The Neuroscience Institute

Canada- South Africa Partnership Mission

7th March 2025

Graham Fieggen

Professor and Head, Division of Neurosurgery

Director, Neuroscience Institute

RURAL EDITION
Sunday, January 20, 1991

Free Press Weekly

Drs. Graham Fieggen and Karen Young are recent arrivals in Emerson from South Africa.

Finding docs out of Africa

By Doug Nairne

EMERSON — A Manitoba town on a frosty morning in January is not the place most people would look for a pair of African doctors.

But Graham Fieggen and Karen Young, general practitioners from Cape Town, South Africa, have joined the large number of international physicians who come to Manitoba each year to try and fill a prescription for much needed rural doctors.

According to the Manitoba College of Physicians and Surgeons, more than half (51.4 per cent) of the 214 doctors practising in rural areas during 1990 were not Canadian. The numbers haven't changed significantly over the past few years, despite efforts to attract Manitoba medical school graduates to smaller centres.

The number of South African doctors in the province more than doubled from 16 in 1989 to 38 last year. They make up the second largest group of [illegible]

story page 3

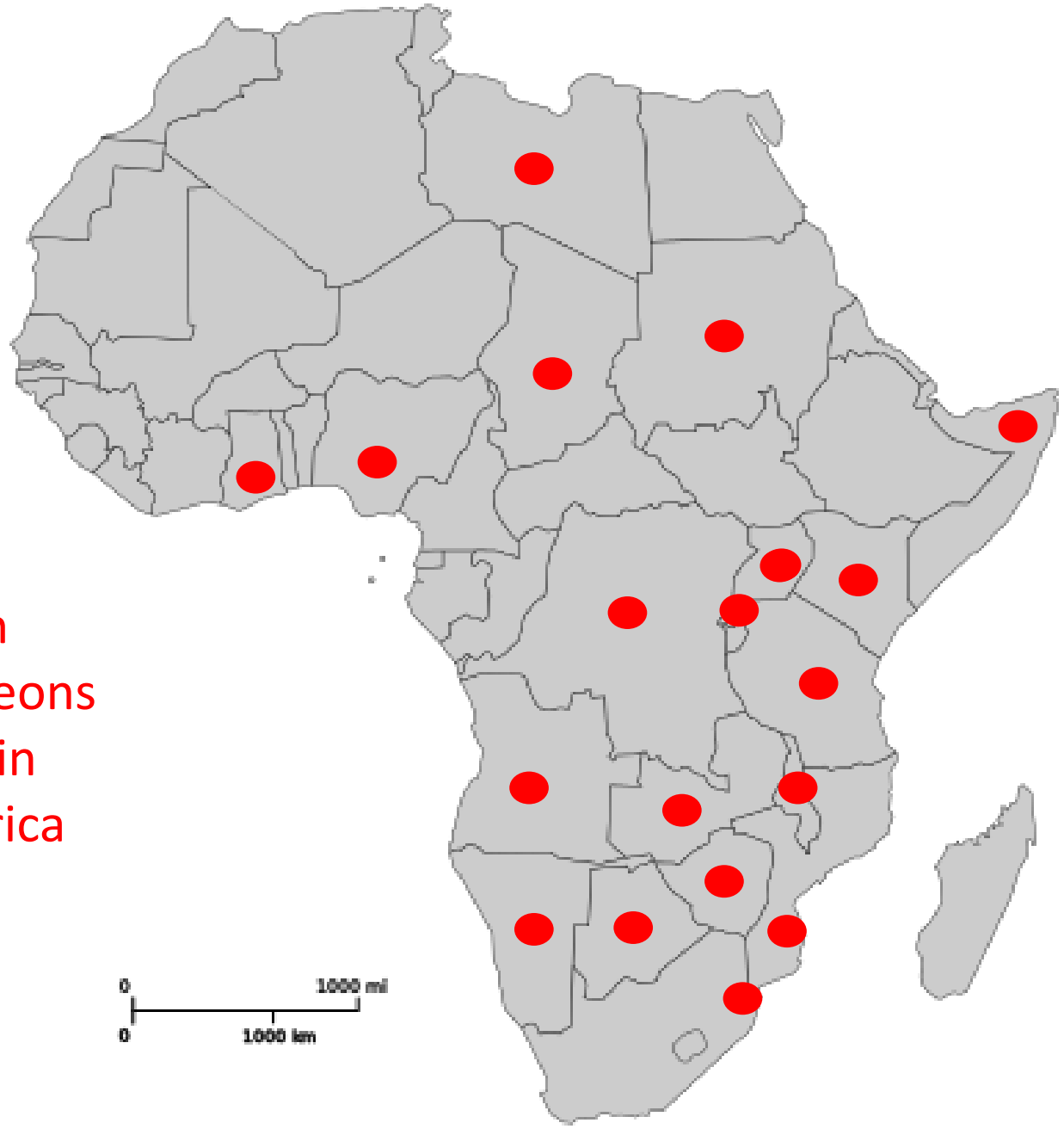
Neurosurgery at UCT

- UCT established 1829
- Medical School 1912
- Neurosurgery 1948

- Helen and Morris Mauerberger Chair 1976
  - JC Kay de Villiers 1976 - 1994
  - Jonathan C Peter 1995 - 2007
  - Graham Fieggen 2008 – present

- Warwick Peacock Sick Kids 1979

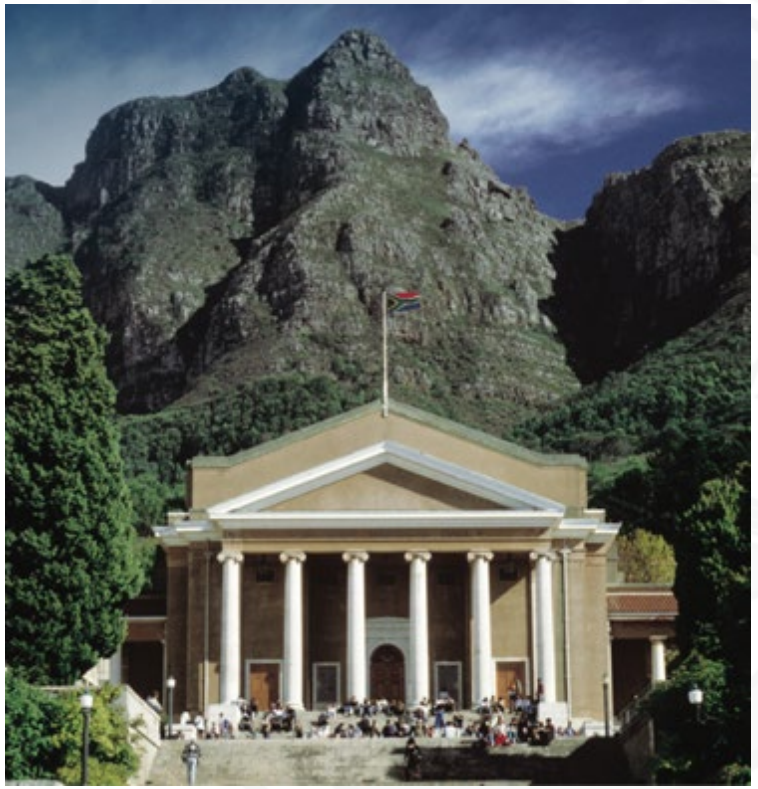
African neurosurgeons trained in South Africa



AFRICA RISING
2nd CAANS Continental Congress 2016
25th SNSA Scientific Meeting
Cape Town • South Africa
26 - 29 July

Why brain research in Africa?

- Sub-Saharan Africa has higher incidence of infections, poor nutrition, and exposure to toxins, trauma and violence
- Wider genetic diversity
- Opportunities for break-through discoveries of relevance to global neuroscience



Notes on the Recent History of Neuroscience in Africa

Vivienne A. Russell[1,2]*

[1]*Department of Human Biology, Faculty of Health Sciences, University of Cape Town, Observatory, Cape Town, South Africa,*
[2]*School of Laboratory Medicine and Medical Sciences, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa*

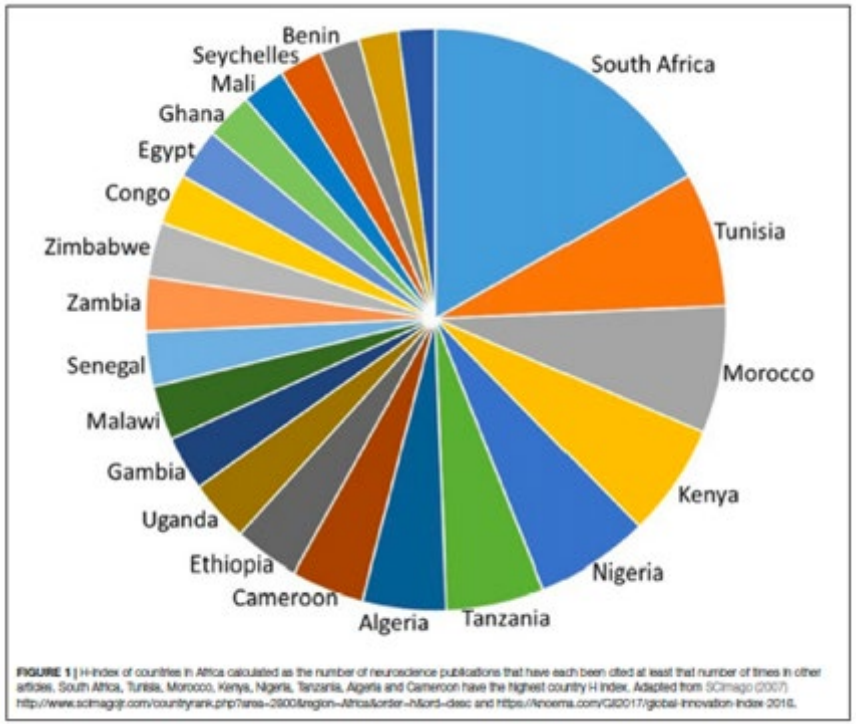


FIGURE 1 | H-index of countries in Africa calculated as the number of neuroscience publications that have each been cited at least that number of times in other articles. South Africa, Tunisia, Morocco, Kenya, Nigeria, Tanzania, Algeria and Cameroon have the highest country H-index. Adapted from SCImago (2007) http://www.scimagojr.com/countryrank.php?area=2800&region=Africa&order=h&ord=desc and https://knoema.com/GII2017/global-innovation-index-2016.

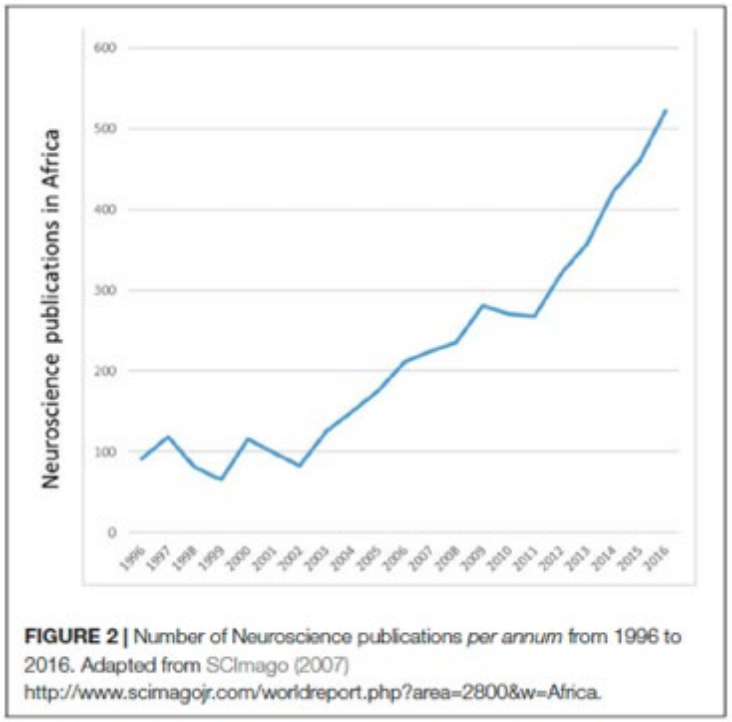
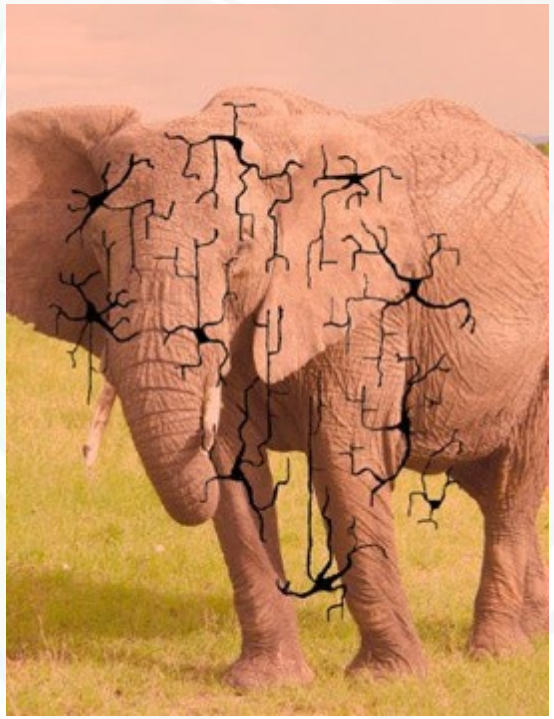


FIGURE 2 | Number of Neuroscience publications *per annum* from 1996 to 2016. Adapted from SCImago (2007) http://www.scimagojr.com/worldreport.php?area=2800&w=Africa.

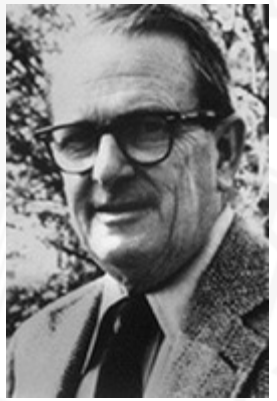
Russell VA (2017) Notes on the Recent History of Neuroscience in Africa. Front. Neuroanat. 11:96. doi: 10.3389/fnana.2017.00096



Alan Cormack (1924-1998)

Physicist assigned to clinical duties at Groote Schuur Hospital, against his wishes!

Worked in J block, alongside cobalt bunker



Awarded Nobel Prize in 1979,

with Godfrey Hounsfield

... **for development of computer-assisted tomography**

Roland Eastman
Neurology

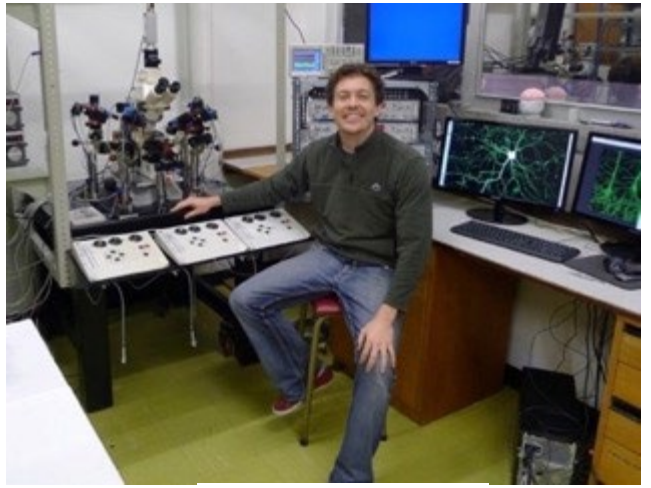
Dan Stein
Psychiatry

Mark Solms
Neuropsychology

Kirsty Donald
Developmental Paeds

Tony Figaji
Neurosurgery

Ernesta Meintjes
Neuroimaging



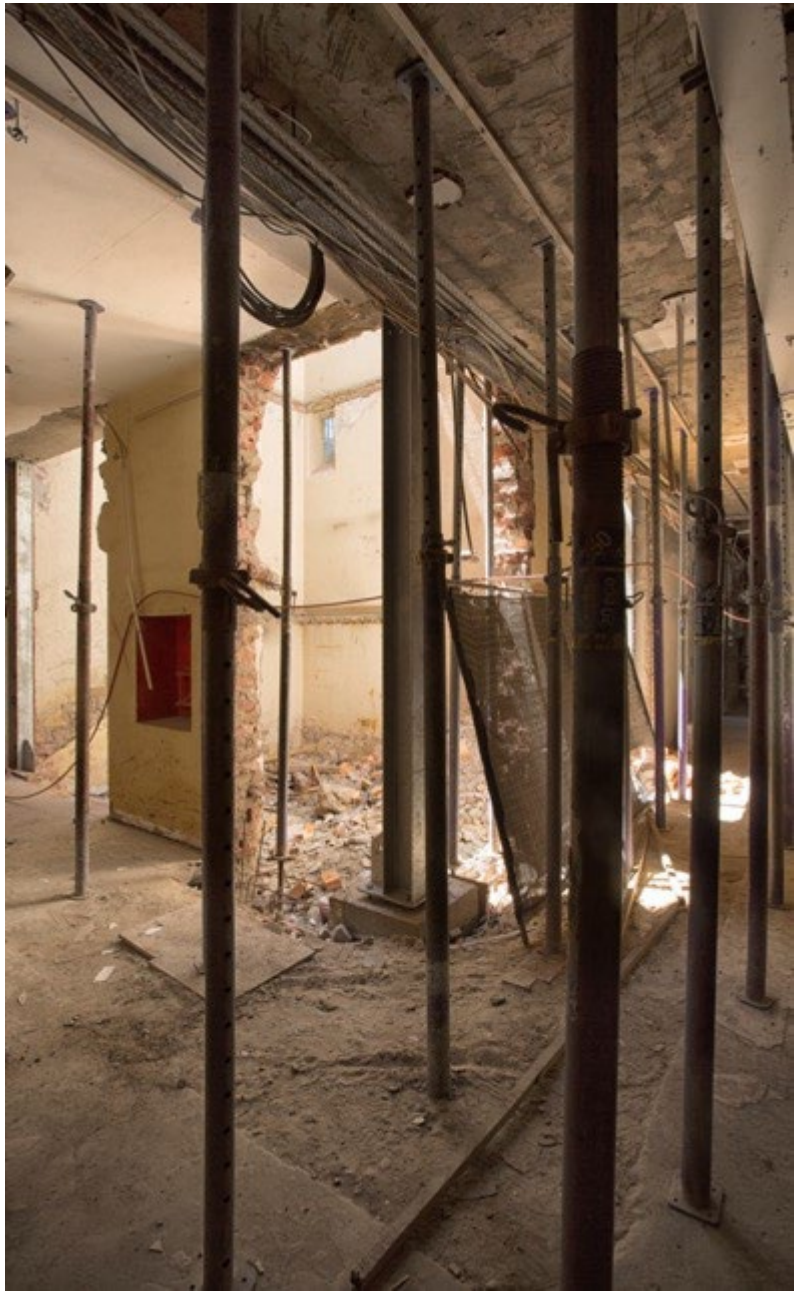
Joe Raimondo
Neuroscience

A space designed to serve and connect people and disciplines

- Focus on innovation and mentorship
- Interdisciplinary environment: clinics, meeting venues, postgrad student workspaces
- Specialised training programmes in clinical neurodisciplines
- Dedicated research neuroimaging suite: 3T MRI and PET/CT
- Expanding capacity for molecular diagnoses and genomics
- Newly established brain bank (+ biorepository)
- Two new laboratories for neuroscience research and innovation

Philanthropy

Greg Hussey, Sarah Archer, Angela Edwards
London 2015



DURING CONSTRUCTION | Wianelle Photography


Tuesday
10th March 2020

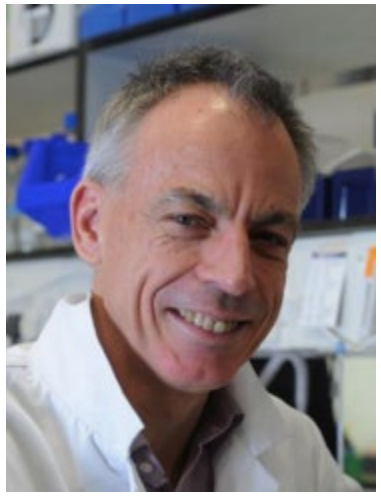
Scientific Advisory Board

Amina Abubaker
Institute for Human Development, AKU
Nairobi, KENYA

Lucie Bruijn
Therapeutic Area Lead
Novartis, UK

Valerie Mizrahi
Director, IDM
UCT, RSA

Charles Newton
KEMRI-WT Collaborative Program
Kilifi, KENYA



Matthew Wood
Associate Head: Innovation
University of Oxford, UK
Director, OHC
Chair

Elisabeth Binder
Max Planck Institute
Munich, GERMANY

Bruce Ovbiagele
Neurology, UCSF
San Francisco, USA

Guy Thwaites
OUCRU, Ho Chi Minh City
VIETNAM

Research Strategy

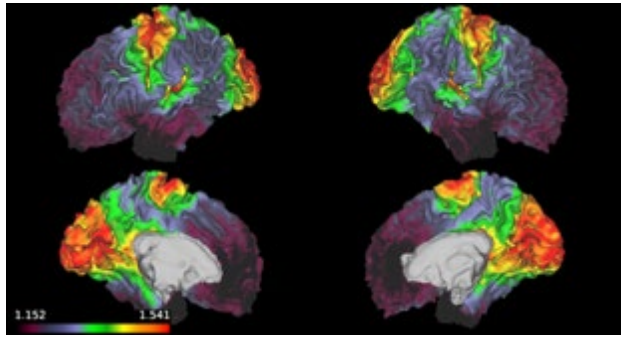
2022 – 2026

Our **vision** is an Africa where people achieve their full potential through **brain health**

Research Strategy

2022 – 2026

Our **mission** is to advance research, training, and advocacy through an **interdisciplinary** network of scientists, clinicians and civil society stakeholders, sharing skills and expertise to improve lives and advance our understanding of the human brain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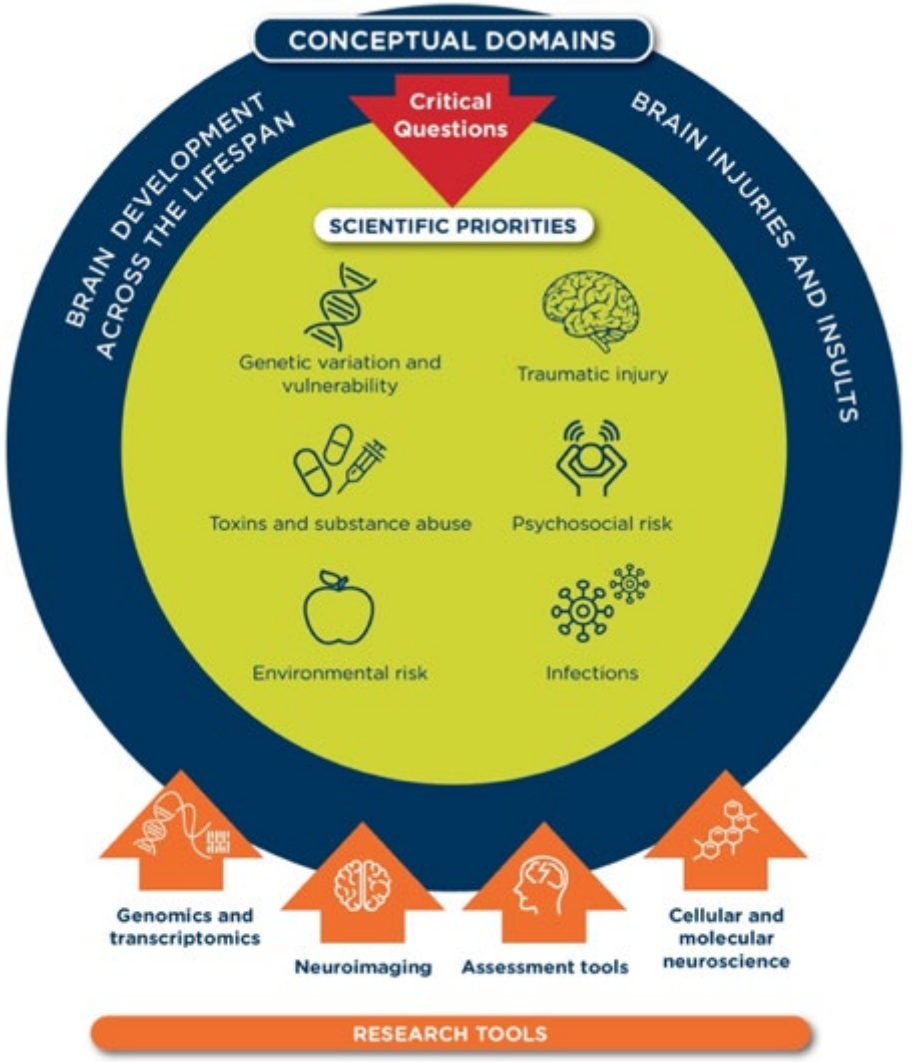
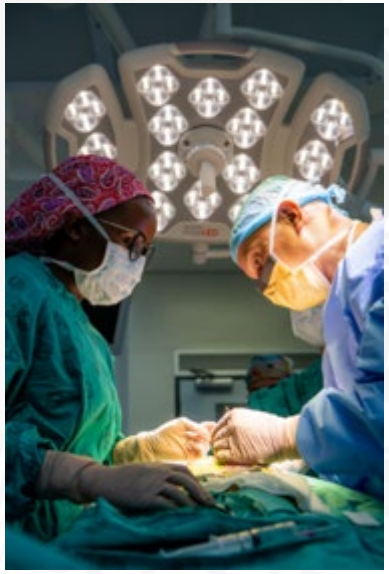
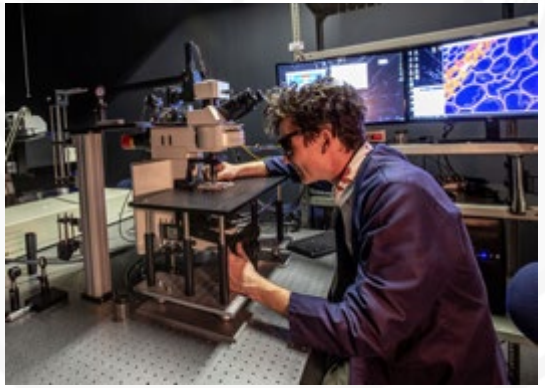
1.541


CONCEPTUAL DOMAINS
Critical Questions
BRAIN DEVELOPMENT ACROSS THE LIFESPAN
BRAIN INJURIES AND INSULTS
SCIENTIFIC PRIORITIES
Genetic variation and vulnerability
Traumatic injury
Toxins and substance abuse
Psychosocial risk
Environmental risk
Infections
Genomics and transcriptomics
Neuroimaging
Assessment tools
Cellular and molecular neuroscience
RESEARCH TOOLS





Critical work highlighting widespread resistance to first-line medication used for status epilepticus in low and middle-income countries

Nature Reviews Neurology • Volume 18, Issue 7, Pages 428 - 441 • July 2022

Why won't it stop? The dynamics of benzodiazepine resistance in status epilepticus

Burman, Richard J.[a, b, c] ✉ ; Rosch, Richard E.[c, d]; Wilmshurst, Jo M.[e, f]; Sen, Arjune[b]; Ramantani, Georgia[c]; Akerman, Colin J.[a]; Raimondo, Joseph V.[f, g, h] ✉

A team of South African researchers uncover why seizure treatment is less effective in low-income and middle-income countries and use clinical insights and experimental evidence to propose a context-specific treatment plan.

Reverse translation research enabled by collaboration between neurosurgeons, neurologists and discovery neuroscientists; performed at Red Cross Children's Hospital and the first electrophysiology lab on the African continent

Translational research informing treatment regime for children with Tuberculous Meningitis

Antimicrobial Agents and Chemotherapy • Open Access • Volume 67, Issue 3 • March 2023

Population Pharmacokinetic Analysis of Rifampicin in Plasma, Cerebrospinal Fluid, and Brain Extracellular Fluid in South African Children with Tuberculous Meningitis

Abdelgawad, Noha[a]; Tshavhungwe, Mvuwo[b]; Rohlwink, Ursula[b,c]; McIlleron, Helen[a,d]; Abdelwahab, Mahmoud T.[a]; Wiesner, Lubbe[a]; Castel, Sandra[a]; Steele, Chanel[a]; Enslin, Johannes[b]; Thango, Nqobile Sindiswa[b]; Denti, Paolo[a] ✉; Figaji, Anthony[b,c]

Journal of Antimicrobial Chemotherapy • Open Access • Volume 79, Issue 2, Pages 280 - 286 • 1 February 2024

Rifampicin and protein concentrations in paired spinal versus ventricular cerebrospinal fluid samples of children with tuberculous meningitis

Combrinck, Jill[a,b] ✉; Tshavhungwe, Phophi[a]; Rohlwink, Ursula[a,b]; Enslin, Nico[a,b]; Thango, Nqobile[a,b]; Lazarus, Jed[a]; Kriegler, Katie[c]; Castel, Sandra[c]; Abdelgawad, Noha[c]; McIlleron, Helen[c]; Denti, Paolo[c]; Wiesner, Lubbe[c]; Figaji, Anthony[a,b]

A bench to bedside approach using brain microdialysis to study site-of-disease pharmacokinetics to answer relevant clinical questions!

Finally settling a blood-brain barrier debate, a team of Neuroscience Institute researchers at the Red Cross Children's Hospital find that the drug rifampicin does, in fact, reach the brain tissue, although concentrations and pharcokinetics of different compartments differ.

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Neuroscience Institute

IDM INSTITUTE OF INFECTIOUS DISEASE AND MOLECULAR MEDICINE

Foundational research in developmental neuroscience: the impact of HIV-exposure (without infection) and anaemia on young brains

Wedderburn et al. BMC Medicine (2024) 22:129
https://doi.org/10.1186/s12916-024-03282-6

BMC Medicine

RESEARCH ARTICLE Open Access

Association of in utero HIV exposure with child brain structure and language development: a South African birth cohort study

Catherine J. Wedderburn[1,2,3*], Shunmay Yeung[2], Sivenesi Subramoney[1], Jean-Paul Fouche[3,4], Shantanu H. Joshi[5,6], Katherine L. Narr[5], Andrea M. Rehman[7], Annerine Roos[1,3,8], Diana M. Gibb[9], Heather J. Zar[1,10], Dan J. Stein[3,4,8] and Kirsten A. Donald[1,3]

JAMA Network Open

Original Investigation | Imaging

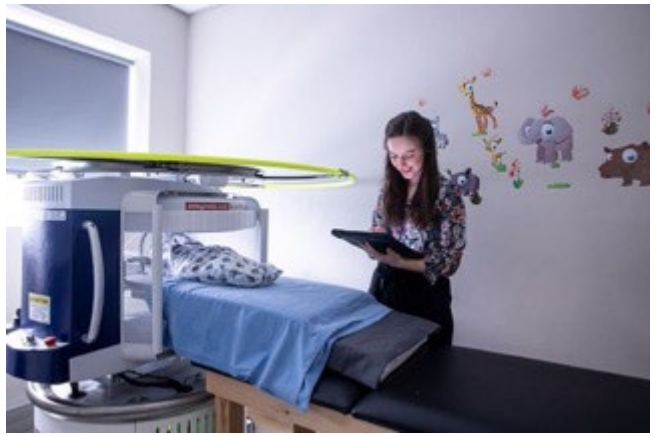
Association of Maternal and Child Anemia With Brain Structure in Early Life in South Africa

Catherine J. Wedderburn, MRCPCH; Jessica E. Ringshaw, MA; Kirsten A. Donald, PhD; Shantanu H. Joshi, PhD; Sivenesi Subramoney, MA; Jean-Paul Fouche, PhD; Jacob A. M. Stadler, MBChB; Whitney Barnett, PhD; Andrea M. Rehman, PhD; Nadia Hoffman, BA; Annerine Roos, PhD; Katherine L. Narr, PhD; Heather J. Zar, PhD; Dan J. Stein, PhD

DRAKENSTEIN CHILD HEALTH STUDY

Critical evidence that advocates for optimizing interventions in pregnant mothers for child brain health

Neuroscience Institute researchers link environmental factors to structural brain changes and functioning in early life, in the Drakenstein Child Health Study.



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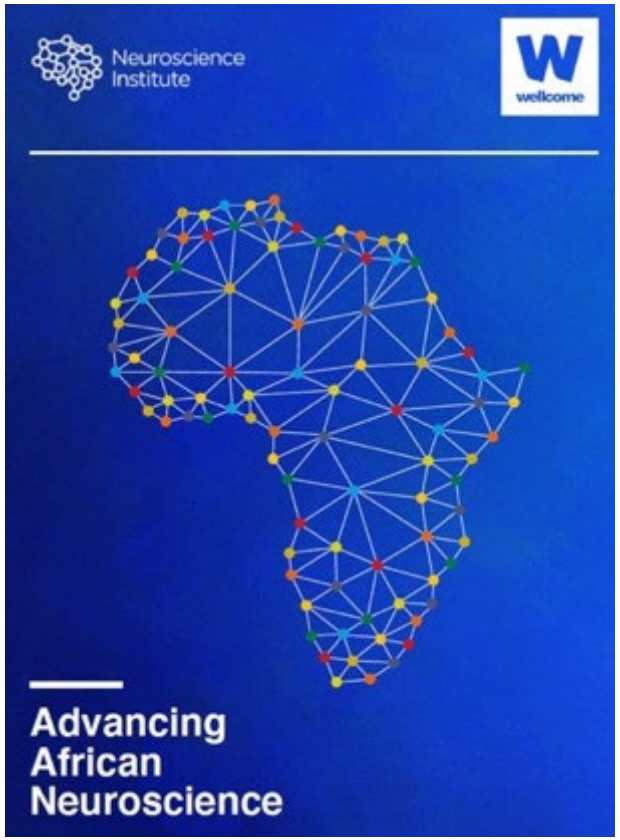
Neuroscience Institute

IDM INSTITUTE OF INFECTIOUS DISEASE AND MOLECULAR MEDICINE

6 domains of distinction for neuroscience in Africa



eLife 2022;11:e80488.

DOMAIN ONE: Diverse DNA of African populations

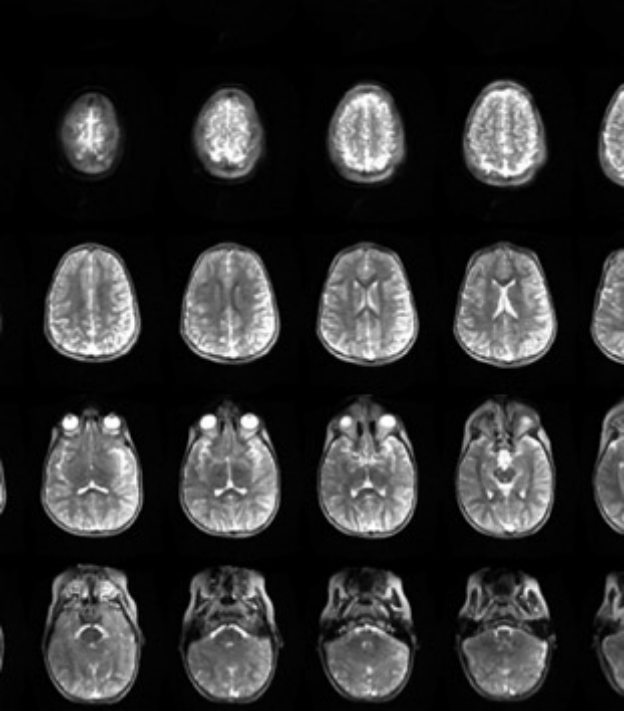
DOMAIN TWO: Diverse African flora, fauna and ecosystems for comparative research

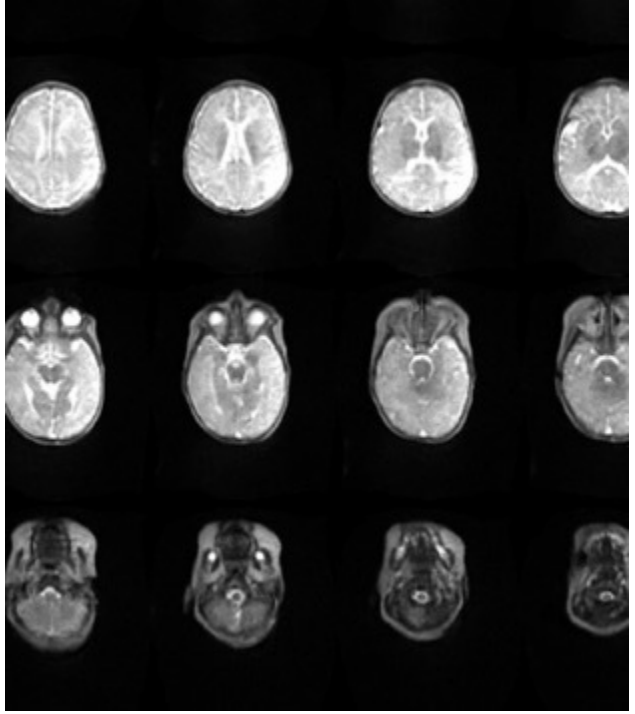
DOMAIN THREE: Child brain health and development

DOMAIN FOUR: Impact of climate change, environmental risks and conflicts on neurological and mental health

DOMAIN FIVE: Access to clinical populations with important conditions less prevalent in the global North

DOMAIN SIX: Innovative reuse and adaptation of existing technology and resources to answer new questions





Low field MRI

Considerations of new low-cost technologies to support understanding aetiological pathways and monitoring interventions

Slide credit: Kirsty Donald

SARChI Clinical Neurosciences Research

Assoc Prof Marc Combrinck 2010 - 2014

Professor Anthony Figaji 2015 - 2018 | 2019 - 2024

Outputs

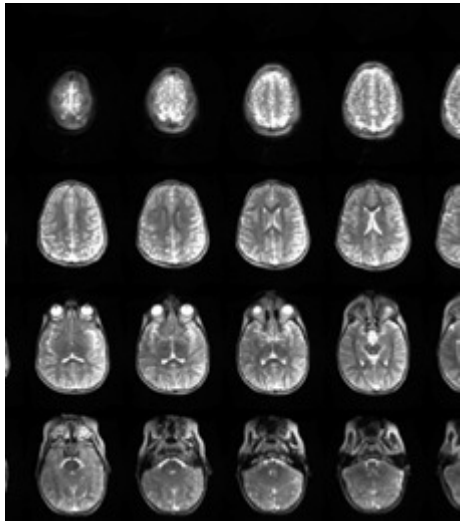
- Established world-leading research group in brain injury (TBM and TBI) which has evolved into African Brain Child
- 115 publications/ 10 years
- 45 postgrad students
- Grants
  - SAMRC/ Gabriel (R14m), NIHR (R70m)
  - NIHR01 (R37m)
  - Wellcome Discovery Award (GBP4.5m)

SARChI Brain Imaging

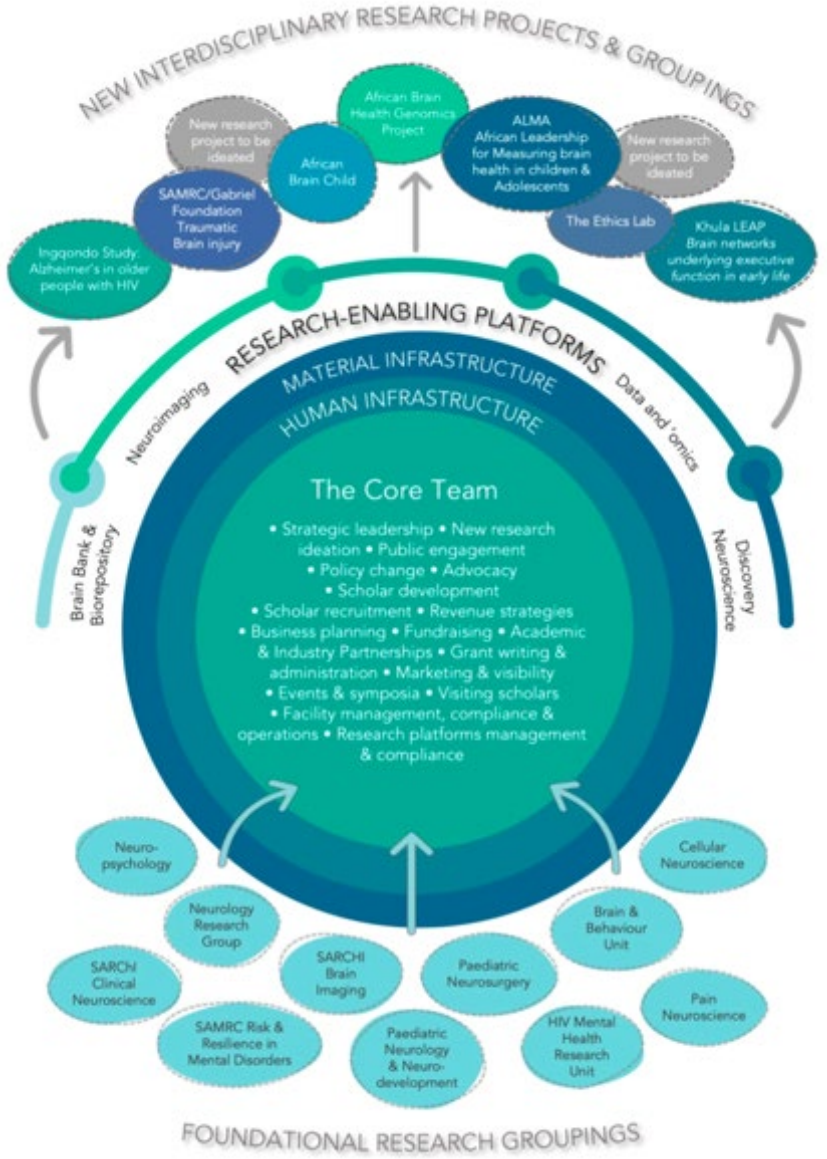
- Professor Ernesta Meintjes (3rd cycle completed)
- CUBIC: Cape Universities (Brain) Body Imaging Centre

  3T Skyra MRI scanner

Low field MRI project

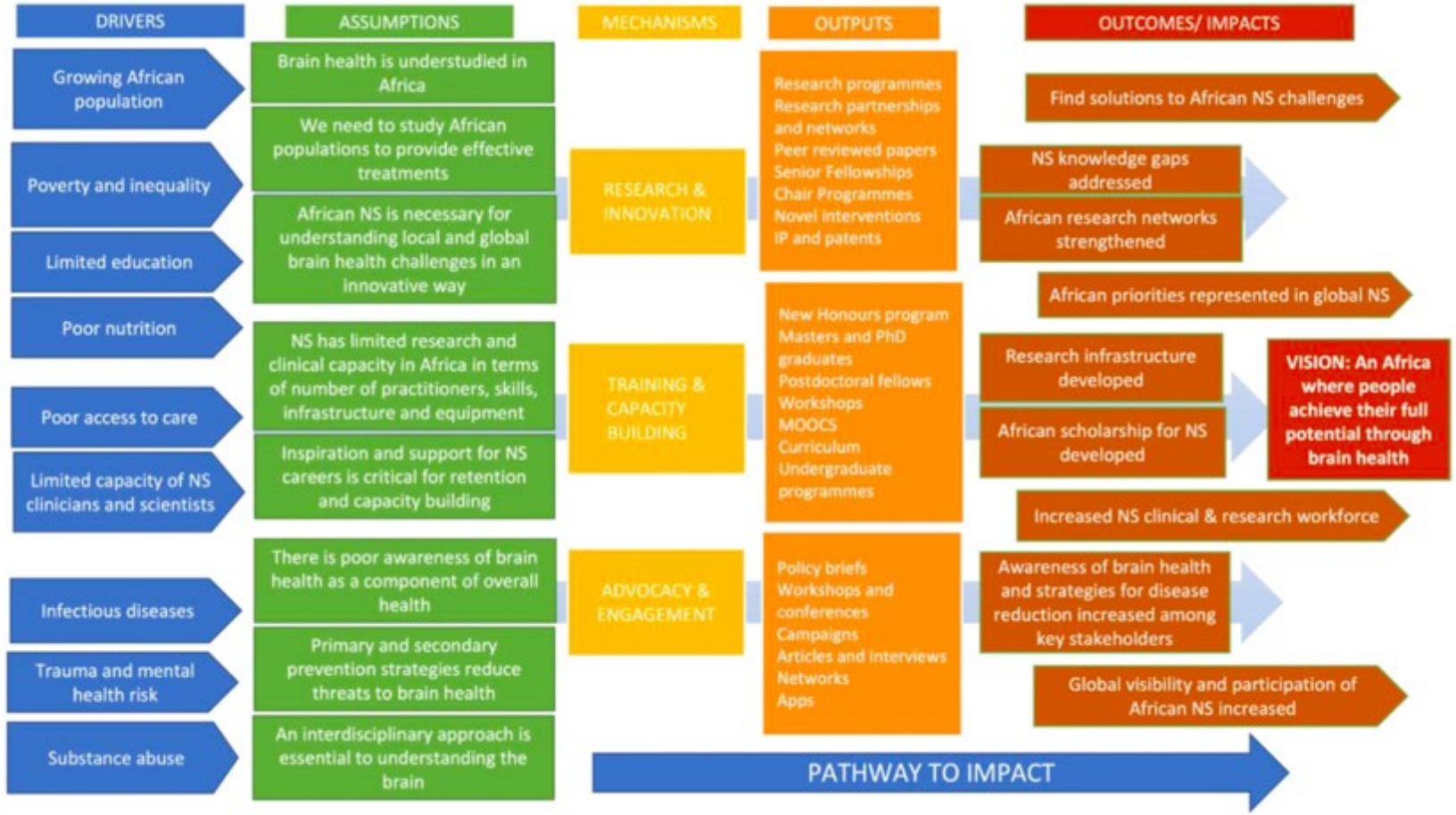


Engagement between Departments and Research Groups



Neuroscience Institute

Theory of Change



Zoë Boshoff
Fundraising and Organisational Development Specialist

UNIVERSITY OF CAPE TOWN
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Understanding the neuroimmune response to cryptococcosis

Towards an Africa where brain infections are well-managed, and brain health is protected

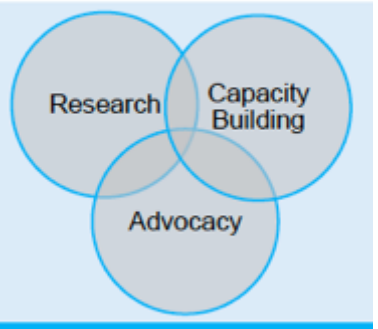
THE CHALLENGE

HUB

Cryptococcal meningitis is a fatal opportunistic fungal infection of the brain responsible for an unacceptably high number of deaths of people living with HIV in Africa. Current treatments are ineffective, unaffordable and inaccessible to most affected people and even with treatment, 70% of infected people die of the disease. The development of more effective drugs has been hindered by our limited knowledge of mechanisms of brain inflammation and injury, which are the most fatal symptoms of the disease.

OUR SOLUTION

The CryptoLab is part of the Department of Human Biology and the Neuroscience Institute at the University of Cape Town which is led by neurobiologist and researcher, Dr Rachael Dangarembizi. The CryptoLab undertakes cutting-edge molecular research to advance our knowledge of how brain injury occurs during infection, to enable better diagnosis and treatment of brain infections. It also builds the capacity of emerging researchers in neuroscience and medical mycology, and advocates for policy change and public awareness of cryptococcal meningitis.



Neurosciences Institute | MRC Centre for Medical Mycology | University of Exeter | University of Birmingham | AFRICA

PROPOSED SOLUTION

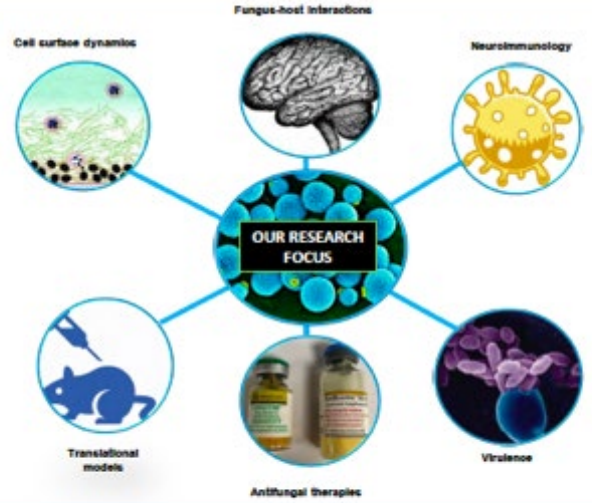
OUR APPROACH

Our goal is to develop a modern basic neuroscience research lab that carries out cutting-edge research develops the next generation of critical thinkers in neuroscience.

OUR IMPACT

The impact of the activities of the CryptoLab includes:

- Improved understanding of the pathogenesis of cryptococcal meningitis
- Increased availability of relevant translational models for studying brain injury of cryptococcal meningitis
- Strengthened capacity and improved productivity in African neuroscience and medical mycology
- Increased public awareness of cryptococcal meningitis (risk, symptoms, treatment options)
- Strengthened relationships and knowledge-sharing with policymakers and clinicians



Neurosciences Institute | MRC Centre for Medical Mycology | University of Exeter | University of Birmingham | AFRICA

INVESTMENT REQUIREMENTS

PLEASE PARTNER WITH US

UCT would like to partner with _____ to support the rollout of this priority, high-impact research initiative. We invite you to consider investing in the CryptoLab.

Our fundraising target for running the CryptoLab at full capacity for the next 5 years is ZAR 15 million. Some specific opportunities for investment include:

- Develop a modern work-space for carrying out cutting-edge research – **ZAR 1 500 000**
- Develop translational models that can be used for studying brain injury in neurocryptococcosis – **ZAR 2 300 000**
- Train Masters, PhD and Postdoctoral students – **ZAR 6 700 000**
- Advance our advocacy, awareness and policy engagement efforts to protect Africa brain health – **ZAR 500 000**

Your investment will allow us to leverage our core infrastructure and skills base of the Neuroscience Institute and HUB

Project Lead: Dr Rachael Dangarembizi
Neuroscience, University of Cape Town
Tel: +27746622273
Email: rachael.dangarembizi@uct.ac.za

WE LOOK FORWARD TO HEARING FROM YOU

UNIVERSITY OF CAPE TOWN

Assoc Prof
Pieter Naude

Assoc Prof Joe
Raimondo

Assoc Prof
Ursula Rohlwink

Dr Melissa Nel

Prof Anthony Figaji

wellcome

Dr Jacquie Bracher
NI
Research
Enterprise
Manager

Our Members

The Neuroscience Institute is a cross-faculty membership-based research entity accredited by the University Research Committee and Senate

Professor Graham Fieggen

Director

Clinical Neuroscience

Developmental Neuroscience

Neurophysiology and Neuroanatomy

More info...

Professor Kirsty Donald

Deputy Director

Clinical Neuroscience

Cognitive & Behavioural Neuroscience

Developmental Neuroscience

etc

More info...

Professor Anthony Figaji

Platforms lead

Clinical Neuroscience

Molecular & Cellular Neuroscience

Neurophysiology & Neuroanatomy

etc

More info...

Professor Dan Stein

Investigators Lead

Clinical Neuroscience

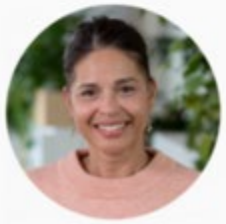
Cognitive and Behavioural Neuroscience

Developmental Neuroscience

etc

More info...

Dr Amy Adams



Assoc. Professor Yumna Albertus

Dr Kathleen Bateman

Dr Adhil Bhagwandin

80 members and counting…

Inaugural Class 2019

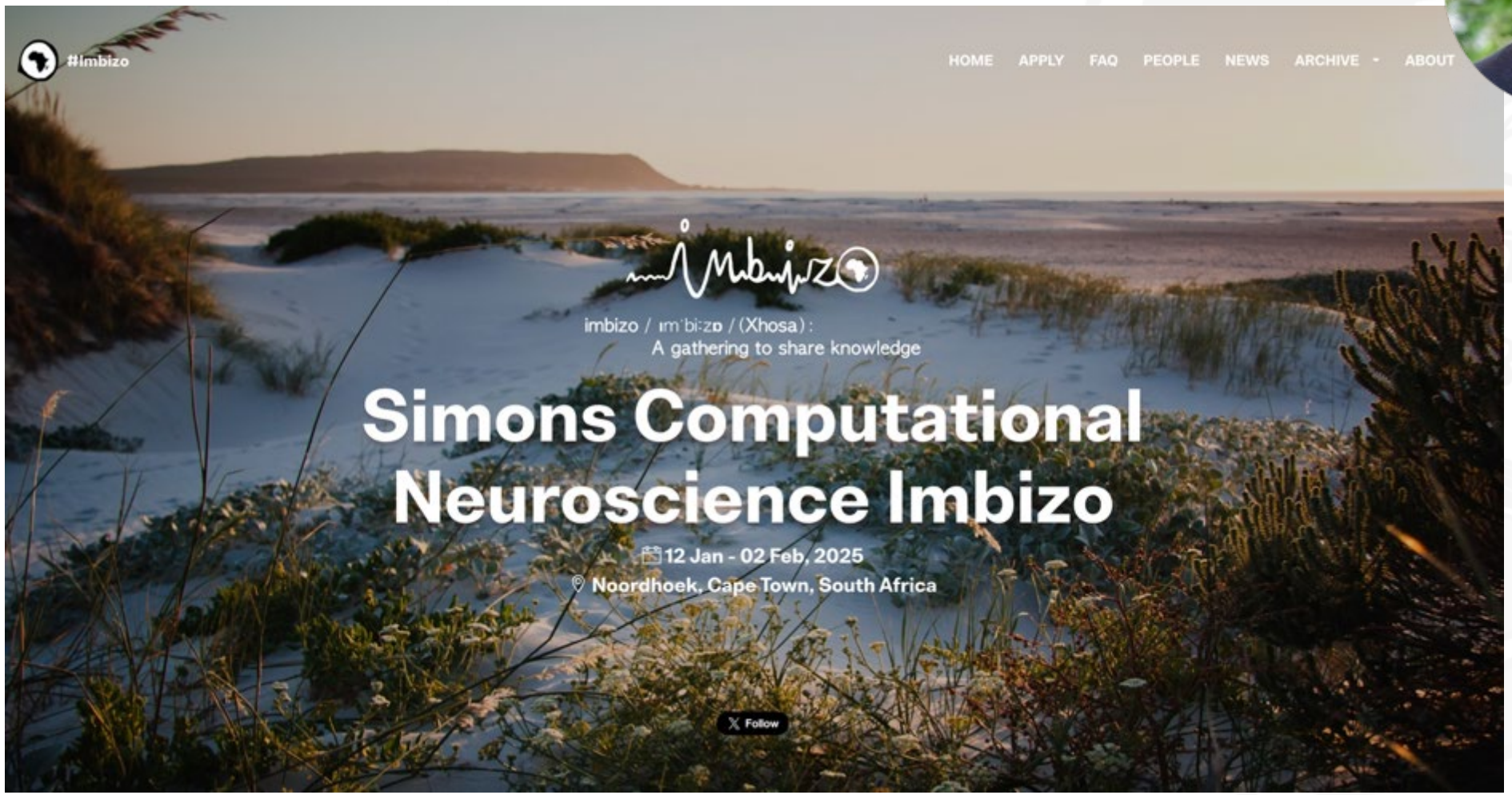
BMedSci(Hons) in Neuroscience

M.Neurosci (2025)

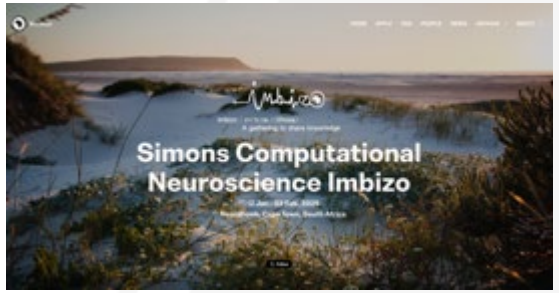
Dr Melike Fourie
Convener

120 credits coursework | 60 credits

		NEW	NEW			NEW	NEW	NEW		NEW	NEW	
	Neuroanatomy and Neuropathology	Molecular and Cellular Neuroscience	Clinical Applications in Neuroscience	Bioinformatics Programming with Python	Health Research Ethics at the Frontier	Social and Behavioural Neuroscience	Machine Learning	Neuroscience Research Skills	Colloquia	Neuroimaging Technologies	Neurogenomics	Research Project
Code:	PSY5028W	HUBxxxF	PRYxxxF	PTY6025F/S	MDNxxxF	CHMxxxS	MAMxxxS	CHMXXXW		HUB5045W	MDNxxxS	xxxxW
Credits:	24	12	12	20	18	12	12	0		14	14	60
NQF level	9	9	9	9	9	9	9	9		9	9	9
Lecturer:	Dr Coenie Hattingh	Dr Hayley Tomes, Prof Joe Raimondo, Dr Rachael Dangarembizi, Dr Dorit Hockman	Prof Mark Solms, Prof John Joska, Prof Tony Figaji, Prof Ursula Rohlwink	Dr Hocine Bendou	Prof Jantina de Vries, Dr Heidi Matisonn, Dr Olivia Matshabane, Dr Rachel Adams	Dr Melike Fourie, Dr Stephan Rabie, Dr Progress Njomboro	Prof Jonathan Shock			Prof Ernesta Meintjes, Dr Tinashe Mutsvangwa, Dr Jia Fan, Dr Fleur Warton, Dr Frances Robertson, Dr Annerine Roos	Dr Melissa Nel, Dr Armin Deffur, Dr Natassja Koen, Dr Lerato Majora, Dr Alina Esterhuizen	


#imbizo
HOME
APPLY
FAQ
PEOPLE
NEWS
ARCHIVE
ABOUT
imbizo / ɪmˈbiːzɒ / (Xhosa):
A gathering to share knowledge
Simons Computational Neuroscience Imbizo
12 Jan - 02 Feb, 2025
Noordhoek, Cape Town, South Africa
Follow

isiCNI-IBRO-SIMONS Comp Neuro Imbizo



Faculty

All | Biophysics | Higher Level Functions | Network Dynamics | Neuro AI | 2017 | 2018 | 2019 | 2020 | 2022 | 2023 | 2024 | 2025

Peter Latham
University College London

Xaq Pitkow
Carnegie Mellon University

Arif Hamid
University of Minnesota Medical School

Joseph Raimondo
University of Cape Town

Henning Sprekeler
Technical University Berlin

Tim Vogels
Institute of Science and Technology Austria

Demba Ba
Harvard University

Thomas Tagoe
University of Ghana

Bard Ermentrout
University of Pittsburgh

Jakob Macke

Daniela Vallentin
Max Planck Institute for Biological Intelligence (In Foundation)

Rachael Dangarembizi
University of Cape Town

Teaching assistants

All | Biophysics | Higher Level Functions | Network Dynamics | Neuro AI | 2017 | 2018 | 2019 | 2020 | 2022 | 2023 | 2024 | 2025

Spiros Chavlis
IMBB-FORTH

Ilenna Jones
Harvard University

Dongyan Lin
McGill University & Montreal Institute for Learning Algorithms

Will Dorrell
University College London, UK

Kira Duesterwald
University College London, UK

Samar Elsheikh
Center for Addiction and Mental Health, Canada

Christopher Currin
Institute of Science and Technology Austria | Deep Learning Indaba\ South Africa

Nina Kudryashova
University of Edinburgh

Mohamed Abdelhack
Krembil Centre for Neuroinformatics

Annik Carson

Laura Naumann
Institute of Science and Technology

NI – AI links
21 01 2025

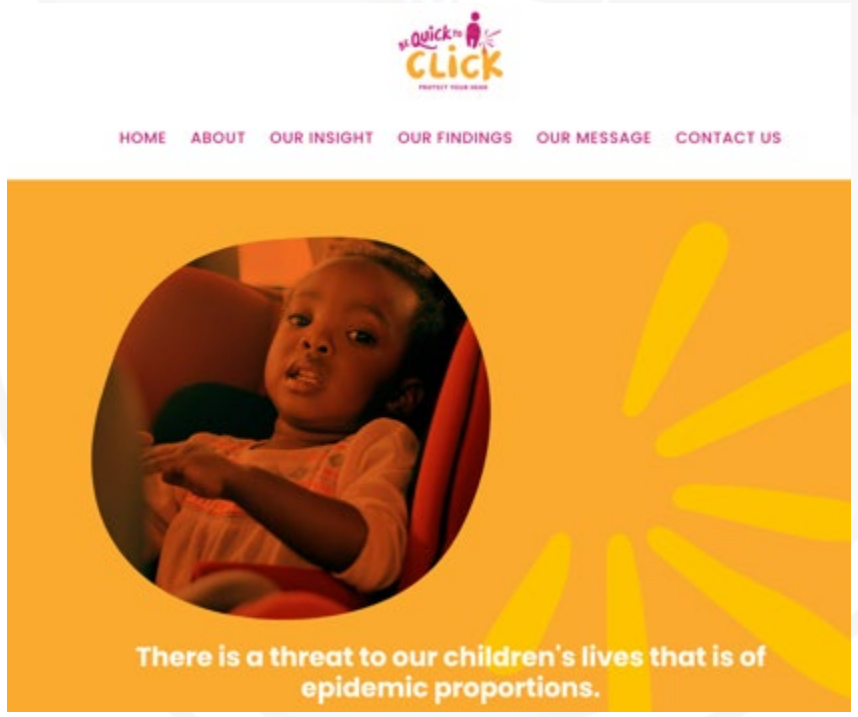
IBRO Schools

IBRO African Centres for Advanced Training in Neuroscience

Community engagement

Brain Awareness Week

Be Quick to Click Initiative
https://protectyourhead.africanbrainchild.com/



Best Global Universities for Neuroscience and Behavior

The field of neuroscience and behavior deals with many subjects, all of which relate to the study of the brain and nervous system. Students learn about topics including molecular psychiatry, neuronal function, basic and clinical neurology, neuronal development, and cellular and molecular neuroscience. These are the world's top universities for neuroscience and behavior. Read the methodology »

BEST GLOBAL UNIVERSITIES
U.S.News & WORLD REPORT

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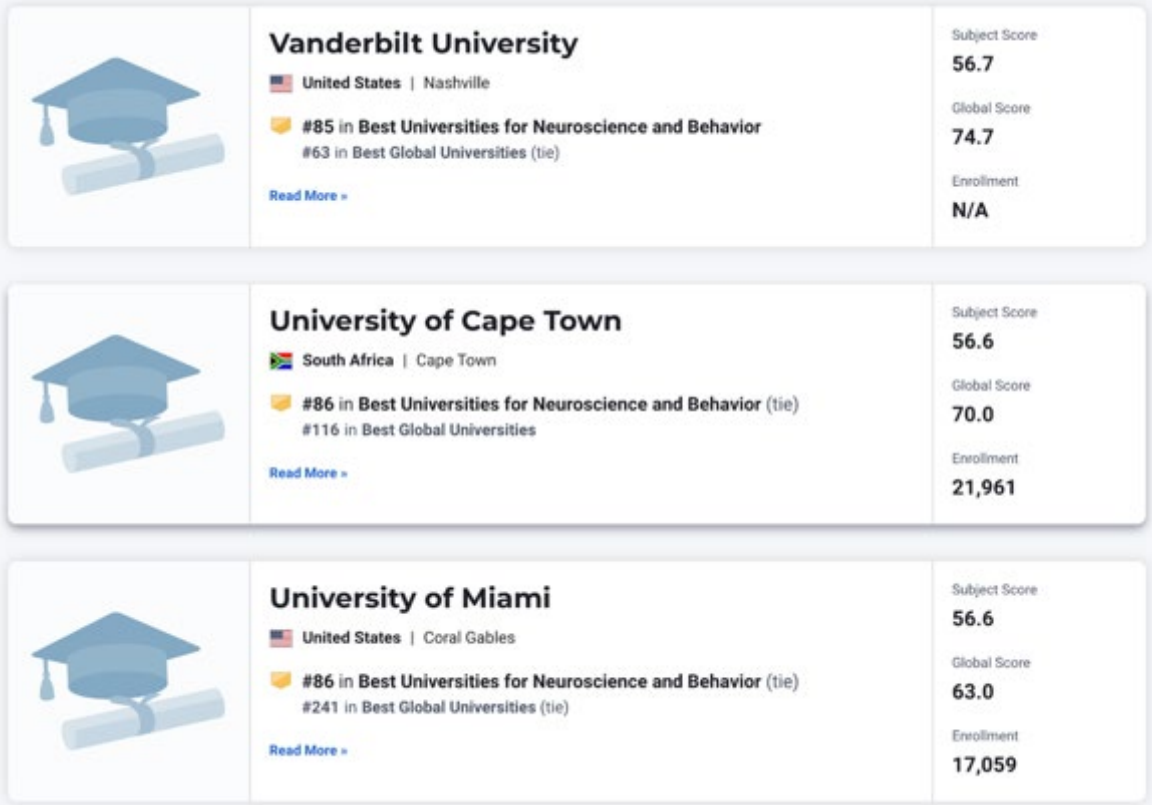

Vanderbilt University

United States | Nashville

#85 in Best Universities for Neuroscience and Behavior
#63 in Best Global Universities (tie)

Read More »

Subject Score 56.7
Global Score 74.7
Enrollment N/A

University of Cape Town

South Africa | Cape Town

#86 in Best Universities for Neuroscience and Behavior (tie)
#116 in Best Global Universities

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Subject Score 56.6
Global Score 70.0
Enrollment 21,961

University of Miami

United States | Coral Gables

#86 in Best Universities for Neuroscience and Behavior (tie)
#241 in Best Global Universities (tie)

Read More »

Subject Score 56.6
Global Score 63.0
Enrollment 17,059

What is our aspiration?

We want to be a world-leading centre for brain research, located in Africa

NI value proposition

- The quest to understand the brain is one of the defining endeavours of the 21st century
- Our vision: an Africa where people reach their full potential through brain health
- Our research strategy: injuries & insults | across the lifespan
- Existing collaborations and relationships
- Experienced and highly effective core team


Neuroscience
Institute
Thank you/ Merci beaucoup