



Message from the PSSA conference organizing committee

The PSSA Conference Organizing Team welcomes all participants at the beautiful UWC campus and is looking forward to a fruitful event.

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...Molecules to Function: *Forging Physiological Frontiers through Research*

The Department of Medical Bioscience at the University of the Western Cape (www.uwc.ac.za) is proudly hosting the 39th Annual Congress of the Physiology Society of Southern Africa (PSSA) from 28-31 August 2011.

The 2011 theme is "**Molecules to Function: *Forging Physiological Frontiers through Research***" and will provide delegates access to the latest research and development in the medical bioscience field.

The Conference pro-

gram has been specifically designed to have a multi-sector focus and will attract a wide range of professionals from the public and private sectors, as well as other research institutes.

Invited keynote speakers are leaders in their fields and the sessions will provide ample opportunity for networking and professional development.

Although planning has been underway since 2010, it is gaining more momentum as we near the con-

ference date.

We have had positive responses from sponsors, and exhibitors have expressed a keen interest in being a part of this prestigious event.

Abstract submission is now open and closes 17 June 2011.

Information regarding registration and deadline dates can be found on the website at

www.pssa2011.co.za, and follow the links.



Organizing committee - Front (from left to right): Prof Gerhard van der Horst, Dr Kareemah Gamielidien, Prof Gert Martiz, Back (from left to right): Prof Burtram Fielding, Prof Edmund Pool, Prof Daneel Dietrich, Prof Maryna de Kock, Ms Linda Sissing, Absent: Dr Sahar Abdul-Rasool



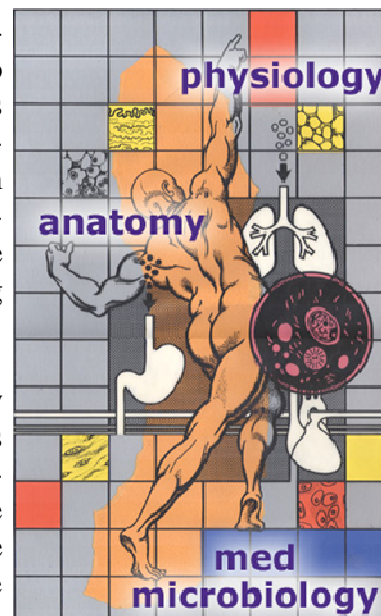
In this newsletter issue, the P S S A host, the University of the Western Cape, in particular the Department of Medical Biosciences (MBS) is introduced.



THE DEPARTMENT OF MEDICAL BIOSCIENCES

In 2002 the departments of Physiology, Anatomy and Microbiology were combined to form the department of Medical Biosciences (MBS). Such mergers are never easy and requires a willingness to “make it work” from everybody. How successful we’ve been is illustrated by the enthusiasm with which the “non-physiologists” contributes to organizing the PSSA conference.

Currently the department has approximately 2400 registered undergraduate students for its various Medical Bioscience, Medical Microbiology and Human Biology modules. These modules are presented to students from the Natural Science Faculty (Medical Bioscience

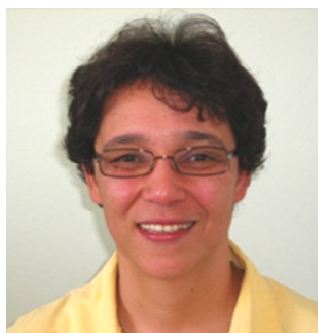


and Pharmacy students) as well as the Community and Health Science Faculty (Dietetics, Natural Medicine, Sport Science, Physiotherapy, Occupational Therapy and Nursing students). Under the research theme *Diseases of lifestyle*, 21 PhD and 31 MSc students do research in reproductive biology, cancer, virology, ecology, etc. (see details of MBS Research Groups elsewhere in Newsletter).

With 2400 undergraduate students, 60 postgraduate students, 25 full time academic staff (17 permanent, 8 contract), and 11 support staff members the department of Medical Biosciences is currently the biggest department at UWC.

MBS is currently housed in the new Life Sciences Building with its modern teaching and research facilities.

A place of quality,
a place to grow, from hope
to action through knowledge

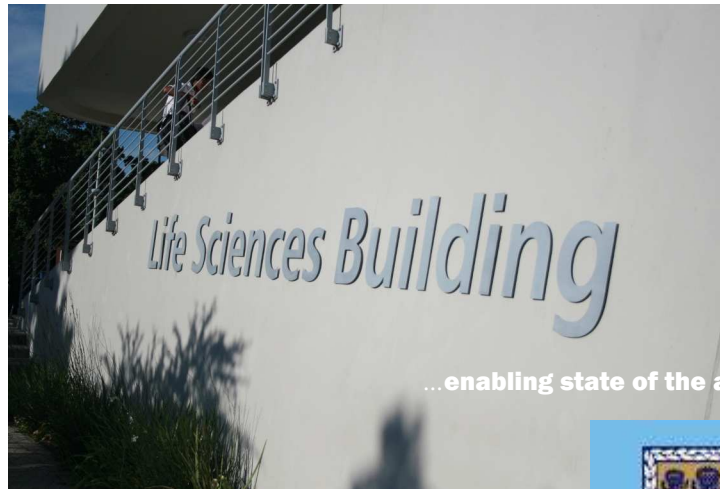


For more information, please visit our website: www.medicalbioscience.uwc.ac.za or contact Mrs Nicola Louw – 021 959 2433.

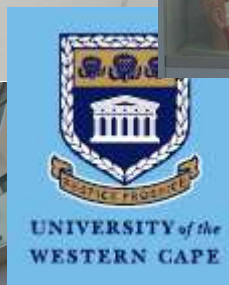
Since the beginning of 2011 the department is headed by Professor Daneel Dietrich (HOD) and she is assisted by Professor Gert Martiz (Deputy HOD).



State of the art facilities...



...enabling state of the art research



....including the learning Centre and Computer



... multiple seminar rooms



...and working space for those publications...





MEDICAL BIOSCIENCES - THE RESEARCH GROUPS

Some more details to a few of the groups

Lung Research

Reproductive Medicine/ Biology

Research on Heart and Vas- cular Diseases:



Virus Research

Environmental Pollution

Female and Neonatal Mor- bidity

Food Toxicol- ogy

Neurobiology Research

Indigenous Plant Extract Research



Virology Laboratory

Lung Research:

This research focuses on the effect of maternal nicotine exposure on lung structural and functional integrity in the offspring:



The developmental origins hypothesis proposes that a change in the in utero environment during periods of high developmental plasticity may change the program that control growth and development. These changes are associated with the onset of certain diseases in the offspring later in life. In our studies we showed that maternal nicotine exposure during gestation and lactation induces microscopic emphysema in the lungs of the offspring. The results of this project suggest that this is due to premature aging of the lungs of the offspring due to an imbalance in oxidant/antioxidant status of the mother and the fetus. The aim of the study is to determine whether this is in fact true and to develop strategies to prevent the change in the program than control lung growth, development and homeostasis.

Reproductive Medicine/Biology:

This research focuses on the effects of African herbal remedies on reproductive functions, the development of new male contraceptive strategies, the effects of genital tract infections on fertilization and health of the infant as well as an extensive programme on comparative spermatology:



Research on Heart and Vascular Diseases:

This research focuses on the effects of poor maternal lifestyle on cardiovascular disease in babies. It also focuses on plant extracts as therapeutic options for atherosclerosis or hypertension as well as on the effects of indigenous plant extracts on cardiovascular parameters.

Virus Research:

This groups focus is centred around the characterisation of RNA viruses affecting human health:

The development of drugs against RNA virus infections is expected to have a significant impact on human health-related quality of life. RNA viruses are responsible for not only very frequent benign diseases, but also for millions of deaths each year. Among the most significant viral infectious agents are hepatitis C virus (more than 150 million infected people in the world) and coronaviruses (10- 15% of all common colds in the world). Prof Fielding's research group in the Molecular Virology Laboratory (MVL) focuses on the interaction of RNA viruses with the human host at the molecular level. Currently we are focussing on Hepatitis C virus and the emerging human coronaviruses SARS-CoV and HCoV-NL63. MVL is studying the role of viral-viral and viral-host protein interactions, with the specific aim at elucidating the role of these interactions in virus pathogenicity.

Neurobiology Research:

This research focuses on the effects of pure methamphetamine (Meth) and "tik" on brain endothelial cells and testicular Sertoli cells as well as on-



MEDICAL BIOSCIENCES - THE RESEARCH GROUPS



Neurobiology Research cont:

The Neurobiology Group is a relatively recently established group within the Department of Medical Biosciences. The group consists of Professor David Fisher (Principle investigator), Dr Kareemah Gamielien, Dr Ruth McBride, Ms Linda Sissing and several post-graduate students. The group is busy finding a niche for themselves in the field of blood-brain barrier (BBB) function. In the Western Cape, abuse of the powerful psychostimulant drug methamphetamine (Meth), commonly known as "tik", severely compromises the ability of the BBB to protect the brain from blood borne bacteria, viruses and toxins. The structural components of the BBB are the tight-junctions between adjacent endothelial cells and in healthy individuals, these proteins prevent paracellular transport. The current research objectives are therefore to develop an in vitro model of the BBB and then to analyze the immediate and short-term effects of tik on the BBB. Results from one of our first pilot studies indicate that there is no significant difference between the effect of tik and pure methamphetamine when it comes to endothelial cell attachment and spreading, suggesting that tik that is sold and used on the streets of Cape Town is of extremely high purity. We are now currently using a battery of cytotoxicity assays to determine the cytotoxicity of Meth and "tik". The next phase of the study will involve taking bioelectrical measurements of the transendothelial resistance (TEER) across a monolayer of endothelial cells. Once the short-term data has been analyzed, we then plan to look at the Meth mechanism of action. This will involve immunocytochemical analysis of tight junction proteins located between the endothelial cells, PCR and western blot analysis. Results from one of our other pilot study experiments showed Meth/"tik"-induced changes to the cell cycle, and this novel mechanism of action will be further analyzed with flow cytometry. Future projects in the planning stages include electrophysiological studies on drug-exposed neurons and the therapeutic effects of indigenous, naturally occurring anti-oxidants on our BBB model.

Environmental Pollution:

This groups focus is centred around the development of biomarkers to monitor effects of water pollutants on health, monitoring of water quality and monitoring of endocrine disrupting components in environmental water.

Female and Neonatal Morbidity:

This research investigates the role of opportunistic infections on pregnancy outcome in HIV-positive mothers and studies the impact of maternal anaerobic endogenous infections on pre-term delivery.

Food Toxicology:

Focus is here the impact of antibiotics used in animal production on food quality

Indigenous Plant Extract Research:

This group studies the use of plant pesticides to improve crop quality, the commercialisation of the patented products, adverse effects of phytopesticides on human health as well as screening of indigenous plant extracts for immunomodulatory activities.



Cancer Research:

This research is entered around the development of new drugs for the treatment of various types of cancer, including multitargeted kinase inhibitors, endoplasmic reticulum stress and apoptosis, statins and synergy with anticancer drugs. It includes research on molecular markers of breast cancer metastasis.



South African National Committee for the International Union of Physiological Sciences

Greetings to the physiology community in the Southern African region.

I'm certain that some amongst us who are seasoned physiologists are aware of most if not all I'm going to share with you. However for the benefit of those who are not in the know, I have a few things to share with you and to those who are in the know, information overload has not yet been scientifically proven to cause any form of mental paralysis (may be mental fatigue).

Background: The International Council for Science (ICSU) is a non-governmental organization representing a global membership that includes national scientific bodies and international scientific unions. PSSA falls under the banner of International Union of Physiological Sciences (IUPS) which is a member to ICSU. ICSU activities in South Africa are coordinated through the ICSU national board of SA and national committees representing various scientific disciplines. As part of its science liaison responsibilities, the national research foundation (NRF) administers the South African ICSU secretariat including the South African National Committee for the International Union of Physiological Sciences (SANC IUPS). The main duties of this committee are as follows: 1) to advise the NRF on matters relating to national membership of IUPS, therefore our major stakeholder is the Physiological Society of Southern Africa (a member society to IUPS) as this society represents a significant number of physiologists / university departments of physiology in South Africa. However, it is important to mention that not all physiology departments or physiologists in South Africa subscribe to PSSA, therefore it is in our interest to support all PSSA endeavors that seek to grow membership and encourage active participation of all physiology departments especially those in the historically disadvantaged institutions... 2) To keep NRF informed on the work of IUPS. 3) To make recommendations to NRF on national delegates to attend business meetings of the IUPS and ICSU and 4) to encourage all physiologists to actively contribute to the scientific programmes of the IUPS and ICSU.

SANC IUPS members: The SANC IUPS is comprised of representatives of various physiology departments across the country. The members are: Dr S Makaula (Chairperson, University of Witwatersrand), Prof K Erlwanger (Ex Officio: President of PSSA, University of Witwatersrand), Dr B Nkeh-Chungag (Walter Sisulu University), Mr M Govender (University of Limpopo), Dr M Mabandla (University of KwaZulu-Natal), Prof D Hiss (University of the Western Cape), Prof E Ojuka (University of Cape Town), Prof A Schutte (North-West University) and Prof C Musabayane (University of KwaZulu-Natal). Very soon we will be joined by two new capacity building delegates and hopefully two new representatives from other universities.

**...strengthen
outreach to
member
societies ...**

**...encourage
active
participation of
all physiology
departments
especially
those in the
historically
disadvantaged
institutions...**

**...improve
quality of
science ...**

**South African National Committee for the International Union of Physiological Sciences cont.**

IUPS representation: As part of its outreach strategy, IUPS seeks to strengthen outreach to member societies and the general public by ensuring that each member society has an IUPS representative. The Committee nominated Dr S Makaula to act as IUPS representative.

African initiative and African Association of Physiological Sciences (AAPS): First of all, I must congratulate WSU and PSSA for successfully advancing this initiative at PSSA2010. There were probably more delegates from other African universities at this conference than any other PSSA conference organized in the recent past. IUPS 'loosely' describes strong and highly active societies as those that organize meetings attracting 1000 or more participants; therefore it is clear from this that the more we grow membership and improve quality of science the faster we graduate from a small society to a large, strong and highly active society. This matter was also discussed at the PSSA AGM 2010. We need to grow membership nationally, in the SADC region and further strengthen relations with other physiological societies in the continent; this may include sending our delegates to their meetings and/or inviting their delegates to PSSA.

Regarding AAPS, we noted with concern that PSSA is no longer a member of AAPS, a number of issues had led to PSSA withdrawing its membership, and other regional societies expressed the same sentiments. We are currently engaging with IUPS on this matter. They have made an indication that they are willing to mediate fresh talks between member societies in Africa in order to invigorate interest in AAPS membership.

PSSA/IUPS Contact Persons: We would like to extend a request to all departmental liaison officers to forward relevant information regarding research activities and community development initiatives to the SANC IUPS secretary (Miss Lynn Ngwenya lynn.ngwenya@nrf.ac.za or chairperson Siyanda.makaula@wits.ac.za). We would like to incorporate all these activities into our annual IUPS/NRF report.



All the best for the year ahead!

Dr Siyanda Makaula

Chairperson : SA National Committee for IUPS

Contact details

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We are on the web !
www.physiolsoc.org.za/

Physiology Society of Southern Africa

The Anatomy Facility at the New Life Science Building

The Department of Medical Biosciences manages the “cutting-edge” Anatomy Facility which is home to the instruction of gross anatomy, embryology, histology and physiology teaching. In February 2010, the facility was fully certified and its operation is governed by the human tissue act. This act ensures that all human materials are treated with utmost dignity and respect, and are processed accordingly.

The facility includes the Anatomy laboratory which is an outstanding teaching laboratory that can cater for 360 students at a time. Numerous LCD display screens and the latest digital projection equipment are used to convey teaching information.

The lab is further supported by the Anatomy museum which displays a large collection of models, posters, plastinated and potted specimen. These are made available for the students to examine during their practical sessions. Teaching tools also include skeletons, bones and digital software.

An embalming suite is attached to the facility together with a small surgical theater for small group dissection and specimen preparation. It also houses a cadaver reception and storage area.

The facility is currently utilized by students at various disciplines (e.g. Medical Biosciences, Pharmacy, Occupational and Physiotherapy). Our future aim is to expand our teaching to include the dentistry students.

