



August 2019



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## Bioinformatics at KRISP

*KRISP at UKZN is reversing brain drain in Africa and achieving scientific excellence!*

The KZN Research and Innovation Sequencing Platform (KRISP) at the University of KwaZulu Natal challenges the status quo to create a scientific environment in Africa that delivers high level science, creates innovation and reverses the brain drain. This vision is starting to pay off, and we are happy to say that in **just two years, we published thirteen manuscripts in Nature, Science and Lancet journals!**



We are very proud of our scientists, many of which left top international organisations to join us in Durban. In addition to brain gain, they also bring a wealth of collaborators. Below a map showing where our collaborators come from across the globe.



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KRISP has also created a world-class genomics and molecular biology laboratory together with bioinformatics infrastructure that is available for collaborative research, training and services in Africa.

We also would like to thank our main funders: The South African Medical Research Council (SAMRC), The Technology Innovation Agency (TIA), The Department of Science and Technology (DST), The European Commission (EC), The Royal Society in the U.K., The Wellcome Trust, The Bill and Melinda Gates Foundation (BMGF), The US CDC and The National Institute of Health (NIH) for believing that it is possible to do high-level research in Africa and reverse the brain drain.

## Genomics Africa

*Genomics Africa drastically decrease the price of sequencing in Africa*

KRISP and DIPLOMICS associated laboratories are launching **Genomics Africa** that is an exciting initiative bringing genomic technologies to Africa to fight our great challenges: loss of biodiversity, famine, migration and diseases.



Collectively, Africans are the most genetically diverse people in the world. We are also one of the most resilient populations to disease. It is on this continent, we expect the next breakthroughs in genetic research to happen. For example, in 2019, the world discovered that the African genome has an additional 300 million base



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pairs and now there is a race to identify genes that can be used to develop better treatments, diagnostics and vaccines.

In order to advance genetics research and bring state-of-art technology to Africa, we created Genomics Africa. Genomics Africa is a not-for-profit initiative that can produce data in Africa at the same quality, price and speed as the international genomics centres. Furthermore, we have started a large training program in Africa in collaboration with international and national organisations. Consequently, we can now keep the samples on the continent and develop local capacity to sequence and analyse the data. For example, Genomics Africa and its partners have already brought state-of-the-art equipment worth US\$ 10 million in equipment to Africa. We have also trained over 1,500 individuals in the last three years. We are now in a position to provide sequencing at the most affordable price in the world.

More information: <http://genomics.africa>

## SASBi Student Council Update

It's been a busy time for the student council! Soon after the SciFest in Grahamstown, we launched into planning the Young Researchers' Symposium (YRS) with the Southern African Society of Human Genetics Young Researchers Forum (SASHG YRF). The YRS will be held a day before the main SASHG congress on the 3rd of August 2019, Intaka Island Eco-Centre, Cape Town.

We're looking forward to seeing and hearing talks and (digital!) posters by South Africa's young and brilliant minds. We are honoured to have three



**SASBI-SC/SASHG Young Researchers' Symposium**  
 Date: Saturday, 3<sup>rd</sup> of August 2019  
 Time: 08:00 – 16:00  
 Venue: Intaka Island Eco-Centre, Century City

**2 weeks to go!**

To keep tabs on all updates and information, please follow the 'SASBI-SC/SASHG YRS 2019' event on Facebook (<https://www.facebook.com/events/357160651543064/>).

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excellent keynote addresses by Professor Eugene Cloete, Dr Michelle Daya and Dr Antonel Olckers.

Look for our report in the next newsletter!

*Mahtaab and the SASBi-SC team*

## Meet Our Students

*Get to know some of our fabulously intelligent and charming students here at KRISP/UKZN*



*What is your full name?*

Name has definitely not changed... Yours truly...  
San Emmanuel James

*Where are you from?*

Don't mind much where I came from but it suffices to say I came through Uganda

*What are you studying? How is your work going to make the world a better place?*

Doing my PhD in Medicine, Major in Virology...

My work involves data analysis and tool development, all of which are intended to help improve our understanding of how the genomic architecture of microorganisms influences the expression of the various phenotypes of interest. The value of this work is in informing the development of interventions and controls of microbial transmitted diseases. Besides microbial GWAS, I also conduct microbiome studies to

elucidate bacterial compositions in unique ecological sites and the role that they play in these sites. Last but not least, I administer KRISP compute infrastructure and help maintain the various websites.

*What do you do when you're not working?*

When I'm not working, I'm a husband and father to two lovely babies that I spend time with. I also love to read books, swim and play the music keyboard. I'm yet to try surfing as my new hot sport.



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*What is your full name?*

Dr Yumna Moosa, uMama kaQiniso

*Where are you from?*

Cape Town, South Africa!

*What are you studying? How is your work going to make the world a better place?*

I am doing a PhD in Bioinformatics.

I am an amateur mathematician who studied medicine by mistake, inspired by a naive desire to "help people". After completing medical internship I came to my senses and registered for a MSc in Virology and Bioinformatics at the University of

KwaZulu Natal. I am interested in human-microbiome interactions, and the way that these complex microbiological networks influence health and disease. This is partly because I have New Age tendencies and like to believe that "We are all One".

I hope to employ my apparently disparate skills be part of translating basic scientific progress into improvements in human health and wellbeing.



*What do you do when you're not working?*

I cook delicious food, then eat it and/or feed it to people I love. I run, climb mountains, do yoga and pray. I cuddle my beautiful child.



*What is your full name?*

Upasana Ramphal

*Where are you from?*

Durban, South Africa

*What are you studying? How is your work going to make the world a better place?*

PhD in Medical Science (virology and genetics) –

So my PhD project is amazing. Despite the current advancements in HIV research, HIV is a major health concern, especially in



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South Africa. Several epigenetic mechanisms, such as DNA methylation, has been shown to alter the expression of a gene without changing the DNA sequence. This subsequently led to diverse clinical outcomes. Levels of DNA methylation within specific host genes are important for HIV disease progression as observed with previous studies that demonstrated host gene expression and methylation levels are associated with HIV disease. CRISPR based technologies are a possible treatment option that may be used to edit genes, as well as the methylation levels, associated with HIV. We have identified specific genes using whole-genome methylation that have an association with HIV disease and, therefore, aim to modify these genes and alter their expression by designing a specialized CRISPR-I assay. This study will report for the first time specific human genes that can be targeted and used as the basis for CRISPR gene therapy against HIV. The use of CRISPR technology, especially with South Africa, offers an exciting new potential therapeutic approach that complements the strategy of using scientific innovation to create transformative medicines for HIV and several other diseases.

*What do you do when you're not working?*

I love cooking, reading, spending time with family, friends & my fur-babies, good movies, walks at the beach. I am extremely passionate about animals and their welfare, so I spend a lot of time volunteering at animal rescue organizations. I also enjoy spending some quality time at the gym and making 'me time' a priority.

## Save the Date

*Upcoming events and deadlines in the next few months*

**11 – 15 November 2019 in Kumasi, Ghana.** *Conference:* International Society for Computational Biology (ISCB) Africa and African Society of Bioinformatics and Computational Biology (ASBCB) Conference on Bioinformatics. Deadline for abstract submission: **30 August 2019.**



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**International Society for Computational Biology (ISCB)**

**3rd Student Council Symposium (SCS) Africa**

IDL Conference Center, Near  
KNUST Swimming Pool

11th Nov 2019

Abstract Submission and Travel  
Fellowship Application

27th Sep 2019

Symposium Registration

01st Nov 2019

**ISCB**  
INTERNATIONAL SOCIETY FOR  
COMPUTATIONAL BIOLOGY

For more information, please contact:  
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or  
San James  
sanemmanueljames@gmail.com

<https://bit.ly/2Gjr1KQ>

**1 – 7 December 2019 at Wellcome Genome Campus, UK.** *Course:* Next Generation Sequencing Bioinformatics. Deadline for applications: **12 September 2019.**

**8 – 10 December 2019 in Heidelberg, Germany.** *Course:* Target Validation Using Genomics and Informatics. Deadline for abstract submission: **15 Sept 2019.** Registration deadline: **27 October 2019.**