

Health Science Matters

Faculty of Health Sciences

SEPTEMBER 2015

UP CSMC and the French Space Agency join forces in the fight against malaria



The Centre for Sustainable Malaria Control (UP CSMC) and the French Embassy in Pretoria co-hosted a workshop at the University in June to explore the potential of a joint research programme using remote sensing – in other words, scanning of the earth by satellite or spacecraft in order to obtain information about it – in an effort to contribute towards the elimination of malaria. The proposed collaborative project is currently known as the 'Remote Sensing for Malaria Control in Africa' programme, or ReSMaCA.

Prof Cheryl de la Rey, Vice-Chancellor and Principal of the University of Pretoria (UP) and HE Elisabeth Barbier, French Ambassador to South Africa and Lesotho, welcomed delegates to

the workshop and expressed their excitement about and hopes for the proposed collaboration. Ambassador Jean-Marc Châtaignier, Managing Director of the French Institute of Research for Development (IRD), in his keynote address, expressed the importance of collaboration among institutions worldwide in creating and sharing knowledge to address the problems of our time.

The idea for the joint research programme came about when the Science Project Manager to the French Embassy in Pretoria met with Prof Tiaan de Jager (Director of the UP CSMC), Dr Taneshka Kruger (Senior Malaria Coordinator), and colleagues from the faculties of Health Sciences and Natural and Agricultural Sciences after the launch of the South African Research Chairs Initiative (SARChI) Chair in Sustainable Malaria in April 2014. Discussions between the two parties were soon expanded to include the French national space agency, Centre National d'Études Spatiales (CNES), and more researchers from the UP CSMC.

It is envisioned that research activities between the UP CSMC and their French partners will focus on the expansion of predictive malaria-risk maps to investigate the impacts of climate variability and changes on the occurrence and intensity of malaria epidemics. Some of these research partners already have similar programmes in place in other African countries.

Prof Tiaan de Jager, Director of the UP CSMC, says that innovative methods, available technologies and a creative approach can assist the University of Pretoria to address some of the serious cross-border issues that currently threaten the malaria elimination targets set by the South African government. As a Collaborating Centre of the Medical Research Council (MRC), the UP CSMC is excited about the new partnership with the French institutions and looking forward to combat malaria, using space technologies.



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Research showcased at Faculty Day

This year's eagerly anticipated Faculty of Health Sciences' Research Day was an eclectic mix of research and innovation. Faculty Day is a key component of the Faculty's research development strategy aiming to nurture young and emerging researchers and give recognition to established researchers. Participants presented their research in the form of oral, poster presentations and posters.

The event spanned one and a half days. This year there were 90 oral presentations, 46 poster presentations, as well as a total of 160 posters on display. On postgraduate level - MSc and higher - prizes were awarded for the best contributions in clinical and pre-clinical research, while undergraduate students and students up to honours level competed for undergraduate prizes.

Presentations were clustered in the Faculty identified research frontier areas and it was exciting to see the range of work presented from basic sciences to clinical by emerging to established researchers in each area.

The second day included addresses from different keynote speakers of which one of the presentations

entitled, 'Partnering for Research Success: Lessons from CAPRISA' by Prof Salim Abdool Karim, Director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA) was certainly the highlight. Prof Karim's presentation provided invaluable insights for both current and prospective medical researchers on aspects such as funding, collaboration and high impact research while remaining locally relevant.

Other speakers highlighted opportunities for collaboration, expanding research through innovation and building a bridge between basic and clinical research. The academic programme concluded with a session on ethical issues related to the generation of research data, with experts breaking down legal and technical information in a palatable manner to the audience by addressing it from a research perspective.

The two days were wrapped up by the resoundingly cheerful and well-attended awards and social function. Congratulations to all the prize winners! Faculty Research Day 2015 undoubtedly contributed to the stimulation of interesting debates, networking, learning and innovation for all who attended.



Prof Eric Buch (Dean: Faculty of Health Sciences), Prof Dianne Manning (Deputy Dean: Education) and Prof Tiaan de Jager (Deputy Dean: Research) with the Research Day prize winners



Street medicine for Tshwane's inner city



The Street Medicine in Tshwane Inner City project was recently initiated by the Department of Family Medicine. Street medicine is the direct provision of basic medical care to those living and sleeping on the streets through mobile services such as walking teams and outdoor clinics. It is the first essential step in achieving higher levels of care through assertive, coordinated and collaborative medical management. At present an estimated 5 000 homeless people are living in the City of Tshwane. Owing to their poor living conditions, these people are exposed to infectious diseases such as tuberculosis, and many of them also suffer from mental illness.

The Department of Family Medicine, under the leadership of Prof Jannie Hugo, are in the process of implementing the first stages of their Street Medicine Programme. Prof Hugo believes that students should be a part of any intervention and that both medical students and students from other departments at the University, such as the Department of Architecture, will form an integral part of the project.

Stage one of the project will be the grass-roots phase, where street rounds will be made and there will be no centralised point/facility. Basic health care services will be provided to homeless people where they live – on the streets of Tshwane. The project will kick off in Marabastad, Arcadia and Sunnyside in Tshwane's inner city, from where it will be rolled out. The service is directly linked to the Ward Based Outreach Team initiative which is an integral part of the re-engineering of primary care in the city.

In stage two, the focus of the project will be on the development of a street medicine team and the establishment of a primary care centre for the homeless. By stage three, the Department hopes to be in a position where multidisciplinary care can be provided to homeless people on a continual basis – 24 hours a day, 7 days a week – and consulting services can be made available to them in hospitals. Stage four of the project will involve the provision of services to other facilities (such as homeless shelters in the city), quality control of the medical services that are provided by the different street medicine teams, and a tangible effort to get the people living on the streets into acceptable permanent housing.

Ansa Heyl

Radiography Alumni Club Meets



The Radiography Alumni Club met in June 2015. The attendees had to come prepared by reading at least one journal article on either Radiography Communication or the importance of patient assessment in Radiography so that there could be stimulating and robust discussions and debate, backed by literature.

Ms Mable Kekana led the discussions: communication; history taking and patient assessment. Following the discussions, it became clear that it is important for radiographers to develop their communication skills to help them in taking accurate clinical history from the patients, assess the level of patient's comprehension and cooperation in the clinical radiography department. Suggestions for the way forward with regard to history taking included that the academic department must encourage the students to take the patient history and write it on the clinical request form. The staff from the clinical department should sensitize qualified radiographers to take accurate clinical history from patients before performing radiographic examinations and radiological procedures.

Mrs Jacqui Peterson's presentation highlighted the benefits that one will enjoy as an alumna on the University of Pretoria. For this Alumni Club Meeting, all attendees brought something along for needy students. Items donated included canned food and toiletries.

Mable Kekana

First-in-human anti-cancer procedure brings hope

In July this year, the Department of Nuclear Medicine at UP, in collaboration with Steve Biko Academic Hospital, ITG Isotopes Technologies Garching GmbH and NTP Radioisotopes SOC Ltd (a subsidiary of the South African Nuclear Energy Corporation), pioneered an exciting first-in-human anti-cancer procedure utilising a combination of radiopharmaceutical diagnosis and therapy. The procedure was developed by ITG and performed in South Africa for the very first time by Prof Sathekge and his team, along with Dr Sebastian Marx and Dr Marian Meckel of ITG and Dr Otto Knoesen of NTP. The diagnostic procedure was accomplished using positron emission tomography/computed tomography (PET/CT), which is a sophisticated nuclear medicine imaging technique.



Prof Mike Sathekge

This new and very promising procedure pioneered by Prof Sathekge and his team, uses a therapeutic emitter of low-energy β -particles that is commonly used in targeted radionuclide therapy. The substance used in the treatment, called DOTA-zoledronate, acts as an imaging agent in combination with the positron emitter $^{68}\text{Ga(III)}$. This 'theranostic' approach, which entails a combination of therapy and diagnostics in

which the same type of targeting molecule is used to obtain images and to deliver the dose of therapeutic isotope selectively to the tumour site, allows for patient-specific dose calculation directly related to the patient's individual tracer uptake profile. It is expected that this procedure will be of great benefit to patients suffering the debilitating effects of metastatic bone disease.

To date, over 100 imaging procedures and treatments employing therapeutic radiopharmaceutical agents for treating neuroendocrine cancer have been performed with great success at Steve Biko

Academic Hospital. In March this year Prof Sathekge also performed Africa's first isotope-labelled theranostics procedure for prostate cancer. This type of procedure has since been done several times and will be performed routinely in future.

The ground-breaking work that Prof Sathekge and his team at the Department of Nuclear Medicine have been doing will ensure that science is taken to the heart of health through thorough research on the diseases that impact the lives of so many people in our country every day.

Ansa Heyl

Dr Kritzinger wins the Colgate Postgraduate Research Competition

Dr Dorette Kritzinger of the Department of Odontology, recently won the Colgate Postgraduate Research Competition of the SA division of the International Association for Dental Research (IADR). She presented part of her MSc (Odont) research: ***The effect of different polishing systems on the surface roughness of a nanocomposite and a microhybrid composite.*** She competed against postgraduate dental students from all four dental schools in South Africa.

This is the most prestigious research prize awarded by the SA Division of the IADR. The prize will give her the opportunity to attend and present her winning paper as the Global Congress of the IADR in Seoul, South Korea next year. Her supervisors were Dr Paul Brandt (Right), Head of the Division of Dental Materials

(Department of Odontology) and Prof FA de Wet, HOD of the same Department.

Well done on your achievement Dorette.

Francois de Wet



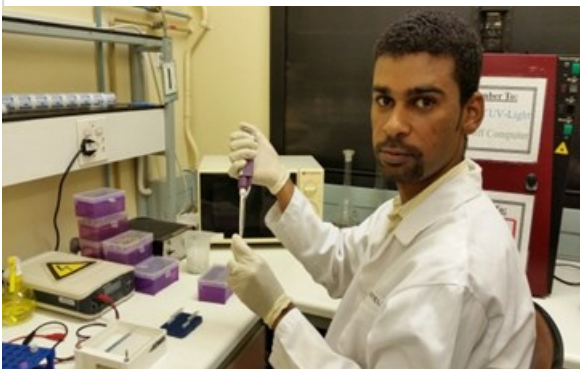
Visitors from Sudan hosted at the Faculty



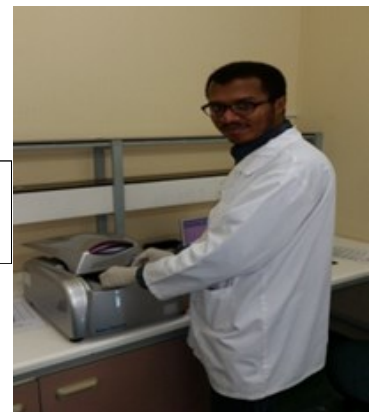
Dr Mohammed, Prof Steenkamp, Prof Pillay (HOD Chemical Pathology), Dr Hatim

In June 2015 two medical doctors, Dr Mohammed Mustafa Mohammed Dafalla and Dr Hatim Abdalla Ahmed Mohammed, from the Institute of Endemic Diseases, University of Khartoum, Sudan, arrived in South Africa to visit the Department of Pharmacology and Chemical Pathology to receive two months training in molecular biology techniques. This collaborative initiative stemmed from an introduction at an International Federation of Clinical Chemistry congress and was supported by the IFCC. Both candidates are currently doing masters degrees and were supervised in South Africa by Prof Vanessa

Steenkamp who was assisted by Dr Chantal van Niekerk. Dr Hatim's study aims to correlate genetic aberrations of the glutathione-S-transferase, Adenomatous polyposis Coli (APC), and vitamin D receptor (VDR) genes to the pathogenesis/aggressiveness of colo-rectal cancer in Sudanese patients. Dr Mohammed is determining whether decreased expression of Major Histocompatibility Complex (MHC) class II and /or increased expression of MHC class I antigens play a pivotal role in tumor-associated immune evasion process in Sudanese patients with colo-rectal carcinoma, thereby contributing to late presentation and probably metastasis (tumor aggressiveness). Both students were able to complete their analysis during their stay and are currently finalising the studies from which joint publications will emanate.



Drs Hatim and Mohammed busy with analyses



Prof Christa Kruger inducted as a fellow of the International Society for the Study of Trauma and Dissociation



Prof Christa Kruger, from the Department of Psychiatry has been inducted as a fellow of the the International Society for the Study of Trauma and Dissociation (ISSTD). A member of ISSTD since 1995, Christa currently serves as a Director on the ISSTD Board, and a member of its standing Scientific Committee, Governance Committee, and Clinical e-journal task force.

The ISSTD is an international, non-profit, professional association organised to develop and promote comprehensive, clinically effective and empirically based resources and responses to trauma and dissociation and to address its relevance to other theoretical constructs. The vision of ISSTD is that social policy and health care will address the prevalence and consequences of chronic trauma and dissociation, making effective treatment available for all who suffer from the effects of chronic or complex trauma; and its mission is to advance clinical, scientific, and societal understanding about the prevalence and consequences of chronic trauma and dissociation. SSTD maintains an honorary membership category of "Fellow of the International Society for the Study of Dissociation" to recognize those members who have made distinguished contributions to the field of dissociation and the Society.

A contemporary approach to adolescent and child mental healthcare

The Parent-Child Programme (PCP) is a community outreach and professional development project, run jointly by the Department of Psychiatry and Weskoppies Psychiatric Hospital. It endeavours to develop the skills of lay and professional persons involved in mental health care of children and adolescents, through pro-social activities. The programme focusses on exploring caregiver–child relationships, behavioural techniques and working with children and adolescents with special needs related to mental health. Ethical conundrums related to child and adolescent mental health are also examined.



The Parent Child Programme Team

The PCP has been in operation since 2008 and grew from a need identified in the Weskoppies Adolescent and Child units, where it was realised that both the patients and their caregivers would benefit from clear, practical guidelines based on the psychological principles used in the units at the time. Initially, the programme offered four condensed workshops throughout the year, dealing with elementary skills for grassroots-level caregivers at the beginning of the year and progressing towards advanced skills workshops aimed at specialist professionals at the end of the year.

The programme proved to be extremely popular among a wide variety of participants, ranging from mental health professionals, educators, primary caregivers, foster parents, community organisations and social workers, to occupational therapists and postgraduate students in the fields of mental health and child/adolescent studies. A couple of years ago, a decision was made to condense the four workshops that were presented over the course of the year into an annual, comprehensive, two-day workshop that would offer greater utility to a wider audience. The number of participants in the PCP workshops increased steadily over the years to a point where the average number of participants now stands at 400 per workshop.

This year's workshop took place at the Faculty of Health Sciences' Prinshof Campus on 30 June and 1 July and had two simultaneous streams, namely lay registration for the general public and CPD registration for professionals. The content of the workshop was formulated in analogy – using nautical imagery to illustrate the roles and relationships in adult–child interactions. For example, relationships were conceptualised as the complementary tasks of a ship's crew, caregivers and healthcare providers were conceptualised as harbours while the children and adolescents in their care were portrayed as voyagers. These roles and relationships were illustrated in various sections in the workshop and provided an interesting and colourful way for the presenters to get their message across.

Expert panel members at this year's event included representatives from the National Department of Education, the Department of Psychiatry at UP, and Weskoppies Hospital's departments of Clinical Psychology, Occupational Therapy and Nursing.

Dr Junaid Hassim, who heads the PCP at UP was very pleased with the turnout at this year's event. He says: "This year's Comprehensive Portfolio saw a record-breaking number of attendees at one sitting, reaffirming a steady progression in the appeal of the PCP. In addition, the active engagement of the audience sustained momentum for both days of the workshop. Professionals and caregivers alike have overwhelmed the Parent-Child Programme's digital media forums with positive feedback. With its integrative presentation framework, it is clear that the programme is benchmarking a contemporary approach to adolescent and child mental healthcare training".

Alzheimer's disease – Old friends and new promises



Prof Vanessa Steenkamp

Alzheimer's disease is the most prevalent form of dementia and accounts for roughly 60–80% of dementia cases. It is an irreversible, progressive brain disorder that slowly destroys memory, thinking skills, and eventually the ability to carry out the most basic tasks of everyday life. The disease currently affects more than 35 million people worldwide, and the World Health Organisation predicts that this number will double every 20 years. This means that by the end of 2050 there will be around 150.4 million people suffering from Alzheimer's disease. Although there is currently no cure, it is possible to treat the symptoms of the disease. Current treatments can temporarily slow the onset of dementia symptoms and improve quality of life.

Prof Vanessa Steenkamp, who currently heads the Phytomedicine Unit in the Department of Pharmacology, is involved in research to discover new potential treatment options for Alzheimer's disease.

She explains that in order to develop treatment modalities, it is important to understand how the disease affects the brain. The two main sections of the brain affected by Alzheimer's disease are the cerebral cortex, which is the part of the brain responsible for language and information processing, and the hippocampus, which is critical for the formation of new memories. This is why one of the most common problems encountered in Alzheimer's patients is that they are able to clearly remember events that happened a long time ago, but they are unable to remember something that happened the previous day.

Prof Steenkamp says that disease progression has been extensively described in literature with regards to the formation of plaques and tangles in the brain. Plaques are abnormal clusters of protein fragments called beta-amyloids that build up between neurons in the brain and harden. Healthy individuals also have plaques in their brain, though the body is able to break them down and eliminate them from the system. Tangles in turn are knots that form around the microtubules in the brain, making them hard and eventually causing them to decay. Microtubules are microscopic tubular structures that are responsible for transporting micronutrients in the brain, so when they break down the brain is effectively starved of these essential nutrients. As the disease progresses, plaques and tangles spread throughout the brain.

Prof Steenkamp says that another area of Alzheimer's research that is pertinent aims at re-establishing acetylcholine levels in the brain. Acetylcholine is a neurotransmitter in the brain that is broken down by the enzyme cholinesterase, and it is well known that an Alzheimer's brain has low levels of the neurotransmitter, and high levels of its enzyme. The Department of Pharmacology, in collaboration with the Department of Chemistry, has been involved with research on compounds that inhibit the cholinesterase enzyme *in vitro*. Novel compounds synthesised from donepezil, the most widely used medication for the treatment of Alzheimer's, have helped to better understand the structure-activity relationship in inhibiting this enzyme. This in turn allows researchers to modify the effect or the potency of a bioactive compound by changing its chemical structure. Using chemical synthesis, new chemical groups can be inserted into the biomedical compound and the modifications can be tested for their biological effects. Compounds that might have a multi-target action against cholinesterase and β -secretase are currently being synthesised by the team.

The Department of Pharmacology's Phytomedicine Unit are also looking into the use of herbal remedies for the treatment of Alzheimer's. Herbal remedies are widely used for disease treatment in developing countries, like South Africa. A general, but false belief is that herbal remedies are safer and more effective than Western treatment options. People also turn to these remedies out of sheer desperation, due to reduced cost, cultural beliefs and accessibility.

Prof Steenkamp and her team are working hard to find alternative ways to treat the disease and help improve the quality of life of these individuals.

Faculty Fun Day

The Faculty hosted its annual community engagement event, the Fun Day for Children with Disabilities in May. The main objective of the day is to give disabled learners a day where they can have fun and enjoy themselves with other disabled learners. More than 300 disabled learners from the greater Tshwane area and Johannesburg took part in the event this year.

Students from all the different disciplines within the Faculty take part in this event. The Fun Day has made a real difference in the lives of all those who have been involved in it: the disabled learners, UP staff and students

