



University of the Witwatersrand

May 2013

EDITORIAL

It's such a pleasure to create an editorial when there is so much good news! **Professor Emeritus John Pettifor** is announced one of Wits' finalists in the NSTF-BHP Billiton awards, **Professor Karen Sliwa** of Wits' SOCRU and UCT is a finalist in two categories of these prestigious awards, and **Dr Lisa Micklesfield** and **Professor Wendy Stevens** and staff receive accolades. Well done to all! Great news too, is the Faculty's continued increase in DoHET publication units (2012). At this stage, our units on articles alone have registered 288, and are still said to be increasing! This is an incredible achievement, as many of our articles are multi-authored, showing extensive collaborations with international researchers. While the DoHET does not provide subsidy recognition for the international authors, our collaborations are far-reaching and important.

Beverley Kramer

LATEST RESEARCH NEWS

Two finalist in the 2013 NSTF-BHP Billiton Awards

The National Science and Technology Forum (NSTF) Awards, hosted in partnership with BHP Billiton, is the flagship project of the largest and most prominent multi-stakeholder representative forum for Science, Engineering, Technology and Innovation (SETI) in South Africa. The Awards encourage and reward excellence in scientific research, technological innovation, education, capacity building and communication. It is an exceptional honour to be a finalist, given the quality of the nominees and the fact that all have made an outstanding contribution to SETI in South Africa. **Emeritus Professor John Pettifor** of the Wits Faculty of Health Sciences was announced as a finalist for the 2013 NSTF-BHP Billiton Awards in the Category: **Individual over a lifetime**. Furthermore, **Professor Karen Sliwa-Hanhle**, Director of Soweto Cardiovascular Research Unit, Faculty of Health Sciences and Director of Hatter Institute for Cardiovascular Research in Africa, University of Cape Town was announced as a finalist in the categories: **Outstanding Contribution to SETI through Research Capacity Development** and **Individual for an outstanding Contribution to SETI through Research and its outputs**. The winners will be announced at a gala banquet on 27 June 2012.



LATEST RESEARCH FINDINGS

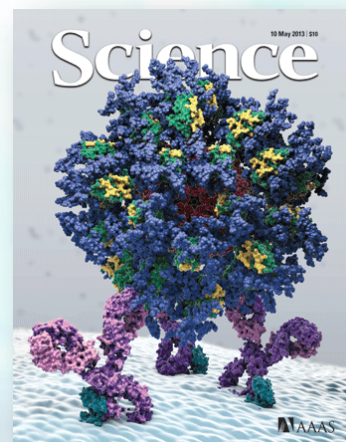
The dengue burden higher than previously reported

Honorary Professor Osman Sankoh from the School of Public Health is a co-author on the article “The global distribution and burden of dengue” that was published in *Nature* in April 2013. Dengue is a systemic viral infection that is transmitted by *Aedes* mosquitoes and usually results in a wide range of clinical symptoms, from mild fever to severe fatal dengue shock syndrome. The study estimated that the global burden of dengue is around 390 million infections per year – this is three times higher than the figure currently reported by the World Health Organization. To date there are no effective antiviral agents for the treatment of dengue, or a licensed vaccine for infection prevention. This study illuminates the global public health burden of dengue and will impact on the development of control strategies including vaccine, drug and vector control methods.



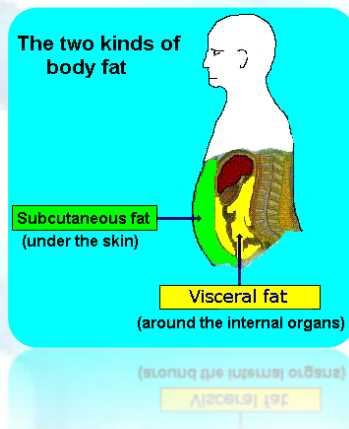
Development of a new tool to identify broadly neutralising antibodies against HIV strains

Professor Lynn Morris of the NICD AIDS Unit and the Wits Faculty of Health Sciences is a co-author on an article which was published in *Science* in May 2013. In the article entitled “Delineating Antibody Recognition in Polyclonal Sera from Patterns of HIV-1 Isolate Neutralization”, the authors describe the development of a new tool for identifying powerful, neutralising antibodies against most strains of HIV. The new tool – known as neutralisation fingerprinting - is a mathematical algorithm that uses existing data on broadly neutralising antibodies (bNAbs) to accurately determine the specific HIV bNAbs in blood samples by analysing the neutralised HIV strains in these samples. This new tool is much faster and less laborious than existing methods that yield information about bNAbs and will be useful in the development of an effective HIV vaccine.



VAT is where it is at!

Visceral Adipose Tissue (VAT) is considered to be more closely associated with obesity related diseases, such as cardiovascular disease and type 2 diabetes, than other indices of obesity including body mass index (BMI) and waist circumference. VAT is the fat around the organs and has been shown to be associated with insulin resistance, although this association tends to be stronger in white South African women compared to black South African women. In fact, in several South African studies it has been shown that for the same level of BMI or waist circumference, black women are more insulin resistant than their white counterparts, despite having less VAT.



Source: www.breathslim.com

For the last few years **Dr Lisa Micklesfield**, a Senior Researcher within **the Developmental Pathways for Health Research Unit (DPHRU)** at Wits, and colleagues at the

University of Cape Town, have explored various methods to measure VAT that have less radiation, are more cost effective and more applicable to a wider community than the current gold standard, computed tomography. Waist circumference can be used as an indirect measure of VAT. However there are a number of limitations with this method, and so Dr Micklesfield and colleagues started exploring alternative methods of measuring VAT including dual energy X-ray absorptiometry (DXA).

“Abdominal regions of interest (ROI) using DXA were no better at estimating VAT than a simple waist circumference measurement.”

In 2010 they published a paper in the journal *Obesity* which showed that using DXA, abdominal regions of interest were no better at estimating VAT than was a simple waist circumference measurement. This finding caught the attention of the DXA manufacturers who suggested that, together they embark on developing a method to more accurately estimate VAT using DXA technology. This work has since received substantial attention internationally at both the *ISCD 19th Annual meeting* and the *Position Development Conference* in Tampa, Florida in March of this year. This methodology has since been included in the DXA software to allow for more accurate measurement of VAT. Future research will include examining the association between this DXA-derived measure of VAT and disease outcomes in different populations and hopefully will increase our understanding of this association.

RESEARCH IN PROCESS

What were the chances? Evolutionary processes at the origin of life

Understanding evolution of complexity has been a major unresolved question in biology. The emergence of cellular life around 3.5 billion years ago was a relatively late stage in biochemical evolution. Biochemistry, geochemistry and physics have provided valuable insights into the thermodynamics and prebiotic origin of RNA polymers. However, once populations of short RNA polymers were

established, an empirical understanding of their evolution to form higher levels of complexity (interactive networks of RNA molecules and eventually a primitive genome) is lacking. The steps or the precise mechanism of how and why a random collection of biomolecules formed an ordered assemblage that displayed at least some of the biochemical properties that we associate with life have never been

reproduced experimentally. In this regard, catalytic RNA (ribozymes) which were the primary molecules in early life may have played a crucial role and can be used as models to study the process towards complexity.



Drs Nisha Dhar and Pierre Durand from the **Department of Clinical Microbiology and Infectious Diseases** focus on understanding the very early steps in the evolution of complex ribozyme molecules. The replication of ribozymes without the aid of proteins is slow, inaccurate and in haphazard fashion and we believe that to cope up with the inefficient system of replication, other alternate strategies by the ribozymes would have played a crucial role in increasing their informational and/or functional complexity. In the effort to highlight the plasticity of RNA evolution, we have shown in our study that a ribozyme polymerase which is capable of passive reproduction and persistence is also able to ligate a substrate oligonucleotide to its own end and thus it also behaves as a ligase ribozyme.

The functional flexibility of this polymerase shows its ability to increase its own complexity and develop more sophisticated catalytic functions. Also, this ligation reaction was independent of the substrate being aligned or being part of the ribozyme and no base pairing with the ribozyme was required. From an evolutionary perspective, this activity is important because it eliminates the need of polymerization for the ligation reaction to take place. Also, it bypasses the fitness constraint for a catalyst to be tightly folded as well behave as a template at the same time. Furthermore, looking at the biochemically simple nature of the reaction (free from base pairing with any template) and the minimal requirement for the complexity to emerge, we were interested in whether this could have been one of the earliest events that facilitated increasing complexity.

"It is expected that early in evolution self-ligation strategies could have been one of the earliest reactions which significantly contributed to the emerging complexity."

To examine this, we created various deletion mutants of this polymerase ribozyme and found that a ribozyme molecule as small as 40 nucleotides can also perform this reaction. We also observed that this ribozyme functions in various reaction conditions with minimal requirements and thus can be considered as an excellent exemplar of a general prebiotic ligase. In addition, the short length of the ribozyme would have made its replication relatively more possible than the longer molecules and thus this kind of a molecule would undoubtedly have been present in prebiotic evolution in a high frequency and played an important role in generating diverse and more complex molecules. It is expected that in evolution self-ligation strategies could have been one of the earliest reactions which significantly contributed to the emerging complexity.

RESEARCH OUTREACH: INVESTING IN COMMUNITIES

HEDUAfrica: Introducing touch screen technology to communities

The HEDUAfrica (Health Education Africa) project, jointly run by the **Soweto Cardiovascular Research Unit**, University of the Witwatersrand and the Hatter Institute of Cardiovascular Research, University of Cape Town recently had their official launch in Soweto. HEDUAfrica realises that one of the biggest challenges facing the health care system is providing adequate access to information. In the past, information was disseminated via brochures and during general check-ups. Frequently, brochures are left behind and very little attention is paid to them because the information is not always self-explanatory.



Hence, HEDUAfrica has provided free health information by using a multi-media platform, which makes health information accessible and exciting by using videos that address potential problems faced by pregnant women.

In the African context storytelling is a major element in conveying information, so the HEDUAfrica audio-visual system fits in comfortably with this cultural mode of communication. HEDUAfrica has installed touch panels in the maternity clinic waiting areas at the Elias Motsoaledi Clinic and the Senaoane Clinic in Soweto. The panels specifically target pregnant women from various socio-economic and educational backgrounds.

We look forward to seeing how HEDUAfrica grows, ensuring access to necessary health information for those belonging to lower socio-economic groups. You can find more information on HEDUAfrica's [website](#).

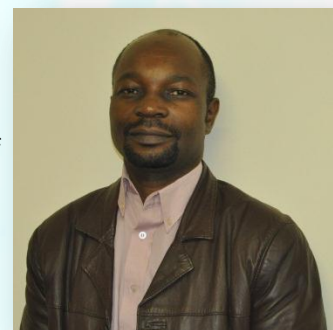
FACULTY RESEARCH NEWS AND EVENTS

Appointment of new Faculty Research Co-ordinator

The Faculty Research Office is delighted to announce the appointment of **Dr Aceme Nyika** as **Faculty Research Co-ordinator**. Dr. Aceme Nyika has gained experience in conducting research, supervising postgraduate students, strengthening capacity of health researchers and managing research project grants. He has been involved in various international collaborative research projects and has published in peer-reviewed journals. He will contribute towards the promotion of research and the training of postgraduate students in the Faculty.

On behalf of the Faculty Research Office, we would like to wish Dr Nyika a happy and successful period in his new role in the Faculty.

Dr Nyika can be reached on 717 2020, or Aceme.Nyika@wits.ac.za.



New Associate Professor in the School of Clinical Medicine

Dr Jerome Loveland from the Department of Paediatric Surgery was recently promoted to **Associate Professor** in the **School of Clinical Medicine**. Jerome received his undergraduate degree from the University of the Witwatersrand in 1996. He completed General and Paediatric Surgery Fellowships in 2004 and 2006 respectively. He is currently Head of Paediatric Surgery, Chris Hani Baragwanath Academic Hospital, and a senior member of the transplant unit at the Wits Donald Gordon Medical Centre. Jerome has specific interests in paediatric hepatobiliary, oncologic, neonatal and laparoscopic surgery, as well as solid organ transplantation. In addition to his clinical work, he has a keen interest in clinical research.



Dr Lisa Micklesfield receives the SEMDSA Endocrinology Award

Dr Lisa Micklesfield (Senior Researcher in Developmental Pathways for Health Research Unit-DPHRU) and colleagues have been awarded the **Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) Endocrinology Award**. The award was bestowed upon them at the 48th Congress of the SEMDSA, which took place in Johannesburg in April 2013, in recognition of them having produced the best original research paper published in endocrinology. "Micklesfield LK, Goedecke JH, Punyanitya M, Wilson KE, Kelly TL. Dual-energy x-ray performs as well as clinical computed tomography for the measurement of visceral fat. *Obesity (Silver Spring)* 2012 May; 20(5):1109-14 (Open access). Read more on page 3!



Wits Students Outshine

The combined 7th African League of Associations for Rheumatology and 23rd South African Rheumatism and Arthritis Association Congress was held in Durban on 3 – 6 April 2013. **Dr Nimmisha Govind**, a PhD Carnegie Fellow won the **best oral presentation award** for her talk entitled "Valine at position 11 of the HLA DRB1 is strongly associated with Rheumatoid Arthritis in black South Africans" and **Jacqueline Frost**, a PhD student, won the **best poster presentation award** for her poster entitled "Fc Gamma Receptor 2B rs1050501 polymorphism is a possible risk factor for Systemic Lupus Erythematosus in black South African patients". Congratulations to them both!

CEOs Award for Excellence

Congratulations to **Professor Wendy Stevens** (Head of the Department of Molecular Medicine and Haematology) in the School of Pathology who has been awarded the National Health Laboratory Service (NHLS) **CEOs Award of Excellence**. Professor Stevens qualified as a medical doctor from the University of the Witwatersrand with *cum laude* in 1989 and pursued a career in laboratory medicine. She received a Best Pathology Registrar Award in 1995. Professor Stevens is renowned for her ideals and contribution to laboratory strengthening.



Best Innovation Award

Professors Lesley Scott and Wendy Stevens, Dr. Bavesh Kana and the GeneXpert R & D Team have been awarded the **Top Award for Innovation 2013** by the National Health Laboratory Service (NHLS) for their innovation and outstanding work. Congratulations to you all!

Best Academic Pathology Laboratory Award

In April 2013, the **Department of Molecular Medicine and Haematology** (Charlotte Maxeke Academic Hospital) was awarded the **Best Academic Pathology Laboratory** country-wide. The laboratory is responsible for specialised tests and provides a comprehensive laboratory service to the Charlotte Maxeke Academic Hospital.

Professor Efraim Kramer Appointed to F-MARC in Zurich

Professor Efraim Kramer was recently appointed to the **FIFA Medical Assessment and Research Centre (F-MARC)** in Zurich. Professor Kramer is the Head of the Division of Emergency Medicine and a member of F-MARC. He is involved in football emergency medicine and research into sudden cardiac arrest on the football field. He has also been invited to be part of the official FIFA delegation to the Confederations Cup in Brazil in June to assist with the provision and research of medical service delivery. Well done Efraim!

WITSIE AT THE CUTTING EDGE: Researcher Profile

Dr Witness Mudzi

Senior Lecturer

Department of Physiotherapy



Who are you and what is your academic/scientific background?

I graduated with a BSc Honours degree in Physiotherapy from the University of Zimbabwe in 1996. I received my MSc in Physiotherapy in 2001 and PhD in 2010, both from the University of the Witwatersrand. I lectured at the University of Zimbabwe before I joined the University of the Witwatersrand in 2004. I am currently the Postgraduate and Research Coordinator of the Department of Physiotherapy. I received the School of Therapeutic Sciences Outstanding Mentor Award in 2009 and the Faculty of Health Sciences recognition for Dedication and Achievement in Research Award in 2012.

What is the nature of the research which you are currently undertaking?

My area of research is adult neurology physiotherapy, with the main focus being on stroke, head and spinal cord injuries. I am particularly interested in the quality of life and participation issues of individuals who have suffered these traumas.

What do you think is the most significant contribution you have made to research/science?

My main contribution to my field of research has been the investigation into the impact of caregiver education on the functional abilities of stroke survivors and their careers, especially in low resource settings in South Africa.

Did you have a particular mentor or supervisor who inspired you in research?

There are too many people that have inspired me in my research career, but Professor Aimee Stewart has been a great influence and my greatest inspiration.

Tell us about what you do when you're not busy at work and carrying out cutting-edge research?

When I am not at work I spend time with my wife Patricia Mudzi and our two boys, Russell Nyasha Mudzi and Ralph Shingi Mudzi.

Read one of Witness's papers: Mudzi W, Stewart A, and Musenge E. Effect of carer education on functional abilities of patients with stroke. *International Journal of Therapy and Rehabilitation* 2012; 19 (7):380-385.

THE NEXT GENERATION: Postdoctoral Fellow

**Dr Arnaud Djami
Tchatchou**



Having completed his PhD in Molecular Biology at the University of the Witwatersrand's Faculty of Science, **Dr Arnaud Tchatchou** joined the **Cardiovascular Pathophysiology and Genomics Research Unit (CPGRU)** in January 2013. Arnaud is under the mentorship of **Professors Gavin Norton and Angela Woodiwiss** from the School of Physiology.

Arnaud says that he chose Wits because it is one of the few higher education institutions in South Africa that offer an internationally recognised standard of learning and research. Arnaud is originally from Cameroon. Having spent some time in Johannesburg, he says he has enjoyed the higher quality of life in Johannesburg.

**Dr Samantha Anne
Nicholson**



Dr Samantha Nicholson completed her PhD from the University of Cape Town. Her PhD thesis focused on bacteriology, more specifically the role of DNA repair in immune evasion in the opportunistic pathogen *Bacteroides fragilis*.

In January 2013, Samantha joined the **Antiretroviral Gene Therapy Research Unit (AGTRU)** under the mentorship of **Professor Patrick Arbuthnot**. Her postdoc research focuses on the development of gene therapies for the treatment of Hepatitis B. Samantha says that she joined the AGTRU because of the great subject field they are involved in and their outstanding publication record. She says that Wits and AGTRU have given her the opportunity to develop her technical expertise in the lab and other skills necessary to further her academic career.

Having spent most of her life in Cape Town, Samantha says that she loves the Johannesburg weather and that she is looking forward to a dry winter with less wind. Samantha's advice to someone considering a Postdoc: "be sure that the project you choose excites you; like everything in scientific research you have to love what you do or the bad days will get you really down!"

FACULTY RESEARCH OFFICE: Staff Profile

Ms Mandisa Habana, Research Administrator

Miss Mandisa Habana joined Wits in 2010 as a DST/NRF Intern and was later appointed as a **Research Administrator** in the Faculty Research Office. Mandisa was born and bred in Port Elizabeth, in the Eastern Cape Province.

Her duties include notifying the Faculty about funding opportunities that are available within the University and those that are from external donors, particularly the Belgium Technical Corporation; servicing various committee meetings; circulating news and information that would be of interest to Faculty members as well as assisting with organising several important groups such as the Postdoctoral Forum and the Emergent Researchers Forum hosted by the Faculty Research Office.

Mandisa has a BA Honours degree in Psychology. She says that she loves to cook and especially likes trying out new recipes.



One-on-one Consultations: Scientific writing skills for research reports, dissertations and theses.

Professors Rose Crouch and **Jenny Kromberg** will be giving 1 hour individual consultations in scientific writing for any FHS postgraduate student or staff member between April and June. Professor Kromberg will be available on Wednesday mornings only, in the Postgraduate Hub. Professor Crouch will be available on Tuesdays, all day, in room 3B25. **Appointments will be by booking ONLY.** For all bookings, contact Jeanine Phigeland on Courses.Health@wits.ac.za



Faculty of Health Sciences Research Office Postgraduate Page

Do you have any significant research news you would like us to include, or comments you would like to make? Please contact Nomfundo.Sibiya@wits.ac.za (news items to reach us by 14 June 2013)

*The newsletter is edited by Professor Bev Kramer, Professor Andrea Fuller, Mrs Suretha Erasmus and Nomfundo Sibiya
Thank you to all who contributed to this month's issue.*