The year 2016 ended on a delightful note as 165 postgraduate students from the Faculty of Health Sciences graduated in December. The degrees were awarded to 31 PhD, 24 Masters by research, 92 Masters by coursework, nine MDent and nine MPH graduates. Congratulations to all the graduates and the supervisors for their hard work!

As January comes to an end, the Faculty of Health Sciences Research Office would like to wish you a happy and successful 2017.

**LEADING RESEARCH NEWS**

**Professor Madhi received an EDCTP award and was also elected as the new Fellow of the Royal Society**

Warm congratulations to **Professor Shabir Madhi**, Director of the Respiratory and Meningeal Pathogens Research Unit who was awarded the Scientific Leadership Award by the European and Developing Countries Clinical Trial Partnership (EDCTP). The EDCTP Scientific Leadership Award is bestowed upon excellent world class scientists who have made a major contribution in strengthening clinical research capacity in Africa.

Professor Madhi was also elected as the Fellow of the Royal Society of South Africa. The Society recognises research excellence and initiates debates on matters of public importance which affect science or arise from its application by encouraging groundbreaking research.

Professor Madhi is an NRF A rated researcher and his research interest focuses on reducing morbidity and mortality from infectious diseases through vaccination. This research is of critical importance to South African children. It includes studies on newly developed vaccines designed to prevent the two leading causes of death in children, namely pneumonia and diarrheal disease.
Professor Peter Cleaton-Jones is a Dentist and a Medical Practitioner. He completed his qualifications in BDS (Dentistry, Wits), MBBCh (Medicine, Wits), PhD (Science, Wits), DSc (Dentistry, Wits), FCD (Dentistry, College of Medicine), DA (Anaesthesiology, College of Medicine), DTM&H (Tropical Medicine, Wits), DPH (Public Health, Wits), PhD (Science, Medunsa), MASSAf. Professor Cleaton-Jones started working as an intern at the Chris Hani Baragwanath Academic Hospital. He then joined the Wits / MRC Dental Research Institute rising to Director in 1977-2006. Professor Cleaton-Jones has received numerous awards including a Silver Medal by the South African Medical Research Council, a South Africa Gold Medal by the Southern African Association for the Advancement of Science, and a Distinguished Service Award of the International Association for Dental Research.

Professor Cleaton-Jones has been involved in research ethics since 1974 when he joined the Human Research Ethics Committee (HREC) Medical; and he became the Chair in 1985. He has served as a member and Chair of the research ethics committees of the Medical Research Council and Human Science Research Council as well as the Wits Animal Ethics Screening committee and the HREC (Non-Medical). He has published over 300 peer-reviewed publications in dental research. Since retiring from dental research in 2006 he has continued to publish in research ethics.

Professor Cleaton-Jones had three mentors. Professor Frikkie van Reenen from the Dental School (Wits) who spotted his research potential when he was a Dental student, Professor Jan Dreyer (Wits) his first ‘boss’ and PhD supervisor who inspired his research interest and Professor Leo Schamrot (Wits) who was his supervisor when he undertook his internship at Chris Hani Baragwanath Academic Hospital.

Peter spends his spare time constructing large working models of steam locomotives. He also devotes his time tracing his family tree.

RESEARCH FINDINGS

Structure and Recognition of a Novel HIV-1 gp120-gp41 Interface Antibody

A preventative HIV vaccine will require broadly neutralizing antibodies to be able to recognize diverse viruses from across the globe. Such antibodies have not yet been elicited by vaccination, but develop in some HIV-1-infected individuals during chronic infection. A better understanding of the regions on HIV-1 envelope trimers targeted by broadly neutralizing antibodies may contribute to HIV-1 vaccine design.

In a paper in *PLoS Pathogens*, Dr Kurt Wibmer from the Department of Virology, supervised by Professors Lynn Morris and Penny Moore, described the isolation of an antibody called CAP248-2B, and characterized its epitope using X-ray crystallography, and negative-stain electron microscopy. This novel epitope spanned both gp120-gp41 interfaces in a manner that is distinct from known HIV antibodies, extending the interface target to include the gp120 C terminus, encircling the base of native pre-fusion trimers.

The study also characterized viral escape pathways from CAP248-2B, and identified unusual mutations in the gp160 cleavage sites that allowed the virus to escape these antibodies. These mutations made HIV-1 viruses 10-100-fold more sensitive to antibodies targeting another highly conserved epitope, the membrane-proximal external region. Incorporating these mutations into vaccine candidates will therefore improve the immunogenicity of gp41, and inform HIV-1 immunogen design.

![Surface view of the HIV envelope trimer colored to show the core epitopes for gp41-directed broadly neutralizing antibodies, including CAP248-2B in green.](image)

**Figure legend:** Surface view of the HIV envelope trimer colored to show the core epitopes for gp41-directed broadly neutralizing antibodies, including CAP248-2B in green.

Hospitalization for Culture-confirmed Pulmonary Tuberculosis in the Era of Childhood Pneumococcal Conjugate Vaccine Immunization

*Streptococcus pneumoniae* and *Mycobacterium tuberculosis* are common causes of childhood pneumonia in Sub-Saharan Africa. Hospitalization for pulmonary tuberculosis in children frequently presents with pneumonia that may be related to superimposed pneumococcal infection.

Dr Vijay Mammen and co-authors from the Department of Paediatrics and Child Health as well as Respiratory and Meningeal Pathogens Research Unit undertook a retrospective study of children hospitalized with pulmonary tuberculosis at the Chris Hani Baragwanath Academic Hospital from 2005 to 2012 to determine the temporal association between routine infant pneumococcal conjugate vaccine immunization which was introduced in 2009 and the incidence of hospitalization for culture-confirmed pulmonary tuberculosis.

The incidence of hospitalization for pulmonary tuberculosis declined significantly before the implementation of the pneumococcal conjugate vaccine, most likely due to the roll out of antiretroviral therapy in South Africa. Further declines in the pneumococcal conjugate vaccine era could not be attributed to childhood immunization with the pneumococcal conjugate vaccine. Ongoing surveillance is, however, planned to monitor whether changes might have occurred after 2012 and with a change from the 7-valent pneumococcal conjugate vaccine to the 13-valent vaccine.


Periprocedural Myocardial Infarction

Coronary artery disease (CAD) has the highest global burden of morbidity and mortality. This is also true for the developing world where there has been significant urbanisation. Percutaneous coronary intervention (PCI) is a widely accepted therapeutic modality for physiologically significant CAD. Periprocedural myocardial infarction (PMI) is a common complication of PCI and well documented in developed countries. However, there is a paucity of data from developing regions, especially in sub-Saharan Africa on the prevalence of PMI despite an increasing incidence of CAD and concomitant increase in PCI.

Dr Nqoba Tsabedze from the Department of Internal Medicine and co-authors have recently published work from the Division of Cardiology at
the Charlotte Maxeke Johannesburg Academic hospital. The researchers used the third universal definition of myocardial infarction to analyse pre- and post PCI cardiac biomarkers amongst a group of consenting adults undergoing coronary intervention. The findings were that PMI occurred in 10.5% of participants undergoing PCI. The research group recommends that large multicenter studies are required in our demographic region to better define risk factors associated with PMI.

![pre PCI MID RCA Stenosis](image1.png)

![post PCI MID RCA Side Branch Compromise](image2.png)

**Figure legend:** Coronary Angiogram images showing Right Coronary Artery (RCA) Mid-Vessel Stenosis and Post-Stenting Side-Branch Pinching


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**Adapting a developmental screening tool for young children in Southern Africa**

In middle and low income countries, there is a paucity of data on children’s early development, contributing to the invisibility and lack of attention to the problems of poor early development. A major contributor to this lack of empirical evidence about early child development and relationships to later outcomes in southern Africa is limited access to standardized developmental assessment and screening tools, with most instruments designed and normed in Western countries. This has far-reaching consequences for identifying and supporting children with developmental difficulties and their families, for monitoring the effects of interventions, and for estimating the national prevalence of developmental delays.

The goal of this study was to test the psychometric properties and appropriateness of the Ages and Stages Questionnaire Third Edition (ASQ-3) in South Africa and Zambia through a combination of caregiver-completed questions and direct observations. The aim was to determine how the instrument may need to be adapted to render age-appropriate assessment in the region. Addressing this gap conveys benefits for both research and health, social and educational services working with young children in this region.

Celia Hsiao from the Developmental Pathways for Health Research Unit and co-authors found consistent psychometric properties of the ASQ-3 in southern Africa compared with those found in the extant literature in other regions of the world.
Analysis of item difficulty at each age revealed adequate levels of difficulty for majority of the items, with exception of the problem solving domain where half of the items at 54 and 60 months have poor pass rates. Sociodemographic variables were significantly associated with children’s performance: higher caregiver levels of education is associated with higher toddler scores on the personal-social domain and higher preschooler scores on the problem solving domain; children whose caregivers earn a salary have higher fine motor scores during toddlerhood and higher problem solving scores during preschool; children who attend preschools have higher gross motor scores during toddlerhood and higher fine motor scores during the preschool years. Overall, this is the first study to provide evidence to support the psychometric properties and feasibility of using the ASQ-3 in both South Africa and Zambia through a combination of caregiver-report and direct observations as a screening instrument to identify potential developmental delays among children 2 months to 5 years who need further assessment.


RESEARCH NEWS AND EVENTS

2017 nominee for the Women of the Award in Healthcare

Shakira Choonara, a PhD research fellow from the Centre for Health Policy, School of Public Health has been nominated for the 2017 Women of Year Award in Healthcare. The annual awards ceremony is coordinated by the Women of Substance (WOS) network, with this year’s event set to take place, 11th March 2017 at Emperors Palace. Shakira’s other notable achievements include being named European Union (EU) Future Leader for Health in 2015, an Emerging Voice for Global Health in 2014, an alumnus of the Ahmed Kathrada Youth Leadership Programme year and is presently Chairperson of the Public Health Association of South Africa (PHASA) Gauteng Branch.
Carnegie Wits Alumni Diaspora Programme hosts Dr Michele Verdonck

The Carnegie-WITS Alumni Diaspora Programme christened the new year with its first visit by Dr Michele Verdonck, Senior Lecturer at the University of the Sunshine Coast in Queensland, Australia. Dr Verdonck was hosted by Professor Benita Olivier from the Department of Physiotherapy, School of Therapeutic Sciences.

Dr Verdonck graduated from the University of the Witwatersrand in 1996 with a double degree in Occupational Therapy and Human Anatomy. As a clinician, she specialised in spinal cord injury rehabilitation having worked at Natalspruit Hospital, Gauteng and at the National Rehabilitation Hospital, in Dublin, Ireland. In 2013, she joined the University of the Sunshine Coast's Occupational Therapy Team.

During her visit in the Faculty, Dr Verdonck engaged with researchers and academics in the School of Therapeutic Sciences and the broader health community in an effort to stimulate and promote research collaborations and networking. She also delivered a number of workshops and lectures on technology-enabled teaching spaces, blended learning, and knowledge translation.

Thank you to all who contributed to this issue.
Do you have any significant research news you would like us to include, or comments you would like to make? Please contact Boipelo.Kgosinkwe@wits.ac.za (news items to reach us by 13 February 2017)

The newsletter is edited by Professor Maria Papathanasopoulos, Nomfundo Sibiya and Boipelo Kgosinkwe