

BUILDING A HEALTHY AFRICA

DRUG DISCOVERY

BRAIN HEALTH

VACCINE DISCOVERY AND EFFICACY

INFECTIOUS DISEASES

HEALTH EQUITY

BIOTECHNOLOGY

NONCOMMUNICABLE DISEASES

CHILD AND ADOLESCENT HEALTH

Health is undeniably a fundamental driver of human development and plays a pivotal role in achieving sustainable and inclusive growth in Africa. While addressing the substantial burden of disease in Africa remains a core objective, UCT's research focuses on the proactive achievement of optimal health, fostering a future where individuals, communities and cities not only combat disease but increasingly avoid disease to flourish, ensuring a more sustainable and inclusive growth trajectory for the continent.



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Drug discovery

Developing drug discovery and development capabilities in immediate proximity to African patient populations is essential for understanding and addressing the urgent healthcare needs of the continent. By pioneering this research in Africa, UCT plays a central role both in enhancing healthcare outcomes and developing capacity on the continent.



HOLISTIC DRUG DISCOVERY AND DEVELOPMENT (H3D) CENTRE

H3D is a leader in its field. The centre's mission revolves around the discovery and development of innovative, life-saving medicines specifically tailored to combat infectious diseases. H3D is committed to constructing Africa-specific models to enhance treatment outcomes for the unique needs of African patients and the training of African scientists – bolstering the region's capacity for advanced drug research.

Brain health

There is a major research gap when it comes to understanding the impact of many brain disorders in Africa. This unique challenge requires researchers to develop context-specific interventions and create opportunities to make breakthrough discoveries of relevance to global neuroscience.



NEUROSCIENCE INSTITUTE (NI)

The NI boasts state-of-the-art technology and facilities that allow interdisciplinary teams to integrate and improve patient care, research, teaching and training and advocacy. Their work encompasses two principal domains: firstly, a focus on brain development spanning the human lifecycle from foetal development onwards; secondly, a focus on brain injuries and insults. Researchers explore critical questions that reflect a focus on the needs of African populations, such as high incidences of infection, inadequate nutrition and exposure to toxins.



Vaccine discovery and efficacy

The field of vaccine research is intricate, requiring a range of expertise. UCT has a profound commitment to pioneering vaccine research. The University's legacy in this field includes contributions such as the development of the yellow fever vaccine, for which former UCT student Max Theiler was awarded the Nobel Prize in Medicine. Diverse partnerships in the private and public sectors, locally and globally, are vital for advancing vaccine research and ultimately safeguarding the health and well-being of communities worldwide.

SOUTH AFRICAN TUBERCULOSIS VACCINE INITIATIVE (SATVI)

South Africa has one of the highest tuberculosis (TB) infection rates in the world. SATVI is a global leader in TB vaccine research, having conducted multiple clinical trials of prospective vaccine candidates as well as TB treatment, diagnostic and immunology studies. The initiative is also completing projects to address critical clinical, epidemiological, immunological and human genetic questions in TB vaccine development. The Initiative's field site is in a region where the rate of TB is amongst the highest recorded in the world.

VACCINES FOR AFRICA INITIATIVE (VACFA)

VACFA has built an extensive network of stakeholders with a shared goal of increasing awareness and promoting uptake of vaccines on the African continent. A significant project is the National Immunisation Technical Advisory Group Support Hub (NISH) which provides training, scientific support and research for National Immunisation Technical Advisory Groups (NITAGs) in the 47 countries of the World Health Organization (WHO) Africa region.

Infectious diseases

UCT's groundbreaking research in the field of infectious diseases is pivotal in addressing the unique healthcare challenges faced by the continent. Infectious diseases – including but not limited to HIV/AIDS, malaria, TB and emerging pathogens – continue to pose a significant burden on public health in Africa. UCT's wide-ranging research endeavours contribute to the development of innovative strategies for prevention, diagnosis and treatment of these diseases.

THE INSTITUTE OF INFECTIOUS DISEASE AND MOLECULAR MEDICINE (IDM)

The largest research entity at UCT, the IDM is a cross-faculty research centre of excellence that tackles diseases of major importance in Africa as well as non-communicable diseases. Led by over 33 independent principal investigators in the basic, clinical and public health sciences with a strong translational focus, the Institute conducts research at the laboratory-clinic-community interface by engaging a wide range of scientific and clinical disciplines. Its specialities include molecular mycobacteriology, precision and genomic medicine, applied proteomics and chemical biology, cancer biotechnology, immunology of infectious diseases, poverty-related infections, vaccinology, tuberculosis research, and HIV research.

WELLCOME CENTRE FOR INFECTIOUS DISEASES RESEARCH IN AFRICA (CIDRI-Africa)

CIDRI-Africa is focused on combatting infection with a particular focus on understanding the challenges of antiretroviral therapy, such as metabolic complications and drug interactions that contribute to the burden of non-communicable diseases on the continent.

Health equity

Health equity is inherently intertwined with the broader vision of building a healthy Africa. UCT recognises the profound impact of social, economic and environmental factors on health outcomes and promotes research seeking to rectify these injustices.



HEALTH AND HUMAN RIGHTS PROGRAMME (HHRP)

The HHRP conducts research and teaching at the interface of public health and human rights. This is a growing interdisciplinary field attracting increasing international attention for its contributions to strengthening health systems and giving a voice to marginalised communities and groups.

GLOBAL SURGERY DIVISION

At least five billion people worldwide lack access to safe, affordable surgical care when needed. In Africa, surgical solutions that work in one context can fail in another and innovations must be tailored to specific challenges. The Global Surgery Division seeks to improve health outcomes and achieve health equity for all who require surgical, obstetric and anaesthesia care, with an emphasis on underserved populations and populations in crisis.

Biotechnology

Biotechnology is an intricate multidisciplinary field that fuses natural and engineering sciences with great potential to manipulate biological systems. It involves organisms such as bacteria, yeast and plants to perform specific tasks or generate essential materials. UCT's biotechnology research contributes to the development of life-saving drugs and genetically modified crops, addressing critical needs across the continent.

THE DEPARTMENT OF MOLECULAR & CELL BIOLOGY

The Department of Molecular & Cell Biology has interests and expertise in diverse areas of biology. The members of staff are involved in research that is of great economic and social importance to South Africa and the rest of Africa. The research includes areas such as health and disease, plant and animal pathogens, viruses, genetic engineering, drought resistant crops and marine aquaculture.





Noncommunicable diseases

Noncommunicable diseases (NCDs) such as heart disease, cancer, diabetes and respiratory illnesses are a growing public health concern across the continent. They exact a substantial toll on the health and well-being of African populations but also pose significant economic and social challenges. Work at UCT on NCDs aims to contribute to healthcare systems that are better equipped to address the health challenges within the local context while reducing the associated societal and economic burdens.



KHAYELITSHA CERVICAL CANCER SCREENING PROJECT (KCCSP)

Over 85% of cases and deaths from cervical cancer occur in low- and middle-income countries (LMICs), particularly in Sub-Saharan Africa. The **KCCSP** develops tests, protocols and algorithms for the prevention of cervical cancer, screening tens of thousands of women and evaluating evidence-based alternatives to pap-smear based programmes.



RESEARCH UNIT ON THE ECONOMICS OF EXCISABLE PRODUCTS (REEP)

Smoking is a major cause of NCDs. Work in the **REEP** focuses primarily on the use of excise taxes to reduce the demand for tobacco products.



CAPE HEART INSTITUTE (CHI)

The **CHI** concentrates on research activities and expertise relating to cardiovascular risk factors and diseases common to Sub-Saharan Africa. Scientific excellence is pursued within several laboratory groups, each headed by a scientist of international stature, and is facilitated by efficient and effective infrastructure and centralised facilities, enabling local research capacity to prosper in Africa.



Child and adolescent health

Given the demographics and inequality across Africa, child and adolescent health is more pressing than on any other continent. The well-being of the youth shapes not only the continent's present but also its future. This is why UCT places particular emphasis on the importance of research into addressing the unique healthcare needs of this demographic.



RESEARCH CENTRE FOR ADOLESCENT AND CHILD HEALTH (REACH)

REACH is a paediatric clinical research unit, the result of a partnership between Red Cross War Memorial Children's Hospital, the Western Cape Health Department and UCT's Department of Paediatrics. The research program addresses national priorities that are also globally relevant, such as HIV, TB and childhood pneumonia. The centre also provides opportunities for training of African healthcare professionals in clinical research, so building the next generation of academics and African leaders in child health.



MEDICAL RESEARCH COUNCIL (MRC) UNIT ON CHILD AND ADOLESCENT HEALTH

A primary focus of the **MRC Unit on Child and Adolescent Health** is on child lung health and the intersection of infection with the emergence of chronic NCDs, addressing lung health from birth through adolescence. Studies focus on the epidemiology, aetiology and risk factors for acute and chronic lung disease and the impact of acute disease on child health and on development of chronic disease.

Photo credits: Front Cover: Public Domain license, CC0 1.0 DEED; **Upper Inside left:** Data acquired at Cardiff University Brain Research Imaging Centre (CUBRIC), Cardiff University, Wales. Visualisation by Klaus Engel and colleagues at Siemens Healthineers; **Lower Inside left:** @migalvanas; **Inside right:** Supplied; **Back Cover:** @migalvanas

Design and layout: Ink Design Publishing Solutions, Cape Town, www.inkdesign.co.za

