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New discoveries show promise for AIDS vaccine

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 Scientists may be able to create a vaccine that also generates these “broadly neutralizing” antibodies. | File photo

Researchers from The Scripps Research Institute (TSRI), the International AIDS Vaccine Initiative (IAVI) and the La Jolla Institute for Allergy and Immunology recently discovered that an engineered vaccine protein bonds with important immune cells that are available in almost all humans, potentially helping create HIV antibodies naturally.

Some people who have HIV infections are able to naturally generate antibodies that are efficient in neutralizing several different HIV strains as they quickly mutate.

With this discovery, scientists may be able to create a vaccine that also generates these “broadly neutralizing” antibodies, stopping HIV infections before they begin.

“We found that almost everybody has these broadly neutralizing antibody precursors, and that a precisely engineered protein can bind to these cells that have potential to develop into HIV broadly neutralizing antibody-producing cells, even in the presence of competition from other immune cells,” William Schief, lead author of the study and TSRI professor and director, said.

This emerging vaccine strategy would require people to receive HIV vaccines that contain several different HIV proteins engineered by scientists. This strategy requires that the first immunogen bonds with neutralizing antibody precursor B cells, which can develop antibodies.

“The challenge for vaccine developers is to determine if an immunogen can present a particular viral surface in a way that distinct B cells can be activated, proliferate and be useful,” Shane Crotty, study co-author and professor at the La Jolla Institute, said. “Using a new technique, we were able to show — well in advance of clinical trials — that most humans actually have the right B cells that will bind to this vaccine candidate. It is remarkable that protein design can be so specific as to ‘find’ one in a million cells, demonstrating the feasibility of this new vaccine strategy.”

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The Scripps Research Institute

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