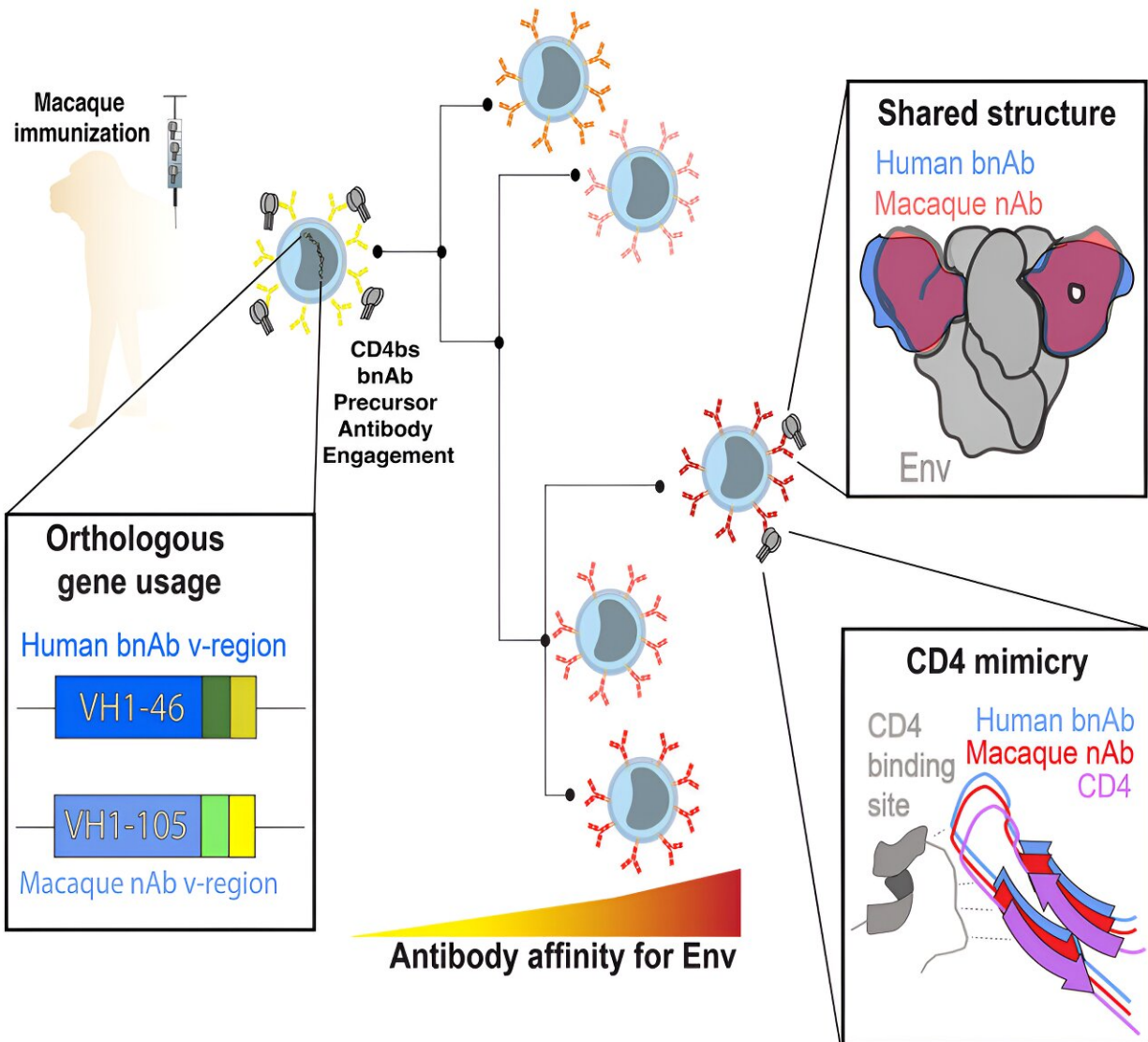


HIV vaccine takes step forward with confirmation of neutralizing antibodies

January 5 2024, by Sarah Avery

Macaque CD4 binding site broadly neutralizing antibody (bnAb) precursor initiation and affinity maturation



Graphical abstract. Credit: *Cell* (2024). DOI: 10.1016/j.cell.2023.12.002

The path to a successful HIV vaccine depends on a critical first step—activating specific immune cells that induce broadly neutralizing antibodies.

Reporting Jan. 4 in the journal [Cell](#), a research team led by the Duke Human Vaccine Institute has achieved that requisite initial step in a study using monkeys. The next phase of the work will now move to testing in humans.

"This study confirms that the antibodies are, at the structural and genetic levels, similar to the [human antibody](#) that we need as the foundation for a protective HIV [vaccine](#)," said first author Kevin O. Saunders, Ph.D., associate director of the Duke Human Vaccine Institute and associate professor in the departments of Surgery, Molecular Genetics and Microbiology, and Integrative Immunobiology.

"We are on the right track," he said. "From here, we just need to begin putting together the additional components of a vaccine."

In earlier work, the research team had isolated naturally occurring broadly [neutralizing antibodies](#) from an individual, and then back-tracked through all the changes the antibody and the virus underwent to reach a point of origin for the native antibody and its [binding site](#) on the HIV envelope.

With that knowledge, they engineered a molecule that elicits antibodies that mimic the native antibody and its binding site on the HIV envelope.

Four years ago, Saunders and colleagues published a [study](#) in *Science* in

which they established that monkeys made neutralizing antibodies when vaccinated with the engineered immunogen, but it was uncertain if those antibodies were like the broadly neutralizing antibody that is needed for a human vaccine.

In the current study, the researchers made a new, more potent formulation of the vaccine and delivered it to monkeys. This time, their goal was to determine whether the neutralizing antibodies generated in the animals were structurally and genetically similar to the [antibodies](#) needed in humans. They were.

"We thought we were on the right track in 2019 and we now have atomic-level detail that confirms those findings," Saunders said. "It's an important step forward."

More information: Kevin O. Saunders et al, Vaccine induction of CD4-mimicking HIV-1 broadly neutralizing antibody precursors in macaques, *Cell* (2024). [DOI: 10.1016/j.cell.2023.12.002](https://doi.org/10.1016/j.cell.2023.12.002)

Provided by Duke University

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