Tribute to Professor Mario Altini

It is with great sadness that we mark the passing of Professor Mario Altini former Head of Department of Oral Pathology, School of Oral Health Sciences. Professor Altini is well known for his prolific work in Oral Pathology, mainly in salivary glands, odontogenic tumours, cysts and a wide variety of other lesions. He was also passionate about Dentistry.

In 2013, Professor Altini was awarded a prestigious senior doctorate, the D.Sc (Medicine) for his research entitled “From odontones to Aids”. The D.Sc is the highest research degree conferred by the University.

Professor Altini published over 90 publications. He taught and trained undergraduate and postgraduate students in the Department of Oral Pathology. He also used to host registrars from other institutions in South Africa to expose them to odontogenic tumours and cysts research which was initiated by the late Professor Mervyn Shear. His research contributions were recognized in many national and international awards. Professor Altini was the Honorary Life Member and Councilor of the International Association of Oral Pathology, the President of the South African Society of Oral Pathology and the Microbiology Executive member of the South African Society of Forensic Dentistry.

Professor Altini was an immensely generous and kind person whose enthusiasm and passion for research inspired many.

Sincere condolences are extended to Professor Altini’s family and friends.
LEADING RESEARCH NEWS

National Research Foundation ratings

Warm congratulations to Professor Christopher Mathew from the Sydney Brenner Institute for Molecular Biosciences and School of Pathology who received an A rating by the National Research Foundation. Professor Mathew’s research focuses on understanding the genetic basis of oesophageal cancer in southern African populations. This is a common disease in sub-Saharan Africa, with a dismal prognosis. In 2016, Professor Mathew was named as a 2016 Thomson Reuters Highly Cited Researcher.

The Faculty of Health Sciences now holds nine NRF A-rated researchers.

Well done too, to Professor Ugo Ripamonti, Director of the Bone Research Laboratory Unit who attained a B rating.

We are exceptionally proud of all the Wits Health Sciences researchers who received new ratings or re-ratings from 2017.

The Helen Laburn Research Prize

In February 2017, the School of Physiology awarded the third Helen Laburn Research Prize to outstanding researchers in the School. The award is in honour of the late Professor Helen Laburn who was once the Deputy Vice Chancellor (Research) and the Dean of the Faculty of Health Sciences.

This year the prize was awarded to Professors Andrea Fuller, Director of the Brain Function Research Group and Angela Woodiwiss, Co-Director of the Cardiovascular Pathophysiology and Genomics Research Unit. Congratulations on this significant award!
Health Sciences researchers receive NRF Thuthuka Awards for 2017

Congratulations to Dr Ann George (from the Centre for Health Science Education), Dr Tanya Augustine and Dr Nanette Briers (from the School of Anatomical Sciences) for being awarded the National Research Foundation (NRF) Thuthuka Post-PhD Track funding for 2017. The grant will support their research entitled “A responsive e-learning system for the challenges facing health sciences education”, “Thrombosis and Immunoregulation in Breast Cancer” and “Improving methodologies and practices in craniofacial identification” respectively. Dr Briers was also awarded the Competitive Grant for Unrated Researchers.

In addition, congratulations too to Ms Abigail Dreyer (from the Department of Family Medicine), Ms Thulile Khanyile (from the HIV Pathogenesis Research Unit) and Dr Reubina Wadee (from the Department of Anatomical Pathology) who received the NRF Thuthuka PhD Track for 2017. The grant will support their research entitled “Community-based learning interventions for mutual benefit”, “HIV-1 sequential Env-based prime-boost vaccine strategies to elicit CAP256-VRC26-like broadly neutralizing antibodies” and “Endometrial Carcinoma: Microsatellite instability and suspected Lynch syndrome in the greater Johannesburg area (2009-2015)” respectively.

The purpose of the NRF Thuthuka Programme is to promote the research development of early-career academics. Well done to all the researchers for their NRF Awards!

Photographs (Top row: left to right): Dr Ann George, Dr Tanya Augustine and Dr Nanette Briers.

Bottom row (left to right): Ms Abigail Dreyer and Ms Thulile Khanyile
Dr Betty Maepa is a lecturer and a researcher in the Antiviral Gene Therapy Research Unit (AGTRU) based in the Department of Molecular Medicine and Haematology, School of Pathology. She completed her BSc and BSc Honours degrees in Microbiology and Biochemistry at the University of Limpopo. She then completed her MSc (Microbial Genetics), Faculty of Sciences and PhD (Molecular Medicine) in the University of the Witwatersrand, Faculty of Health Sciences. Dr Maepa joined the AGTRU as a Postdoctoral research fellow and has since been intrigued and absorbed by the gene therapy research field.

As a result of current treatments failure to eliminate Hepatitis B virus (HBV) in all the infection cases, approximately 1 million people per year still die of HBV-related liver complications globally. AGTRU has designed efficient gene therapeutics against HBV. Dr Maepa’s current research focus is to develop genetically modified viruses for the clinically relevant delivery of anti-HBV gene therapeutics.

Dr Maepa’s mentors include Professor Rachmond Howard from the University of Limpopo, Professor Eric Dabbs from Wits, Faculty of Sciences, Professor Valerie Mizrahi from the University of Cape Town and Professor Patrick Arbuthnot, Director of the AGTRU.

Dr Maepa stated that all her supervisors and mentors have inspired her in different ways and made a significant contribution to the lessons that she still lives by.

Betty loves spending time with her family. She also enjoys running marathons.

RESEARCH FINDINGS

Sugar and health in South Africa: Potential challenges to leveraging policy change

A growing body of evidence indicates that excessive sugar consumption is driving epidemics of obesity and related non-communicable diseases (NCDs) around the world. South Africa, a major consumer of sugar, is also the third most obese country in Africa, and 40% of all deaths in the country result from NCDs. A number of fiscal, regulatory, and legislative levers could reduce sugar consumption in South Africa one of which is a sugary drinks tax, and the focus of this paper. South Africa has announced that a sugary drinks tax will be implemented in 2017. This intervention has the potential to prevent obesity at the population level and save lives from NCDs.

Dr Alex Myers from the Rural Public Health and Health Transitions Research Unit (Agincourt) and co-authors highlighted the challenges that government might anticipate with regards to a sugary drinks tax, many of which are already playing out in the South African context. The research is focused on the industrial, economic, and societal context. The affected industry actors have been part of the South African economy for over a century and remain influential. To deflect attention, the targeted industries can be expected either to advocate for self-regulation or to promote public–private partnerships. The research findings caution against both approaches as evidence suggests that they will be ineffective in curbing the negative health impacts caused by excessive sugar consumption.


A comparison of limb bone and muscle size and structure between four popular endurance sports

Low magnitude bone-loading sports may benefit bone size and strength in the exercised limbs bearing in mind that a bigger bone size translates to a stronger bone. This study compared three-dimensional (peripheral quantitative computed tomography-pQCT) measures of lower arm and lower leg strength and structure, and limb muscle cross-sectional area and strength in male endurance athletes taking part in four different sports that load the relevant exercising bones differently. The first two groups of athletes consisted of men taking part in non-weight bearing and non-impact sports i.e. swimmers and road cyclists. The next group consisted of men taking part in the non-weight bearing, impact sport of mountain biking, and finally there was a group of men who performed the weight bearing, impact sport of road running. All the athlete groups were also compared to a sedentary group of men. Professor Tanja Oosthuyse from the School of Physiology and co-authors found that the group of swimmers tended to have bigger arm muscles, a greater upper body strength and greater arm bone size as well as strength...
compared to the sedentary men and/or the road cyclists. There were however no differences in arm muscle size or strength or bone size and strength between the swimmers and the groups of mountain bikers or runners. Runners had greater lower leg bone size compared to the sedentary men, the swimmers and the road cyclists, without showing differences in lower leg bone strength or lower leg muscle size and strength. Both mountain bikers and road cyclists failed to display any difference in lower-leg bone size and strength or lower-leg muscle size and strength compared to the sedentary men.

Researchers concluded that in swimmers, the muscle and bone size and strength of the main exercised limbs, the arms, is greater than controls and road cyclists. Conversely, although runners experience impact and weight-bearing loading, lower-leg bone size is greater without a substantial difference in bone strength compared to controls and non-impact sports. Failure to observe a difference in lower-leg bone and muscle measures indices in mountain bikers and road cyclists to the sedentary group was unexpected.


**Sex-Specific Effects of Adrenergic-Induced Left Ventricular Remodeling in Spontaneously Hypertensive Rats**

Systemic hypertension is the leading cause of heart failure in urban, economically developing communities in South Africa. Understanding the mechanisms responsible for the progression from compensated left ventricular hypertrophy to heart failure in hypertension is therefore an important goal in South Africa. In response to a pressure overload on the heart, women develop more marked concentric hypertrophy and systolic function remains higher than in men.

To explore the possibility that males are more susceptible to adrenergic-induced left ventricular dilatation in pressure overload hypertrophy, the aim was to assess the impact of sex on chronic adrenergic-induced left ventricular dilatation, eccentric remodeling, and the mechanisms thereof, in spontaneously hypertensive rats (SHR). Dr Frederic Michel and co-authors from the Cardiovascular Pathophysiology and Genomics Research Unit, School of Physiology demonstrated that data compared with female SHR and male SHR are more susceptible to the adverse effects of chronic adrenergic receptor stimulation in the transition from pressure overload hypertrophy to cardiac dilatation. An
increased fibrosis may be responsible for the observed sex difference in adrenergic receptor stimulation-induced left ventricular remodeling in hypertension. This research brought evidence that testosterone may play a role in the adverse effects of sympathetic nervous system activation on the progression to heart failure in hypertension. Future studies will investigate the role of sex steroids in this process.


**Detection and quantification of differentially culturable tubercle bacteria in sputum from patients with tuberculosis**

Dr Melissa Chengalroyen (supervised by Professor Bavesh Kana) from the Centre of Excellence for Biomedical TB research (CBTBR) and co-authors interrogated the presence of non-replicating, differentially culturable *M. tuberculosis* in the sputum of TB patients. Anecdotal evidence pointed to the presence, in sputum, of differentially culturable tubercle bacteria (DCTB) that are unable to grow on solid media but can be recovered in liquid media supplemented with resuscitation promoting factors, a group of bacterial growth stimulatory enzymes secreted by *M. tuberculosis*. This intriguing observation was interrogated in a cross-sectional observational cohort of patients infected with TB or TB-HIV from various clinics in Soweto.

The CBTBR first established the methodology to detect and quantify DCTB and thereafter, the combination of carefully collected sputum samples and a refined methodology, allowed for the detection and definition of five operationally distinct sub-classes of tubercle bacteria in the sputum of treatment naïve TB patients. These sub-populations are expected to respond differentially to TB therapy and most likely form the microbiological basis for the protracted treatment required for achieving functional cure in TB patients. Moreover, enhanced recovery of
DCTB improved bacterial detection in sputum smear negative TB patients that are generally difficult to identify using standard diagnostics. Sputum from TB-HIV-1 infected individuals, with CD4 counts >200 cells/mm³, displayed higher levels of culture filtrate-responsive organisms than sputum from TB-HIV-1 infected individuals with CD4 counts <200 cells/mm³. This study represents the most comprehensive analysis of differentially culturable tubercle bacteria to date, with important implications for diagnosis of TB particularly in individuals with paucibacillary disease. Moreover, the quantitation of differentially culturable organisms now provides a novel biomarker to assess treatment response and risk of disease recurrence. The data provide preliminary microbiological evidence to validate the long-standing hypothesis that the host immune response to TB infection drives bacteria into phenotypically distinct, drug tolerant states.


RESEARCH NEWS AND EVENTS

Promotion to Emeritus Professor

Congratulations to Professors Peter Cooper and Pravin Manga for being honoured with the status of Emeritus Professor for their outstanding contribution to the University. Professor Cooper’s research focus is on aspects of neonatology and probiotics, while Professor Manga’s research interest is on valvular and ischaemic heart disease.

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 Nomfundo.sibiya@wits.ac.za (news items to reach us by 13 March 2017)
The newsletter was edited by Professor Maria Papathanasopoulos, Nomfundo Sibiya and Boipelo Kgosinkwe