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3 December 2021

UCT researchers honoured in L'Oréal-UNESCO programmes for scientific excellence

Lusani Mamushiane, Hendrina Shipanga and Cosnet Lerato Rametse (from left)
Photo: Mohamed Hassan

Three PhD candidates from the University of Cape Town (UCT) have been recognised by the L'Oréal-UNESCO For Women in Science programme for their excellent contributions to science in South Africa and sub-Saharan Africa.

Dr Cosnet Lerato Rametse, a PhD candidate in the Division of Immunology, and Lusani Mamushiane, a PhD candidate in UCT's 5G laboratory, have both been selected for the South African National Young Talents Programme 2021 and have received research grants of R80 000 each.

Hendrina Shipanga, who is completing her PhD in Medical Biochemistry, has been selected for the Sub-Saharan Africa Regional Young Talents Programme 2021, which comes with a research grant of EUR10 000 (approximately R177 000).

The Women in Science Sub-Saharan Africa regional programme, established in 2010, and the South African National programme, established in 2019, are both joint initiatives by L'Oréal and the United Nations Educational, Scientific and Cultural Organization (UNESCO) to promote and encourage the participation of young African women in science.

Every year, 15 doctoral and five post-doctoral students are selected by a jury of eminent African scientific experts to participate in the regional programme, while five doctoral and two post-doctoral students are selected to participate in the national programme.

Beyond the financial support, these programmes also include leadership training offering invaluable networking opportunities and equipping the young scientists with knowledge and skills that will come in handy as they break through the glass ceiling.

Shipanga, Rametse and Mamushiane attended a week-long leadership training in Kigali, Rwanda along with colleagues from the sub-Saharan- and South African Young Talents Programme 2021 at the end of November.

Hendrina Shipanga

Analysis of driver gene mutations in Oesophageal Squamous cell carcinoma

Oesophageal cancer is the sixth cause of cancer-related deaths worldwide and more than 80% of the Oesophageal Squamous Cell Carcinoma (OSCC) cases and deaths worldwide occur in less developed regions. Sub-Saharan Africa is one of the two high-risk areas for OSCC.

The aim of Shipanga's study is to identify driver gene mutations and biomarkers associated with OSCC in South African patients. Normal and tumour DNA samples isolated from OSCC patients have been used for Whole Genome Sequence (WGS) to characterise OSCC in South Africa. Shipanga is currently conducting ongoing validation studies and the next step will be carrying out functional studies to investigate the biological role of the genes of interesting OSCC development.

"I am really honoured and inspired to be part of the 2021 Young Talents," says Shipanga. "Inclusion and participation of women in science is vital for transformation and development of the continent."

Dr Cosnet Lerato Rametse

The effect of asymptomatic sexually transmitted infections on HIV susceptibility in the penis

Having recently completed her medical internship, Rametse made the decision to return to academia through the UCT Clinical Scholar intercalated programme rather than immediately pursuing a career in medicine.

"Academia is usually the pursuit of much older medical practitioners at later stages of their careers, and rarely by females," she says.

Being exposed to rural and vulnerable communities in her upbringing, she has always been passionate about healthcare and it has driven her desire to contribute to locally-relevant disease knowledge.

Rametse's research project focuses on seeking to understand HIV susceptibility and acquisition mechanisms in males, a key contributor population group which is not widely researched.

Due to the fact that the highest incidence of HIV infections is among women of reproductive age, research has also tended to focus on male-to-female HIV transmission and female acquisition. Despite the fact that the male penis has various potential sites of HIV acquisition, research around acquisition and susceptibility in males remains low world-wide.

Although clinical trials have confirmed that Medical Male Circumcision (MMC) reduces infection risk by 60%, the remaining 40% has not been fully determined and neither have the reasons behind MMC's ability to reduce transmission.

Rametse's work examines and assesses some of these biological or immunological mechanisms and is set to provide invaluable insight into HIV susceptibility in males. This, in turn, will be used as a foundation to generate alternative preventative methods, outside of circumcision.

About being chosen as one of the 2021 Young Talents for the South African National Programme, Rametse says:

"I feel so honoured and privileged to be part of a programme that allows me to meet and network with women from various countries in Africa who are all trailblazers, leaders and excellent scientists in their own countries and of course internationally."

Lusani Mamushiane

5G RAN Network Sharing Empowered by Machine Learning and Network Slicing

Thousands of South Africans – especially those living in rural areas – are unable to access the internet, due to a lack of telecommunication infrastructure and affordable connectivity options. As the digital and analogue worlds become more entwined, South Africa's growing digital divide is putting these communities at risk of being entirely excluded from important socio-economic opportunities.

"My ultimate project goal is to build a prototype that will demonstrate the feasibility of telecommunication infrastructure sharing, to accelerate broadband penetration in South Africa. This will help to bridge the current digital divide that is ever-expanding," says Mamushiane.

From a technical perspective, the research aims to demonstrate the feasibility and benefits of integrating machine learning and network slicing to mobile network infrastructures.

Mamushiane aims to quantifiably demonstrate how infrastructure sharing could potentially stimulate competition and save costs for internet service providers which would ultimately lower internet retail prices. What's more, the model benefits every tier of the telecommunications chain: customers will gain improved access, SMMEs will be able to participate in the industry and suppliers will benefit from production cost savings.

In response to being included in the South African National Young Talents Programme 2021, Mamushiane says: "This recognition is so validating and humbling to me. It means that I am doing something useful with my life. I am a contributing member of society. It's the confidence booster that I needed and I appreciate so much."

ENDS

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