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**Nurturing Health Professionals in
Education and Research**

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Kuching, Sarawak
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Abstract Book



LIST OF ABSTRACTS

Keynote

NURTURING HEALTH PROFESSIONALS IN EDUCATION AND RESEARCH

Prof. Emerita Tan Sri Dr. Sharifah Hapsah Syed Hasan Shahabudin,
Professor Emerita of Medical Education and Former Vice Chancellor of Universiti
Kebangsaan Malaysia.

Plenary

PL1	IN VITRO STUDIES ON THE EFFECTS OF TOCOTRIENOL ON BONE CELLS Prof. Dr. Ima Nirwana Soelaiman, Universiti Kebangsaan Malaysia (Malaysia)
PL2	A NEW PHARMACOLOGICAL APPROACH TO PREVENTING MYOCARDIAL ISCHAEMIA/REPERFUSION INJURY Prof. Dr. Owen Woodman, RMIT University, Melbourne (Australia)
PL3	FLAVONES FROM NICOTIANA PLUMAGINIFOLIA SHOW ANALGESIC AND ANXIOLYTIC ACTIVITIES IN MICE MODEL Prof. Dr. Abdur Rashid, University of Dhaka (Bangladesh)

Symposium

S1	INTRINSIC ANDROGEN RECEPTOR INDEPENDENCE IN PROSTATE EPITHELIAL CELLS Dr. Chua Chee Wai, Shanghai Jiao Tong University (China)
S2	TEACHING AND ASSESSING CLINICAL REASONING: ARE WE DOING IT RIGHT? Prof. Datuk Dr. Harlina Halizah Siraj, Universiti Kebangsaan Malaysia (Malaysia)
S3	ENSURING JUSTICE IN FORENSIC INVESTIGATION Professor Dr. Faridah Mohd Nor, Universiti Kebangsaan Malaysia (Malaysia)
S4	THE VALUE OF PATIENTS REPORTED OUTCOMES AFTER ACUTE CORONARY SYNDROMES Associate Professor Dr. Lawrence Anchah, Universiti Malaysia Sarawak (Malaysia)
S5	OBESITY – A HUGE PROBLEM Dr. Loh Huai Heng, Universiti Malaysia Sarawak (Malaysia)
S6	POLYPHENOL RICH-EXTRACT OF ROSELLE AMELIORATES CARDIAC DYSFUNCTION AND STRUCTURAL ALTERATION IN DIABETIC RATS Prof. Dr. Siti Balkis Budin, Universiti Kebangsaan Malaysia (Malaysia)

Oral Communication

OC01	<p>SYNERGISTIC ANTIBACTERIAL EFFECT OF LEAF, ROOT, AND STEM BARK EXTRACTS OF ACACIA NILOTICA AND PSIDIUM GUAJAVA ON EXTENDED SPECTRUM BETA LACTAMASE (ESBL) PRODUCING ESCHERICHIA COLI AND KLEBSIELLA PNEUMONIA</p> <p>Salawudeen A, Agbo E.B, Tahir F, Suleiman M.A, Adamu M.T</p>
OC02	<p>FLAVONES FROM NICOTIANA PLUMBAGINIFOLIA SHOWING ANALGESIC AND ANXIOLYTIC ACTIVITIES IN MICE MODEL</p> <p>Md. Shafiullah Shajib, <u>Mohammad A. Rashid</u></p>
OC03	<p>PALMITIC RICH INTERESTERIFIED FATS ELEVATED PLASMA HDL, LARGE HDL SUB-FRACTIONS AND REGULATION OF HEPATIC GENES BY ENHANCING CHOLESTEROL CLEARANCE PATHWAY VIA REVERSE CHOLESTEROL TRANSPORT (RCT) IN A HAMSTER MODEL</p> <p><u>Gowri Nagapan</u>, Goh Yong Meng, Che Anisahs Che Idris, Noor Lida Mat Dian, Kanga Rani Selvaduray and Nagendran Balasundram</p>
OC04	<p>THE EVALUATION OF LIVER OXIDATIVE STRESS PARAMETERS IN METABOLIC SYNDROME RATS TREATED WITH TOCOTRIENOL</p> <p><u>Wong Sok Kuan</u>, Chin Kok-Yong, Ima-Nirwana Soelaiman</p>
OC05	<p>THE EFFECTS OF OIL PALM PHENOLICS (OPP) ON LIPID METABOLISM BIO-MARKERS OF HYPERLIPIDAEMIC GOLDEN SYRIAN HAMSTER</p> <p>SB Syarifah-Noratiqah, Syed Fairus, HMS Qodriyah, Isa Naina-Mohamed</p>
OC06	<p>RESVERATROL PREVENTS NICOTINE-INDUCED HYPERTENSION AND CARDIAC DYSFUNCTION IN RATS</p> <p><u>Anand Ramalingam</u>, Norsyahida Mohd. Fauzi, Siti Balkis Budin, Rebecca H. Ritchie, Satirah Zainalabidin</p>
OC07	<p>TESTOSTERONE REDUCES EXPRESSION OF MECA-79 AND NUMBER OF EMBRYO IMPLANTATION SITE IN EARLY PREGNANCY RAT MODEL</p> <p>Mohd Helmy Mokhtar, Nelli Giribabu, Naguib Salleh</p>
OC08	<p>SEXUAL DIMORPHISM OF THE SUBPUBIC ANGLE: A PRELIMINARY STUDY USING COMPUTED TOMOGRAPHY (CT) SCAN IN MALAYSIANS</p> <p><u>Siti Hanum Mohd Ali</u>, Normaliza Omar, Mohamed Swarhib Shafie, Nik Azuan Nik Ismail, Helmi Hadi, Faridah Mohd Nor</p>
OC09	<p>PAST, PRESENT AND FUTURE STATUS OF HIV/AIDS GLOBAL PANDEMIC</p> <p>Narendra Kumar Chopra, Ma Han Ni</p>
OC10	<p>AGE ESTIMATION FROM DENTAL IMAGING ON PREMOLARS IN</p>

	ADULTS Donni S, Haslinda R, Phrabhakaran N, Aspalilah A
OC11	Post-Mortem Changes of <i>Sus scrofa domestica</i> in Equatorial Climate in Sarawak, Malaysia Ting Kwong Ing, Normaizatul Afizah Ismail, Faridah Mohd Nor, Ab Halim Mansar
OC12	MICROARRAY ANALYSIS OF THE MOLECULAR MECHANISM INVOLVED IN EOPD AND LOPD PATIENTS IN MALAYSIA Nor Ilham Ainaa Muhsin, Wan Fahmi Wan Mohamad Nazarie, Ahmad Rasyadan Arshad, Muhiddin Ishak, Zamzureena Mohd Rani, Fairuz Fatin Zolkafali, Ambrose Louise, Siti Aishah Sulaiman, A Rahman A Jamal, Nor Azian Abdul Murad
OC13	PERTURBATION OF HOST-MICROBES INTERACTION IN GUT TUMOR MICRO-ENVIRONMENT: AN EVIDENCE FROM MICROBIOME SECRETOME STUDY Siok-Fong Chin, Putri Intan Hafizah Megat Mohd Azlan, Luqman Mazlan, Hui-min Neoh, Raja Affendi Raja Ali, Rahman Jamal
OC14	ENDOSCOPY AS PART OF INITIAL WORK-UP FOR ISOLATED UNINTENTIONAL WEIGHT LOSS: OESOPHAGOGASTRODUODENOSCOPY BUT NOT COLONOSCOPY SHOULD BE CONSIDERED Khairul Najmi Muhammad Nawawi, Raja Affendi Raja Ali
OC15	MORPHOMETRIC ANALYSIS OF 3D CT IMAGES OF SCAPULA FOR SEX DETERMINATION IN MALAYSIAN POPULATION Normaliza Omar

Young Investigator Award

YIA01	REGRESSION OF INVASIVE DUCTAL CARCINOMA TREATED WITH SIROLIMUS AND SUNITINIB IN NMU- INDUCED ANIMAL CANCER MODEL Nurul Fathiyatul Nabila Jaffar, Muhammad Shahidan Muhammad Sakri, Tengku Ahmad Damitri Al-Astani b Engku Daud@Tengku Din, Hasnan Jaafar
YIA02	MESENCHYMAL STEM CELLS-DERIVED NEURAL PROGENITOR STEM CELLS TREATED IMPROVES FUNCTIONAL RECOVERY IN RAT SPINAL CORD INJURY Putri Nur Hidayah Al-Zikri, Fauziah Mohamad Idris, Jafri Malin Abdullah, Hasnan Jaafar
YIA03	DYSREGULATION OF EMT MARKERS DRIVEN BY EPIGENETIC REGULATOR SETD1A IN TRIPLE NEGATIVE BREAST CANCER CELL LINES Ezanez Azlina Mohamad Hanif, Paul B Mullan

YIA04	OPTIMISATION OF A PC 12 CELL-BASED <i>IN VITRO</i> STROKE MODEL FOR SCREENING POTENTIAL NEUROPROTECTIVE AGENTS Pin Fen Chua, William K. Lim
YIA05	TRPC3-NOX2 COMPLEX ACTIVATION UNDERLIES ADENOSINE TRIPHOSPHATE (ATP)-INDUCED CARDIOMYOCYTE ATROPHY <u>Suhaini Sudi</u> , Motohiro Nishida, Caroline Sunggip
YIA06	TREATMENT WITH TRF MODULATES OXIDATIVE STRESS-INDUCED OSTEOCLAST DIFFERENTIATION AND ITS ACTIVITY <i>IN VITRO</i> Nur Fathiah Mohd Radzi, Zakiah Jubri, Suzana Makpol, Ima Nirwana Soelaiman and <u>Ekram Alias</u>
YIA07	FROM DISEASED TO QUIESCENCE: THE EFFECT OF RETINOIC ACID SUPPLEMENTATION ON KERATOCONIC FIBROBLASTS <i>IN VITRO</i> UNDER SERUM-FREE CONDITION <u>Fadhilah Zainal Abidin</u> , Dimitrios Karamichos, Francisco Figueiredo, Che Connon
YIA08	PHOTOPROTECTIVE EFFECTS OF PTEROSTILBENE SUPPLEMENTATION ON MELANOGENESIS ACTIVITY AND OXIDATIVE STRESS IN UVB IRRADIATED BALB/C MICE Tava Shelan Nagapan, Dayang Fredalina Basri, Ahmad Rohi Ghazali
YIA09	ANTI-ATHEROSCLEROTIC PROPERTIES OF BERBERIS VULGARIS AQUEOUS EXTRACT IN CHOLESTEROL-FED RABBITS Nurul Huda Mohd Nor, Fauziah Othman, Sabariah Md Noor Eusni Rahayu Mohd Tohit
YIA10	ANTIOXIDANT, ANTIMICROBIAL, ANTI-DIARRHEAL AND ANALGESIC ACTIVITIES OF <i>DIOSPYROS MALABARICA</i> (DESR.) KOSTEL. Md. Moniruzzaman, <u>Mohammad Kaisarul Islam</u> , Mohammad A. Rashid
YIA11	A PRELIMINARY FORMULATION OF BIOMATERIAL BONE PASTE Penny George, Zariyantey Abd Hamid, Md. Zuki Abu Bakar Zakaria, Enoch Kumar Perimal, B.Hemabarathy Bharatham
YIA12	GOAT MILK PREVENTS AGEING-INDUCED MEMORY DECLINE VIA ENHANCING BRAIN NEUROTROPHIC FACTORS <u>Afifa Safdar</u> , Khairunnuur Fairuz Azman, Rahimah Zakaria, Che Badariah Ab Aziz and Usman Rashid
YIA13	THE ANTIHYPERTENSIVE EFFICACY OF <i>PIPER SARMENTOSUM</i> AQUEOUS EXTRACT AS COMPARED TO PERINDOPRIL IN SPONTANEOUSLY HYPERTENSIVE RATS <u>Fatimatuzzahra Hashim Fauzy</u> , Maizura Mohd Zainudin, Hidayatul Radziah Ismawi, Taher El-Shami

YIA14	<p>CHANGES IN THE HEART METABOLIC PROFILE OF MYOCARDIAL INFARCTION RATS INDUCED WITH ISOPRENALINE BY PALM TOCOTRIENOL-RICH FRACTIONS</p> <p><u>Khairul Anwar Zarkasi</u>, Satirah Zainalabidin, Tan Jen-Kit, Nur Haleeda Hakimi, Nur Zuliani Ramli, Zakiah Jubri</p>
YIA15	<p>THE EFFECTS OF KELULUT HONEY ON BLOOD PRESSURE, FASTING LIPID PROFILE AND ADIPOCYTE HISTOMORPHOMETRY IN RATS WITH METABOLIC SYNDROME INDUCED WITH HIGH CARBOHYDRATE AND HIGH FAT DIET</p> <p><u>Nur Zuliani Ramli</u>, Kok-Yong Chin, Khairul Anwar Zarkasi, Fairus Ahmad</p>
YIA16	<p>CYCLOOXYGENASE-2 INHIBITORY COMPOUNDS FROM THE LEAVES OF GLYCOSMIS PENTAPHYLLA (RETZ.) A. DC.: CHEMICAL AND IN SILICO STUDIES</p> <p>Mahfuza Afroz Soma, Md. Ruhul Kuddus and Mohammad Abdur Rashid</p>
YIA17	<p>THE RELATIONSHIP BETWEEN METABOLIC SYNDROME AND BONE HEALTH AMONG MALAYSIANS IN KLANG VALLEY</p> <p>Kok-Yong Chin, Chin Yi Chan, Subramaniam Shaanthana, Fairus Ahmad, Nor Aini Jamil, Pei Yuan Ng, Norliza Muhammad, Ima-Nirwana Soelaiman, Norazlina Mohamed</p>
YIA18	<p>PREDICTORS OF BONE HEALTH AMONG MIDDLE-AGED AND ELDERLY MALAYSIANS IN KLANG VALLEY</p> <p>Chin Yi Chan, Norazlina Mohamed, Soelaiman Ima-Nirwana and Kok-Yong Chin</p>
YIA19	<p>PREVALENCE AND CHARACTERISTIC OF YOUNG ADULTS WITH ACUTE MYOCARDIAL INFARCTION IN A SINGLE REFERRAL CENTRE IN PAHANG</p> <p><u>Mohd. Zhafri</u>, Samsul Draman, Aszrin Abdullah, Jamalludin A. Rahman, Norbaiyah M. Bakrim, Azarisman Shah M. Shah</p>
YIA20	<p>RELATIONSHIP BETWEEN PANORAMIC INDICES AND BMD OF MANDIBLE, HIP AND SPINE AMONG MALAY</p> <p><u>Noorshaida Kamaruddin</u>, Zainul Ahmad Rajion, Mohd Ezane Aziz, Asilah Yusof</p>
YIA21	<p>POST PARTUM ENDOTHELIN-1 AND ANGIOGENIC FACTORS CAUSING PERSISTENT ENDOTHELIAL DYSFUNCTION IN MOTHERS WITH HYPERTENSIVE DISORDERS OF PREGNANCY</p> <p><u>Hidayatul Radziah Ismawi</u>, Maizura Mohd Zainudin, Nurjasmine Aida Jamani, Taher FT Elshami, Tariq Abdul Razak</p>
YIA22	<p>POLYPHARMACY AMONG ELDERLY IN NURSING HOMES</p> <p>Koo Kai Xuan, <u>Marhanis-Salihah Omar</u>, Adliah Mhd-Ali, Mohd Makmor-Bakry</p>
YIA23	<p>THE PERFORMANCE OF CALCANEAL QUANTITATIVE ULTRASOUND IN OSTEOPOROSIS PREDICTION AMONG MALAYSIANS AGED 40 YEARS AND ABOVE IN KLANG VALLEY</p> <p>Subramaniam, Shaanthana, Soelaiman, Ima-Nirwana, Kok-Yong, Chin</p>

Posters

P01	Aphrodisiac Potential of Mangrove Plant in Costal Area of Sabah Extract (<i>Rhizophora Mucronata</i>) Syamimi Khalid, Sarifah Rejab, Ahmad Hazri Ab. Rashid, Noor Rabihah Aid, Aidawati Shabery, Nurul Husna Abdullah, Roslan Sulaiman
P02	ANTI-INFLAMMATORY EFFECT OF POLYGONUM MINUS FLAVONOID-RICH-FRACTION AGAINST CISPLATIN-INDUCED HEPATOTOXICITY IN SPRAGUE DAWLEY RATS <u>Nurul Raudzah Adib Ridzuan</u> , Teoh Seong Lin, Norhashima Abdul Rashid, Faizah Othman, Syarul Nataqain Baharum, Farida Hussan
P03	CYTOTOXIC ACTIVITY OF TINOSPORA CRISPA CRUDE EXTRACTS (STEM) AGAINST K562 HUMAN LEUKEMIA CELLS Normah Awang, Haziratul Iffah Ruzali, Rapidah Mohamad, Nurul Farahana Kamaludin and Chan Kok Meng
P04	MARANTODES PUMILUM LEAF EXTRACT RESTORED MECHANICAL STRENGTH OF FRACTURED TIBIA IN OSTEOPOROSIS RAT MODEL <u>Norazlina Mohamed</u> , Tijjani Rabiul Giuze, Ahmad Nazrun Shuid
P05	IN VITRO STUDY OF THE EFFECTS OF TANNIC ACID ALONE OR IN COMBINATION WITH PAMIDRONATE ON OSTEOBLAST PROLIFERATION AND MINERALIZATION <u>Hermizi Hapidin</u> , Nor Munira Hashim, Hasmah Abdullah
P06	EFFECT OF GYNURA PROCUMBENS ON CARDIAC MARKERS IN ACUTE MYOCARDIAL INFARCTION MODEL Syarifah Aisyah Syed Abd Halim, Norzana Abdul Ghafar, Srijit Das, Zakiah Jubri
P07	Dual-Crosslinked Gelatin Bioactive Scaffold as a Potential Acellular Treatment for Diabetic Foot Ulcer Mohd Yunus Mohd Heikal , Mior Azman Mior Arif, Mh Busra, Fauzi
P08	EFFECT OF TOPICAL APPLICATION OF <i>POLYGONUM MINUS</i> ESSENTIAL OIL ON WOUND HEALING OF STREPTOZOTOCIN-INDUCED DIABETIC RATS <u>Seong Lin Teoh</u> , Mohamad Ali Abdul Rahiman, Srijit Das
P09	TOCOTRIENOL PROTECTS THE BONE AGAINST LONG TERM GLUCOCORTICOID EXCESS VIA ANTIOXIDANT ACTIVITIES Elvy Suhana Mohd Ramli, Fairus Ahmad, Mohamad Fairuz Yahaya, Ima Nirwana Soelaiman
P10	THE EFFECTS OF KELULUT HONEY ON BODY FAT PERCENTAGE AND OMENTAL FAT MASS IN RATS WITH METABOLIC SYNDROME INDUCED WITH HIGH CARBOHYDRATE AND HIGH FAT DIET Fairus Ahmad, Nur Zuliani Ramli, Kok-Yong Chin, Khairul Anwar Zarkasi

P11	EFFECTS OF TOCOTRIENOL-RICH FRACTION ON STRESS-INDUCED GASTRIC MUCOSAL LESIONS AND ITS RELATION TO PROSTAGLANDINS AND COX-1 MRNA <u>Nur Azlina Mohd Fahami</u> , Kamisah Yusof, Qodriyah Mohd Saad
P12	THE TREATMENT OF DIABETIC WOUNDS AND THE ROLE OF NATURAL PRODUCTS Srijit Das, Teoh Seong Lin
P13	ANTIPYRETIC ACTIVITY OF HIBISCUS ROSA-SINENSIS STEM EXTRACT Anandarajagopal Kalusalinagm, Maisarah Binti Khairi, Abdur Rahman Auf Ali, Abdullah Khan
P14	ROSELLE ATTENUATES CARDIAC REMODELING AFTER MYOCARDIAL INFARCTION <i>IN VIVO</i> Satirah Zainalabidin, Lislivia Si Yiang Nee, Anand Ramalingam, Norsyahida Mohd Fauzi, Siti Balkis Budin
P15	THE EFFECTS OF ANNATTO TOCOTRIENOL DELIVERED USING SELF EMULSIFYING DRUG DELIVERY SYSTEM ON BONE MINERAL DENSITY IN AN ANIMAL MODEL OF POSTMENOPAUSAL OSTEOPOROSIS Nur Vaizura Mohamad, Ima Nirwana Soelaiman, Chin Kok Yong
P16	DISEASE ACTIVITY INDEX SCORE TO ASSESS INFLAMMATION IN A COLITIS-ASSOCIATED CANCER MOUSE MODEL Nurul Hazliana Harun, Norhazlina Abdul Wahab, Nordashima Abd Shukor, Norfilza Mohd Mokhtar, Raja Affendi Raja Ali
P17	SYNTHESIS, CHARACTERISATION AND EVALUATION OF IN-VITRO ANTIOXIDANT ACTIVITY OF NOVEL BENZOTRIAZOLE DERIVATIVES Anandarajagopal Kalusalingam, Hemala Parasuraman, Abdullah Khan
P18	CORNEAL STROMA GENE EXPRESSION IN SUPERFICIAL ABRASIVE INJURY OF BILAYER CORNEAL EQUIVALENT Norzana Abd Ghafar, Ng Sook Luan, Jemaima Che Hamzah, Chua Kien Hui
P19	SYNTHESIS AND CYTOTOXIC ACTIVITY OF ORGANOTIN(IV) BIS(2-METHOXYETHYL) DITHIOCARBAMATE IN K562 CELLS <u>Rapidah Mohamad</u> , Normah Awang, Nurul Farahana Kamaludin, Nor Fadilah Rajab, Asmah Hamid
P20	DETERMINATION OF BIOCHEMICAL MARKERS FOR PRIMARY CREATINE DISORDERS USING SYMMETRY ® C18 COLUMN AND DIRECT INJECTION ANALYSIS BY TANDEM MASS SPECTROMETRY (MS/MS) Marleena M , Ismarulyusda I, Salina AR, Ngu LH, Anasufiza H, Asmah H
P21	MOLECULAR IDENTIFICATION OF <i>CHRYSOMYA MEGACEPHALA</i>

	USING GUSTATORY RECEPTOR 1 GENE – PRELIMINARY STUDY <u>Syamsa Rizal bin Abdullah</u> , Siti Nur Akmal bt Ghazali, Emelia binti Osman
P22	OVARIAN SEROUS CYSTADENOCARCINOMA DRUG-TREATMENT TRANSCRIPTOME ANALYSIS OF TCGA DATA USING DESEQ2 Wan Fahmi Wan Mohamad Nazarie, A Rahman A Jamal, Nurul-Syakima Ab Mutalib
P23	ANTIPROLIFERATIVE AND APOPTOSIS INDUCTION ACTIVITIES OF NOVEL ORGANOTIN(IV) DITHIOCARBAMATE COMPOUNDS ON HUMAN LEUKEMIC CELL LINES <u>Norraphat Uttraphan Pim</u> , Nurul Farahana Kamaludin, Normah Awang, Yang Farina Abdul Aziz
P24	MODIFIED HIGH-CARBOHYDRATE HIGH-FAT DIET AT SHORTER DURATION INDUCES METABOLIC AND BEHAVIOURAL CHANGES IN YOUNG RATS Mohamad Fairuz Yahaya, Nurul ‘Ain Arshad, Teoh Seong Lin
P25	MOLECULAR STUDY ON DENGUE VIRUSES CIRCULATING DURING DENGUE OUTBREAKS IN SANDAKAN AND KUDAT, SABAH (2016-17) <u>Tin Sabai Aung</u> , Amalina Emran, Win Win Than, Tin Tin Thein, Mie Mie Sein, Timothy Jr Gintarong, Chua Tock Hing & Nobumichi Kobayashi
P26	VALIDATION OF AN ELECTROSPRAY IONIZATION TANDEM MASS SPECTROMETRY (ESI-MS/MS) DIAGNOSIS METHOD FOR PRIMARY CREATINE DISORDERS FOR USE IN CLINICAL LABORATORY Marleena M, Ismarulyusda I, Salina AR, Ngu LH, Anasufiza H, Asmah H
P27	GENE EXPRESSION PROFILE OF PLATINUM-RESISTANT OVARIAN SEROUS CYSTADENOCARCINOMA <u>Wan Fahmi Wan Mohamad Nazarie</u> , A Rahman A Jamal, Nurul-Syakima Ab Mutalib
P28	CARDIOMYOCYTE HYPERTROPHY INDUCTION BY ANGIOTENSIN II IN H9C2 CELLS <u>Kamisah Yusof</u> , Siti Hawa Nordin, Ahmad Asmadi Yusof, Juriyati Jalil
P29	EVALUATION OF EARLY CARDIAC REMODELING AT DIFFERENT TIME POINTS IN RAT MODEL OF MYOCARDIAL INFARCTION Shafreena Shaukat Ali, Kamisah Yusof, Satirah Zainalabidin
P30	PSYCHOSOCIAL CORRELATES OF DEPRESSION AMONG PATIENTS ON METHADONE MAINTENANCE THERAPY IN A MALAYSIAN TERTIARY SUBSTANCE ABUSE TREATMENT CENTRE Suzaily Wahab, Tee Chun Keat, Raynuha Mahadevan, Eni Rahaiza, Law Kian Boon
P31	A STUDY OF CARDIAC INVOLVEMENT IN 200 CASES OF DENGUE FEVER IN SHANTI I.D CLINIC VADODARA (GUJARAT STATE) INDIA.

	Narendra Kumar Chopra
P32	SUICIDAL BEHAVIOUR, DEPRESSION AND FUNCTIONAL DISABILITY AMONG ELDERLY INPATIENTS IN A MALAYSIAN TERTIARY CENTRE Suzaily Wahab, Tien Yong Chua, Rosdinom Razali, Zanariah Mat Saher
P33	MAINTAINING HEALTHY AGEING THROUGH NATURAL HORMONES OR BIOIDENTICAL HORMONE THERAPY Ismail Tambi, Stephanie Yang
P34	ACTIVITIES OF DAILY LIVING AMONG ELDERLY WITH LOWER BODY FRACTURE <u>Ahmad Nazrun Shuid</u> , Nurul Izzah Ibrahim, Mohd Sharkawi Ahmad, Mohamed S Zulfarina, Sharifah Nurul Aqilah Sayed Mohd Zaris, Isa Naina Mohamed, Norazlina Mohamed, Sabarul Afian Mokhtar
P35	IT IS NOT JUST THE BRAIN: ABNORMAL AUDITORY-BRAINSTEM PROCESSING IN PATIENTS WITH SCHIZOPHRENIA Noor Alaudin Abdul Wahab, Suzaily Wahab, Mohd. Normani Zakaria
P36	IT IS NOT JUST THE BRAIN II: CLICK AUDITORY BRAINSTEM RESPONSE WITH NOISE AS A POTENTIAL TEST IN SCHIZOPHRENIA PATIENTS <u>Noor Alaudin Abdul Wahab</u> , Suzaily Wahab, Mohd. Normani Zakaria
P37	MALE FACTOR INFERTILITY- IMPACT OF YOGA-BASED LIFESTYLE INTERVENTION Mehta V, Dada R, Mishra S
P38	UNUSUAL ARRAY OF NEURAL COMMUNICATIONS IN THE INFRA TEMPORAL FOSSA USEFUL FOR SKULL BASE SURGERY Gandhi S, Mehta V, Kohli M, Dada R
P39	SEROPREVALENCE AND MOLECULAR DETECTION OF TOXOPLASMOSIS AMONG HEMATO-ONCOLOGY PATIENTS IN HOSPITAL UNIVERSITI SAINS MALAYSIA <u>Aisha Khodijah Kholib Jati</u> , Suharni Mohamad, Wan Suriana Wan Ab Rahman
P40	UTILIZATION OF EVIDENCE-BASED THERAPY FOR THE TREATMENT OF TYPE 2 DIABETES MELLITUS IN MALAYSIAN PRIVATE PRACTICE Menon BV, Kassab YW
P41	THE EFFECTS OF FICUS FELTOIDEA ON BONE MINERAL PARAMETERS IN OVARIECTOMIZED RATS Norliza Muhammad, Nancy Mary Fernandez, Norazlina Mohamed
P42	EFFECTS OF VITAMIN E ISOMERS ON BONE STRUCTURE

	Nur Farhana Mohd Fozi, James Jam Jolly, Chin Kok Yong, Chua Kien Hui, Ekram Alias, Ima Nirwana Soelaiman
P43	3-D PRINTING: ENTERING THE NEW DIMENSIONS IN FORENSIC ODONTOLOGY <u>Ranjana Garg</u>
P44	THE INFLUENCE OF PHYSICAL ACTIVITY LEVEL AND SEDENTARY BEHAVIOR ON BODY COMPOSITION COMPONENTS IN ADOLESCENTS <u>Mohamed S Zulfarina</u> , Razinah Sharif, Shuid A Nazrun, Isa Naina-Mohamed
P45	A STUDY ON PROPHYLACTIC EFFECT OF POLYHERBAL DRUG MIXTURE IN NORMAL AS WELL AS ALLOXAN- INDUCED DIABETIC RATS Tasneem Nayla Mredula, Abu Asad Chowdhury and Mohammad Shah Amran
P46	EFFECTS OF KELULUT HONEY ON OXIDATIVE STRESS AND BONE STRUCTURE OF GLUCOCORTICOID INDUCED OSTEOPOROSIS IN MALE RATS Mohd Amir Kamaruzzaman, Elvy Suhana Mohd Ramli, Ilma Nirwana Soelaiman

YIA04

OPTIMISATION OF A PC 12 CELL-BASED *IN VITRO* STROKE MODEL FOR SCREENING POTENTIAL NEUROPROTECTIVE AGENTS

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Abstract

Aims/Objective: PC12 cells can be differentiated into a neuronal phenotype with nerve growth factor (NGF), and were widely used as an *in vitro* stroke model for screening neuroprotective agents. However, certain PC12 cell variants were reported to be non-responsive to NGF for differentiation, while optimisation studies of media and growth surface substrates are rare. This study aimed to test three commonly used PC12 variants for growth parameters and differentiation ability to set up an optimal *in vitro* stroke model.

Methods: PC12 cells (Riken cell bank), PC12 Adh and PC12 Neuroscreen-1(NS-1) cells were tested. The optimisation included cell culture medium, substrate, response to NGF-induced differentiation and duration of oxygen-glucose deprivation (OGD) by measuring cell viability and apoptosis. Validation of the *in vitro* system was done by testing with a known neuroprotectant, 8-OH-DPAT.

Results: The optimal culture media for PC12 cells (Riken) and NS-1 cells was DMEM. Collagen IV was the best substrate for PC12 cells (Riken) and NS-1 cells. PC12 Adh showed no preference for media or substrates. NS-1 cells gave the highest NGF-induced differentiation (72.7%), followed by PC12 (Riken,36%) and PC12 Adh (6.9%). NS-1 achieved optimal differentiation after three days of 150 ng/ml NGF treatment. Treatment with 8-OH-DPAT on NGF-differentiated NS-1 cells after three hours of OGD showed a significant reduction in apoptosis ($P<0.05$).

Conclusion: An *in vitro* stroke model using NS-1 cells grown in DMEM with collagen IV was optimised as substrate. Differentiated NS-1 cells subjected to 3-hour OGD had enabled the screening of neuroprotectants for treatment of stroke.