

Penny Moore Interview



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Penny Moore is a researcher affiliated with the National Institute for Communicable Diseases (NICD), the University of Witwatersrand and CAPRISA, in South Africa. Her research focus is on the study of HIV neutralizing antibodies and their interplay with the virus.

We recently chatted with Penny about HIV antibody research and its importance in the development of an effective HIV vaccine.

Name: Penny Moore

Position: Reader and SARChI Chair of Virus-Host Dynamics, University of the Witwatersrand and National Institute for Communicable Diseases

Research Interest: The remarkable ways in which viruses direct and misdirect the immune system!

Is a humoral response important in controlling the virus in HIV-infected people? No – although everyone infected with HIV mounts a vigorous humoral immune response, the virus is able to mutate to escape these antibodies. This is true even in those unusual individuals who make broadly cross-neutralizing antibodies that target conserved sites, but have no apparent clinical benefit. However, this is a very different scenario to a vaccine that would elicit such antibodies before infection, and provide sterilizing immunity.

How does studying broadly neutralizing antibody lineages and evolution help with HIV immunogen design? Studies of the ontogeny of broadly neutralizing antibodies have provided key insights into how these unusual antibodies develop. For example, we now know that many of these antibodies come from precursors that are very rare, This means that immunogens must be tailored to select for these unusual precursors. We also now know that broadly neutralizing antibodies develop through a constant “arms race” with the virus, with exposure to diverse viral variants ultimately resulting in the maturation of breadth. Understanding how this dynamic interplay between virus and host shapes antibodies provides us with a template for vaccine design, that seeks to coax the immune system along the pathway to breadth.

How has your research contributed to this knowledge? Our studies in the CAPRISA cohorts of infected donors in Kwa-Zulu Natal have allowed us to make significant contributions to understanding how broadly neutralizing antibodies develop. This is only possible because of the enormous commitment of the CAPRISA donors, who have in some cases donated blood every few months for more than a decade, and the dedicated staff who care for them.

What are the latest advances in antibody-based immunogen design research? This is a hugely exciting time in HIV vaccine research. Immunogens specifically designed to select for rare

B cell precursors have shown promise in humanized mice and will be tested for immunogenicity in humans in 2017. In parallel there have been huge strides in determining the structure of the HIV envelope trimer in its native, functional form. This opens up new possibilities for using these trimers as the basis of immunogens to elicit broadly neutralizing antibodies.

Interview by Thandeka Moyo