Two companies, Sanofi Pasteur and Novartis, are involved in the clinical side of the Thai trial follow-up, working on components of vaccine combinations to be tested in follow-up trials.

The protective antibody identified in patient analysis of the RV144 trial joins several broadly neutralizing antibodies, isolated from HIV-infected people around the world, which are highly potent against HIV. They are also capable of blocking a broad range of HIV variants—a key to vaccine development, as HIV is wildly mutable. In addition to the virus-neutralizing antibodies PG9, PG16 and VRC01 reported in *Science* (**326**, 285–289, 2009; **329**, 811–817, 2010), 17 novel broadly neutralizing antibodies (some of which were 10–100 times more potent than PG9, PG16 and VRC01) were reported in *Nature* last August (*Nature* **477**, 466–470, 2011). This discovery was a result of a collaboration between the International AIDS Vaccine Initiative (IAVI), university laboratories and biotech companies, such as Seattle-based Theraclone Sciences, which contributed its process for isolating the antibodies, and S. San Francisco, California–based Monogram Biosciences, which contributed its neutralization assays.

Now researchers are trying to delineate the nature of the epitopes on the HIV envelope to which broadly neutralizing antibodies bind. "It's very basic [research]," says Fauci. "They're still trying to develop the right conformational structure of what these epitopes are." But eventually there will be a need for the private sector, he says. "You're going to need companies to come along and partner with the basic scientists to develop these immunogenic epitopes—how do you scaffold them, how do you present them to the body—so that they would induce an immune response." But getting to that point won't be easy. "How to translate that into a vaccine—it's not trivial," says Jaap Goudsmit, CSO at vaccine developer Crucell in Leiden, The Netherlands.

The few existing private sector vaccine developers have been funded by government and charitable sources, such as NIH, IAVI in New York, and the Bill and Melinda Gates Foundation in Seattle. Those organizations tend to direct the course of the research and supply nearly 97% of the global investment in preventive HIV vaccine research, according to the HIV Vaccines and Microbicides Resource Tracking Working Group. "VCs [venture capitalist] are simply not investing in the area," says David Cook, COO at IAVI. "Living on grants is a very uncertain way of living."

With large public and philanthropic funding organizations controlling the direction of research, and those funders forced to pool diminishing resources, the field could use more independent voices from the private sector, say some scientists. "One of the biggest problems in the field is the lack of diversity of opinions and approaches," says Bruce Walker, director of the Ragon Institute in Charlestown, Massachusetts. "NIH, Gates Foundation, IAVI, et cetera, are aligning around specific products to take forward," particularly in pursuing Thai trial repeat studies, he says. Some scientists are questioning the wisdom of concentrating resources on a single approach, he says. "Most funders agree that multiple concepts merit testing, but there is just not enough funding to do that."

**Emily Waltz,** *Nashville*

## Around the world in a month