

## HEALTH AND WELL-BEING RESEARCH CLUSTER

Head: **PROF. DR. ZAMBERI SEKAWI**

Leading PTJ: Faculty of Medicine and Health Sciences, Universiti Putra Malaysia,  
43400 UPM Serdang, Selangor

Contact: zamberi@medic.upm.edu.my / Tel: 03-89472367

RESEARCH CLUSTER CODE	HWB
NO. OF PROGRAMME	9
NO. OF GROUP	39
NO. OF RESEARCH CENTRE	2
SYNOPSIS	<p><i>This research cluster encompasses multi and transdisciplinary research on diverse disciplines in the field of medicine and health sciences. The integration of the various disciplines will enhance the understanding of disease process, health and human behavior alongside with the application of technology in diagnostics, treatment, prevention and health promotion through innovative and novel approaches. This will eventually be translated into better health for the population and nation.</i></p> <p>Kluster penyelidikan ini merangkumi penyelidikan yang pelbagai dan transdisiplin pelbagai disiplin dalam bidang perubatan dan sains kesihatan. Integrasi pelbagai disiplin akan meningkatkan pemahaman tentang proses penyakit, kesihatan dan tingkah laku manusia bersama dengan aplikasi teknologi dalam diagnostik, rawatan, pencegahan dan promosi kesihatan melalui pendekatan inovatif dan novel. Ini akhirnya akan diterjemahkan kepada kesihatan yang lebih baik bagi penduduk dan negara.</p>
DESCRIPTION (with NABC elements)	<p><b>Need</b></p> <ul style="list-style-type: none"> <li>• Human health is getting increasingly complex and requires new approaches.</li> <li>• As cost of healthcare is increasing, there is a need for better and efficient transdisciplinary approach to save cost</li> <li>• The surge of modern technologies is a golden opportunity to re-look at conventional approaches to health care to seek for better health and well being</li> </ul> <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Multi and transdisciplinary research programmes</li> <li>• Build on existing expertise</li> <li>• Integrated, coordinated research groups</li> <li>• International linkages</li> </ul> <p><b>Benefit to UPM</b></p> <ul style="list-style-type: none"> <li>• Cost savings – avoid duplication of research</li> <li>• Efficient use of resources</li> <li>• More focused programmatic research and activities</li> <li>• Build research team culture</li> </ul> <p><b>Benefit to Society</b></p> <ul style="list-style-type: none"> <li>• Improvement in health care</li> <li>• Affordable health care cost</li> <li>• Advancement of health technologies</li> </ul> <p><b>Competitor</b></p> <ul style="list-style-type: none"> <li>• Sister Research Universities such as UKM, USM and UM are in the forefront as they have a dedicated teaching hospital.</li> <li>• The other newer Universities are increasingly involved in health research.</li> </ul>

Code	Research Programme	Synopsis	Leader of Research Programme	Research Groups
HWB01	Computer Assisted System In Health (CASH)	<p>The main purposes of this program are to research, to develop a computer integrated health system and to pursue the effective use of the untapped clinical data for scientific research with the ultimate goal to improve human health. The professionals in the medical fields are faced with an increasing quantity of highly complex, multi-dimensional and ill-structured data. There are vast amounts of clinical data; some are digitally stored in heterogeneous platform form while others are still recorded on paper.</p> <p>These collections of data are naturally, highly complex, multi-dimensional, and unstructured. Thus, medical practitioners cannot effectively integrate, apply and manipulate all this data into knowledge for further clinical research advancement. This program will study on how to tap on healthcare knowledge and integrating them into a unified clinical information infrastructure for clinical discoveries beyond human expert diagnosis and decision making. To comply and fulfill the requirements of a total solution for computer integrated health system that satisfy medical practitioner, this program covers knowledge and involvement of expertise from four research groups; Computer Graphics, Vision and Visualization (CGV2) Digital Information Computation and Retrieval (DICR), Database Theory, Technology and Application (DTTA) and Distributed Network Computing (DNC). Intelligent computing</p>	<p>Assoc. Prof. Dr. Rahmita Wirza O.K. Rahmat (FSKTM)</p> <p>rahmita@fsktm.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Computer Graphics, Vision and Visualisation (CGV2) – Assoc. Prof. Dr. Rahmita Wirza O.K. Rahmat (FSKTM)</li> <li>2. Digital Information Computation and Retrieval (DICR) – Assoc. Prof. Dr. Shyamala Doraisamy (FSKTM)</li> <li>3. Database Theory, Technology and Application (DTTA) – Assoc. Prof. Dr. Hamidah Ibrahim (FSKTM)</li> <li>4. Distributed Network Computing - Prof. Dr. Mohamed Othman (FSKTM)</li> <li>5. Intelligent Computing- Assoc. Prof. Dr Mohd Nasir Sulaiman (FSKTM)</li> </ol>
HWB02	Diagnostics and Innovative Therapeutics for Human and Animal Diseases	<p>The main research areas in this program include cancer diagnostics and therapeutics, immunotherapeutics and bioceuticals, nutri-cosmeceuticals, nutrigenomics and nanodelivery, veterinary comparative oncology, ruminant diseases and herd health management and animal model. The program focuses on development of diagnostic tests and tools for early cancer detection, prevention and therapy; discovery and development of diagnostic and innovative therapies for common and emerging diseases with social and economic impact in animals and humans, and development of novel nutraceuticals and cosmeceuticals from natural bioresources and their optimal nano delivery systems to target tissues and organs. In addition the program also focuses on integrated study on large and small ruminant diseases of importance, and herd health management for sustainable productivity of food producing animals.</p> <p><b>Keywords:</b> Diagnostic, therapeutic, cancer, human, animal, diseases.</p>	<p>Prof. Dr. Md Zuki Abu Bakar (VET)</p> <p>zuki@vet.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Ruminant Diseases Research Centre - Prof. Dr. Mohd Zamri Saad (RC / FPV)</li> <li>2. Immunotherapeutics and Bioceuticals – Assoc. Prof. Datin Dr. Hjh. Sharida Fakurazi (IBS)</li> <li>3. Molecular Diagnostics and Therapeutics - Prof. Dr. Seow Heng Fong (FPSK)</li> <li>4. Virus and Therapeutics - Prof. Dr. Tan Wen Siang (FBSB)</li> <li>5. Nutri-Cosmeceuticals, Nutrigenomics and Nanodelivery - Prof. Dr. Maznah Ismail (IBS)</li> <li>6. Cancer Diagnostics and Therapeutics - Prof. Dr. Suhaila Mohamed (IBS)</li> <li>7. Veterinary and Comparative Oncology – Prof. Dr. Rasedee Abdullah (FPV)</li> <li>8. Animal Model in Biomedical Research – Prof. Dr. Md Zuki bin Abu Bakar (FPV)</li> </ol>
HWB03	Environmental & Occupational Health and Health Promotion	<p>Researches in environmental and occupational health are intended to address the numerous environmental hazards detrimental to health of children, workers and public health. There is a need to improve on the understanding of the mechanism and interaction between human health and the environment in order to develop better preventive measures. Adults and children from low socioeconomic background are more at risk of environmental threats. Everyone has the right to be protected from environmental hazards. There is also a need to develop more researches in the environmental and occupational health fields.</p> <p>This group is under the new Department of Environmental and Occupational Health. Further collaborations were made with academics from other faculties within UPM, local as well as international institutions.</p> <p><b>Keywords:</b> Environmental and occupational health, children, environmental threats</p>	<p>Prof. Dr. Zailina Hashim (FPSK)</p> <p>zailina@medic.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Environmental Health - Prof. Dr. Zailina Hashim (FPSK)</li> <li>2. Physical Education and Sports Science – Assoc. Prof. Dr. Aminuddin Yusof (FPP / AS)</li> <li>3. Age Related Disabilities and Technologies – Dr. Chan Yoke Mun (IG)</li> <li>4. Occupational Health - Assoc. Prof. Dr. Shamsul Bahari Mohd Tamrin (FPSK)</li> <li>5. Children’s Health – Dr. Juliana Jamaluddin (FPSK)</li> </ol>

HWB04	Infectious Diseases	<p>This program focuses on human infections caused by viruses, bacteria (particularly methicillin-resistant <i>Staphylococcus aureus</i>), opportunistic fungi (particularly <i>Candida</i> and <i>Aspergillus</i>), food-borne pathogens (particularly <i>Listeria monocytogenes</i> and <i>Campylobacter</i>) and parasites. Research projects in the program have a common direction of combating these infectious pathogens via clinical, epidemiological and molecular approaches in order to improve public health in line with national policies. The members work in teams with ongoing and future research themes that include enhancing fundamental knowledge in virulence, drug resistance mechanism, identification of biomarkers, molecular epidemiology and discovery of novel antimicrobial compounds; with the ultimate goal of developing vaccines and improved diagnostic kits as well as new therapeutic candidates for eradicating the infections</p> <p><b>Keywords:</b> Infections, Pathogens, Microbiology</p>	<p>Prof. Dr. Norlijah Othman (FPSK)</p> <p>nor@medic.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Multidrug Resistant Microbial Populations Impact on Veterinary and Public Health – Assoc. Prof. Dr. Latiffah Hassan (FPV)</li> <li>2. Infectious Diseases - Prof. Dr. Norlijah Othman (FPSK)</li> </ol>
HWB05	Medical Genetics	<p>A genetic disorder is caused by an anomaly in an individual's gene. It has been estimated that one child in every 200 born will suffer from diseases such as muscular dystrophy, thalassemia and haemophilia, to name a few. Cancer, which results from abnormal gene function is also a genetic disease. Due to their high prevalence, genetic disorders place considerable economic burdens not only on affected individuals and their families but also on the community and the nation.</p> <p>Therefore, this program focuses on the study of the genetic mechanisms that can lead to the development of a genetic disease, and the exploration into the development of prospective therapeutic strategies at the molecular and cellular levels using state-of-the-art techniques and emerging technologies. By doing so, we hope to find new molecular and cellular targets for effective diagnosis and therapies of genetic diseases.</p> <p>The goal of this program is to enable medical practitioners to deal with genetic disorders effectively - for most of which, till date, there is no cure.</p> <p><b>Keywords:</b> genetic disorders, molecular mechanisms, diagnostic and therapeutic targets.</p>	<p>Prof. Dr. Rozita Rosli (FPSK)</p> <p>rozita@medic.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Genetic and Regenerative Medicine Research Centre - Dr Syahril Abdullah (RC / FPSK)</li> <li>2. Genetic Mechanisms of Human Diseases - Dr. Syahril Abdullah (FPSK)</li> <li>3. Translational Genomics - Prof. Dr. Rozita Rosli (IBS)</li> <li>4. Thalassaemia - Prof. Dr. Elizabeth George (FPSK)</li> </ol>
HWB06	Natural Products Discovery and Development	<p>Our main approach is enriching the scientific contents of Malaysia's biological resources through realization of high-value added outcomes, based on its effective and sustainable development. The national asset, in the form of biodiversity with traditional medicinal knowledge, is expected to intensify the potential of developing the asset as a source of national prosperity. This program is directed towards the discovery of new molecular entities from natural resources that have physiological activity and/or novel mechanisms of action as leads for new drug templates. Activities encompass the isolation and structural characterization of bioactive molecules, chemical modification, drug design as well as total synthesis or semi-synthesis of therapeutically important compounds.</p> <p><b>Keywords:</b> Natural, Synthetic, Biological activities.</p>	<p>Prof. Dr Khozirah Shaari (IBS)</p> <p>khözirah@science.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Natural Products Discovery - Dr. Intan Safinar Ismail (IBS)</li> <li>2. Natural Products Metabolomics - Prof. Dr. Khozirah Shaari (IBS)</li> <li>3. Natural Product Chemistry - Prof. Dr. Mohd Aspollah Sukari (FS)</li> <li>4. Drug Discovery of Haruan (<i>Channa Striatus</i>) - Prof. Dr. Abdul Manan Mat Jais (FPSK)</li> </ol>
HWB07	Molecular Imaging	<p>In the past decades, we have witnessed the importance of non communicable diseases including coronary artery diseases, malignancy and cerebro-vascular diseases as the main cause of death in Malaysian hospitals. Molecular imaging is a new field in medicine characterizing, and quantifying the biological processes at the cellular and subcellular levels within intact living organisms. The field exploits specific molecular probes as the source of image contrast where it provides the imaging signal in almost all molecular imaging assays. The development, validation, and application of this novel imaging technique in living subjects should further enhance our understanding of disease mechanisms and go hand in hand with targeted personalised therapy. The findings can be correlated with gene expressions and the discovery of novel biomarkers with potential utilization in drug discovery.</p>	<p>Prof. Dr. Abdul Jalil Nordin (PPDN)</p> <p>abdjalil@upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Translational Molecular Imaging and Nuclear Medicine - Prof. Dr. Abdul Jalil Nordin (PPDN)</li> </ol>
HWB08	Nutrition and Non-communicable Diseases	<p>Non-communicable diseases (NCDs) represent the leading threat to human health and development. Nutrition plays a major role in the prevention and management of NCDs. The Nutrition and NCDs research programme will focus on requirements, metabolisms and role of nutrients, nutrition and physical activity against NCDs through multidimensional research such as food-, community-, clinical- and</p>	<p>Assoc. Prof. Dr. Azrina Azlan (FPSK)</p> <p>azrina@medic.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Nutritional Sciences Research – Assoc. Prof. Dr. Azrina Azlan (FPSK)</li> <li>2. Nutritional Epidemiology and Health Promotions - Assoc. Prof. Dr. Mohd Nasir Mohd.</li> </ol>

		<p>molecular/biochemistry-based studies. This programme aims to develop innovative strategies related to risk prevention and quality management of NCDs. Through such innovation, the programme could reduce the disease burden of NCDs and consequently improve the nation's productivity and quality of life.</p> <p><b>Keywords:</b> Nutrition, Non-communicable Diseases, Risk Prevention and Management</p>		<p>Taib (FPSK)</p> <p>3. Clinical Nutrition Research - Dr. Barakatun Nisak Mohd Yusof (FPSK)</p>
HWB09	Regenerative Medicine	<p>Research in regenerative medicine program explores the fundamental aspects of stem cells that address the underlying mechanisms of cell renewal, tissue specific differentiation which govern to developmental process. Stem cells are currently been investigated as potential remedy for myriad kind of diseases that ranging from genetically linked disorders, inflammatory diseases, cancers, injuries as well as esthetic therapy. This program aims to investigate the basics of stem cells in normal and disease models of both animal and human systems which unravel the molecular and cellular mechanisms thus, potentially to be translated into clinical applications.</p> <p><b>Keywords:</b> Stem cells, differentiation, transplantation, immune modulation &amp; tissue engineering</p>	<p>Assoc. Prof. Dr. Rajesh Ramasamy (FPSK)</p> <p>r.rajesh@medic.upm.edu.my</p>	<ol style="list-style-type: none"> <li>1. Stem Cells and Immunity – Assoc. Prof. Dr. Rajesh Ramasamy (FPSK)</li> <li>2. Generation and Manipulation of Pluripotent Stem Cells - Dr. Norshariza Nordin (FPSK)</li> <li>3. Haematopoietic Stem Cells, Thalassaemia and Stem Cell Banking - Prof. Dr Elizabeth George (FPSK)</li> <li>4. Tissue Engineering – Prof. Dr. Fauziah Othman (FPSK)</li> <li>5. Amniotic Fluid Stem Cells And Genetic Screening – Dr. Thilakavathy Karuppiah (FPSK)</li> <li>6. Mesenchymal Stem Cells And Neuro-Inflammation - Assoc. Prof. Dr. Sharmili Vidyadaran (FPSK)</li> <li>7. Genetic and Regenerative Medicine Research Centre – Dr. Syahril Abdullah (RC / FPSK)</li> </ol>

Tarikh Kemaskini: 18 Jun 2013