

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

The newsletter is presented as a PDF document and provides links to the full articles in our website. KRISP newsletter will also cover the work of the Southern African Treatment Resistance Network (SATuRN)

In our first issue, we would like to bring attention to a number of news, awards, talks, blogs, 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:

News: KwaZulu-Natal Research and Innovation Sequencing Platform (KRISP) Established

News: KRISP & SANTHE trainee wins Best Abstract at DELTAS Africa meeting

Video: Durban at the forefront of DNA research - eTV news

Blog: Bioinformaticians are pioneering the future of science

Blog: Meeting of the Swiss, Swedes and South Africans minds

Publication: HIV-1 full-genome phylogenetics of generalized epidemics in sub-Saharan Africa: impact of missing nucleotide characters in next-generation sequences.

Workshop: 11th Annual Workshop on Advanced Clinical Care - AIDS (AWACC), Durban, South Africa, 6-7 Sep 2017

KRISP Newsletter

By: Tulio de Oliveira, on behalf of KRISP team

KRISP is alive, and one month since UKZN signing the contract with the Technology Innovation Agency (TIA), we have a newsletter! Everything is happening faster than we expected.

We now have a website, a new laboratory and a focused and motivated team. We have been riding in a wave of positivity and would like to share some of the recent developments.

The media has been very interested in KRISP and it has been quite fun but also challenging, sometimes, to translate our scientific vision and achievements to the general public. If you are interested, you can read some of the news pieces and watch the TV clips from links in this newsletter.

We have also been travelling around the world in order to bring new technologies and ideas to South Africa. KRISP Blogs is where we record this process. **Dr. Yumna Moosa's** blog tells us in a very quirky and entertaining way of her recent experiences in Prague at one of the top bioinformatics conferences in the world. **Nicolette Crozier, Ben Chimukangara** and **Dr. Veron Ramsuran** wrote about their recent travel to Switzerland and Sweden to learn from leading genomics and bioinformatics institutes.

We even received an award in our first month! **Dr Marcel Tongo Passo** was awarded the best abstract among 500 fellows at DELTAS annual meeting in Ghana. Dr. Passo was also awarded two grants from the SANTHE programme to generate whole genomes of HIV-1. His project focuses on the origin of HIV-1 and we look forward to producing one of the largest datasets on the Congo Basin, which is where HIV-1 originated.

A critical function of KRISP will be to make genomics, epigenetics and bioinformatics technology accessible to academic, industrial and commercial users, who might not otherwise pursue these technologies or use alternative international resources. KRISP also aspires to capacitate the next generation of scientists. In this newsletter, we advertise three upcoming training events, which will be presented in Durban, Lisbon and Brazil.

In order to bring high-level science to our users, we are also hosting KRISP Talks, which is a monthly event. **Dr Carren Ginsburg** (Wits) will be our next speaker, and he will be giving a talk on the 23 August about migration, AIDS/TB and non-communicable diseases in Kenya and South Africa.

KRISP is the result of hard work by **Professor Rob Slotow, Professor Deresh Ramjugernath, Dr. Tim Newman** and **Professor Salim Abdool Karim**, among others. We will always be grateful for their support and mentorship. We also received the support of many other people! In fact, when UKZN asked us to draft a press release, over half of the text was acknowledgements to all of the people that helped to make KRISP a reality.

KRISP was also born because of our inherently rebellious nature. KRISP wants to challenge the status quo and create a scientific environment in South Africa that drives innovations in global health and reverses the brain drain. We are still in the beginning and we would like to finish this first newsletter with a saying that was widely used in Africa to motivate people to overcome great challenges: **"A Luta continua..."**

KRISP News



KZN RESEARCH INNOVATION AND SEQUENCING PLATFORM ESTABLISHED KRISP News - 2017-07-12

“By Lihle Sosibo, UKZN Ndaba Online. The Technology Innovation Agency (TIA) and UKZN have signed an agreement for the establishment of KRISP - the KwaZulu-Natal Research and Innovation Sequencing Platform.”

Link: <http://www.bioafrica.net/news.php?id=179>

NEXT GENERATION DNA SEQUENCING RESEARCH CENTRE OPENS IN DURBAN, SOUTH AFRICA – eNCA & eTV NEWS

KRISP News - 2017-03-17

“By Judith Subban & Sandile Makhubela eTV news. KRISP vision is to revert brain drain and produce genomics data in South Africa to answer key scientific questions related to HIV & TB transmission. KRISP to provide services to the scientific, commercial and industrial community...”

Link: <http://www.krisp.org.za/videos.php>



KRISP Talks



A multi-centre analysis of internal migration and AIDS/TB and NCD-related mortality in Kenya and South Africa

KRISP Talks - 2017-08-23

“KRISP Talks by Dr Carren Ginsburg, SAMRC/Wits Rural Public Health & Health Transitions Research Unit (Agincourt), 23 August 2017 (11am - midday), K-RITH building, Nelson R Mandela School of Medicine, UKZN, Durban, South Africa. All welcome, no need to RSVP!”

Can the type of jeans you wear determine your treatment response?

KRISP Talks - 2017-06-23

“Professor Bonga Chiliza, Head of Department of Discipline of Psychiatry: College of Health Sciences, UKZN, gave a very engaging talk on Schizophrenia. His talk presented some of their published results on the side effects of medication and the genetics associated with it. The talk was presented on 23 June 2017, K-RITH building, Nelson R Mandela School of Medicine, Durban, South Africa.”



KRISP News



PhD fellows Zandile Sibisi, from left, Benjamin Chimukangara, Mlungisi Dlamini and Dr Tongo Marcel work on the state-of-the-art DNA sequencing machines at the KZN Research and Innovation Sequencing Platform (KRISP) centre, based at UKZN's medical school. Picture: S'bonelo Ngcobo

DURBAN AT THE FOREFRONT OF DNA RESEARCH - By Arthi Gopi, *Independent on Saturday Newspaper*, 15 Jul 2017.

KRISP attracts the brightest - Durban is leading the way in DNA research, having attracted some of the brightest minds in the science field, in a new state-of-the-art lab in the city

Based at the Nelson Mandela School of Medicine, the centre will be officially launched later this year but scientists are already hard at work analysing data.

Professor Tulio de Oliveira, of KRISP, an HIV genetic data and bioinformatics software development expert, said the Technology Innovation Agency (TIA) and UKZN signed an agreement for the establishment of KRISP, paving the way for KZN to join a national group of state-of-the-art DNA centres.

Web: www.krisp.org.za/news.php?id=180

'Right here in Durban, South Africa, we can now produce some of the best, high quality data in DNA sequencing, without having to send it out of KZN or even out of the country for analysis,' de Oliveira said.

The centre has attracted academics, who left the country, to come back to SA, and specifically Durban, in what De Oliveira called a **'reverse brain drain'**.

One such scientist, Dr Veron Ramsuran, an expert in genetics, was at NIH/Harvard in the US when he was lured to Durban.

'I've been looking at HIV from a host perspective and we found surprising results that will soon be published in a medical journal. In effect, we can analyse a host and analyse the virus and determine what kind of treatment would work, it allows us to be very specific in treatment,' he said.

KRISP Team



Dr Marcel Tongo Passo, a SANTHE Post-doctoral trainee, has won a "Best Abstract" award at the DELTAS (Developing Excellence in Leadership, Training and Science) Africa Annual Grantees Meeting 2017, held in Accra, Ghana, between 3 to 5 July. Passo is based at KRISP (KwaZulu-Natal Research and Innovation Sequencing Platform) and HPP (HIV Pathogenesis Programme) at the University of KwaZulu-Natal, South Africa.

Out of 500 fellows from 11 cutting edge, public health related, research programmes - including 54 institutions in 21 African countries - Passo was selected to present at the meeting and ended up winning this prestigious award. He said he felt deeply honoured and grateful for the recognition.

Web: www.krisp.org.za/news.php?id=181

Dr. Eduan Wilkinson, a KRISP Fulbright scholar at University of Florida (UF) news from the US: HiPerGator is enabling infectious disease transmission research in UF's Emerging Pathogens Institute.

Among the research underway at the EPI are two studies by graduate students: Taylor Paisie is studying Cholera in Haiti. In addition to researching Cholera, the Salemi Lab also includes Eduan Wilkinson, a KRISP postdoc studying HIV transmission in his native South Africa. Wilkinson is able to run 16,000 very large sequences on HiPerGator in one week, thanks to UFIT's ability to optimize job scripts and provide exceptional software.

Web: www.krisp.org.za/news.php?id=186



Taylor Paisie and Dr. Eduan Wilkinson sequencing Cholera whole genomes in Prof. Marco Salemi's laboratory, University of Florida.

'By analyzing genomic sequences we can construct relationships between pathogens so we can see what's driving the transmission. We can also use these methods to evaluate how public health interventions are impacting the epidemic.' Dr. Wilkinson says.

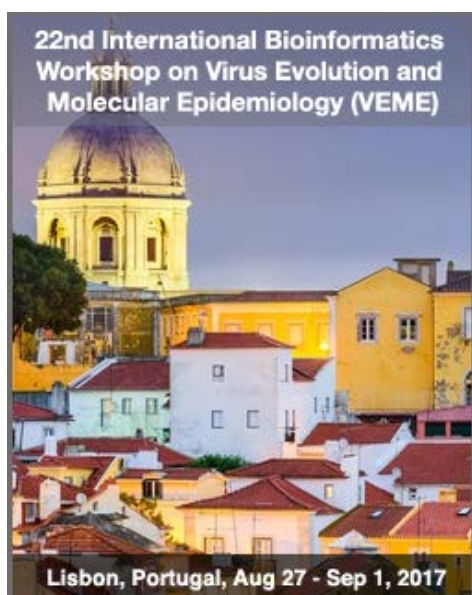
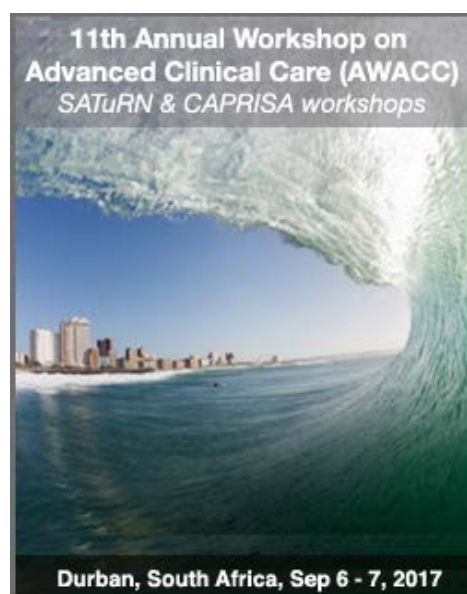
KRISP Training

11th Annual Workshop on Advanced Clinical Care - AIDS (AWACC), Durban, South Africa, 6-7 Sep 2017:

The workshop is targeted at 400 clinicians, clinical virologists and nurses working in the public sector who are currently involved in the treatment of patients with HIV and TB in KwaZulu-Natal, South Africa.

KRISP, the Southern African Treatment and Resistance Network (SATuRN) in partnership with CAPRISA ACC will present a full day programme on HIV & TB Drug Resistance and Clinical Management.

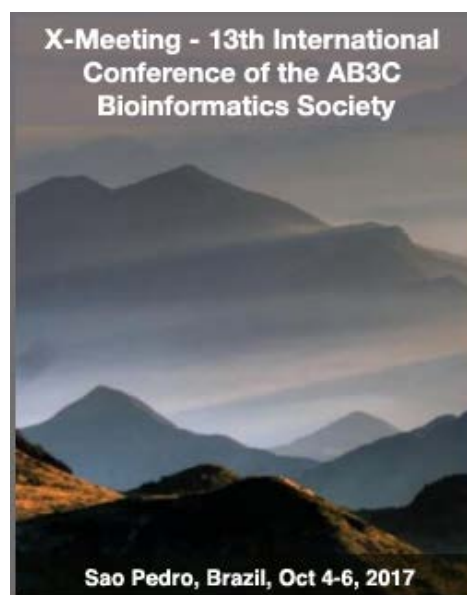
Web: www.krisp.org.za/news.php?id=183



VEME, Lisbon, Portugal, Aug-Sep 2017:

It is recognized as one of the best international virus bioinformatics courses. It covers sequence analysis, phylogenetics, phylodynamics methods and large scale methods for next-generation sequencing (NGS) analytics. KRISP members are faculty and organizers of VEME.

Web: www.krisp.org.za/news.php?id=184



X-Meeting, São Pedro, Brazil, 4-6 Oct 2017:

Bioinformatics is now a strategic area for Brazil and all of the world, therefore, it is also strategic to the development of Science, Technology and Economy. The X-Meeting is a Brazilian event with international reach which has an average of 400 participants.

Web: www.krisp.org.za/news.php?id=185

KRISP Blogs



Bioinformaticians are pioneering the future of science, Dr. Yumna Moosa reports on her recent travel to Prague to attend the largest bioinformatics conference in the world...

"I was doing an all-night shift in the hospital where I'm working this year when I received an e-mail offering a 1,000 USD Travel Fellowship to attend a conference in Eastern Europe. But in order to receive the grant I had to register for the conference (and pay the not insignificant fees) by 9am the next day. Classic 419 scam, right?"

Fortunately, it wasn't, and today I find myself in Prague, Czech Republic, buzzing after three days at the world's premier bioinformatics and computational biology meeting: the annual meeting of the International Society for Computational Biology, the 25th Intelligent Systems in Molecular Biology Conference...."

Web: www.krisp.org.za/blogs.php?id=45



Meeting of the Swiss, Swedes and South Africans minds, Nicolette Crozier, Benjamin Chimukangara & Dr. Veron Ramsuran report on their recent travel to Switzerland and Sweden to learn from some of the top genomics & bioinformatics centres in the world...

"We arrived at SciLife Laboratory and were privileged to experience the beautiful architecture and surroundings that host this prestigious Institute. Our days involved several presentations and group meetings where many heads of departments met with us, allowed us to question them and proposed different strategies and solutions for developing KRISP into a successful molecular biosciences platform using their knowledge and experience they had gained over the years..."

Web: www.krisp.org.za/blogs.php?id=44



HIV-1 full-genome phylogenetics of generalized epidemics in sub-Saharan Africa: impact of missing nucleotide characters in next-generation sequences. Ratmann O, Wymant C, Colijn C, Danaviah S, Essex M, Frost SDW, Gall A, Gaiseitsiwe S, Grabowski M, Gray R, Guindon S, von Haeseler A, Kaleebu P, Kendall M, Kozlov A, Manasa J, Minh BQ, Moyo S, Novitsky V, Nsubuga R, Pillay S, Quinn TC, Serwadda D, Ssemwanga D, Stamatakis A, Trifinopoulos J, Wawer M, Leigh Brown A, de Oliveira T, Kellam P, Pillay D, Fraser C. *AIDS Res Hum Retroviruses*. 2017 May 25. doi: 10.1089/AID.2017.0061



Proximity to healthcare clinic and depression risk in South Africa: geospatial evidence from a nationally representative longitudinal study. Tomita A, Vandormael AM, Cuadros D, Slotow R, Tanser F, Burns JK. *Soc Psychiatry Psychiatr Epidemiol*. 2017 Mar 15. doi: 10.1007/s00127-017-1369-x.



Sequence and Phylogenetic Analysis of the Untranslated Promoter Regions for HLA Class I Genes. Ramsuran V, Hernández-Sánchez PG, O'hUigin C, Sharma G, Spence N, Augusto DG, Gao X, García-Sepúlveda CA, Kaur G, Mehra NK, Carrington M. *J Immunol*. 2017 Mar 15;198(6): 2320-2329. doi: 10.4049/jimmunol.1601679. Epub 2017 Feb 1.



Incident HIV during pregnancy and early postpartum period: a population-based cohort study in a rural area in KwaZulu-Natal, South Africa. Chetty T, Vandormael A, Thorne Claire and Coutsooudis A. *BMC Pregnancy and Childbirth*, 2017, doi.org/10.1186/s12884-017-1421-6

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