UCT Neurology Research Group

Neurological Diseases Research Fund
Overview
The Neurology Unit of the University of Cape Town (UCT) is a dynamic teaching and research facility for the neurosciences. It falls under the UCT Faculty of Health Sciences which, in 2012, became the first tertiary institution in Africa to be placed in the Top 50 health universities in the world for pre-clinical, clinical and post-graduate training.

The UCT Faculty of Health Sciences has built a reputation for the excellence of its teaching, training and cutting edge research; and its graduates and postgraduates are highly regarded internationally. Moreover, the Faculty publishes more peer reviewed papers in high impact journals than any other health faculty in the country. It has kept pace with global trends and evidence-based approaches to Academic Health Sciences and, in so doing, it has contributed significantly to the overall improvement of the health status of sub-Saharan Africans as well as contributing very materially to building clinical neuroscience research capacity relevant to our continent.

More than a decade ago, the Neurology Research Group was established within the Division of Neurology at the University of Cape Town with the specific aim of further promoting research into neurological disorders prevalent in sub-Saharan Africa including but not confined to stroke, dementia, neuropathy, and Myasthenia Gravis, as well as HIV- and tuberculosis-related neurological illnesses. Members of the Group have conducted research and closely supervised
postgraduate students working towards their Master’s degrees or doctorates in the fields of clinical neuroscience or related molecular and cell biology. These students have performed extremely well, many obtaining their postgraduate degrees with distinction. At the same time these students and other members of the Group have produced important clinically meaningful research while publishing numerous peer-reviewed articles in international journals.

The Neurology Research Group receives very little in the way of monetary or financial contributions from the University of Cape Town. Instead, it is dependent on research grants from local and international research bodies. Moreover, most of the Group’s post-graduate students are at the beginning of their careers and, consequently, they do not have an established curriculum vitae with sufficient publications to attract adequate funding for their research projects. With this in mind, the Neurological Diseases Research Fund (NDRF) has been established with the specific aim of facilitating “start-up” funding for such students when they begin their projects or “top-up” funding, when this is required during the course of their research.

Donations to the UCT Neurological Diseases Research Fund
The Neurology Research Group invites donations to the UCT Neurological Diseases Research Fund. These will enable the Group to continue its important established research programmes and support capable young post-graduate fellows as they complete their Masters and PhD degrees in an environment in which it is very difficult to attract funding for their research. We welcome all donations to the fund. Should donors wish to make a bequest and ear-mark the donation for a specific neurological disorder or programme listed within the groups’ current areas of expertise, then such monies will be allocated accordingly. Donors will also be provided with feedback on the progress of the research projects they support.

Members of the UCT Neurology Research Group
Director: Associate Professor Jeannine Heckmann
Head of Neurology: Associate Professor Alan Bryer
Head of Geriatric Medicine: Prof Marc Combrinck
Neurologists: Dr Kathleen Bateman
Dr Lawrence Tucker
Dr Edward Lee Pan
Dr Suzaan Marais (affiliated)
Research areas

Stroke

Stroke is estimated to be the most common cause of permanent neurological disability and a common cause of death in Southern Africa. Clinical and laboratory-based research projects run by the Group are focusing on causes of stroke in young persons; in addition a longitudinal study is under way to evaluate the underlying biological mechanisms in HIV-associated stroke. The Group was also instrumental in drawing up the current national stroke treatment guidelines and set up what still remains the only dedicated Stroke Unit in the South African Public Health Sector.

Dementia

Clinical and laboratory-based research has been undertaken and is ongoing into neurodegenerative conditions causing dementia in the Southern African context including Alzheimer’s disease and the neurocognitive disorders associated with HIV.

Neuromuscular disorders and neuroimmunology

The Neurology Group runs the largest and most dynamic Myasthenia Gravis Research Unit on the African Continent, as well as providing quaternary level care for patients with this condition referred from both the public and private health care sectors. Ongoing clinical and laboratory-based research projects are focussing on improving therapeutic strategies and increasing understanding of complications of this disease relevant to Africa. In collaboration with the University of Stellenbosch, the Group has recently started research on Motor Neuron Disease and runs a dedicated specialist patient clinic caring for patients with this condition. Projects related to neuromuscular disease in HIV-infected subjects focusing on the impact of aging are ongoing. Moreover, the Neurology Group is co-ordinating the South African research participation in the International Guillain-Barre Syndrome (GBS) Outcome Study, a multicentre study looking at biomarkers that predict outcome in GBS.
Neurological Infectious Diseases

The Group has established clinical and laboratory-based research projects to investigate the risk factors associated with the development of neuropathy in HIV-infected subjects and the work performed thus far has produced important insights and numerous publications. The incidence of tuberculosis (TB) in Southern Africa, and Cape Town in particular, is amongst the highest in the world. Important research has been started by the Group assessing the impact of TB meningitis on the cognitive morbidity in adults. Research efforts in bacterial meningitis have looked at promoting early, accurate diagnosis of meningitis, including reporting unusual presentations of this disease.

Neurogenetics

Long-standing clinical and laboratory-based research has been established for patients with inherited neurodegenerative conditions such as familial spinocerebellar ataxia (SCA). Current research is directed at developing an alternative multiplex PCR technique for the molecular diagnosis of the most common SCAs. Molecular studies are planned in order to reveal potential founder effects within the Southern African region.

Epilepsy

There are approximately 2 specialist neurologists and 1 neuro-technologists practicing per million population in South Africa and significantly fewer in our neighbouring states. We are committed to the training of competent healthcare professionals in the neurological sciences and, to this end, the Group is setting up a geographically efficient web-based distance-learning platform for neurophysiology training in electroencephalography (EEG). Other clinically relevant courses will follow. The project has the support of the World Federation of Neurology, the International League Against Epilepsy and the Neurological Association of South Africa. It is anticipated that the majority of sub-Saharan career neurology registrars and many neuro-technologists will enrol and the programme will be tested for efficacy.

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Addendum:
Peer reviewed papers emanating from the UCT Neurology Research Group (2009-2015):

International publications:


Local publications:


Recommendations for the use of immunoglobulin therapy for immunomodulation and antibody replacement: CME article. Peter JG, Heckmann JM, Novitsky N. S Afr Med J 2014; 104; 11; 796


Degrees achieved by fellows supervised by the UCT Neurology Research Group (2009-2015):

Post-doctoral fellows:
Post doctorate 2010-2012: The effects of prednisone and steroid-sparing agents on Decay Accelerating Factor (CD55) expression: implications for Myasthenia gravis. Abrahams A

PhD degrees:
PhD (Medicine) 2013: HIV-associated sensory neuropathy in an African cohort: a longitudinal study of risk factors predisposing to antiretroviral induced painful neuropathy. Van der watt JJ
PhD 2013: The relationships between Alzheimer’s disease, inflammation, the APO E genotype and neuronal integrity. Grace L

MSc degrees:
MSc (Medicine) 2015 (Distinction): Distal sensory polyneuropathy and associated risk factors in community-based South Africans with HIV after twelve months of anti-retroviral therapy. Vermaak J-R.
MMed (Neurology) 2015: The utility of CSF PCR in central nervous system Varicella zoster infection in HIV. Stanley A.
MSc (Med) 2014. The associations between plasma homocysteine, vitamin B12, folate, the apolipoprotein E genotype and Alzheimer’s disease. Mohamed I.
MSc (Med) (with distinction) 2014: The role of systemic inflammation and the apolipoprotein E gene in human immunodeficiency virus-associated cognitive impairment. van Brakel E.
MMed (Neurol) (with distinction) 2014: A review of cases of motor neurone disease seen at Groote Schuur Hospital from 2005 to 2010. Daude A.
BSc Hons (Cell Biol) course work and mini dissertation: Studying the functionality of African–specific variations of the Transforming Growth Factor B1 regulatory region. Buys J-M.
MSc (Medicine) 2013 (Distinction): the role of von Willebrand factor and its cleaving protease, ADAMTS13, in young patients with HIV-related stroke. Sallie S.
MSc (Cell Biology) 2013: Identifying the molecular basis for treatment resistance in a subset of Myasthenia gravis patients of African ancestry. Auret J.
MSc (Med) (with distinction) 2012: HIV-associated neurocognitive disorders: biomarkers and the response to anti-retroviral therapy. Cross H.
MSc (Medicine) 2012: Distal sensory polyneuropathy in HIV/TB co-infection: the role of Vitamin B6 status and NAT 2 genetic variation. Centner C.
MMed (Psychiatry) 2012: Neuropsychiatric symptoms in patients with thymoma-associated and non-thymoma myasthenia gravis. Freeman CF.
MMed (Neurology) 2012 (Distinction). Early outcomes of thrombolysis for acute ischaemic stroke in a South African Tertiary Centre. Wasserman S.
MSc (Medicine) 2011: Identification of a suitable SNP for allele-specific silencing of the disease causing gene in
SCA1 patients in South Africa. Baine FK.


MSc (Med) 2010: The role of inflammation, oxidative stress and the apolipoprotein E genotype in HIV-associated cognitive impairment: a clinical, biochemical and neuro-imaging study. Mahne AC.

MMed (Family Med) 2010: The morbidity associated with painful neuropathy in HIV-infected subjects on antiretroviral therapies: An assessment of self management strategies. Ismail M.

MSc (Medicine) 2009 (Distinction): Distal sensory polyneuropathy in South African infected with HIV: a cross-sectional analysis of a community based cohort. Maritz J.

MSc (Cell Biol) 2009 (Distinction): Molecular analysis of Decay Accelerating Factor as a potential susceptibility factor to developing treatment resistant extraocular muscle involvement in Myasthenia Gravis. Uwimpuhwe H.

Current students:

A/Prof Heckmann (supervisor)  
Dr M Nel—PhD  
Dr R Rautenbach—MSc  
Dr A Waweru—MMed  
Ms J-M Buys—MSc  
M Borkum—PhD  
H Bagula—MPH  
B Mombour—MPH

Dr Bateman (supervisor)  
Dr C Albertyn—MSc

A/Prof Bryer (supervisor)  
Dr D Smith—Post doctoral fellow  
Dr W Matshikiza—MMed  
Dr. I Ebrahim—MMed  
Dr. V. Vimbai Mandizvidza—MPH

Prof Combrinck (supervisor)  
Mr B Christ—PhD  
Dr MV Gule—MMed  
Dr H Jeena—MSc (Med)  
Dr Lina Groenewald MPhil (Psychiatry)

Students from international universities who have published under the NRG:

K Scott, University College London, UK; 2009  
A Hearne, University College London, UK; 2010  
N Faunce (in preparation), University of Kansas, USA; 2014