A threshold level and specificity of inflammation determines HIV susceptibility

A recent study, published in Frontiers in Immunology, shows that a threshold level and specificity of inflammation may be protective against HIV infection.

This study assessed how inflammation, simulated by adding bacterial or viral components into a cellular model to stimulate Toll-Like receptors (TLRs), caused cells to secrete inflammatory proteins, activate cells and impact HIV infection of target T cells.

Two major factors favour HIV infection, high levels of inflammation gauged by measuring soluble inflammatory proteins and increased activation of HIV target T cells.

In this laboratory model, immune cells isolated from blood were stimulated with various bacterial and viral components and then infected with HIV. Soluble inflammatory proteins produced by immune cells and cellular activation and infection states of HIV target cells were measured. Specifically, it was found that TLR4-stimulation reduced rather than increased HIV susceptibility of target T cells, did not cause exaggerated activation and reduced CCR5 expression of T cells, despite the potent inflammatory environment it created (Figure).

These findings indicate that TLR agonists play a powerful although complex role in the dynamics of HIV infection and that a threshold level and type of inflammatory response may be protective against HIV.

The immunological processes that govern inflammation are therefore critical and may tip the balance between protection versus susceptibility to HIV infection.

This research further highlights the potential therapeutic use of these TLR agonists to combat HIV infection.

For further reading:

Figure A: Radial spider plot of soluble inflammatory mediators secreted from immune cells after stimulation with TLR agonists LPS (green), R848 (orange) or Pam3CSK4 (purple) or the positive control PHA (blue) or left unstimulated (red). B: Histogram representing HIV infection rates of target cells (CD4+ T cells) for unstimulated, LPS, R848, Pam3CSK4 or PHA stimulated conditions.
CAPRISA Director appointed Adjunct Professor of Immunology and Infectious Diseases at Harvard

We congratulate Professor Salim Abdool Karim, Director of CAPRISA, on his appointment as an Adjunct Professor in Immunology and Infectious Diseases at Harvard University. As an adjunct honorary appointment, his responsibilities at Harvard are mainly related to research and occasional teaching.

Abdool Karim conveyed his deep gratitude to Quarraisha Abdool Karim, his family, the Board of Control and Scientific Advisory Board members, the excellent CAPRISA research team and his friends and colleagues, saying that “this achievement would not have been possible without their strong support and encouragement.”

This appointment is a major accolade for CAPRISA and Abdool Karim’s accomplishments as its Director. “It reflects the excellence achieved in research at CAPRISA,” he said.

CAPRISA Vaccine team recognised for excellence

Two landmark HIV vaccine trials, the HVTN 702 (Uhambo) and HVTN 705 (Imbokodo) efficacy trials successfully completed enrolments earlier this year. The HVTN 702 trial, investigating a clade C vaccine, enrolled a total of 5407 men and women from South Africa, while HVTN 705, a mosaic vaccine trial, recruited 2622 young women from across Africa. Dr Nivashnee Naicker (Site-Principal Investigator for HVTN702) said that the CAPRISA team at the eThekwini Research Clinic made a substantial contribution by enrolling more than 400 participants into these trials. The team was acknowledged at the Full Group Meeting held in Washington where they received awards for ‘Excellent Data Submission’ and high participant retention. Dr Nigel Garrett, Head of Pathogenesis and Vaccine Research at CAPRISA, presented the results of the HVTN 108 study, a Phase 1 study investigating the safety and immunogenicity of a DNA vaccine, in the plenary session at the meeting.

Best Poster Award for PhD candidate

Vincent Hlatshwayo, a NICD PhD student supervised by Prof Penny Moore and Dr Cathrine Scheepers, attended the 24th VEME workshop and the Croucher Summer Course held in Hong Kong (4-9 August, 2019), which took place despite ongoing political turmoil. This workshop, which is recognized as one of the best international virology bioinformatics courses, provided 90 virologists from different countries around the world with intensive training in the mathematical principles and computer applications used in the study of virus evolution and for conducting detailed molecular epidemiological investigations. Vincent was awarded the prize for the best poster.
Quarraisha Abdool Karim invited to serve on CARI

Professor Quarraisha Abdool Karim, Associate Scientific Director at CAPRISA has been invited to serve as an advisor on the Coalition for African Research and Innovation (CARI) that focuses on advancing scientific capacity in the development of sub-Saharan Africa.

Dr Felix Dapare Dakora, President of the African Academy of Sciences and Dr Francis Collins, Director National Institutes of Health said they were “especially interested in discussing measures and incentives to create sustained public and private investment in African research institutions and to achieve the Sustainable Development Goals’ health targets by 2030.” “Scientific innovation in Africa is on the rise, and momentum is building for new measures to strengthen and sustain the capacity of African universities and research institutions to become an effective force for economic growth and local solutions for health and development challenges.”

Abdool Karim said it was a privilege to contribute and advance CARI’s vision in this important initiative on the African continent.

CARI is the strategic partnership of the African Academy of Sciences, African Union Development Agency, U.S. National Institutes of Health, Wellcome Trust, and the Bill & Melinda Gates Foundation to explore opportunities and galvanise support to create a strengthened, sustainable, and autonomous African biomedical research enterprise.

Q&A with CAPRISA’s Head of Ethics and Law

Professor Jerome Singh, CAPRISA’s Head of Ethics and Law speaks about the phenomenal impact of being a Fogarty fellow which was “life-changing”.

In an interview featured in the NIH Fogarty International Centre’s newsletter, Global Health Matters, Jerome Singh who became Head of Ethics and Law at CAPRISA after completing a year-long training program in bioethics which was supported by Fogarty’s AIDS International Training and Research Program (AITRP).

In addition to his role at CAPRISA, he teaches at the University of Toronto’s School of Public Health and serves as a consultant to several United Nations entities including the WHO, UNAIDS and UNICEF.


Prestigious scholarship for student

CAPRISA congratulates Kapil Narain, a CAPRISA Research Placement and a fifth-year medical student at UKZN, who is one of four students selected globally as a recipient of the Changemaker Scholarship programme funded by the Alliance for Health Systems and Policy at the WHO. Narain attended the 72nd World Health Assembly (WHA) and the IFMSA Youth Pre-World Health Assembly workshop (PreWHA) in Geneva, Switzerland. He said that meeting Dr Tedros Adhanom Ghebreyesus, Director-General of the WHO was a highlight.

Narain said he was honoured to be part of CAPRISA and “each and every day I am constantly inspired and stimulated by the sheer degree of scientific rigour, novelty, clinical relevance and Innovation.”
**Scientific papers published in 2019**

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