



CAPRISA

CENTRE FOR THE AIDS PROGRAMME OF RESEARCH IN SOUTH AFRICA

Newsletter

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The 2018 March for Science in Durban attracts huge support from scientists and students

In this Issue

Our feature this month is the 2018 March for Science that was held in Durban and was convened by Prof Quarraisha Abdool Karim.

On page 2 we report on research by PhD student Simone Richardson that investigated the HIV-specific Fc effector function early in infection and its relationship with the development of broadly neutralizing antibodies.

The acquisition of the Pac Bio Sequel system - a first in Africa - by the NICD as well as CAPRISA's participation at the adherence conference in Russia and Zimbabwe is highlighted on page 3.

On page 4 we celebrate the graduation of CAPRISA Fellows and Staff and share a few memories from the March for Science.

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Leading the March for Science in Durban (L-R): Mr Musa Mthembu, Mr Nithia Mudurai, Mr Ravi Pillay, Prof Salim Abdool Karim, Dr Pete Zacharias, Prof Deresh Ramjugernath, Prof Mala Singh, Prof Glenda Gray, Prof Sabiha Essack, Dr Koleka Mlisana and Prof Quarraisha Abdool Karim

The second annual March for Science in Durban held on 14 April 2018 saw an impressive turnout by students, scientists, civil society and government officials participating and making their voices heard in support of science, innovation and use of evidence to improve lives. The march attracted over 1000 participants, a four-fold increase in numbers compared to the inaugural march held in 2017.

The Durban chapter of the March for Science was a partnership of six organisations: the University of KwaZulu-Natal (UKZN); the South African Medical Research Council (SAMRC); the South African Medical Students Association (SAMSA); the University of KwaZulu-Natal Medical Students Representative Council (MSRC), the Centre for the AIDS Programme of Research of South Africa (CAPRISA); and Global Laboratories.

Convenor of the march and associate Scientific director of CAPRISA, Professor Quarraisha Abdool Karim said she was inspired and pleased with the

large number of students from all disciplines at the UKZN who participated in the March and extended special thanks to those who played a leadership role in organising the march.

Last year, Abdool Karim led the inaugural global march for science in Durban that generated widespread interest as evidenced by the increased presence of members of the public joining the march. Of note was the increase in numbers of families especially those with young children who joined the march. UKZN's Dr Tanya Reinhardt had both young and old enthralled by her experiments and "magic" and parents had a hard time getting their children to head back home.

Several speakers called for increased local investments in science. Speakers included: Professor Salim Abdool Karim Director CAPRISA; Mr Ravi Pillay MEC for Human Settlements, KwaZulu-Natal; Dr Koleka Mlisana, Head of the Department of Microbiology at UKZN;

...continued on page 2



The 2018 Durban March for Science...

...(from page 1)

Prof Glenda Gray President, SAMRC; Mr Nithia Madurai CEO, Global Laboratories; Councillor Khumalo from the Mayor's Office at the eThekweni Municipality; Mr Musa Mthembu President of the SAMSA; Mr Ahmed Raja President of the MSRC and Dr Bonginkosi Mfuzo.

"Scientists in South Africa have made a profound contribution to advance science and to undertake scientific discoveries that are world class. The Durban March for Science is testament of our commitment to high impact science and research," said Dr Albert van Jaarsveld, Vice-Chancellor of UKZN. Professor Glenda Gray said that countries like "South Africa need to see the value of investing in science." "Medical research has translated into lives saved and an increase in life expectancy in South Africa, showing the value of science in health," said Professor Gray. "I stand for the March for Science because I strongly believe that science is a gift to humanity," said Musa Mthembu, President of SAMSA. "It knows no country, no race, gender or age, because knowledge belongs to humanity and it is the torch that illuminates the world."

Abdool Karim said she hoped that the march in Durban would catalyse new chapters across the African continent and in other cities in South Africa and looks forward to even greater participation of the public, students, decision makers and academics in 2019.

....continued on page 4

HIV-specific Fc effector function early in infection predicts broadly neutralizing antibody development

A study by Simone Richardson (right), a PhD student at the National Institutes for Communicable Diseases (NICD) was recently published in *PLoS Pathogens* entitled "HIV-specific Fc effector function early in infection predicts the development of broadly neutralizing antibodies". Simone is supervised by Professor Lynn Morris, CAPRISA Research Associate and Dr Nono Mkhize, a senior scientist at NICD.



While the induction of broadly neutralizing antibodies (bNABs) is a major goal of HIV vaccination strategies, there is mounting evidence to suggest that antibodies with Fc effector function also contribute to protection against HIV infection. This study showed that HIV-infected individuals from the CAPRISA cohort who show a diversified and potent Fc response early in infection were more likely to develop bNABs later on. In addition, antibodies from individuals with bNABs showed more IgG subclass diversity to multiple HIV antigens, which also correlated with Fc polyfunctionality. Germinal center activity represented by CXCL13 levels and expression of activation-induced cytidine deaminase (AID) was found to be associated with neutralization breadth, Fc polyfunctionality and IgG subclass diversity. This provides evidence for a common mechanistic link between the regulation of the Fc and Fab mediated activities in these individuals (Figure).

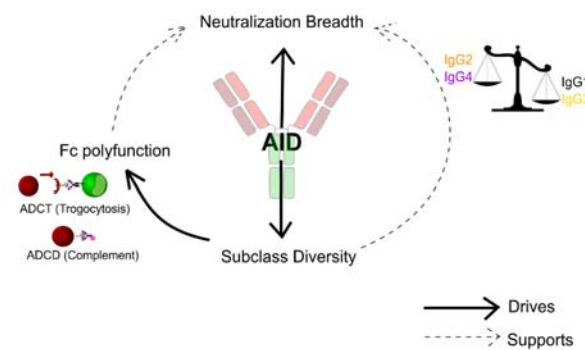


Figure: Early Fc effector function can predict the development of broadly neutralizing antibodies

"Simone has done ground-breaking work. She is one of the few people who has examined both ends of the antibody molecule. Most people study one end or the other!" said Prof Morris. "Her finding that an Fc effector function profile that arises early and predicts neutralization breadth could have important implications for the testing of vaccine candidates designed to generate neutralizing antibodies", she added.

For further reading see:

<http://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1006987>



NICD unveils state-of-the art PacBio Sequel system - the first on the African continent



Prof Penny Moore CAPRISA Research Associate, Dr Arshad Ismail Head of the NICD Sequencing Core Facility, Dr Mushal Ali, Bioinformatics Scientist (NICD) and Dr Carol Crowther, Project Manager (NICD) with the newly installed PacBio Sequel.

The National Institute for Communicable Diseases (NICD) recently acquired a state-of-the art PacBio Sequel system, the first on the African Continent. The PacBio was funded through NRF grant awarded to CAPRISA Research Associate Prof Penny Moore, and Dr Arshad Ismail, head of the NICD Sequencing Core, as part of the NRF Research Infrastructure Support Programme. The PacBio Sequel System is based on Single Molecule, Real-Time (SMRT) Sequencing technology. Sequel SMRT cells contain 1 million zero-mode waveguides, and have average read length of over 10,000 base pairs, producing 10 Gb per cell.

“Through an MRC Strategic Health Innovation Partnerships (SHIP) funded project, and working closely with Prof Carolyn Williamson’s lab at UCT, this platform will provide NICD with a powerful platform for full envelope deep sequencing in CAPRISA donors who developed broadly neutralizing antibodies, “explained Moore. “This will allow a much deeper understanding of how viral evolution shapes these antibodies.” Moore said that PacBio will also be “invaluable for understanding breakthrough infections in passive antibody trials, including the ongoing AMP trial, and the CAP256-VRC26.25 CAPRISA 012 trial which will soon begin.”

Representing CAPRISA at international Conferences in Russia and Zimbabwe



Professors Salim and Quarraisha Abdool Karim were invited to participate in the VI Eastern Europe and Central Asia AIDS Conference (EECAAC) held in Moscow, Russia over three days, 18 – 20 April.



Nurses Siphesihle Gumede, Nondumiso Mthembu and Research Clinician Jienchi Dorward were invited to attend and chair a session at the Harare Adherence to HIV Prevention and Treatment Conference hosted by the University of Zimbabwe College of Health Sciences Clinical Trial Unit on 26th and 27th April.



CAPRISA Fellows and staff graduate

We congratulate six CAPRISA Fellows and three members of staff who recently graduated at the University of KwaZulu-Natal and the University of South Africa's graduation ceremonies held in April. The Fellows received support from the DST-NRF Centre of Excellence in HIV Prevention. The following Fellows successfully completed their degrees: Olayide Arodola (PhD);

Nireshni Mitchev (MMedSci); Usangiphile (Sah) Buthelezi (MMedSci); Janine Jewanraj (MMedSci); Samukelisiwe Ngcobo (MMedSci) and Kimone Fisher (MMedSci). The staff members are: Bhavna Maharaj (Master of Pharmacy, Pharmacy Practice); Jennifer David (BA Hons Psych) and Hlengiwe Shozi (BA HSSS).



Olayide Arodola



Nireshni Mitchev



Sah Buthelezi



Janine Jewanraj



Samukelisiwe Ngcobo



Bhavna Maharaj



Jennifer David



Hlengiwe Shozi



Kimone Fisher

Photos from the March for Science



Top left: Marchers assembling outside of the Durban City Hall, top right: Dr Tanya Reinhardt captivating both young and old with her chemistry experiments; bottom right: Marchers making their way from the Durban City Hall to Gugu Dlamini Park.





Scientific papers published in 2018

- Flynn PM, Taha TE, Cababasay M, Fowler MG, Mofenson LM, Owor M, Fiscus S, Stranix-Chibanda L, Coutsooudis A, Gnanashanmugam D, Chakhtoura N, McCarthy K, Mukuzunga C, Makanani B, **Moodley D**, Nematadzira T, Kusakara B, Patil S, Vhembo T, Bobat R, Mmbaga BT, Masenya M, Nyati M, 19* Theron G, Mulenga H, Butler K, Shapiro DE. Prevention of HIV-1 transmission through breastfeeding: efficacy and safety of maternal antiretroviral therapy versus infant Nevirapine Prophylaxis for duration of breastfeeding in HIV-1-infected women with high CD4 Cell count (Impaact Promise): A randomized, open label, clinical trial. *JAIDS* 2018; 77(4):383-392.
- Vandormael A, Dobra A, Barnighausen T, **de Oliveira T**, **Tanser F**. Incidence rate estimation, periodic testing and the limitations of the mid-point imputation approach. *International Journal of Epidemiology* 2018; 47(1):236-245.
- 21 Fiore-Gartland A, Carpp LN, **Naidoo K**, Thompson E, Zak DE, Self S, Churchyard G, Walzl G, Penn-Nicholson A, Scriba TJ, Hatherill M. Considerations for biomarker-targeted intervention strategies for TB prevention. *Tuberculosis* 2018 ; 109: 61-68.
- 22 Laeyendecker O, Konikoff J, Morrison DE, Brookmeyer R, Wang J, Celum C, Morrison CS, **Abdool Karim Q**, Pettifor AE, Eshleman SH. Identification and validation of a multi-assay algorithm for cross-sectional HIV incidence estimation in populations with subtype C infection. *Journal of the International AIDS Society* 2018 ; 21(2): e25082. doi: 10.1002/jia2.25082.
- 23 **Tanser F**, Azongo DK, Vandormael A, Bärnighausen T, Appleton C. Impact of the scale-up of piped water on urogenital schistosomiasis infection in rural South Africa. *eLife*. 2018; 7: pii: e33065. doi: 10.7554/eLife.33065.
- 24 Dzomba A, Govender K, Mashamba-Thompson TP, **Tanser F**. Mobility and increased risk of HIV acquisition in South Africa: a mixed-method systematic review protocol. *Systematic Reviews*. 2018 ; 7(1):37. doi: 10.1186/s13643-018-0703-z.
- 25 Gupta RK, Gregson J, Parkin N, Haile-Selassie H, Tanuri A, Andrade Forero L, Kaleebu P, Watera C, Aghokeng A, Mutenda N, Dzangare J, Hone S, Hang ZZ, Garcia J, Garcia Z, Marchorro P, Beteta E, Giron A, Hamers R, Inzaule S, Frenkel LM, Chung MH, **de Oliveira T**, Pillay D, **Naidoo K**, **Kharsany A**, Kugathasan R, Cutino T, Hunt G, Avila Rios S, Doherty M, Jordan MR, Bertagnolio S. HIV-1 drug resistance before initiation or re-initiation of first-line antiretroviral therapy in low-income and middle-income countries: a systematic review and meta-regression analysis. *Lancet Infectious Diseases* 2018 ;18(3):346-355.
- 26 Mvubu NE, Pillay B, **McKinnon LR**, Pillay M. Mycobacterium tuberculosis strains induce strain-specific cytokine and chemokine response in pulmonary epithelial cells. *Cytokine* 2018; 104:53-64.
- 27 Zelnick JR, Seepamore B, Daftary A, Amico KR, Bhengu X, Friedland G, Padayatchi N, Naidoo K, O'Donnell MR. Training social workers to enhance patient-centered care for drug-resistant TB-HIV in South Africa. *Public Health Action* 2018; 8(1):25-27

*continuation from previous newsletter

Scientific Reviews

Abstracts submitted for review		Manuscripts submitted for review		Ancillary studies submitted for review	
Total#	Cumulative^	Total#	Cumulative^	Total#	Cumulative^
2	397	0	231	1	86

for month, ^ since committee initiation



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