

Catherine Koofhethile



Kegakilwe



Dr Catherine Kegakilwe Koofhethile is currently in the final stages of her Postdoctoral/Fogarty Fellowship at Harvard T H Chan School of Public Health, Boston, USA. She also holds a Research Associate position at the Botswana Harvard AIDS Institute Partnership, Botswana and will soon be transitioning to set up her own research group there.

During her post-doctoral fellowship, she has received numerous awards, some of which include the Harvard University, Boston University, Northwestern University, and University of New Mexico (HBNU) Global Health Fellows Consortium grant, as well as the Harvard University Center for AIDS Research (HU CFAR) developmental award under the role of Principal Investigator and the Sub-Saharan African Network for TB/HIV Research Excellence (SANTHE) Collaborative grant under the role of a Co-Principal Investigator. Most recently, she together with one of mentors received funding from Campbell Foundation in the US to advance HIV research.

In 2010, Dr Koofhethile was a recipient of the Organization for Women in Science for the Developing World (OWSD) PhD

Research Fellowship and graduated with her PhD in 2016 under the HIV Pathogenesis Programme (HPP) at the University of KwaZulu-Natal, South Africa. During her PhD studies she was selected to join about 600 other young scientists from around the world to attend the 64th Lindau Nobel Laureates meeting (Medicine/Physiology) in Germany. This prestigious meeting allowed young scientists to engage with about 37 Nobel laureates in one conference ([64th Meeting of Nobel Laureates in Lindau, Germany](#)).

In 2016 she won the African-German Network of Excellence in Science (AGNES) Junior Researcher Award and in that same year, she became a member of the Organization for Women in Science for the Developing World (OWSD) and a member of the OWSD Botswana National Chapter.

She holds a Bachelor of Science degree with Honors (BSc with Hons) in Medical Microbiology from The University of Surrey (UK) and in 2001, she was recognized as having the best presentation on Koch's Postulates study under the subject of Mycology. Dr Koofhethile attained her Master of Science degree (MSc) in Immunology from the University of Birmingham (UK) and over the course of her career so far, she has gone on to receive over 12 scholarships to present her research at international conferences.

What led you to the field of immunology?

I took on Immunology as one of my modules during my undergraduate studies, and I was fascinated by it. Initially I was not really good at it, but my lecturer, who was also my personal tutor, was very instrumental in helping me understand Immunology. From the moment I scored 50% in my first test, I decided 'I was going to show this module flames and get far better marks.

I also always wanted to understand microorganisms and how they cause diseases, but Immunology stood out for me because it

gave me the platform to study how the human body uses the Immune system to respond to foreign materials.

What are your research interests and why?

In the late 1980s when I was in primary school, HIV /AIDS was becoming a real problem and I got to witness first-hand, how people lived with full blown AIDS. For a very long time I asked myself why AIDS was incurable and getting to the bottom is this is what influenced my decision to become a scientist. I took as many opportunities as possible, throughout the course of my education and even after, to be part of HIV-related research projects.

After my master's degree, I worked as a graduate research assistant at Oxford University in the Goulder Lab where I successfully generated HIV sequences from HIV-1 clade B and C infected individuals and was a part of team that characterized HIV specific immune responses in these same individuals. Through my PhD project, I aimed to understand the factors that mediate a lack of control in individuals with clade C HIV-1 infection, who possess protective HLA alleles.

All the research work I had been involved in up to this point was specifically relevant for vaccine design. During my post-doctoral fellowship however, I switched to working towards advancing HIV cure related research by assessing and characterizing the genetic composition of the HIV proviral reservoir in adolescents from Botswana who were receiving long-term antiretroviral treatment (ART) and infants who initiated ART within the first 4 months of life.

How has your research contributed to better understanding what we know about HIV/AIDS?

My PhD research provided data on the evolution of immunological and virological events associated with viral control and lack of viral control in chronic HIV-1 subtype C infection in the presence or absence of protective HLA class I

alleles. The data indicated that not all HIV specific CD8⁺ T cell responses among viremic controllers are effective at suppressing viral replication. I was able to show that while viremic control in individuals with protective HLA class I alleles was associated with broad CD8⁺ T cell responses, viremic control in those without protective HLA class I alleles seemed dependent on alternative mechanisms.

Part of my current work has involved looking at the impact of early initiation and long-term ART on the sensitivity of assays that detect HIV antibodies and viral nucleic acid. I have shown in a case study that termination of long-term ART following negative HIV tests can lead to viral rebound, suggesting that a negative HIV test result following ART termination should be cautiously interpreted. I have also evaluated the impact of long-term ART and sustained viral suppression on inducible replication-competent proviruses and demonstrated that long-term ART does not lead to complete elimination of reservoirs among perinatally infected adolescents with HIV-1C. I am currently generating more data to uncover the virological and immunological mechanisms that allow HIV to persist long term in the presence of ART.

What awesome activities are you involved in outside of your research work?

I am woman of God and teach Sunday School every other Sunday, as well as help out with other youth activities. I also love singing, so I spend a lot of spare time learning different songs and recording music at home.

Every Saturday, I have a virtual meeting with my nephews and nieces (14 years and younger) where I teach them basic Setswana, to help them learn how to effectively communicate in their mother tongue.

I mentor several young people from different countries. Due to multiple requests, I have received to provide mentorship and

guidance to soo many other young people, I decided to start the '*Dr Khei Inspire Foundation*', and I am very optimistic that this foundation will do exactly what its name states- inspire *others*. I want to use the foundation as a platform to mentor a lot more children, especially from the rural areas of Botswana.

As a member of the Executive Committee of OWSD-Botswana National chapter, my role is to facilitate school outreach programmes to encourage more girls to take up STEM careers.

I recently decided to be a lot more active with my YouTube channel, where I interview people from different walks of life about their journeys since I believe that everyone has an inspirational story to tell. Although I have taken a short break from this due to my current busy schedule, I will resume in the summer.

Since the start of the COVID-pandemic, I have had to learn how to cook, so I found myself experimenting on different dishes and I've now grown to love cooking and actually host friends over every Sunday for lunch.

What advice do you have for young aspiring immunologists?

My Immunology lecturer during my undergraduate studies told me that in order to learn and enjoy Immunology, you must study it as if you are learning a new language. Additionally, Immunology or rather science is continuously evolving as we discover more things. So, be open minded, be passionate, be self-driven and read!

You have lived in 3 other countries apart from your home country, Botswana. What has the experience been like for you while you were an international student and now as a post-doctoral fellow and immigrant in USA?

Despite the challenges, it has been very interesting. It involves a lot of sacrifice, and because of being away from

home, I have missed out on a lot of family events. I have lost family members and could not even make it to their funerals, I have also missed my sister's wedding. The worst experience was when my dad passed on and I felt like I had not spent much time with him as I am always away. My family is everything to me, and I actually talk to my family members every single day. Because they have so much faith in me, this pushes me to work harder.

I do have a hard time whenever I am sick and my family is far away, but I have learnt how to survive. I have had to learn how to have a voice, speak up and be heard as well as stand up for myself because I'm alone and have no one else to cover for me.

My character does help me cope with a couple of challenges too. I want to think that I am well mannered, kind, friendly and respectful, so I have been able to make friends wherever I go. I have created my own families away from home in all these 3 countries I've lived in, and it helps that I am good with maintaining friendships.

What do you think are key factors for people to put into consideration when deciding to move to another country in order to advance their career? How should people prepare themselves to succeed professionally and adapt socially when they are away from home?

Do not be fascinated by 'moving and living abroad' ideas without a proper plan. Have a plan, set achievable goals, and stick to your plans. Don't let what people show you on social media make you think that life on the other side is all roses. Learn to put in the work in whatever you do. Be open minded, have the will to learn and be teachable. If your plans don't necessarily work out, don't waste time hanging onto it, but rather be prepared to adjust your strategy and move on where necessary. Do not be afraid to fail too. Allow yourself to learn from your mistakes.

Normalize personal reviews. Every now and then, I sit and evaluate myself, my progress and my goals and see if my plans need any adjustments. Be passionate about what you do so that when things don't work out in the lab for instance, passion helps you keep moving forward.

Be self-driven because no one is going to spoon feed you here. Don't focus much on 'feelings' or how and whether people like you or not. Do not compare yourself or your situation with others. Don't be too hard on yourself but acknowledge when you are not okay and get a therapist. Take care of your mental health. It is okay to say 'No'. Do not feel the pressure to take on too much work which can easily send you in to anxiety. Do not be shy to ask for help. There is power in being vulnerable.

Give yourself time to relax and enjoy life as well. Take time off, learn about the country you live in, their culture, their food, and so on. *Once you understand the culture, it's easy to adapt to a new environment.*

Apart from your current research area, what other research fields would you like to contribute to in the near future?

I love solving problems, so I'd like to use my experiences to tap into cancer research one day. I am also open to carrying out research on drug design & development, vaccinology as well as health policy. As part of my transition plans, I will be adding COVID-19 work to my research.

Care to share some recent or favourite publications of yours with us?

I love all of my publications, but I recently thoroughly enjoyed updating a book Chapter with one of my Mentors on the Global HIV/AIDS epidemic. A complete list of my publications can be found here:

<https://pubmed.ncbi.nlm.nih.gov/?term=Koofhethile&sort=date&ac=yes>

Interview by Vanessa Muwanga