



CAPRISA

CENTRE FOR THE AIDS PROGRAMME OF RESEARCH IN SOUTH AFRICA

Newsletter

Nov/Dec 2018 Volume 17 Issue 11

CAPRISA researchers & research associates among world's most Highly Cited Researchers

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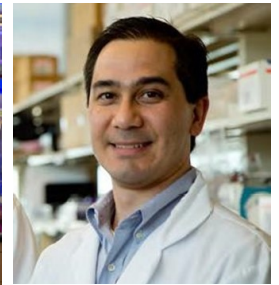
Our feature story for the final newsletter for 2018 focuses on the CAPRISA researchers who feature in the list of the world's most highly cited researchers published by the Web of Science's Clarivate Analytics.

On page 2 we report on the 9th annual HIV Prevention workshop co-hosted by the Ragon Institute, CAPRISA, AHRI and HPP in the Drakensberg, South Africa.

We feature the Al Sumait award presented to Salim Abdool Karim by the Kuwait Foundation for the Advancement of Science and spotlight Quarraisha Abdool Karim's contribution to the documentary, *The Last Mile* on page 3.

On page 4 we report on the preparations for the NIH-funded CONTEXT study and congratulate our scientists on receiving the prestigious TWAS prizes.

For this final issue we include a special feature capturing highlights at CAPRISA during 2018 on pages 5&6.



Professors Salim Abdool Karim, Lynn Morris, Bruce Walker and Dan Barouch are in the list of the world's most highly cited researchers published this week by the Web of Science's Clarivate Analytics. The list includes 6,078 scientists – 4,058 scientists for outstanding contributions in one of 21 fields of the sciences and social sciences while 2,020 scientists for having exceptional performance across multiple fields.

Only 10 South African scientists (primary affiliation in South Africa) are on the list. By university affiliation, there are 3 scientists from the University of Cape Town (UCT), 2 in each of University of Stellenbosch (US), University of Pretoria (UP) and University of the Witwatersrand (Wits) and 1 from the University of KwaZulu-Natal (UKZN).

This year's list includes 17 Nobel laureates, including two of this year's prize winners. More than 40%

(n=2,639) of the 2018 Highly Cited Researchers are from the United States. The second ranked country is the United Kingdom with 546 (9.0%) of the listed researchers, followed by China with 482 (7.9%) of the researchers.

Clarivate Analytics, which is part of the Web of Science, produced this 2018 annual list of the world's most influential researchers by citations in the sciences and social sciences. Researchers are included in this list based on their exceptional research performance, determined by production of multiple highly cited papers that rank in the top 1% by citations for field and year in Web of Science for the period 2006 to 2016. An alternate criterion for selection is a citation count to highly cited papers that ranks a researcher in the top 1% by citations in a field of research for the period 2006-2016.

For more details and to access the full list see: <https://hcr.clarivate.com/#>

CONTACT DETAILS

CAPRISA
Doris Duke Medical
Research Institute (DDMRI)
2nd Floor
University of KwaZulu-Natal
Private Bag X7, Congella 4013
South Africa

T: +27-31-260 4555
F: +27-31-260 4566

E-mail: caprisa@caprisa.org

www.caprisa.org.za

Caprisaofficial

@CAPRISAofficial



9th HIV Prevention Workshop hosted by CAPRISA, Ragon Institute, AHRI & HPP



Senior and young investigators from across the globe attended the 9th annual HIV prevention workshop, hosted by CAPRISA, the Ragon Institute, AHRI and HPP, held in the tranquility of the Drakensberg at the Cathedral Peak hotel, on the 12-16th November. The meeting focused on broadly neutralizing antibodies (bNABs) and vaccine research as the field moves towards longer term immune based prevention strategies.

The meeting kicked off with a discussion on achieving the UNAIDS goal of 90-90-90, to achieve epidemic control. This session included discussion around the need to improve ART access to males to prevent HIV transmission to young females (Quarraisha Abdool Karim), to better implement test and treat strategies (Mark Siedner), the epidemiological pathways of HIV transmission (Frank Tanser), and some enlightening and worrying findings about the lack of uptake of ART in young women, even though they understood the risks of HIV (Krista Dong).

The other three sessions of the day focussed on host and epigenetics, strategies and models of HIV vaccine and cure research, and tissue-specific HIV infection and the role this plays in prevention and cure strategies.

Notable talks included how epigenetics can be used to determine the regulation of mucosal immunity (Paul McLaren) and how transcriptomics can be used to assess risk of HIV acquisition (Lyle Mckinnon), how CD8⁺ T cells can migrate against blood flow to perform antiviral activity (Uli Von Andrian), and how gut CD4⁺ T cells are irreversibly depleted (Hendrik Kløverpris). Tom Hope delivered a visually stimulating talk on how antibodies and viruses are

distributed in the body using a macaque model and ground-breaking microscopy techniques.

The sessions on bNABs and vaccines focussed on antibody structure and the impact on vaccine design; how to target HIV reservoirs as well as HIV eradication and cure.

Notable talks included the importance of priming during vaccine trials to elicit bNABs (Bill Schief); the conformational changes of HIV envelope during receptor or antibody binding (Pamela Bjorkman); the central nervous system (Alex Sigal) and lymph nodes (Zaza Ndhlovu) as reservoir sites and their role in viral evolution and escape during ART; and the role of viral evolution and diversity in latency establishment (Melissa-Rose Abrahams, Kavitha Reddy, Kamini Gounder and Jaclyn Mann), and bNAB development (Bongiwe Ndlovu).

The final session focused on future HIV prevention strategies. Talks included the use of bNABs as PrEP and the use of innate stimulants for the reversion and eradication of HIV latency (Dan Barouch); the potential use of monkey bNABs in passive immunisation and the benefits of the primate models (Mario Roederer); the modification of bNABs for improved efficacy (Lucio Gama); and the hurdles faced with the use of bNABs (Mohammad Sajadi).

Delegates were treated to a welcome respite from the scientific discussions with an amazing array of activities that included a guided hike, a guided quad bike tour, a zip line canopy tour, and a helicopter ride to Cathedral Peak. Delegates left the meeting inspired by novel ideas.

- Ross Cromarty



CAPRISA Director awarded prestigious Kuwait prize for his research contributions

Professor Salim Abdool Karim Director of CAPRISA, was awarded the prestigious Al-Sumait Prize, \$500,000 and a gold medal, for research contributions to African Development by the Amir of Kuwait at a special event held in Kuwait on 5 December. The Al-Sumait prize “recognizes the best studies, scientific projects, applied research, and innovative initiatives that have a significant impact and lasting influence on advancing progress to economic and social development in Africa”.

The award was established by His Highness Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah, the Amir of the State of Kuwait in 2013 and is named after the late Dr Abdulrahman Al-Sumait, a Kuwaiti medical doctor who dedicated his life to raising funds to support humanitarian and charity work for health, education and food projects for the less fortunate in African Nations. The Kuwait Foundation for the Advancement of Sciences (KFAS) and a Board of Trustees oversee the prize.

Professor *Françoise Barré-Sinoussi*, Chair of CAPRISA’s Scientific Advisory Board congratulated him on receiving this award, saying “this is a well-deserved recognition for Professor Abdool Karim for his excellent research that has made a major impact on the HIV epidemic in Africa”.

Abdool Karim said he was honoured and humbled to be a recipient of this prize. “It is really a recognition for the hundreds of scientists who have toiled many hours in their laboratories, clinics and communities in undertaking studies with me over the last 30 years. I am deeply thankful to the thousands of individuals who have participated in these studies – none of this could have been achieved without their dedication and commitment”.

Dr Adnan Shihab-Eldin, Director General of the KFAS, which administers the prize told the audience that this years Laureates had been working tirelessly to improve life expectancy and quality of life for millions of people living on the con-



Professor Salim S. Abdool Karim receiving the 2018 Al-Sumait Prize from the Amir of Kuwait, His Highness Sheikh Sabah Al-Ahmed Al-Jaber Al-Sabah, and the Director-General of the Kuwait Foundation for the Advancement of Science (KFAS), Dr Adnan A. Shihab Eldin.

continent of Africa and beyond and their dedication and determination was truly inspiring”.

‘The Last Mile’ – documentary featuring Quarraisha Abdool Karim, Denzel Washington & Tom Hanks



Prof Quarraisha Abdool Karim with Ms Kim Snyder director of the Last Mile during the recording in Durban.

is one of the interviewees, reflecting on the devastation of the epidemic particularly in Africa and the significant gains made thirty years on. Her message is clear: there is no time for complacency as new HIV infections continue to spread at unacceptable levels. Abdool Karim is the UN-AIDS Special Ambassador for Adolescents and HIV.

The 25-minute documentary, released by Coca Cola and RED, features interviews with *Philadelphia* cast members Tom Hanks, Denzel Washington and Mary Steenburgen, and screenwriter Ron Nyswaner, who reflect on the making of the film and how it helped shift societal perceptions about HIV/AIDS from fear to compassion.

The Last Mile was released in Toronto on November 30 on the eve of World AIDS Day 2018 (themed: Know your status), is available globally on streaming platforms including Amazon, iTunes, YouTube and Facebook. *Philadelphia* will be re-released in theatres in select cities together with *The Last Mile* marking the iconic film’s 25th anniversary.

The *Last Mile*, can be viewed on YouTube at: <https://www.youtube.com/watch?v=sAt33Q9gAsQ>

A recently produced short documentary, *The Last Mile*, highlights the progress made in the fight against HIV/AIDS since the release of the movie *Philadelphia* in 1993. CAPRISA’s Quarraisha Abdool Karim



NIH site visit in preparation for the CONTEXT study



Linda McNeil of FHI360 conducted a site visit at CAPRISA on 3 and 4 December in preparation for the CONTEXT study. This study, which is funded by the National Institutes of Health (NIH), is a collaboration between Emory University and CAPRISA and is led by Emory’s Dr Neel Gandhi and Dr Koleka Mlisana at the

National Health Laboratory Services as the principal investigators together with Drs Kogie Naidoo (CAPRISA Head: TB and HIV Treatment) and Nesri Padayatchi (Deputy Director, CAPRISA) as co-investigators. The study is scheduled to start in January 2019 and aims to determine the role of casual contact and migration in the XDR

transmission in South Africa: a geospatial, genomic and social network study (CONTEXT) - thereby establishing the proportion of XDR TB transmission that occurs through casual contact, and identify locations where transmission occurs using genomic, social network, and geospatial analyses.

2018 TWAS awards presented to scientists



We congratulate Professor Lynn Morris, CAPRISA honorary senior scientist, (centre), Dr Barbara Burmen, senior research officer at the Kenya Medical Research Institute (right) and Associate Professor Sedaminou Gbenoudon at the Université d’Abomey-Calavi,

Abomey-Calavi, Benin (L), who were awarded prizes for research excellence from The World Academy of Sciences (TWAS) on 27 November at the TWAS 14th general conference held in Trieste, Italy.

Morris received the prestigious TWAS 2018 Prize in Medical Sciences for her “pioneering studies on the neutralising antibody response to HIV infection that has provided fundamental insights for HIV vaccine development”. She is the interim Executive Director at the National Institute of Communicable Diseases (NICD) and Research Professor at the University of Witwatersrand.

The TWAS-Abdool Karim Prize in Biological Sciences were awarded to Burmen for her “innovations in the clinical practice, policy and research mentorship, focussed on HIV and tuberculosis”, and to Gbenoudon for her “particular devotion to research in the field of immunobiology and for results that change the perception of severe malaria disease”. This prize is sponsored by Salim & Quarraisha Abdool Karim.



A review of CAPRISA highlights from 2018

New scientific discoveries & findings

Total papers: **103**; IF>5: **40%** CAPRISA 1st author: **38%**



Elevated *HLA-A* expression impairs HIV control through inhibition of NKG2A-expressing cells

Veron Ramsuran,^{1,2,3,4,5,6,7} Vivek Naranbhai,^{1,2,3,4,5,6,7} Amir Horowitz,⁸ Ying Qi,⁹ Maureen P. Martin,¹⁰ Yoko Yuki,¹¹ Xiaoliang Gao,¹² Victoria Walker-Sperling,¹³ Gregory Q. Del Prete,¹⁴ Douglas K. Schneider,¹⁵ Jeffrey D. Lifson,¹⁶ Jacques Fellay,¹⁷ Steven G. Deeks,¹⁸ Jeffrey N. Martin,¹⁹ James A. Goulder,²⁰ Steven M. Wainberg,²¹ Nelson L. Michael,²² Gregory D. Kirk,²³ Susan Buchbinder,^{24,25,26} David Haas,²⁷ Thuahli Ndong'u,^{28,29,30,31} Philip Goulder,^{32,33} Peter Farham,³⁴ Bruce D. Walker,^{35,36,37} Jonathan M. Carlson,³⁸ Mary Carrington^{39,40}

Research led by Drs Veron Ramsuran and Vivek Naranbhai sheds new light on how specific human genes can lead to the faster progression of AIDS-related illness in people living with HIV who are not on treatment.



Integrin $\alpha 4 \beta 7$ expression on peripheral blood CD4⁺ T cells predicts HIV acquisition and disease progression outcomes

Aida Sivo^{1,2}, Alexandra Schweg^{3,4}, David Sheward⁵, Vincent Jung⁶, Sergey Trgovac⁷, Lenine J. Liebenberg^{8,9}, Noniashila Yendo-Zuma¹⁰, Andrew Bhatia¹¹, Ruth S. Meade¹², Philippe Schuster¹³, Nigel Cassell¹⁴, Ntshona Ramonoso¹⁵, Aidaa Engidagbe¹⁶, Fatima Nwasa¹⁷, Claudia Cissita¹⁸, James Arthur¹⁹, Anthony S. Faust²⁰, Aggrey Oloo Acaah²¹, Joshua Kinosh²², Bernard S. Bajaga²³, Muth Kinosh²⁴, Carolyn Williamson²⁵, Rupert Kauf^{26,27}, Jo Ann S. Passmore^{28,29}, Mitya Phamphak³⁰, Jintana Anonwattana^{31,32}, Aida Sivo³³, Quarraisha Abdool Karim³⁴, Saim S. Abdool Karim³⁵, Lyle R. McKinnon^{36,37}, on behalf of the CAPRISA004 and RV254 study groups

Research led by Drs Aida Sivo and Lyle McKinnon show that pre-HIV infection levels of $\alpha 4 \beta 7$ expression on peripheral blood CD4⁺ T-cells was associated with an increase in rates of HIV acquisition in women from the CAPRISA 004 trial of tenofovir gel.



Genital inflammation undermines the effectiveness of tenofovir gel in preventing HIV acquisition in women

Lyle R. McKinnon^{1-3,4}, Lenine J. Liebenberg^{1,5,6}, Noniashila Yendo-Zuma⁷, Deresero Arushay^{8,9}, Sinaye Ngcapu¹⁰, Aida Sivo¹¹, Nico Nagelkerke¹², Jose Gerardo Garcia Lerra¹³, Angela D Kaahaba¹⁴, Lindi Masson¹⁵, Leila E Mansoor¹⁶, Quarraisha Abdool Karim¹⁷, Saim S Abdool Karim¹⁷ & Jo-Ann S Passmore^{18,19}

Research led by Drs Lenine Liebenberg and Lyle McKinnon show that Genital inflammation increased the risk of HIV acquisition 2.4 fold



Community-based HIV prevalence in KwaZulu-Natal, South Africa: results of a cross-sectional household survey

Ayesha M Kharsany, Cherie Cassard, David Mkhangale, Lene Lewis, Anwar Goolbsy, Ashraf Pooni, Kgomotso Gwede, Gavin George, Sean Beckett, Ntshona Ramonoso, Saneliswa Mbizima, Carole Tobetsi, Zivahle Chipato, Mandy Gwede, Tse Momo, Quarraisha Abdool Karim

Research led by Dr Ayesha Kharsany showed that HIV prevalence in a community survey in 9,812 men and women from uM-gungundlovu district, KwaZulu-Natal was 36% overall and was significantly higher in women than men (44% vs 28, p<0.001)



Awards and accolades



Quarraisha Abdool Karim appointed UKZN Pro Vice-Chancellor (African Health) and received the 2018 Ward Cates Spirit award



Nesri Padayatchi (left), Penny Moore (middle) and Bavesh Kana (right) individually received the 2018 South African Medical Research Council Scientific Merit award (Silver)

Lynn Morris appointed acting head of the National Institute for Communicable Diseases in Johannesburg and is the 2018 recipient of the TWAS Prize in Medical Science



Kumeren Govender, a research placement at CAPRISA, received a Rhodes Scholarship to complete a PhD at Oxford University in the UK

Jienchi Dorward awarded a Wellcome Trust Clinical PhD Fellowship to complete a DPhil at Oxford University in the UK





Media and advocacy



CAPRISA was a co-organiser of the 2018 March for Science that was held in Durban and attracted over 1000 participants

THE WALL STREET JOURNAL Slowdown in HIV/AIDS Progress Puts Focus on Young Women

In sub-Saharan Africa, infection rates are high, triggering warnings

BY BETSY MCKAY

VULINDELELA, South Africa—Public-health leaders in the fight against HIV/AIDS have come to an ominous realization: Progress in cutting new infections has slowed, in part because of a persistent cycle of transmission among young women in sub-Saharan Africa.

New HIV infections have been reduced around

Dr. Quarraisha Abdool Karim saw the first signs of the transmission cycle in 1989 when she conducted a study in KwaZulu-Natal that found HIV to be 3.2 times more common in women than in men. She also found that women were infected at younger ages than men. "It was very clear when you looked at the prevalence data that young boys were not infecting" the girls their own age, but rather older men were, she said.

HIV in South African women profiled in front page article of *The Wall Street Journal* and in *The Atlantic*



Olga Khazan Mar 22, 2018

VULINDELELA, South Africa—Mbali N. was just 17 when a well-dressed man in his 30s spotted her. She was at a mall in a nearby town, alone, when he called out. He might have been captivated by her almond eyes and soaring cheekbones. Or he might have just seen her for what she was: young and poor.

Impacting policy development and South Africa's scientific stature

THE LANCET HIV

Transmission networks and risk of HIV infection in KwaZulu-Natal, South Africa: a community-wide phylogenetic study

Tulio de Oliveira*, Ayesha B M Kharsany*, Tiago Graf, Cherie Cawood, David Khanyile, Anneke Grobler, Adrian Puren, Savathree Madurai, Cheryl Baxter, Quarraisha Abdool Karim, Salim S Abdool Karim

Lancet HIV paper showing the cycle of transmission shapes the global & local HIV response

Get on the Fast-Track

The life-cycle approach to HIV

LET OUR ACTIONS COUNT

SOUTH AFRICA'S NATIONAL STRATEGIC PLAN ON HIV, TB and STIs 2017-2022

EDITORIAL

HIV—no time for complacency

Today, the global HIV epidemic is widely viewed as triumph over tragedy. This stands in stark contrast to the first two decades of the epidemic, when AIDS was synonymous with suffering and death. But have we turned the tide on HIV sufficiently to warrant directing its attention and investments elsewhere?

Highly effective treatment, through an array of about 30 new antiretroviral drugs, has given people living with HIV an almost normal life span and instilled hope in high-burden communities. Activism played a key role in ensuring global access to treatment. Simplified, low-cost, one-pill-a-day, three-drug combination regimens with minimal side effects are now widely available. The road to fighting HIV is long, but the path is clear.

and discrimination that adversely affects their quality of life and undermines their human rights.

An even bigger challenge looms large: how to slow the spread of HIV. The steady decline in the number of new infections each year since the mid-1990s has almost stalled, with little change in the past 5 years. HIV continues to spread at unacceptable levels in several countries, especially in marginalized groups, such as men who have sex with men, sex workers, people who inject drugs, and transgender individuals. Of particular concern is the state of the HIV epidemic in sub-Saharan Africa, where young women aged 15 to 24 years have the highest rates of new infections globally. Their sociobehavioral and biological risks—including age-disparate sexual relations and inconsistent condom use—continue to fuel the epidemic.

Quarraisha Abdool Karim (TOP) and Salim S. Abdool Karim (BOTTOM) are professors

Science

World Health Organization

Guidance on ethical considerations in planning and reviewing research studies on sexual and reproductive health in adolescents

Jerome Singh
principal author of the WHO guidelines



Scientific papers published in 2018

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83 **Naidoo K, Dookie N, Naidoo K, Yende-Zuma N, Chimukangara B, Bhushan A, Govender D, Gengiah S, Padayatchi N**. Recurrent tuberculosis among HIV-coinfected patients: a case series from KwaZulu-Natal. *Infection and Drug Resistance* 2018; 11:1413-1421

84 Perciani CT, Sekhon M, Hundal S, Farah B, Ostrowski MA, Anzala AO, **McKinnon LR**, Walter J, MacDonald KS. Live Attenuated Zoster Vaccine Boosts Varicella Zoster Virus (VZV)-Specific Humoral Responses Systemically and at the Cervicovaginal Mucosa of Kenyan VZV-Seropositive Women. *J Infect Dis* 2018; 218(8):1210-1218.

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89 **Ramsuran V**, Ewy R, Nguyen H, Kulkarni S. Variation in the untranslated genome and susceptibility to infections. *Frontiers in Immunology*. 2018; 9: 2046.

Senior scientist receives CAPRISA Achievement Award for excellence



Professor Ayesha Kharsany, senior scientist at CAPRISA received the CAPRISA Achievement award for her study on the HIV incidence in Vulindlela that received recognition and praise from the CAPRISA Scientific Advisory board.

Kharsany's data and execution of the study was highly commended. Dr Nesri Padayatchi deputy director at CAPRISA presented the award to Kharsany.



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



UNAIDS
CAPRISA is the UNAIDS Collaborating Centre for HIV Research and Policy



CAPRISA hosts a MRC HIV-TB Pathogenesis and Treatment Research Unit

CAPRISA hosts a DoH-MRC Special Initiative for HIV Prevention Technology



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