

# | SALIM S ABDOOL KARIM |



## TOP THREE AWARDS

- African Union's Kwame Nkrumah Continental Scientific Award, 2015
- President's Award for Outstanding Achievement in World Health (to the CAPRISA 004 Leadership Team) from the Drug Information Association, 2011
- Science-for-Society Gold Medal Award from the Academy of Science of South Africa (ASSAf), 2011

## DEFINING MOMENT

My plenary address in 2015 at the General Assembly of the African Union in Addis Ababa on the critical importance of science for Africa's prosperity.

## WHAT PEOPLE DO NOT KNOW

I was a disco DJ at *Disco Inferno* for a few years while I was a medical student in the late-1970s.

## THE CLINICAL RESEARCH CRUSADER

Salim Abdool Karim is a revolutionary in everything he does, be it opposing apartheid rule, challenging AIDS denialists, or revamping South Africa's medical research funding. Along the way, he has ruffled some feathers. But 'Slim', as he is known to most, gets away with it because his actions are designed for the greater good, and because he is a master at what he does.

Today, he is one of South Africa's best-known AIDS scientists. He is the founding Director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA), a 150 million Rand per year multi-institutional research centre headquartered at the University of KwaZulu-Natal's (UKZN) Nelson R Mandela Medical School.

In partnership with his wife, Quarraisha, an equally accomplished HIV researcher, he has played a key role in turning the focus of the world onto the devastating HIV and tuberculosis epidemics ravaging South Africa, and in particular his home province of KwaZulu-Natal.

"We do science for the betterment of society," he says. "Our ambition is to undertake globally relevant and locally responsive research that can make a real difference to people's lives."

## EDUCATION AND EARLY LIFE

The son of a poor factory worker, Salim Abdool Karim grew up in central Durban. In 1970, when he was ten years old, he and his family were forced to move from their home in the city centre to the newly developed Chatsworth township that had been designated for Indians under the Group Areas Act.

He got his nickname 'Slim' (clever in Afrikaans) at the Gandhi Desai High School in the Durban city centre, to which he continued to commute even after his family's relocation. As a young man he played an active part in the anti-apartheid movement although, as an avid follower of Mahatma Gandhi, he never took up arms in the struggle.

His first choice for university study was engineering. Unable to secure a scholarship for engineering, he opted for medicine when he secured two scholarships for medical studies instead. He obtained his medical degree from the University of Natal medical school in 1983. It was a hotbed of activism at the time as the only medical school in the country that allowed students who were not white. As a medical student he was a delegate at the launch of the United Democratic Front (UDF) in Mitchell's Plain, coming back to Durban an even more inspired anti-apartheid activist.

He was an ambitious student, keen to explore new ideas and opportunities. He published his first research paper with his mentor, Professor Jerry Coovadia, in the *International Journal of Health Services* as a third-year medical student. After graduating, he did his internship at the King Edward VIII Hospital in downtown Durban and registered as a medical professional in 1985. He simultaneously completed a diploma in computer science through the University of South Africa, to satiate his thirst for all things technological.

In 1987, he obtained a fellowship to study epidemiology at Columbia University in New York. Less than a week before his departure, he met his wife-to-be, Quarraisha. Later that year, he returned home to get married and the two went together to study at Columbia University after their wedding.

## AN UP-AND-COMING AIDS RESEARCHER

Buoyed by his learning experiences in New York, which was in the throes of the AIDS epidemic at the time, Abdool Karim returned to South Africa with his wife in late 1988. He took a job as Registrar in public health medicine at the Medical School in Durban to complete his specialist training. In 1993, he joined the South African Medical Research Council (MRC) as the Director of its Centre for Epidemiological Research.

Over the next few years he pioneered the establishment of several research centres in South Africa based on large grants from international sources. In 1997, he led a consortium that won funding from the Wellcome Trust in the UK to set up the Africa Centre for Population Studies and Re-

productive Health in northern KwaZulu-Natal. He also secured a substantial grant from the US National Institutes for Health (NIH) to become part of HIVNET, an international network that conducted HIV prevention trials.

When the HIVNET grant came to an end after two years, he secured two new grants from the NIH: One to establish a HIV prevention trials unit, and another to create a HIV vaccine trials unit at the MRC. These grants were trailblazers, as the primary applicant was the MRC, rather than a US institution as was the norm for NIH research grants at the time.

The research funding that Abdool Karim acquired from international research agencies for his home institution, dwarfed what was available within South Africa at the time. Applying for and managing these research centres gave him valuable experience that he would later put into bringing an even bigger and more multi-faceted grant into South Africa to create CAPRISA.

In 2000, Abdool Karim was the Scientific Programme Chair of the International AIDS Conference in Durban. It was the first such conference to take place in a developing country. At this time, South Africa's government had become notorious for denying the link between HIV and AIDS, and he was one of the scientists who opposed the AIDS denialists, whom he saw as being responsible for the loss of thousands of South African lives.

In 2001, Abdool Karim was recruited from the MRC to become Deputy Vice-Chancellor for Research at the University of Natal (which, in 2004, formed part of the new University of KwaZulu-Natal).

Shortly after arriving at the university he heard that the NIH was offering a new funding opportunity that would allow groups of developing country researchers to set up world-class medical research centres targeting HIV in the communities most affected by the disease.

## A NEW AIDS CENTRE IS BORN

Slim and Quarraisha formed a consortium with colleagues from the NICD in Johannesburg, the University of Cape Town, the University of the Western

Cape and Columbia University, and applied for the grant. They were successful in winning over US\$12 million to be paid out over five years, and in 2002, CAPRISA was born.

From the outset CAPRISA's primary research priorities were to study acute HIV infection, with a view to developing insights for vaccines, as well as how to best treat patients with HIV and tuberculosis, the dual epidemics ravaging Africa. The centre established clinical research facilities at an urban TB clinic, as well as in the rural village Vulindlela, an hour's drive from Durban.

CAPRISA's scientific achievements have included developing a best-practice treatment approach for TB and HIV co-infection, which has been adopted by the World Health Organisation. It has also pushed the envelope in producing HIV prevention technologies that can be used and controlled by women.

CAPRISA's famous 004 trial found that a vaginal gel containing the antiretroviral tenofovir inserted before and after sex reduced women's risk of HIV infection by 39%, with an even higher rate of protection if women adhered closely to the dosing regimen. The gel was also found to protect women against infection with Herpes Simplex type-2, a virus that commonly causes genital ulcers.

Quarraisha and Slim jointly presented the CAPRISA 004 results at the International AIDS Conference in Vienna, in July 2010. It was hailed as a landmark study – the first evidence that antiretrovirals can prevent sexual transmission of HIV and the first microbicide trial to ever show a positive result. Unfortunately, later studies of the gel found that in a clinical setting, women seemed unwilling to use the gel as directed, reducing its efficacy and usefulness in real-world applications.

The disappointing tenofovir gel results in recent clinical studies did not discourage him. He stepped forward with new energy to develop long-acting HIV prevention approaches that can circumvent the adherence challenges experienced by women. The field of HIV prevention needs alternatives, he says. There won't be a one-size-fits-all solution.

Abdool Karim and his colleagues in CAPRISA's acute infection study have identified a highly active broadly neutralising antibody, able to kill a wide range of HIV strains. The antibody was isolated from a woman in KwaZulu-Natal, whose body had developed it to cope with her HIV infection. The antibody has been successfully tested in monkeys and is now being manufactured for human trials as a 3-monthly injection to protect women from acquiring HIV. If it works it will be an amazing discovery to come out of South Africa.

Says Abdool Karim: "What makes CAPRISA different is the way we work with the community and try to impact their lives. For us, the research is more than test tubes and Petri dishes; it's about the people."

There are also many challenges remaining in understanding TB and HIV, he says. He was one of the three-person team that convinced the Howard Hughes Medical Institute (HHMI) to base its first research centre outside the United States (US) in South Africa, leading in 2008 to the creation of the KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), which carries out basic research on TB and HIV. K-RITH and CAPRISA now share a world-class research building on the UKZN medical school campus.

## REVITALISING THE MRC

In April 2012, he was appointed President of the MRC after repeated attempts by the MRC's Board had failed to fill the post. He accepted it as a part-time job on the request of Aaron Motsoaledi, the country's health Minister, who was Abdool Karim's classmate in medical school. The MRC was in bad shape at the time. Its many intramural research units were eating up most of its research funding, with little left for the country's badly stretched medical schools. A report by ASSAf in 2009 had found clinical research to be in dire straits in South Africa.

During his two years as the council's head, he overhauled its research priorities, slimming them down to match South Africa's ten major killers, including HIV, TB and heart disease. He also axed a quarter of the council's staff and closed more than half of its 27 intramural units, leaving only 11

behind. Such major change could have made him unpopular, had he not proceeded to fill the council's coffers with new funding.

First, he secured R340 million from Treasury's Economic Competitiveness Fund to fund 'flagship projects' addressing South Africa's key health problems. Having had great successes in winning large grants from the NIH as a researcher, he then chose to employ this skill and his international linkages for the common good of South African research. At the end of 2013, just before Abdool Karim left the council, the MRC launched a US\$40 million (>half a billion rands) five-year programme jointly with the NIH for research on tuberculosis, HIV and HIV-related cancers.

Another partnership, with the Bill & Melinda Gates Foundation and the South African government, resulted in a three-year research fund, worth close to R1 billion, for AIDS/TB diagnostics, treatments, vaccines and other technologies.

After leaving the MRC, he went back to being scientific Director of CAPRISA. He has held a number of international positions as well. Since 2000, he has been a Professor of Epidemiology at Columbia University and an adjunct Professor of Medicine at Cornell University. Columbia recently appointed him to a newly endowed Global Health Professorship named after CAPRISA. In 2013, he was asked to Chair a new Joint United Nations Programme on HIV/AIDS (UNAIDS) Scientific Expert Panel. CAPRISA is also a long-standing UNAIDS Collaborating Centre on HIV prevention research and policy, meaning it advises the international body on scientific issues related to HIV prevention.

Abdool Karim sports a relentlessly positive view of the role that South Africa's scientists can play in the country's future. "Armed with a fistful of original ideas, entrepreneurial spirit, and a brave willingness to explore new terrain, the country's scientists are well placed to help the nation realise the South African dream: Sustainable development, economic prosperity and healthy lives. This can be achieved with active support for both education and research in the hallowed halls of academia, as this is critical to sowing the seeds of tomorrow's success on the path to greatness," he says.

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A. Academy of Science of South Africa (ASSAf) Publications

C. ASSAf Policymakers' Booklets

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2017

# Legends of South African Science

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