



Novel approach leads to potential HIV-1 vaccine

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The first human trial of a new vaccine against HIV-1 has just begun, and Los Alamos National Laboratory played a key role in its development.

The HIV-1 mosaic vaccine in the trial was originally designed by Laboratory researcher Bette Korber and her team. “My life’s work has been devoted to developing strategies to create a global HIV vaccine; mosaics were a realization of one such strategy,” says Korber.

The search for an HIV vaccine has been challenging due in part to the virus’s extraordinary diversity. HIV-1 has an ability to mutate rapidly, which results in multiple strains and subtypes in different parts of the world.

Understanding the history and structure of the virus has been key to developing the vaccine antigens, which are known as ‘mosaic’ because they are assembled from multiple natural sequences. The goal of the mosaic vaccine is to generate immune responses that can cover a broad range of HIV variants.

A radical but reasoned approach

“It was initially very difficult to convince biologists that mosaic proteins, designed by evolving sequences in a computer, could ever lead to a viable vaccine approach. It is hugely rewarding to see this progress being made,” says Korber.

The mosaic design was based on input that included thousands of HIV sequences kept at [the Los Alamos HIV Database](#), a publicly available international resource funded through the National Institutes of Health. The HIV database holds sequences gathered from scientists all over the world; it currently houses over 800,000 HIV sequences.

“Thanks to experimentalist colleagues who were willing to give this radical but reasoned approach a try, mosaics have come a long way. Now we have to settle in for a few more years of suspense as the human trial unfolds.”

Janssen Pharmaceutical Companies of Johnson & Johnson have partnered with The Bill & Melinda Gates Foundation and National Institutes of Health to conduct the trial, known as “Imbokodo,” the Zulu word for “rock,” from a South African saying that refers to the strength of women and their importance in the community.

The trial will evaluate whether the investigational vaccine regimen is safe and able to reduce the rate of HIV infection among 2,600 sexually active women in sub-Saharan Africa.

[Learn more about the science here.](#)

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