



CAPRISA

CENTRE FOR THE AIDS PROGRAMME OF RESEARCH IN SOUTH AFRICA

Newsletter

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Salim Abdool Karim & Anthony Fauci jointly awarded the 2020 John Maddox Prize

In this Issue

In our feature story in the final issue of the newsletter for 2020 we congratulate the eminent winners of the 2020 John Maddox award.

On page 2, we feature Bill Gates's tribute to Profs Salim & Quarraisha Abdool Karim on his blog "Heroes in the field", report on the Science Forum South Africa held recently and Prof Nesri Padayatchi's NRF B-rating.

We congratulate Dr Cathrine Scheepers of the NICD for her publication in *Cell Reports*; highlight CAPRISA's participation in a GBV community awareness event and profile The Sunday Times Top 100 companies honorary award, which was presentation to Prof Salim Abdool Karim, on page 3.

On page 4 we summarise CAPRISA contribution to Covid-19 vaccine development and cover NICD's contributions to SARS-CoV-2 assays.

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Dr Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases (NIAID) in the US, and Professor Salim Abdool Karim Director of CAPRISA in South Africa were jointly awarded the prestigious 2020 John Maddox Prize for standing up for science. The award was presented by a panel of international judges at a virtual reception held on Monday 14th December. The Prize which is a joint initiative of the charity Sense about Science and the scientific journal *Nature*, is awarded annually to individuals for standing up for sound science in public.

According to the judges, Abdool Karim and Fauci were chosen 'for going beyond the line of duty as government advisors on health and had communicated the complex and changing science of Covid-19 to the public and policymakers, in the midst of international uncertainty and anxiety'.

"The Maddox Prize serves an important purpose in recognizing those who stand up for sound science and evidence," said Magdalena Skipper, editor-in-chief, *Nature*. "It is our pleasure to work with Sense about Science to recognize the roles that Anthony Fauci and Salim Abdool Karim have played in this pandemic and also that of the AIDS crisis in the 1980s."

The judges recognised that 'Abdool Karim has a reputation for clear and honest communication, something that has al-

lowed him to generate public trust in fast-moving science. Respected for his international science advocacy, engaging with the media and the public has become integral to his role as a scientist. Anthony Fauci received the prize in recognition of his work to help the public understand both the science behind complex and controversial public health issues, and how the nature of science influences government responses.'

"The unprecedented challenges faced by the world in 2020 call for individuals with wisdom, resilience, and integrity. The remarkable winners of this year's Maddox Prize exemplify such qualities in spades," Lo FRS, Director, Li Ka Shing Institute of Health Sciences.

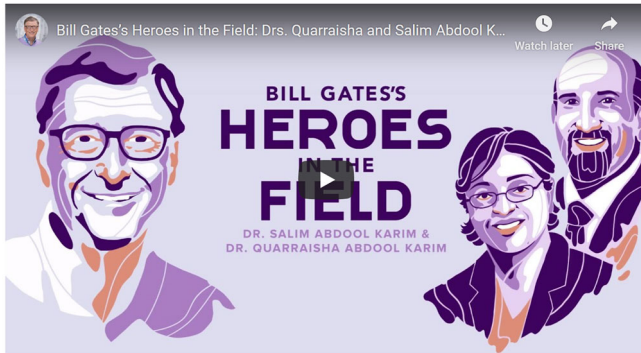
Prof Abdool Karim 'has been an amazing ambassador for evidence-based science and science communication with politicians, policymakers, scientists, and the general public, said Professor Jonathan Jansen President and Chairperson of the ASSAf Council in South Africa.



Dr Anthony Fauci (L) and Prof Salim Abdool Karim (FRS) participate in a session at the 2016 IAS, held in Durban.



Bill Gates pens a personal tribute to Salim and Quarraisha Abdool Karim on World AIDS Day



ers to make sure their research efforts are informed by realities on the ground and embraced by their neighbors, he wrote.

'Drawing on their experiences from HIV and TB, they are helping guide the COVID-19 response in South Africa and around the world. So, when a pandemic comes along, we have a network of experts like Quarraisha and Salim ready to pitch in. What strikes me about this couple is how upbeat they are, even in the face of devastating diseases like the coronavirus and HIV. Their motto at CAPRISA is, "Each day that you come to work, you should be looking for how today is going to be better than yesterday." That is a lesson we can all take to heart'.

On his Blog Heroes in the Field, Bill Gates penned a personal tribute on World AIDS Day to Salim and Quarraisha Abdool Karim and traced their humble journey as young students to 'two most respected HIV/AIDS researchers in the world'. Salim and Quarraisha make it a priority to empower the people they're trying to help. They work closely with community lead-

Click here to read the Blog and watch the video: <https://www.gatesnotes.com/Health/Heroes-in-the-field-Drs-Quarraisha-and-Salim-Abdool-Karim>

Enriching the public discourse on the role of science in society

Science for Social Justice was the topic of Professors Salim and Quarraisha Abdool Karim's joint lecture at the opening of the 2020 Science Forum South Africa hosted by the South African department of science and technology, the Council for Scientific and Industrial Research (CSIR), the Human Sciences Research Council of South Africa (HSRC) and European South African Science and Technology Advancement Programme (ESASTAP held on 10th December.

Several sessions were presented by the European Commission's Joint Research Centre and the Africa-Europe Innovation Partnership.



(L-R): Prof Salim Abdool Karim, Amb Francisco

Also, at the opening session the Chilean ambassador to South Africa, HE Francisco Berguño presented the Abdool Karims with the commemorative '500 years of Magellan Award' from the government of Chile for their research in HIV prevention and treatment. According to ambassador Berguño, Chile commemorates this date through the recognition of innovators who, through

their research or actions, have contributed to providing solutions to global needs. "This initiative also seeks to recognise innovation and entrepreneurship, with the aim of building a better world together, as well as bringing Chile closer to the field of international interest and thus strengthening ties of collaboration," Berguño said.

TB expert receives an NRF B rating



CAPRISA congratulates Professor Nesri Padayatchi, CAPRISA's Deputy Director on being awarded a B-rating by the National Research Foundation (NRF), made to researchers who enjoy 'considerable international recognition by their peers for the high quality and impact of their recent research outputs'.

Padayatchi has more than three decades of clinical and research experience in the management of TB and related diseases. She is an independent scientist with expertise in Public Health and Epidemiology focusing on TB/HIV co-infection in South Africa.

She serves on several international advisory bodies including the International Union Against TB and Lung Diseases Ethics Advisory Group, the Indian Council for Medical Research' TB Research Consortium and the Independent Data Monitoring Committee of the British MRC.



Antibody isotype switching as a mechanism to counter HIV neutralization escape



Congratulations to Dr Cathrine Scheepers of the NICD for her publication in *Cell Reports* which shows that antibody isotype switching provides a previously un-

described mechanism to counter HIV neutralization escape.

Neutralizing antibodies (nAbs) to highly variable viral pathogens show remarkable diversification during infection, resulting in an “arms race” between virus and host. Studies of nAb lineages have shown how somatic hypermutation (SHM) in immunoglobulin variable regions enables maturing antibodies to neutralize emerging viral escape variants. However, the immunoglobulin constant region (which determines isotype) can also influence epitope recognition.

In this study, Scheepers used longitudinal deep sequencing of an HIV-directed nAb lineage, CAP88-CH06,

and identified several co-circulating isotypes (IgG3, IgG1, IgA1, IgG2 and IgA2), some of which shared identical variable regions. Firstly, she showed that IgG3 and IgA1 isotypes were better able to neutralize longitudinal autologous viruses and epitope mutants than IgG1. Secondly, detrimental class switch recombination (CSR) events that resulted in reduced neutralization could be rescued by further CSR, which we termed “switch redemption”. Thus, CSR represents an additional, and previously undescribed immunological mechanism to counter viral escape from HIV-specific antibody responses.

CAPRISA joins communities against GBV

CAPRISA participated in a gender-based violence (GBV) event hosted by a community activist forum based in Umngeni Municipality, held at the Mpophomeni Community Centre on 4th of December during the annual campaign, 16 Days of Activism against GBV, which takes place globally. Representatives from the Department of Social Development, the South African Police Service & the Centre of Community & Justice also participated in this community-awareness event.

Dr Hilton Humphries, Scientist at CAPRISA, delivered the opening address and presented a grim overview of the global and local statistics and impact of GBV. Humphries said that ‘communities actively engaged in discussions and expressed concern that increasing numbers of women and girls are subject to violent attacks, often by their partners daily and called for immediate scaling up of prevention measures.’ A National Action Plan to End Gender Violence and Femicide is in place in the country.



Dr Hilton Humphries presents on overview of GBV to the Vulindlela community.

The Sunday Times bestows a special honorary award for leadership



A special honorary award was bestowed for the first time in the history of the *Sunday*

Times Top 100 Companies, to Professor Salim Abdool Karim at a virtual awards ceremony held on 12th November, in recognition of his commitment in guiding South African leadership in the fight against the COVID-19 pandemic.

The *Sunday Times* Top 100 Companies Awards is one of the most prestigious and highly anticipated events on the South African

business calendar, where leaders of industry, our economic giants are honoured. Abdool Karim was recognised for ‘his ability to translate complex science into easily understandable language resonated with a nation in a high state of anxiety in the early days of the lockdown and he quickly become a popular – and even more importantly – a trusted and credible figure’.



CAPRISA participates in global COVID-19 vaccine trials



Dr Nigel Garrett, Nurse Mpume Khoza, Study Coordinator Bongizi Zuma and Counsellor Thembelani Nyathi conducting COVID-19 outreach work in Durban

In partnership with the COVID-19 Prevention Network (CoVPN) and in collaboration with pharmaceutical companies CAPRISA is contributing to operation Warp Speed towards a COVID-19 vaccine. CAPRISA is among the many African research groups contributing to global COVID-19 vaccine development and testing.

Under the leadership of Principal Investigators Dr Nivashnee Naicker and Dr Disebo Makhaza, study teams at CAPRISA's eThekweni and Vulindlela Clinical Research Sites enrolled more than 150 participants into the Janssen 'Ensemble' phase 3 trial. Prof Daya Moodley's team at the Umlazi CRS enrolled more than 250 participants into the Novavax phase 2 trial.

Additional trials with the CoVPN and Sanofi-Pasteur, and with Merck are due to start at CAPRISA in early 2021. 'It is vital for South Africa to be part of the COVID-19 vaccine effort, which will raise awareness among its people and policy makers, and may therefore help to accelerate the rollout of a potential candidate vaccine to help control the pandemic,' says Dr Nigel Garrett, Head of HIV Pathogenesis and Vaccine Research at CAPRISA.

NICD HIV Virology Section Pivots Towards SARS-CoV2 assays

The NICD HIV Virology Section have rapidly redirected their expertise in defining HIV humoral responses to SARS-CoV-2. This is providing insights into immune correlates of recovery and protection from COVID-19 in South Africa.

In March, working with Dr Florian Krammer (Icahn School of Medicine), Dr Thandeka Moyo, Frances Ayres and Thandeka Molaudzi expressed spike and RBD proteins and established serology assays to quantify binding responses in SARS-CoV-2 infected and convalescent patients. These proteins have been shared with several labs across South Africa.

The existing HIV-based neutralization assay was rapidly modified to measure SARS-CoV-2 neutralizing antibodies by Tandile Modise

and Prudence Kgagudi, with molecular support from Dr Bronwen Lambson and Brent Oosthuysen. Cells expressing ACE-2 were provided by Dr Michael Farzan (The Scripps Research Institute) and the assay optimised in collaboration with collaborators Drs David Montefiori (Duke University) and Nicole Doria-Rose (Vaccine Research Centre - US). The SARS-CoV-2 neutralization assays are being used to determine the titers, kinetics and durability of nAb responses to SARS-CoV-2 in convalescent cohorts and the ChAdOx vaccine trial.

Dr Simone Richardson, Nelia Manamela and Boitumelo Motsoeneng have established a suite of assays to measure SARS-CoV-2 Fc effector functions in longitudinal convalescent cohorts. These assays include complement deposition and antibody dependent cellu-



Dr Penny Moore, Acting Head Virology Section, NICD

lar cytotoxicity, phagocytosis and trogocytosis.

More recently, in studies led by Dr Nono Mkhize, the lab has started to perform single B cell sorts from convalescent SARS-CoV-2 donors. This work is funded by an MRC grant to Prof Penny Moore .



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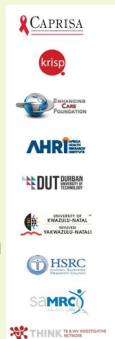
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KZN Covid-19 Research Consortium holds inaugural conference

The inaugural virtual conference of the KZN Covid-19 Research Consortium provided a unique platform for over 50 leading researchers and clinicians to collaborate on their Covid-19 research. Over three days from 30th November to 2nd December, 24 presentations on clinical and basic science Covid-19 research were made by researchers in KwaZulu-Natal. CAPRISA's Professor Salim Abdool Karim delivered the first plenary on: Covid-19 vaccine results:

What do they mean for South Africa? "The KZN Covid-19 conference provided an excellent platform for academics and researchers to help advance understanding on the clinical, biologic and psychosocial impact of Covid-19 on health and health systems, especially among vulnerable TB and HIV infected individuals," said Professor Kogie Naidoo, Head of HIV-TB treatment research at CAPRISA.




 CAPRISA hosts a DST-NRF Centre of Excellence in HIV Prevention
 
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