

# New study marks important implications for design of HIV vaccine

A PhD student Jinal Bhiman from the Faculty of Health Sciences at the University of the Witwatersrand has published a study in the prestigious journal, Nature Medicine, describing how the changing viral swarm in an HIV infected person can drive the generation of antibodies able to neutralise HIV strains from across the world. The study has important implications for the design of a protective HIV vaccine.



© Monika Wsniowska - [Fotolia.com](https://www.fotolia.com)

The development of a vaccine remains the best possibility for ending the HIV pandemic. However, the researchers say that a major challenge has been the inability to stimulate broadly neutralising antibodies that are able to deal with the enormous variability of HIV.

While some infected people are naturally able to make broadly neutralising antibodies, these antibodies often have unusual features, and generally need to go through an extensive maturation process in order to acquire breadth. Studying these rare people to understand how such antibodies develop provides a roadmap for vaccine strategies.

Through a variety of 'high tech' approaches, including the isolation of monoclonal antibodies from single B cells and ultra-deep sequencing of shifting viral populations over more than three years of infection, the researchers studied one woman who developed potent broadly neutralising antibodies.

The team, led by Professors Penny Moore and Lynn Morris, was able to look back in time to identify the unique virus that bound the precursors of what would become broadly neutralising antibodies, beginning the immune pathway to breadth.

"The study also showed how these early antibodies matured to become broadly neutralising. As the HIV-swarm struggled to evade these potent early antibodies, it toggled through many mutations in its surface protein. This exposed the maturing antibodies to a diverse range of viruses within this single infected woman," the researchers say.

"Antibodies exposed to this high level of viral diversity in turn mutated to be able to tolerate variation, thus acquiring the ability to neutralise diverse global viruses."

These findings provide insights for the design of vaccines that can 'kick-start' and then shape the maturation of broadly neutralising antibodies in HIV uninfected individuals, to provide protection from HIV exposure.

The study was performed at the National Institute for Communicable Diseases of the National Health Laboratory Service, as part of the Centre for the AIDS Programme of Research in South Africa (CAPRISA) consortium, with long-standing collaborations with the University of Cape Town (UCT), the US National Institutes for Health Vaccine Research Center and Columbia University.

The South African Department of Science and Technology, the SA Medical Research Council Strategic Health Innovations Programme, the US National Institutes of Health and the Wellcome Trust funded this research.

For more, visit: <https://www.bizcommunity.com>