage of glibenclamide to intensify efficacy of treatment.

**Keywords:** *Swietenia macrophylla* King, Glibenclamide, Aqueous extract, Antidiabetic, Additive

**PG-P- 8: BIOLOGICAL AND CHEMICAL INVESTIGATIONS OF MALAYSIAN  
AQUATIC FUNGI AND THEIR SECONDARY METABOLITES**

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Diverse aquatic samples were collected from various aquatic biosphere of Malaysia and about forty-nine strains of fungi were isolated from it. Out of forty-nine isolated fungal strains, eighteen strains were chosen on the basis of their morphological growth for investigation of their biological and chemical aspects. Standard operating procedures were followed in order to isolate fungal cultures from collected aquatic samples and their secondary metabolites isolation. All the fungi were treated with different media conditions in order to see the effect of media on production of secondary metabolites. The organic extracts of selected fungi were subjected into the high performance liquid chromatography (HPLC) for the initial metabolic profiling. The HPLC chromatograms of fungal extracts of selected cultures showed prominent peaks of secondary metabolites. The HPLC chromatograms of fungal extracts obtained from different media conditions fungi showed variation in the production of secondary metabolites. The HPLC chromatograms with significant concentration of secondary metabolites were taken under consideration in order to proceed further for purifying secondary metabolites. Further purification of fungal secondary metabolites was carried out through semi-preparative HPLC. Four secondary metabolites have purified so far and have analyzed through Nuclear Magnetic Resonance (NMR) spectroscopy. The characterizations of four isolated secondary metabolites are still under progress using various spectroscopic techniques.

**Keywords:** Aquatic samples, Fungal strains, HPLC, Secondary metabolites, NMR

**PG-P- 9: HAIR GROWTH-PROMOTING POTENTIAL OF GLUCOSAMINE SULFATE; ROLE OF PROTEOGLYCANS AND VASCULAR ENDOTHELIAL GROWTH FACTOR**

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Glucosamine sulfate (GS) is a naturally occurring amino monosaccharide which stimulates synthesis and inhibits degradation of glycosaminoglycans in synovial fluid and extracellular matrix of connective tissues. The papilla is a large structure at the base of hair follicles which mainly made up of connective tissues. It has been postulated that glucosamine sulfate might be involved in stimulation of hair growth. This study assessed the molecular mechanisms of various concentrations GS formulation on hair cycle. GS (1%, 5% and 10%) and minoxidil 2% as the standard hair growth promoter were topically applied to the shaved dorsal surface of Wistar rats everyday for 21 days. Quantitative and qualitative data showed GS significantly increased hair length, number of hair follicles and improved skin thickness. It also prolonged anagen phase while catagen phase was abridged. Up regulation of syndecan and versican gene showed GS were effective at catagen phase. There was incremented expression of vascular endothelial growth factor genes (VEGF). The signaling and transcription factor Sonic hedgehog (Shh) was upregulated. Our results collectively suggest that GS has hair growth-promoting potential. This effect may be due to its modulation of syndecan and versican and growth factor gene expression on hair cycle.

**Keywords:** Glucosamine sulfate, Hair growth, Hair follicle, Growth factor genes, Proteoglycans

**PG-P- 10: ANTI-CANCER EFFECT OF ASIATIC ACID (AA) AGAINST ORAL  
SQUAMOUS CELL CARCINOMA (OSCC)**

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Oral cancer is among the most common cancer occurring in South East Asia with a survival rate of 50% for the past thirty years due to its poor prognosis. Oral squamous cell carcinoma (OSCC) is the most prevalent oral cancer. This study has aimed to evaluate the anti-proliferative effect of Asiatic acid (AA), a pentacyclic triterpene against OSCC in both *in vitro* and in orthotopic xenograft model. Antiproliferative activity was determined by MTS assay. Expression of genes that account for cell proliferation namely Bax and Bcl-2 were determined by quantitative RT-PCR with AA (30  $\mu$ M and 40  $\mu$ M). For the *in vivo* study, the oral cancer xenograft model was developed by injecting OSCC into the tongue of severely compromised immunodeficiency (SCID) mice followed by treatment of AA (10 mg/kg) and normal saline. The IC<sub>50</sub> for AA in OSCC following 72 h incubation was 15  $\mu$ M. AA initiated apoptosis by suppressing expression of Bcl-2 genes by 62% and upregulating Bax genes by two folds. Treatment in oral cancer model with AA significantly slowed the growth of tumor compared to control. In conclusion, AA showed promise as a potent anti-proliferative agent against oral squamous cell carcinoma.

**Keywords:** Asiatic acid, Oral squamous cell carcinoma, Apoptosis, SCID mice, Xenograft, Bax, Bcl-2

**PG-P- 11: *IN VITRO* ANTI-INFLAMMATORY EFFECTS OF *ERYTHROXYLUM CUNEATUM* ON LIPOPOLYSACCHARIDE-INDUCED RAW 264.7 CELL LINE**

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*Erythroxylum cuneatum* which can be found in the tropical regions of South America, Africa, Southeast Asia, and Australia was used traditionally in treating diabetes mellitus, bodily discomfort and also as tonic for miscarriages. However, not many studies have been conducted on this plant to prove the folkloric claims. Study on *E. cuneatum* was conducted to determine the anti-inflammatory effects on LPS-induced RAW 264.7 cell line. MTT assay was performed to determine the IC<sub>25</sub> and IC<sub>50</sub> of *E. cuneatum*. To investigate the anti-inflammatory cytokines and antioxidant enzyme levels, cultured murine macrophage cells were induced with 1 µg/mL of LPS and treated with IC<sub>25</sub> and IC<sub>50</sub> of *E. cuneatum*. After 24 hours, cells were processed for measurement of TNF-α, IL-1β, SOD, GPx and catalase levels. Indomethacin (100 µg/mL) was used as a reference drug. Levels of TNF-α was significantly decreased ( $p = 0.023$ ) in LPS-induced RAW 264.7 cell line when being treated with *E. cuneatum*. The extract also was able to modulate the antioxidant enzymes to inhibit the effects of LPS on RAW 264.7 cells. In conclusion, *E. cuneatum* may possess anti-inflammatory effects in LPS-induced RAW 264.7 cell line by inhibiting the production of TNF-α and modulating antioxidant enzymes in the macrophages.

**PG-P- 12: WOUND HEALING ACTIVITY OF *HIBISCUS ROSA-SINENSIS* LEAVES  
EXTRACTS**

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The wound healing potential of *Hibiscus rosa-sinensis* leaves were evaluated in 30 female Sprague-Dawley rats. The rats were randomly divided into 5 groups of 6 rats each. Rats were anesthetized using ketamine/xylazine cocktail and full thickness incision wounds were created on the dorsal part of the rats. The animals were topically treated with water and ethanol extracts at a dose of 0.01 g/ml once a day for 15 consecutive days. A positive control group was treated with cetrimide 2% solution and one group served as untreated controls. In another group, wounds were left open without suture and further treatment. The tensile strength and wound healing process was evaluated macroscopically and histologically after 2 weeks. Wounds treated with both *Hibiscus rosa-sinensis* leaves water and ethanol extracts showed better healing with slightly visible fine-line scar. Histological evaluation showed that wound treated with both *Hibiscus rosa-sinensis* leaves extract was reepithelialized, granulation tissues in the wound were nearly replaced by fibrosis and hair follicles were almost healed. Also, the ethanol extracts of *Hibiscus rosa-sinensis* leaves-treated skin had the highest tensile strength. In conclusion, both water and ethanol extracts of *Hibiscus rosa-sinensis* may possess wound healing effects and therefore could be a possible alternative to conventional treatments.

**Keywords:** *Hibiscus rosa-sinensis*, Wound healing, Tensile strength, Full thickness incision, Cetrimide

**PG-P- 13: CIPROXIFAN INCREASES ANTIOXIDANT ACTIVITIES WHILE  
DECREASES OXIDATIVE STRESS IN TRANSGENIC MICE MODEL OF  
ALZHEIMER'S DISEASE**

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Histamine H3 receptor antagonist, ciproxifan has been shown to enhance the release of neurotransmitters that are responsible in cognitive process. Ciproxifan represents an attractive drug target for a number of indications including cognition. This study was aimed to evaluate the effect of ciproxifan on antioxidant enzymes and oxidative stress in transgenic mouse model of Alzheimer's disease (AD). The drug was administered to the male transgenic mice by intraperitoneal injection for 15 days with two selective doses (1 and 3 mg/ml). At the end of the treatment, the animals were sacrificed and their brains were isolated for further assays. The levels of glutathione, catalase and superoxide dismutase were determined for antioxidant activities while the level of lipid peroxidation and nitric oxide for oxidative stress. The results showed that ciproxifan significantly alleviated the level of glutathione, catalase and superoxide dismutase while significantly decreased the levels of lipid peroxidation and nitric oxide. The results showed that the compound has potential in enhancing antioxidant activities while inhibiting the oxidative stress in transgenic mice model of AD.

**Keywords:** Alzheimer's disease, Ciproxifan, Antioxidant, Oxidative stress

**PG-P- 14: BIOCHEMICAL ANALYSIS OF ACACIA HONEY ON OBESE INDUCED RATS**

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Honey is a natural substance with many medicinal properties, which include: antibacterial, hepatoprotective, hypoglycemic, antihypertensive agents, and possesses antioxidant properties. In addition, it reduces hyperglycemic level in diabetic rats and humans. However, the effect of honey in treating obesity is yet to be revealed. In this study, the biochemical effect of Acacia honey (AH) on obese-induced rats was observed. The honey used in this study was produced by *Apis mellifera* from Acacia plant species. It was selected since it is produced commercially in Malaysia and contained high level of antioxidant compounds. Thirty male *Sprague Dawley* rats weighing between 180 to 220 grams were divided into five groups: Group 1-standard normal diet and water, group 2-standard normal diet and AH, group 3-high fat diet (HFD) and water, group 4-HFD and AH honey and group 5- HFD and Orlistat. The animals were obese-induced for eight weeks *ad-libitum*. Treatment with AH and Orlistat were given for 8 weeks. Changes in body weight and daily calorie intake were measured regularly during the experimental period. Meanwhile, blood samples were obtained every month for analyses of serum concentrations of glucose, lipids and liver markers and kidney functions. Body weight gain was lower for rats fed with honey, but was observed higher in food consumption compared to HFD group. There was no significant change in energy efficiency ratio in AH group compared to HFD group. Serum concentrations of triglyceride and cholesterol were lower ( $P < 0.05$ ) by 6.3 mmol/L and 6.45 mmol/L respectively. Reduction was also observed in the glucose level ( $P < 0.05$ ) by 2.1 mmol/L and in the level of ALT ( $P < 0.05$ ) by 24 U/L. In this study, honey was observed to lower weight gain by lowering the level of triglycerides and inducing high energy efficiency when compared to HFD group.

Keywords: Acacia honey, Biochemical analysis, *Sprague Dawley* rats



**PG-P- 15: PHYSICOCHEMICAL AND ANTIOXIDANT PROPERTIES OF WILD  
HARVESTING AND BEEKEEPING HONEY IN MALAYSIA**

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The origins of honey in Malaysian market are from both wild harvesting and beekeeping industry. Wild harvesting honey is mainly from the beehive of wild bee, *Apis dorsata* found in Malaysia rainforest. Beekeeping honey is produced by two trained bees, *A. cerana* and *A. mellifera*. Wild and beekeeping honeys are believed to possess different physicochemical and antioxidant properties. Therefore, the objective of this study is to measure the physicochemical and antioxidant properties from wild harvesting honeys (Gelam and Tualang honey) and beekeeping honeys (Acacia and Pineapple honey). Gelam and Tualang honeys were collected from the forest at Marang, Terengganu and Tasik Pedu, Kedah while Acacia and Pineapple honeys were obtained from beekeeping farms in Johor. Selected physicochemical parameters such as the total phenolic content and radical scavenging activity of honeys were investigated. All honey samples have low pH ranging from 3.64 to 4.21 and moisture content ranged from 20.8 - 23.5%. In terms of colour and appearance, Pineapple has the lightest (34 mm Pfund) and Gelam has the darkest (150 mm Pfund) colour. Gelam honey contained the highest phenolic content (132.45 µg GAE/ g) followed by Tualang (106.01 µg GAE/ g), Acacia (60.95 µg GAE/ g) and lastly Pineapple (51.9 µg GAE/ g). All honeys showed good antioxidant activity using DPPH assay (34.99-73.12%). The results have highlighted that wild harvesting honeys have better physicochemical and antioxidant properties than beekeeping honeys. These results should then be used by beekeepers and relevant authorities to improve the quality of honey derived from beekeeping.

**Keywords:** Antioxidant, Beekeeping honey, DPPH, Physicochemical, Total phenolic content, Wild harvesting honey

**PG-P- 16: ANTI-OBESITY EFFECT OF *TINOSPORA CRISPA* ON WINSTAR RAT  
MODEL**

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*Tinaspora crispa* is widely used in tropical and sub-tropical countries as an ancient medicine. Previous studies reported the potential of *T. crispa* in lowering blood glucose, lipids and cholesterol levels, and containing antioxidant properties. However, complete effects of *T. crispa* as an antiobesity agent has yet to be discovered. Hence, the aim of present study is to unveil the anti-obesity potential of *T. crispa* in Wistar rats. The rats were divided into five groups: a normal control (NC); high fat diet control (HFD); a *T.crispa* treatment group fed with high fat diet (HFDTC), normal control fed with *T.crispa* (NCTC) and an orlistat treatment group fed with high fat diet (HFDO). In this study, the respective groups were to be obese for eight weeks. *T.crispa* was then administered into respective HFDTC and NCTC groups at single dose of 100 mg/kg for eight weeks continuously. The blood samples were derived and analyzed for biochemical test. The treatment with *T.crispa* had showed a significant decreased ( $P < 0.05$ ) in percentage of body weight compared to HFD group. Moreover, the biochemical analysis of this study indicates that *T.crispa* significantly ( $P < 0.05$ ) control the level of total cholesterol, triglycerides and glucose in blood serum that caused by the consumption of high fat diet. Antioxidant compounds in the plant are thought to contribute to the effects observed. However, this required further analyses. In conclusion, *T.crispa* is showed to be one of the alternative solutions to overcome obesity.

Keywords: *Tinaspora crispa*, Obesity, High fat diet, Wistar rats

**PG-P- 17: THERAPEUTIC POTENTIAL OF NATURAL PRODUCTS AGAINST  
HUMAN SKIN PATHOGENS: *IN VITRO* PRELIMINARY STUDY**

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Skin infection e.g. impetigo and dermatophytosis are a major public health problem especially in tropical countries like Malaysia. Although these infections are not life threatening, they can cause morbidity especially for immunocompromised and diabetic patients and in the elderly who may experience atypical and locally aggressive infections, including extensive skin disease, subcutaneous abscesses, and disseminated disease. Increasing incidence of resistance to common treatment reported by several studies prompt us to investigate and compare efficacy and safety of promising bioactive entity from nature (plant and endophyte) with selected antibacterial and antifungal drugs. Hexane, methanol and aqueous extracts of *Piper betel*, *Allamanda cathartica*, *Allium sativum* and ethyl acetate extracts of endophytes *HAB11R3* and *HAB10R12* were tested against selected common bacterial infection and dermatophytes purchased from ATCC. Bacteria e.g. *Enterococcus faecalis*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli* and *Pseudomonas aeruginosa* were tested using CLSI (2012), M100-S22 whilst dermatophytes e.g. *Tricophyton rubrum*, *Tricophyton mentagrophyte*, *Epidermophyton floccosum*, *Microsporum canis*, *Microsporum gypseum* based on CLSI (2002), M38-A. Minimum fungicidal concentrations (MFC) and Minimum Bactericidal Concentration (MBC) were determined by sub-culturing the contents of each visibly clear well from the MIC assay for colony count. The safety profiles of tested extracts were identified against normal skin fibroblast BCL-2522. Among tested extracts, aqueous extract of *A. cathartica* (ACAE) exhibited moderate antibacterial and strong antifungal activities; *HAB11R3* showed strong in both antibacterial and antifungal activities. The minimum inhibitory concentration (MIC) of *HAB11R3* varied from 125 ug/mL – 225 ug/mL and 43.65 ug/mL – 500 ug/mL whilst ACAE from 467.7 ug/mL – 500 ug/mL and 57.54 ug/mL – 215 ug/mL against all tested bacteria and dermatophytes, respectively. The results of MBC and MFC studies revealed *HAB11R3*, *HAB10R12*, methanol and aqueous extracts of *A. cathartica* leaves were fungicidal. The antidermatophytic activity of ACAE and *HAB11R3* were comparable to fluconazole. However, safety profile study showed IC<sub>50</sub> of ACAE was 290 ug/mL while *HAB11R3* > 1000 ug/mL. The results indicated ACAE possesses promising antifungal agents.

**Keywords:** Natural products, Minimum Inhibitory Concentration, Antifungal, Antibacterial

**PG-P- 18: ANTIOXIDANT CAPACITY OF AQUEOUS EXTRACT OF  
*MYRMECODIA PLATYTYREA* TUBER**

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*Myrmecodia platytyrea* (*M. platytyrea*) locally known as sarang semut is an epiphytic plant that belongs to the family of Rubiaceae. In Papua Island, decoction of *M. platytyrea* tuber is used as a remedy for treatment of minor ailments to severe diseases. Thus, the antioxidant properties present in this plant were evaluated as it has potential to treat oxidative stress-related diseases. Total phenolic content (TPC), total flavonoids content, 1,1-Diphenyl-2-picryl-hydrazil (DPPH) scavenging activity as well as ferrous iron chelating assay (FIC) were measured to analyse the antioxidant properties of aqueous extract of *M. platytyrea*. Results showed that *M. platytyrea* tuber extract contained  $199.48 \pm 31.06$   $\mu\text{g}$  GAE/g dry weight of total phenolic content and  $1246.63 \pm 212.19$   $\mu\text{g}$  myrecetin equivalent/ g dry weight of total flavonoid content. *M. platytyrea* also exhibited ferrous iron chelating activity with  $\text{IC}_{50}$  values of  $199.53 \pm 64.23$   $\mu\text{g/ mL}$ .  $\text{EC}_{50}$  value of *M. platytyrea* tuber extract for DPPH scavenging activity was  $164.69 \pm 2.37$   $\mu\text{g/ mL}$ . In conclusion, *M. platytyrea* tuber extract showed potential antioxidant activities which can be exploited in the management of diseases as in the folklore medicinal claims.

**PG-P- 19: NEUROPROTECTIVE EFFECTS OF MAHANIMBINE IN SK-N-SH NEUROBLASTOMA CELLS AGAINST LPS-INDUCED NEUROINFLAMMATION**

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Neuroinflammation is an important component of neurodegenerative diseases including Alzheimer's disease (AD) and Parkinson's disease (PD). The present study was designed to investigate the potential neuroprotective effect of mahanimbine isolated from *Murraya koenigii* leaves in a cell-based AD model using cultured SK-N-SH neuroblastoma cells incubated with lipopolysaccharides (LPS). LPS is known as toxic cell membrane component of gram negative bacteria that can cause neuroinflammation which directly responsible for the loss of cell viability and production of reactive oxygen species (ROS). Neuroprotection and reactive oxygen species (ROS) assays were conducted to assess cell viability and formation of ROS. Exposure of SK-N-SH to 100 µg/ml LPS caused a significant cell viability loss and increased the intracellular ROS. However, pre-treatment with mahanimbine increased the viability of cells and consequently attenuated LPS-induced ROS formation. These data suggested that mahanimbine might have neuroprotection against LPS-induced neuroinflammation.

**Keywords:** Neuroinflammation, Alzheimer disease, ROS, Lipopolysaccharides, Mahanimbine

**PG-P- 20: TARGETING THE INSULIN-LIKE GROWTH FACTOR (IGF) SYSTEM  
AND THE INSULIN SIGNALLING (IS) PATHWAY INDUCES APOPTOSIS IN  
HEPATOMA G2 (HEPG2) CELL LINES TREATED WITH *TINOSPORA CRISPA***

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Insulin-like growth factor (IGF) signalling system regulates growth and development of hepatoma G2 (HepG2) cell by controlling the cell proliferation. The exaggeration of IGF-1 receptor (IGF-1R) stimulation by its self-producing IGF-1 ligands and hyperinsulinemia condition promotes uncontrolled growth and inhibits apoptosis. Moreover, alteration of the insulin signalling (IS) pathway in the cells contributes to insulin resistance. Concomitantly, it upsurges the deterioration of cell growth rate. *Tinospora crispa*, a local plant, is known to have insulin sensitivity effects. However, effects of *T. crispa* in the IGF and IS pathways in compensating insulin resistance and thus induce apoptosis in HepG2 cancer cell lines are yet to be discovered. A series of IGF and IS pathways protein were investigated through Western blotting method in order to track the compensatory mechanism. IGF-1R overexpression in HepG2 impaired insulin-induced AKT phosphorylation. After treated with *T. crispa* extract, IGF-1R function in the cells was down-regulated and has induced apoptosis via the increment of protein expressions of Bad, caspase 8, 9 and 3 and reduction of an anti-apoptosis protein, Bcl-2. The extract permitted the function of the IS pathway in enhancing insulin-induced autophosphorylation (PY20) on its  $\beta$ -insulin receptor (IR- $\beta$ ). Consequently, it stimulated phosphorylation of IRS, and increased protein expressions of Akt and GAPDH. The condition further improved glucose uptake (GLUT4) process in the cells. The outcomes revealed the potential of *Tinospora crispa* as an anti-cancer agent by targeting insulin-like growth factor system and insulin signalling pathway.

Keywords: Apoptosis, HepG2, Insulin-like growth factors system, Insulin signalling pathway, *Tinospora crispa*

**PG-P- 21: POTENTIALS OF STEVIOSIDE IN REGULATING INSULIN  
SENSITIVITY IN**

**TNF- $\alpha$  INDUCED INSULIN RESISTANT 3T3-L1 ADIPOCYTES**

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Stevioside is one of the many steviol glycosides that are commonly extracted from the leaf of *Stevia rebaudiana* Bertoni plant. This perennial shrub is native to South American regions and has been applied in folk medicines. Stevia has also been used as an alternative natural sweetener due to its high sweetening properties despite having really low to zero caloric value. Due to the increasing numbers of patients suffering from metabolic diseases, stevioside have garnered much attention as a possible alternative therapy to treat such illnesses. In this project, insulin sensitivity of an insulin resistant cell culture model, 3T3-L1 adipocytes were explored with accordance to stevioside treatments. Cells were initially cultured to confluence and differentiated prior to experiments. Insulin resistance were then induced to the adipocytes with tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ). An incubation of 24 hours with said cytokine was then preceded by stevioside treatments of varying concentrations from 30 to 120  $\mu$ M. The antidiabetic drug, rosiglitazone maleate (AVANDIA) was used as a positive control. Cells were analysed for changes in glucose uptake and also in the differences of the protein expressions via Western blotting. Phosphotyrosine (pY20) and the phosphorylated insulin receptor substrate 1 (pIRS1) proteins were both highly responsible in insulin signalling. We discovered that stevioside worked as efficiently as AVANDIA in elevating glucose uptake with a maximum at a concentration of 90  $\mu$ M coupled with insulin induction while AVANDIA was observed without insulin induction. Western blotting profile also showed that both stevioside and AVANDIA were able to restore pY20 expressions in the insulin resistant cells. Stevioside also managed to elevate the pIRS1 expressions when compared to the controls. This supports the hypothesis that stevioside potentiates insulin sensitivity in the insulin resistant 3T3-L1 adipocytes.

**Keywords:** Diabetes, Insulin resistance, 3T3-L1, Stevia, Stevioside, Glucose uptake, pY20, pIRS1

**PG-P- 22: CHARACTERIZATION OF THIRD TRIMESTER AMNIOTIC FLUID  
DERIVED STEM CELLS IN RAT**

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Amniotic fluid-derived stem (AFS) cells established from second trimester pregnancy are broadly multipotent and non-tumorigenic. While the AFS cells of third trimester pregnancy were reported to be safer alternative, reports on their characteristics are limited. Here we aim to further characterize the embryonic and adult stem cell properties of rat AFS cells from third trimester pregnancy, using flow cytometry and immunocytochemistry. The rat AFS cells were cultured in embryonic stem cell culture medium supplemented with leukemia inhibitory factor (LIF) on a gelatin-coated flask. The cells were then subjected to characterization of Sox2, CD90, CD105, CD34 and CD45 markers using flow cytometry. The AFS cells showed spindle-shaped morphology, resembling fibroblast cells and they proliferate very rapidly. They are positive for mesenchymal stem cell markers, CD105 and CD90, weak expression for embryonic stem cell marker, Sox2 and negative for hematopoietic cell markers, CD34 and CD45. In addition to flowcytometry analysis, qualitative expression of SSEA-1 marker was detected by immunocytochemistry. The results indicate that AFS cells from third trimester pregnancy has similar characteristics with AFS cells from second trimester pregnancy with intermediate characteristics between embryonic and adult stem cells. Therefore, the third trimester amniotic sample may provide safer access to broadly multipotent and non-tumorigenic AFS cells.



**PG-P- 23: TOXICITY EVALUATION OF SELECTED MALAYSIAN HONEY IN  
COMPARISON TO MANUKA HONEY IN RATS**

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The intestinal absorption of peptide and protein drugs through oral administration is usually very poor because they are impermeable through the intestinal mucosa due to hydrophilic macromolecules. Furthermore, it can bring damage and irritation to intestinal cellular membrane. Honey is a complex solution containing of mixture of sugars, variety of minerals, vitamins, protein, organic acids, flavonoids, enzymes, phenolic acids, and phytochemical properties. Lactate dehydrogenase (LDH) and protein were common biological markers to assess membrane damage. The released LDH and protein were studied to evaluate the safety of local honey namely Gelam, Tualang, Acacia, and Nenas honey in comparison to Manuka honey in rats. To evaluate the toxicity of local honey with 5(6)-carboxyfluorescein (CF) by measuring the release of LDH and protein in the rat intestinal membrane. Methods and results: *In situ* closed loop method was used throughout the experiments. After 4 hr of intestinal administration of CF with and without honey, the perfusate in the intestine was collected for the determination of LDH and protein. Based on the results, most local honey was considered to be safe as it is comparable to control level. However, Tualang honey showed high toxicity for LDH and protein assay as compared to control; 5.1 and 1.6 fold respectively. Manuka honey showed 3.1 fold LDH value and normal protein release as compared to control. In conclusion, all Malaysian honey was considered to be safe except for Tualang honey. On the other hand, Manuka honey showed high LDH with normal protein released.

**Keywords:** Toxicity, Lactate dehydrogenase (LDH), Protein, Malaysian honey, 5(6)-carboxyfluorescein, *In situ* closed loop method

**PG-P- 24: ACUTE TOXICITY STUDY OF 3,4,10-TRIMETHOXYSTILBENE**

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Stilbene is a well-known natural polyphenol that have diverse pharmacological activities such as antioxidant, anti-inflammatory and chemopreventive agent. Therefore, synthesis of stilbenes analogues have increased tremendously to improve the biological activities. 3,4,10-trimethoxystilbene is a novel synthetic stilbene produced through Heck reaction with antiproliferative effect against human hepatocellular carcinoma (HepG2) cell line. Thus, this study was carried out to determine the toxicity effect of 3,4,10-trimethoxystilbene according to the Acute Toxic Class Method from Organisation for Economic Co-operation and Development (OECD) guideline for Testing of Chemical 423 (2001). Both female and male albino mice were administrated with single dose of 3, 4, 10-trimethoxystilbene (2000 mg/kg) via oral gavage and observed for 24 hours until 14 days for mortality and behavioural changes. After 14 days, mice were sacrificed and signs of toxicity were determined by gross necropsy, histology, blood biochemistry and hematology. Data showed that no sign of toxicity and mortality were recorded. This compound also did not show any significant differences on body weight, relative organ weight, haematological and blood biochemistry levels when compared with control group (corn oil, p.o.). Since no toxic effects were recorded on both male and female mice treated with 3, 4, 10-trimethoxystilbene, it is concluded that this compound is safe for consumption.

Keywords: Acute toxicity, Stilbene, 3, 4 , 10-trimethoxystilbene

**PG-P- 25: NEUROPROTECTION OF VIRGIN COCONUT OIL ON MEMORY IMPAIRED RATS IS MEDIATED PARTLY THROUGH INFLAMMATORY AND CHOLINERGIC PATHWAYS.**

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Neuroinflammation has been implicated in the pathogenesis of Alzheimer's disease (AD). It is often characterized by activation of glial cells and the subsequent up-regulation of various cytokines. Neuronal damage would then set in and lead to deterioration of cognitive function. Virgin Coconut Oil (VCO) is an ingredient widely used in the pharmaceuticals, nutraceuticals and cosmetics industries. It has been reported to possess anti-bacterial, anti-viral, anti-oxidants and anti-inflammatory properties. Capitalizing on these therapeutic effects, the present study investigated for the first time the potential neuroprotective effect of VCO against memory impairment induced by lipopolysaccharide (LPS) *in vivo*. Male Wistar rats (n = 6/group) were randomly assigned to control group (saline), LPS-treated group (LPS only), standard group ( $\alpha$ -Tocopherol) and VCO treated group (1, 5 and 10ml/kg). Prior to administration of 0.25 mg/kg LPS (i.p.), rats were treated with various concentrations of VCO for 31 days by oral gavage. Cognitive function of these rats were assessed by time (escape latency) and total distance (escape latency) taken by the animal to reach the platform of the Morris Water Maze. The concentrations of IL1- $\beta$ , a proinflammatory cytokine and acetylcholine from brain homogenates were then measured using Procarta Immunoassay Kit and Acetylcholine Assay Kit, respectively. Pretreatment of the memory impaired rats with 10 ml/kg VCO significantly reduced escape latency and escape distance by  $38.97 \pm 1.21\%$  and  $30.63 \pm 0.38\%$ , respectively. Brain homogenates of memory impaired rats pretreated with 10ml/kg VCO showed significant attenuation of the effect of LPS. The LPS-induced up-regulation of IL1- $\beta$  concentration was significantly ( $p < 0.001$ ) reduced by  $65 \pm 0.63\%$ . Conversely, 10ml/kg VCO significantly increased acetylcholine concentration by  $30 \pm 0.14\%$  when compared to the LPS-induced group. The findings strongly implied that VCO could be useful for the prevention of AD. This neuroprotective effect was mediated, at least in part, through both the inflammatory and cholinergic pathways.

**Keywords:** Virgin Coconut Oil, Alzheimer's disease, Inflammation, Lipopolysaccharide, IL1- $\beta$ , Acetylcholine

Pharmaceutics (PH)

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**PH-O- 1: DEVELOPMENT OF A CONTROLLED RELEASE STEARIC ACID  
NANOPARTICLES ENRICHED CREAM FOR TOPICAL DELIVERY**

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Lipid nanoparticles are colloidal carrier systems that have extensively been investigated for their controlled release application. In this work, salicylic acid loaded stearic acid nanoparticles (SAN) were prepared and their *in vitro* release property was evaluated. Salicylic acid loaded SAN was prepared by the melt emulsification method combined with ultrasonic technique. The physicochemical properties, thermal analysis, encapsulation efficiency and *in vitro* slow release of SAN were studied. The TEM micrograph of SAN containing salicylic acid showed that they are spherical in shape, with a mean particle size of 230 nm. Their mean zeta potential value was found to be around -40 mV. Differential scanning calorimetry and Powder X-ray diffraction analysis showed that the SAN prepared has lower crystallinity as compared to pure stearic acid. This may be due to the presence of surfactant in the preparation of SAN which disrupt the stearic acid crystalline matrix. Consequently, the overall particle crystallinity is decreased, leading to 50% encapsulation efficiency of salicylic acid. The *in vitro* release study showed a sustained release of SAN enriched cream for salicylic acid over a period of 24 hours. Our findings suggest that salicylic acid loaded SAN in cream could be a promising delivery system for the enhancement of the therapeutic efficacy in the topical treatment application.

**PH-O- 2: MICROENCAPSULATION OF *LACTOBACILLUS* SP IN CHITOSAN COATED ALGINATE-XANTHAN GUM BEADS ENHANCED SURVIVABILITY IN SIMULATED GASTROINTESTINAL CONDITION AND HEAT TREATMENT**

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Probiotics possess therapeutic properties, which are essential for human health. Their vulnerability in harsh gastric conditions and intense heat during processing often limited the optimal use of probiotics as nutraceuticals. Microencapsulation of probiotics in polymeric matrix serves as a good option that can enhance probiotic protection. This study is aimed to improve both pH and heat stability of *Lactobacillus* sp. LAB 12 by incorporating them within alginate (ALg) and xanthan gum (Xn) microcapsules coated with the polysaccharide chitosan (C). A total of four different beads (ALg, ALgXn, ALgC and ALgXnC) were prepared using the extrusion technique. They were characterized in terms of bead size, morphology, physical properties (FTIR, XRD and DSC analysis), encapsulation efficiency, and survivability in stimulated gastric juice (SGJ), release in simulated intestinal fluid (SIF) and at high temperature. The results indicated narrow size distribution of all freeze dried beads, ranging from  $1312.4 \pm 12.4\mu\text{m}$  to  $1343.2 \pm 4.8\mu\text{m}$ . The highest encapsulation efficiency was demonstrated by ALgXnC ( $90.64 \pm 0.45\%$ ). Whilst ALgXn showed 43.7% increase in survival after 2h of SGJ treatment, the increased survivability of probiotics in ALgXnC was more superior, yielding 51.9% more than those of ALg and ALgXn ( $p < 0.05$ ). The cell viability in ALgXnC during release in SIF was  $9.20 \pm 0.07 \log\text{cfu/g}$  as opposed to free cells ( $4.7 \pm 0.28 \log\text{cfu/g}$ ). During the heat treatment, chitosan coating showed improvement in the heat resistant of the beads as the loss in viability of LAB12 in ALgC and ALgXnC at  $75^{\circ}\text{C}$  (5.8% and 5.4%, respectively) and  $90^{\circ}\text{C}$  (6.5% and 7.5%, respectively) were very minimal. In conclusion, ALgXnC was able to protect probiotics with enhanced survival rate in simulated gastrointestinal condition and heat treatment. The results implied the possible use of probiotic incorporated in ALgXnC as a new functional food ingredient with health claims.

**Keywords:** Microencapsulation, Probiotic lactobacilli, Alginate, Xanthan gum, Chitosan

**PH-P- 1: SYNTHESIS OF TRICARBALLYLIC ACID BASED TRITHIOL  
MONOMER: A POTENTIAL MONOMER FOR COLON TARGETED DRUG  
DELIVERY SYSTEM**

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Colon drug delivery system is very useful to deliver drugs for treatment of localised colonic diseases such as inflammatory bowel disease, ulcerative colitis and Crohn's disease. Disulphide cross-linked polymer is found to be useful in preventing premature drug release and thus making colon drug targeting achievable. Disulphide bond will only be cleaved by the low redox potential environment in the colon. Recently, branch-chained disulphide polymers had received more attention due to the fact that it is less susceptible for degradation in low pH condition of the stomach compared to linear-chained disulphide polymers. Therefore, the aim of this work is to synthesise tricarballic acid based trithiol monomer for polymerisation into branch-chained disulphide polymers. The monomer was synthesised by amide coupling reaction between tricarballic acid and (triphenylmethyl) thioethylamine by using the two-step synthesis. The monomer was deprotected by using trifluoroacetic acid and triethylsilane to release the thiols in preparation for further polymerisation. White powdery solid was obtained with the yield of approximately 20-25%. Spectroscopic and CHNS elemental analysis results complemented with the desired monomer. FT-IR showed the presence of amide peaks and supported by the mass analysis using LC-MS. The synthesised trithiol monomer has potential to be polymerised as branch-chained disulphide polymer for colon targeted drug delivery system.

**PH-P- 2: DEVELOPMENT AND VALIDATION OF HPLC-UV METHOD FOR THE  
ESTIMATION OF ZALTOPROFEN IN HUMAN PLASMA**

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A simple, rapid, selective and sensitive high-performance liquid chromatography (HPLC) method was developed and validated for the determination of zaltoprofen in human plasma sample. The drug was extracted with ethyl acetate. Zaltoprofen was measured in plasma using a validated HPLC method with UV detector at 254 nm chromatographic peaks were separated on 5  $\mu$ m Intersil, C18 column (4.6 x 250 mm x 5  $\mu$ m) using 40:60 v/v Phosphate buffer pH3, Acetonitrile as mobile phase at a flow rate of 1 ml/min. The chromatograms showed a good resolution with no interference from plasma. The retention time of zaltoprofen and internal standard (Nevirapine) were approximately  $4.0 \pm 0.05$  min and  $10.7 \pm 0.03$  min respectively. The mean recovery from human plasma was found to be above 50%. The method was linear over the concentration range of 0.15 to 20  $\mu$ g/mL with correlation coefficient of 0.9983 ( $r^2$ ) 0.9983. This method could successfully apply to pharmacokinetics studies.

Key words: Zaltoprofen, Bioanalytical method, LLE, HPLC



**PH-P- 3: EFFECTS OF CITRIC ACID AND TRISODIUM CITRATE  
ON THE VISCOSITY PROFILE OF HYDROXYPROPYLMETHYLCELLULOSE  
SOLUTION**

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The effects of citric acid and trisodium citrate on the viscosity profile of hydroxypropylmethylcellulose (HPMC) solution were examined. HPMC solutions (1.0% w/w), with or without the additive, were subjected to viscosity testing by means of a rotatory viscosimetry method in a temperature range from 30 to 60°C. The viscosity of HPMC solution can be reduced when appropriate concentrations of additives were used. Smaller molecular weight additive namely citric acid demonstrated the best viscosity lowering effect except at 60°C. Interestingly, the viscosity lowering property of trisodium citrate was greatly enhanced at a high solution temperature, following the incorporation of a high concentration of additive. Unlike trisodium citrate, the viscosity lowering characteristics of citric acid, namely the largest reduction extent of viscosity as well as the required concentration of additive, were less affected by the solution temperature.

**Keywords:** Hydroxypropylmethylcellulose (HPMC), Citric acid, Trisodium citrate

**PH-P- 4: VISCOSITY MODIFYING EFFECTS OF CITRATE ADDITIVES ON  
HYDROXYPROPYLMETHYLCELLULOSE SOLUTION**

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The effects of citrate additives on the viscosity profile of hydroxypropylmethylcellulose (HPMC) solution was examined using citric acid, triacetin, triethyl citrate and trisodium citrate as the model compounds. Both 0.5 and 1.0 %w/w HPMC solutions, with or without the additives, were subjected to viscosity testing by means of U-tube viscosimeter at  $30.0 \pm 1.0^\circ\text{C}$ . The molecular characteristics of HPMC solution and selected samples of HPMC-additive solutions were evaluated using the fourier transform infra-red spectroscopy technique. The viscosity of HPMC solution can be reduced when appropriate concentrations of additives were used. In the case of 0.5 %w/w HPMC solution, the smallest molecular weight additive namely citric acid demonstrated the best viscosity lowering effect. Nonetheless, the viscosity of 1.0% w/w HPMC solution was reduced by trisodium citrate to a greater extent than that of by other additives. The concentration of additive, corresponding to the largest reduction extent of viscosity, increased with the use of HPMC solution of high polymer content. Interestingly, the trisodium citrate could induce the formation of a viscous HPMC solution when a moderate amount of additive was used. Nevertheless, a less viscous HPMC solution was produced at high and low concentrations of trisodium citrate. The viscosity profiles of HPMC and HPMC-additive solutions cannot be aptly explained by additive molecular weight and/or molecular interaction of polymer and/or additive via the O-H moiety. The changes in viscosity of HPMC solution with respect to the incorporation of additive could involve modification of other physical properties as well as non-O-H moiety of polymer and/or additive.

**PH-P- 5: DEVELOPMENT AND VALIDATION OF REVERSE PHASE HPLC  
METHOD FOR SALBUTAMOL IN AQUEOUS PREPARATIONS**

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An improved and rapid HPLC method for detection of salbutamol sulphate in aqueous preparations has been developed. The determination was performed using HPLC system with an octadecylsilane column and a solvent system comprising of orthophosphate buffer and acetonitrile in the volume ratio of 90:10. The detection was carried out using a UV detector set at a wavelength of 202nm. The method was validated with respect to the linearity, accuracy, precision and detection limit. The calibration curve was drawn by plotting peak area against concentration and showed linearity in the range of 25 – 2500µg/L. A straight line was fitted to the data by linear regression which was  $Y=586.02x + 3907$ . The coefficient of regression obtained was 0.9999. The percentage recovery was found in the range of 92% – 101% indicated the accuracy of the method. Precision was calculated as interday and intraday variations. The percentages of relative standard deviation were found to be less than 2, indicating a high degree of precision of the method. The detection and the quantification limit for this assay were calculated to be 7.4458µg/L and 24.8192µg/L, respectively, which were below the minimum expected concentrations of sample for this assay. It can be concluded that the developed method offers not only simple and rapid analysis but also consistently accurate and highly precise salbutamol aqueous HPLC assay.

**PH-P- 6: METHOD VALIDATION OF GAS CHROMATOGRAPHY FOR THE  
DETERMINATION OF CAPRYLIC ACID METHYL ESTER IN STRUCTURED  
VIRGIN COCONUT OIL**

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A gas chromatographic (GC) separation method with Flame Ionization Detector (FID) has been developed for the separation and quantification of caprylic acid methyl ester in oil samples rich in medium chain triacylglycerols (MCTs). Medium chain caprylic acid is a potential permeation enhancer for active ingredients in pharmaceutical and cosmetics products. Analysis was performed using a gas chromatography (Perkin Elmer 6890N, Santa Clara, CA) fitted with a FID. The column used was a polar capillary column zebron ZB-FFAP [0.25 mm internal diameter, 30 m length and 0.25 µm film thick (Phenomenex, Bellefonte, PA, USA)] at a split ratio of 1:25 and at a column pressure of 15 psi. This method is rapid and specific, and within 2.24 minutes it provides the separation of caprylic acid methyl ester which has 6 carbon chains. The calibration was linear over a concentration range of 62.5 - 2000 µg/ml. The relative standard deviation (%R.S.D.) and percentage errors were less than 3%. The specificity, sensitivity, reproducibility of this method makes it suitable for the determination of caprylic acid methyl ester in various oils.

**Keywords:** Caprylic acid methyl ester, Fatty acid, Gas chromatography, Method validation, Structured virgin coconut oil (SVCO)

**PH-P- 7: DEVELOPMENT AND CHARACTERIZATION OF LEVODOPA-LOADED  
PLGA NANOPARTICLES FOR INTRANASAL DRUG DELIVERY**

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Macromolecular drugs are too large and too hydrophilic to penetrate the blood brain barrier (BBB) from the systemic circulation and would be rapidly degraded by gastrointestinal enzymes or the liver cytochromes, if taken orally. Nanoparticulate drugs has been recognized as an alternative to the more conventional routes of administration to bypass the BBB and rapidly target therapeutics directly to the central nervous system (CNS). Purpose of this study is to develop the formulation of nanoparticles for direct intranasal drug delivery. Levodopa-loaded PLGA nanoparticle was produced using two different methods; nanoprecipitation and solvent evaporation technique. For nanoprecipitation method, PLGA (2% w/v) was dissolved in acetonitrile (ACN) and then mixed with solution containing PVA (1.5% w/v) and levodopa (1 mg/ml). Results showed the size was ranged from 207 nm to 230 nm and drug content was 62 %. For solvent evaporation method, PLGA (1% w/v) was dissolved in dichloromethane (DCM) before being mixed with PVA (1% w/v) in deionized water containing levodopa (1 mg/ml). This method produced nanoparticles size ranged from 198 nm to 210 nm with drug content of 74%. In conclusion, nanoparticles produced from solvent evaporation method showed smaller size and higher drug content as compared to nanoprecipitation method.

**Keywords:** Levodopa, Nanoparticles, PLGA, Nanoprecipitation, Solvent evaporation

**PH-P- 8: DEVELOPMENT OF HPLC ASSAY METHOD FOR GAMMA-LINOLENIC ACID**

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Reverse phase high performance liquid chromatography (RP-HPLC) method using UV detector was developed for analysis of gamma-linolenic acid (GLA). Zorbax 300SB C-18 (5  $\mu$ m, 250 x 4.6 mm internal diameter) column was the stationary phase and 90% (v/v) acetonitrile and 10% (v/v) deionized water were employed as the mobile phases in an isocratic manner. Detection was done by UV at 211 nm wavelength with the flow rate of 0.8 ml/min. Calibration curves for GLA were linear with average correlation coefficient 0.995. The coefficient of variation for interday analysis were all less than 1% except for day-2. This study was able to have a great reduction in retention time in comparison to the previous research finding.

Keywords: Gamma-linolenic acid, High performance lipid chromatography

**PH-P- 9: DEVELOPMENT OF IBUPROFEN NANOEMULSION FORMULATION  
BY NANOPHASE EMULSIFICATION TECHNIQUE**

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Ibuprofen, a phenyl propionic acid derivative, is a non-steroidal anti-inflammatory drug (NSAID) which shows low oral bioavailability due to its lipophilicity characteristic. The use of nanoemulsion based formulations may enhance the bioavailability of lipophilic drug such as ibuprofen. The purpose of this study was to develop a series of nanoemulsion formulations which comprised of ibuprofen as the active ingredient, olive oil as the oil phase, sucrose laurate as the surfactant and glycerol as the co-surfactant. Nanophase emulsification technique was performed to produce concentrated emulsion known as nanophase gel (NPG) based on various oil: surfactant ratio and ibuprofen concentration. Nanoemulsion formulation was prepared from NPG by introducing into distilled water. The nanoemulsion formulations were evaluated by comparing the mean droplet size, polydispersity index (PDI) and zeta potential. Based on the results, all formulations produced showed narrow droplet size distributions ranging from 100 nm to 200 nm and PDI value less than one. In this study, nanoemulsion formulation with composition of oil: surfactant ratio of 5:1 containing 20% (w/w) olive oil showed the most stable results with droplet size of 150.5 nm, PDI value of 0.056 and zeta potential of -32.3 mV. This formulation was selected to be loaded with 3.0% (w/w) of ibuprofen showed the droplet size of 152.1 nm, PDI value of 0.067 and zeta potential of -20.7 mV.

The data collectively showed that the oil: surfactant ratio of 5:1 containing 20% (w/w) olive oil and 3.0% (w/w) ibuprofen was more stable as compared to other formulations in terms of droplet size properties and zeta potential values.

**Keywords:** Ibuprofen, Nanoemulsion, Olive oil, Sucrose laurate, Nanophase gel (NPG)

**PH-P- 10: CHARACTERIZATION AND STABILITY EVALUATION OF VARIOUS EMULSION FORMULATIONS BY EMULSIFICATION TECHNIQUE**

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Emulsion is a complex and unstable system in which a liquid is dispersed into another immiscible liquid phase. The objectives of this study were to evaluate the particle size distribution and stability of emulsions with different formulations containing different types of oils (jojoba, olive, grape seed and waglinol), Olivem 1000 at different homogenizing time of 5 minutes, 10 minutes and 15 minutes respectively. All formulations were prepared by using hot mixing technique. The characterization study was carried out by measuring the particle size distribution and uniformity of the formulations. Furthermore, stability analysis was performed by using a Lumifuge stability analyzer for a period of 30-day. Based on the results, the increment in homogenization time resulted in reduction of droplets size. Most of the formulations showed uniformity values less than one. The emulsion formulation which composed of 10% (w/w) oil, 7% (w/w) Olivem 100 and 83% (w/w) water showed a narrow particle size distribution as compared to other formulations. Additionally, most of the formulations were stable upon storage for one month. Formulation containing waglinol (Formulation 1) was the most stable with homogenization time of 5 minutes that showed no separation upon storage for 1 month and 1 year. In conclusion, Formulation 6 containing grape seed oil and 10 minutes homogenization time was the most preferable formulation due to its smallest droplet size and good stability with no phase separation upon storage for 1 month.

**Keywords:** Nanoemulsion, Characterization, Stability, Homogenizing time, Olivem



**PH-P- 11: ENHANCEMENT OF SOLUBILIZATION OF IBUPROFEN USING  
SUCROSE LAURATE**

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Micelles are used in drug delivery to minimize drug degradation, drug loss, prevent harmful side effects and increase drug bioavailability. The low toxicity of non-ionic surfactants makes them particularly interesting for solubilization and drug delivery purposes. The aim of this work was to improve the solubility of a poorly-soluble drug (ibuprofen) using sucrose monolaurate. Sucrose laurate is preferred than other non-ionic surfactants due to its high value of Hydrophil Lipophil Balance (i.e. 15) and less toxic. Sucrose laurate was used in different concentrations ranging from 2 to 20% to aid ibuprofen solubilization. Ibuprofen was analyzed using UV-Visible Spectrophotometer at wave length of 222 nm. The results showed that sucrose laurate in the concentration of 20% gave the best solubility of ibuprofen up to 45 mg/ml. It was noticed that the low critical micelle concentration of sucrose laurate favors the solubility of this poorly soluble drug. The finding of this research suggested that sucrose laurate can be successfully used for enhancing drug solubility and hence, the bioavailability of ibuprofen for pediatric administration.

Keywords: Ibuprofen, Sucrose laurate, Micellar solubilization

**PH-P- 12: FORMULATION AND CHARACTERIZATION OF NOVEL  
MEMANTINE HYDROCHLORIDE LOADED PNVC-IA NANOPARTICLES**

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Memantine hydrochloride (MEM HCl) is an NMDA receptor antagonist that has been demonstrated to be effective in the treatment of patients with Alzheimer's disease. This work focuses on the formulation and characterization of nanoparticles containing MEM HCl for intranasal drug delivery to ensure sufficient concentration within the brain to exert its optimal effect. A novel poly N-vinyl caprolactam-itaconic acid (PNVC-co-IA) nanoparticle as a carrier for MEM HCl was formulated using the dispersion polymerization method (DPM). DPM involves a homogeneous solution of monomer(s) with initiator and surfactant, in which stabilized polymeric nanoparticles are formed by the precipitation of the resulting polymers. MEM HCl was loaded in the polymer nanoparticles by remote loading method. MEM HCl loaded polymeric nanoparticles were characterized by Fourier transform infrared spectroscopy (FTIR), wide angle X-ray diffraction (WAXD), differential scanning calorimetry (DSC), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Surface charge on the polymeric nanoparticles was evaluated by Zeta potential analysis. WAXD analysis revealed an amorphous nature of the blend polymeric nanoparticles; probably due to the increased composition of itaconic acid (IA). It was found that the crystalline form of MEM HCl was completely dispersed at molecular level in the polymer nanoparticles. The results showed that an increase in carboxylic groups from IA led to negative charge on the surface of the nanoparticles. The incorporation of MEM HCl in polymer nanoparticles decreased the segmental mobility of the polymer chain hence increasing the glass transition of the polymer nanoparticles. Additionally there was a significant decrease in melting temperature peak which might be attributed to miscibility of MEM HCl with its polymeric components (IA and NVC). TEM results of blank nanoparticles showed uniform spherical nanoparticles with size ranging from 80 - 250 nm. There was no significant difference in shape after MEM HCl loading of polymeric nanoparticles. It was noticed that MEM HCl formed a thin layer outside the nanoparticles surface. Our results exhibit drug-polymer interactions and these polymeric nanocarriers may be a suitable candidate for targeted drug delivery applications.

**Keywords:** Polymeric nanoparticles, Poly N-vinyl caprolactam, Poly Itaconic acid, Memantine hydrochloride, Physicochemical properties

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