



For the high-profile paper see *Nature* 2014; 509: 55–62

For more on the broadly neutralising antibody responses see *Nature Medicine* 2012; 18: 1688–92

For more on the broadly neutralising antibody responses see *Nature Medicine* 2015; 21: 1332–36

## Lynn Morris: the continuing quest for an HIV vaccine

"I hope to be part of the team that discovers an HIV vaccine so we can put a stop to the 2 million new infections that happen globally every year," Lynn Morris tells *The Lancet Infectious Diseases*. She is well placed to work towards this goal, as head of the HIV Virology section at South Africa's National Institute for Communicable Diseases, and as a research professor at the University of the Witwatersrand, Johannesburg, South Africa.

It was at that same university that she majored in both zoology and microbiology, opting to specialise in the latter. Like many researchers, Morris also wanted to experience life outside South Africa; she moved to the UK to do her PhD in a busy and competitive lab at the University of Oxford. This move was key to Morris obtaining a Royal Society Fellowship and the chance to do a post-doc in Australia, where she studied the immunology of leishmaniasis in a mouse model. "I then realised I wanted to do something with a bigger impact," she recalls. "I moved into clinical research. It was the early 1990s and the HIV epidemic was just starting to take hold in South Africa, so I returned home where I have worked on HIV for most of the past 24 years."

She is very proud of her team's achievements working at the tip of Africa. One of her most high-profile papers is a 2014 *Nature* publication with the National Institute of Health (NIH)'s Vaccine Research Center showing how certain types of HIV antibodies develop. "Probably the biggest breakthrough in the last 7 years has been the discovery and study of broadly neutralising antibodies that are found in some HIV-infected people," she says. "These are the types of antibody responses that we need for a vaccine and so the realisation that they could be made by the human immune system was paradigm-shifting." Together with her close colleague Penny Moore and with samples from the Centre for the AIDS Programme of Research in South Africa (CAPRISA) cohort, they showed the crucial role that virus evolution plays in shaping broadly neutralising antibody responses, research that they published in *Nature Medicine*. This project has another spin-off; namely the possible development of the CAP256-VRC26 monoclonal antibody as passive immunotherapy for HIV prevention. "The possibility that this antibody may be tested in the KwaZulu-Natal community from which it was isolated is particularly exciting", she says.

"Lynn Morris is an exceptionally talented scientist, totally dedicated to the search for a safe and effective HIV vaccine," says Salim S Abdool Karim, director of CAPRISA, Johannesburg, South Africa. "She has a special flair to see solutions while everyone else is still wading through the problem in the lab. Like many, I have come to appreciate both her dedication to scientific discovery as well as her caring and nurturing role as a mentor to the young researchers in her lab. She is a truly world-class scientist."

Indeed, Morris' leadership and mentorship skills were brought to fore in the recent HIV Research for Prevention (HIVR4P) conference in Chicago, IL, USA, which she was invited to chair and to which she brought seven of her team of young researchers. She strongly believes that the key to defeating the HIV epidemic involves collaboration both within her own discipline and across other HIV specialist areas, including development of microbicides, other forms of pre-exposure prophylaxis, and continuing scale-up of treatment as prevention.

Lately, Morris's focus is shifting towards two NIH-led efficacy trials that started this year in South Africa. The first is a traditional approach that is testing a subtype C version of the partially efficacious RV144-type HIV vaccine. The second is the antibody-mediated protection trial that aims to determine if passive infusion of the VRC01 monoclonal antibody can prevent infection. "Both trials are being done in people at high-risk of HIV infection. Our laboratory is involved in the clinical endpoint immunogenicity testing on these trials and has been through a long and stringent process of accreditation. I think it's very important that a lot of the laboratory work for these trials will be done on the African continent," says Morris. "It means we will be part of the solution to the AIDS epidemic."

But many hurdles to a vaccine remain, says Morris, not least that "that there are no clear correlates of protection since no-one has ever naturally recovered from HIV infection." She adds: "One might think that making vaccines is easy given the recent successes with Ebola and Zika vaccines; but make no mistake: an HIV vaccine is an enormous scientific challenge!" And Morris says that, even if a successful vaccine reaches the market, "the sobering fact is that any vaccine is unlikely to be 100% efficacious, thus safe sexual practices and the use of proven prevention modalities such as pre-exposure prophylaxis are here to stay and need to be the new normal."

And while she is clearly driven and focussed in the lab, it's not surprising she needs an outlet when work is over. "My free time is all about being active," she says. "All the day's stresses dissipate when I jump into a canoe, get on a bike, or go hiking in the mountains."

"Lynn and her colleagues pioneered the concept of studying the antibody response during HIV infection to understand how the immune system makes potent and broadly neutralising HIV antibodies," says John Mascola, director of the Vaccine Research Center at the National Institute of Allergy and Infectious Diseases (Bethesda, MD, USA). "When we do finally learn how to make an effective HIV vaccine, it is likely that we will look back at Lynn's work as the pivotal first step toward understanding how to generate protective antibodies against HIV."

Tony Kirby