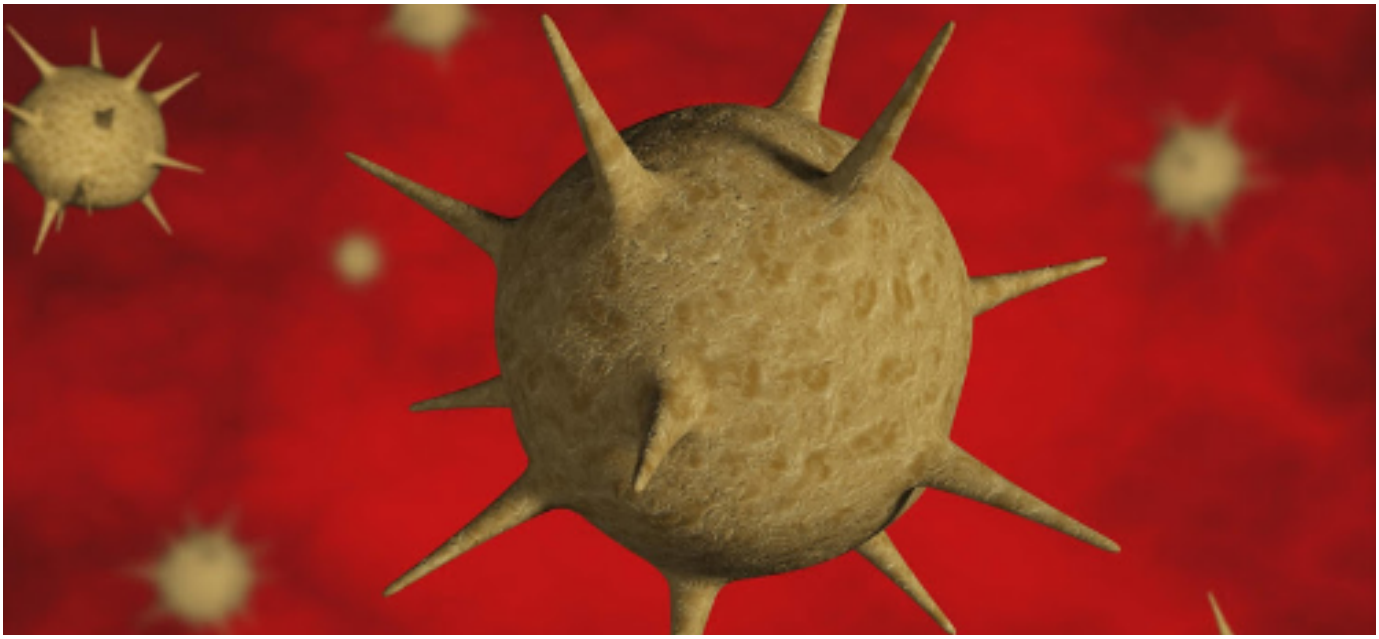
Vol 2, Num 1
Jan 2018

KRISP Newsletter

KwaZulu-Natal Research Innovation and Sequencing Platform



Introduction:

The concept behind this newsletter is that anyone with 15 minutes to spare can learn about the work of the KwaZulu-Natal Research Innovation and Sequencing Platform (KRISP), which is hosted at University of KwaZulu-Natal (UKZN), Durban, South Africa

KRISP wants to want to challenge the status quo and create a scientific environment in South Africa that drives innovations in global health and reverses the brain drain. A critical function of KRISP will be to make genomics, epigenetics and bioinformatics accessible to academic, industrial and commercial users.

In our first issue of 2018, we would like to bring attention to a number of innovations, news, toys, papers and capacity building workshops

Produced by: Nicolette Crozier, Zandile Sibisi, Eduan Wilkinson, Veron Ramsuran, Marcel Tongo Passo, Mlungisi Dlamini, Benjamin Chimukangara and Tulio de Oliveira.

Website: www.krisp.org.za

Highlights:

Innovation: **Durban SPARK Innovation Breakfast**

News: **SA study reveals important link between genes and AIDS**

News: **Our paper was selected as one of the 20 Most Influential Conservation Ecology Papers of 2017**

Toys: **Equipment available for collaborative research, training, diagnostics & sequencing services**

Publication: **Elevated HLA-A expression impairs HIV control through inhibition of NKG2A-expressing cells. Science 2018**

Workshop: **KRISP & CAPRISA Advanced Clinical Care Workshop, Durban, 15-16 March, 2018**

Workshop: **23rd International Bioinformatics Workshop on Virus Evolution and Molecular Epidemiology (VEME), Berlin, 26-31 August, 2018**

SPARK GLOBAL

"KRISP is starting an open monthly meeting to foster innovation and entrepreneurship in Durban. **The Durban SPARK Innovation Breakfast** meeting is a monthly meeting that is associated with the **SPARK Global Program at Stanford** University, which is one of the most successful innovation programmes in Silicon Valley, USA.

Wednesday 14 February 2018 (7-8am)
Introduction to Durban and Stanford SPARK program & discussion on 'Big data storage using DNA: a revolutionary technique for affordable and accurate long-term storage of data'

Wednesday 7 March 2018 (7-8am)
Entrepreneurship & Innovation in Brazil: A presentation by Eduardo Emrich Soares, CEO, Biominas. Biominas is considered the top bio-incubation and innovation programme in Brazil and it has inspired dozens of spinoff companies that have contributed billions of dollars to the Brazilian bioeconomy.

Wednesday 4 April 2018 (7-8am)
Innovation in the heart of Silicon Valley: Stanford & Singularity University. Prof. Tulio de Oliveira (Director KRISP) and Prof. Deresh Ramjugernath (DVC Research UKZN) will share their experience and visit to Stanford & Singularity Innovative Programs

The Durban Spark Innovation Breakfast meeting takes place in the **K-RITH Tower Building**. It is located at the **Nelson R Mandela School of Medicine, UKZN, (719 Umbilo Road, Durban).**

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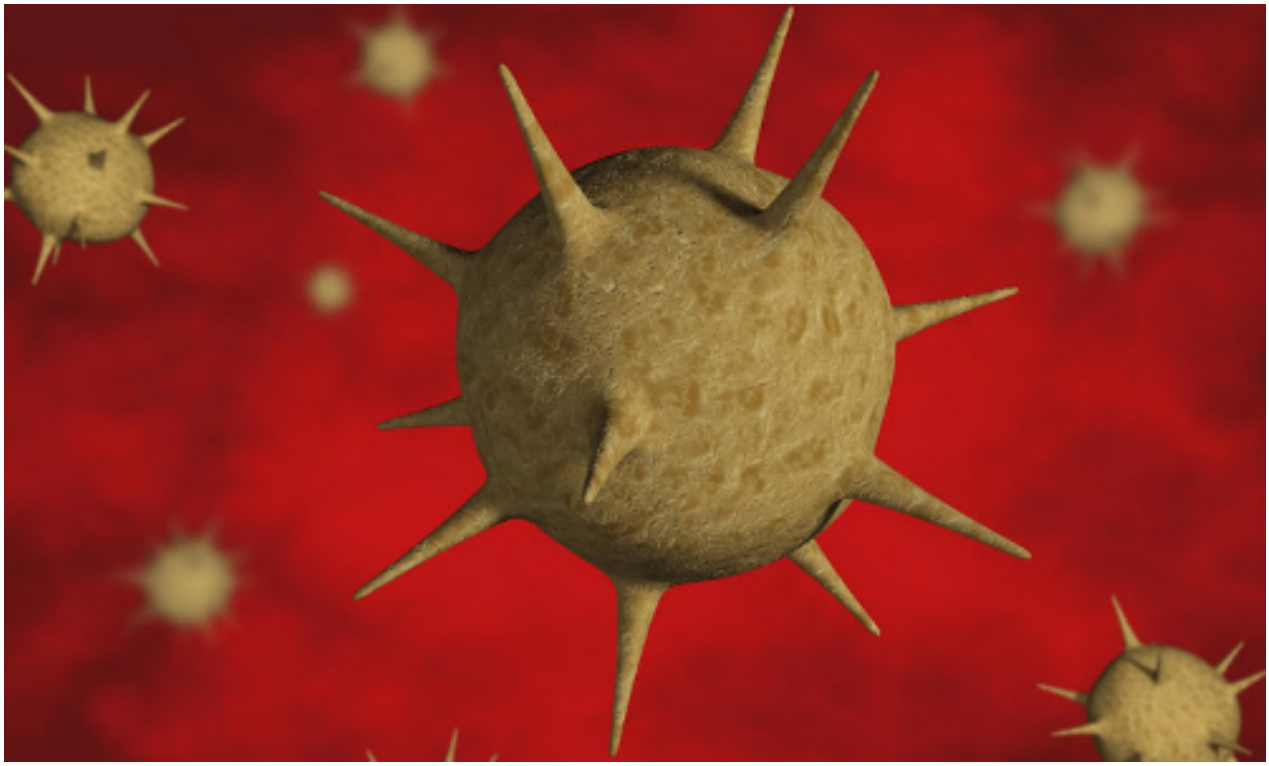
KRISP News: SA study reveals important link between genes and AIDS



Sunday Times, 19 Jan 2018. HIV/AIDS researchers have never understood why people infected with HIV developed AIDS at different times? but now they suspect that it all has to do with their genes.

A study by South African and US researchers (**Ramsuran et al. Science 2018**) has shed new light on how specific genes in people can lead to the faster progression of Aids-related illnesses in people living with HIV who are not on treatment.

The study, which polled 9,763 people living with HIV in South Africa and the US, showed that individuals with the specific HLA type progress from asymptomatic HIV infection to becoming ill with AIDS faster.

It is estimated that about two million people, of about seven million living with HIV in the country, have this specific HLA type.

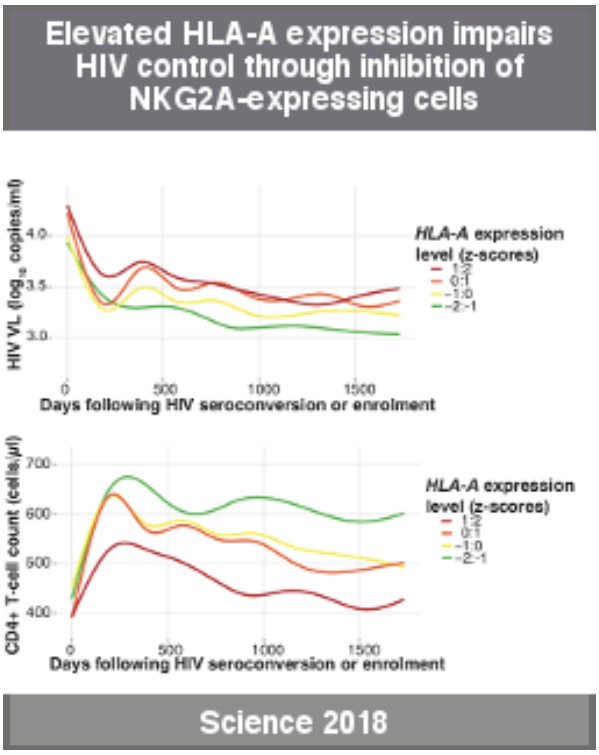
The research team included scientists from KRISP, CAPRISA and the HPP based at the University of KwaZulu-Natal and researchers from the US National Institutes of Health (NIH) and the Ragon Institute at Harvard.

'I was pleasantly surprised by the findings as I expected the opposite results since the HLA genes were thought to protect against viruses,' said Dr Veron Ramsuran, co-leader of the study who is a scientist at KRISP and CAPRISA.

'Moreover, these findings are exciting because drugs to target the HLA interaction with immune cells are being developed for cancer but may be repurposed for HIV treatment and cure strategies.' said Dr Vivek Naranbhai, a South African physician and scientist currently at Harvard University

Web: http://krisp.org.za/news.php?id=205

KRISP Papers



Inhibiting natural killer cells in AIDS

"The human leukocyte antigen (HLA) gene complex varies enormously among individuals and helps explain individual variation in immunity to infectious diseases. Ramsuran et al. Science 2018, examined data from almost 10,000 HIV infections.

Expression of the HLA-A and -B alleles was associated with higher viral load, reduced CD4+ T cell counts, and accelerated progression to AIDS. Higher levels of HLA-A expression increased expression of HLA-E, which blocks a specific receptor (NKG2A) on the immune cells that normally eliminate virus-infected cells. Thus, targeting NKG2A might provide a therapeutic avenue for HIV treatment. "

Web:
http://krisp.org.za/publications.php?pubid=177

One of the 20 Most Influential Conservation Ecology Papers of 2017

"Our Paper on Green Environment & Depression Selected as One of the 20 Most Influential Conservation Ecology Papers of 2017 by F1000!.

The benefits of exposure to green space and health (independent of exercise) is important but contested. In my view, there has been excessive and premature celebration of its virtues. I like contact with green space, especially rich in fresh air and biodiversity. But can such exposure offset important causes of ill-health, such as poverty and discrimination. This paper suggests that may be unlikely, at least in the context of post-apartheid South Africa."

Web: **www.krisp.org.za/news.php?id=208**

KRISP Toys: Equipment available for collaborative research, training, diagnostics & sequencing services

Sequencers

Ion S5 next-generation sequencing

NGS of Amplicons, Microbial Whole Genomes, Exomes, Transcriptomics, 16S RNA, Microbiome

Sequencers

Ion Chef

NGS library preparation, microbial genomes, exomes, transcriptomics

Sequencers

Illumina Miseq

NGS of Amplicons, Microbial Whole Genomes, Exomes, Transcriptomics, 16S RNA, Microbiome

Sequencers

Oxford Nanopore MinION

NGS of Amplicon, Microbial Whole Genomes, Human Genetics, Cancer & Environmental samples

Sequencers

ABI Sanger 3130xl Genetic Analyzer

Sanger Sequencing: Amplicon, Drug Resistance, HLA typing

RNA/DNA/Protein extraction

KingFisher Flex extraction system

RNA/DNA, protein, cell, purification & extraction

RNA/DNA/Protein extraction

QIAGEN QIAcube

RNA and DNA purification & extraction

PCR

QuantStudio 7 Flex Real-Time PCR System

PCR quantification, Gene expression, High Resolution Melting (HRM)

PCR

ProFlex 3x32-Well PCR System

PCR, gene amplification

PCR

BioRad QX200 Droplet Digital PCR System

ddPCR, absolute quantification, DNA, RNA, alleles

PCR

Applied Biosystems Veriti Thermal Cycler

PCR, DNA and RNA amplification, polymerase chain reaction

PCR

Applied Biosystems Thermal Cycler 2720

PCR, DNA and RNA amplification, polymerase chain reaction

KRISP Papers

OPEN ACCESS

Elevated HLA-A expression impairs HIV control through inhibition of NKG2A-expressing cells.
Ramsuran V, Naranbhai V, Horowitz A, Qi Y, Martin MP, Yuki Y, Gao X, Walker-Sperling V, Del Prete GQ, Schneider DK, Lifson JD, Fellay J, Deeks SG, Martin JN, Goedert JJ, Wolinsky SM, Michael NL, Kirk GD, Buchbinder S, Haas D, Ndung'u T, Goulder P, Parham P, Walker BD, Carlson JM, Carrington M. **Science.** 2018 Jan 5;359(6371):86-90. doi: 10.1126/science.aam8825

Effect of genetic variation in UGT1A and ABCB1 on moxifloxacin pharmacokinetics in South African patients with tuberculosis.
Naidoo A, Ramsuran V, Chirehwa M, Denti P, McIlleron H, Naidoo K, Yende-Zuma N, Singh R, Ngcapu S, Chaudhry M, Pepper MS, Padayatchi N. **Pharmacogenomics**. 2018 Jan;19(1):17-29. doi: 10.2217/pgs-2017-0144.

Case report: mechanisms of HIV elite control in two African women.
Moosa Y, Tanko RF, Ramsuran V, Singh R, Madzivhandila M, Yende-Zuma N, Abrahams MR, Selhorst P, Gounder K, Moore PL, Williamson C, Abdool Karim SS, Garrett NJ, Burgers WA. **BMC Infect Dis.** 2018 Jan 25;18(1):54. doi: 10.1186/s12879-018-2961-8.

KRISP Training

KRISP & CAPRISA HIV & TB Advanced Clinical Care Workshop, Durban, 15-16 March, 2018

23rd International Bioinformatics Workshop on Virus Evolution and Molecular Epidemiology (VEME), Berlin, Germany, 26-31 August, 2018

For more information please contact:

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EXCELLENCE IN SCIENCE THE ROYAL SOCIETY

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