

New technique paves the way for finding a HIV vaccine

November 5 2015, by Jane Gardner



Researchers are one step closer to finding an effective vaccine against HIV thanks to a new approach to systematically understanding the

immune response to the virus.

The technique, termed 'Systems Serology', was developed by University of Melbourne researcher, Dr Amy Chung, from the Peter Doherty Institute for Infection and Immunity (Doherty Institute) in conjunction with researchers at the Ragon Institute of Massachusetts General Hospital (MGH), Massachusetts Institute of Technology (MIT) and Harvard, Boston in the USA.

Using similar tools to Systems Biology, Systems Serology is a combined experimental and computational analytical method that effectively teases out the complex [immune response](#) needed for an effective HIV vaccine. This latest development is described in the paper Systems Serology analysis of vaccine-induced humoral immunity published in *Cell* today.

Dr Chung, the first author of the study, who helped develop the approach while working with Associate Professor Galit Alter at the Ragon Institute of MGH, MIT and Harvard and Professor Douglas Lauffenburger at MIT as part of her American Australian Association and National Health and Medical Research Council (NHMRC) Early Career Fellowships, said the technique provided an unprecedented depth of understanding to these potentially protective immune responses.

"Antibodies are a key part of protection against viruses like HIV. They can harness a variety of different 'weapons' to eliminate virus," she said, "But the exact immune responses or combinations to induce protective immunity against HIV are still unclear.

"Using Systems Serology we revealed unique, vaccine-induced antibody 'fingerprints', which highlighted known and novel markers of what is needed to protect a person from becoming infected with HIV."

Approximately 34 million people have died due to HIV-related causes

worldwide. By the end of 2014, there were an estimated 36.9 million people living with HIV globally, with approximately two million people becoming newly infected with the virus¹.

Director of the Doherty Institute and a world leader in research and clinical management of HIV, University of Melbourne Professor Sharon Lewin, said creating an effective vaccine would be the only cheap and scalable way to prevent HIV infection on a global level.

"Although we now have multiple emerging and highly effective ways to prevent HIV infection through the use of antivirals, including pre exposure prophylaxis or PREP, an effective vaccine is still a top priority," she said.

"The development of Systems Serology is a major step forward in analysing vaccine- effectiveness and could certainly lead to identifying the exact combination of immune responses required to eliminate HIV transmission through vaccination.

"What's more, this new analytical approach could also be applied to a multitude of other infectious diseases including Ebola and Mycobacterium Tuberculosis to help evaluate future antibody-based vaccines. We are delighted Amy chose to return to the Doherty Institute to continue this exciting work."

Provided by University of Melbourne

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