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Could We Have a Zika Vaccine Soon?

by MAGGIE FOX



Inspectors begin to spray insecticide around Sambadrome, the outdoor grounds where thousands of dancers and musicians will parade during the city's Feb. 5-10 Carnival celebrations in Rio De Janeiro on Jan. 26. Leo Correa / AP

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A vaccine against the Zika virus could be ready for testing in people by the end of the year, experts said this week.

It's a blindingly fast timeline by U.S. drug development standards, but the speed doesn't come because Zika's a killer virus that needs an emergency response. It's because Zika is a conveniently close relative of two real killer viruses - dengue and West Nile virus.

"It is to our advantage we already have existing vaccine platforms to use as a sort of jumping off point," said Dr. Tony Fauci, head of the National Institute for Allergy and Infectious Diseases (NIAID).

"NIAID is currently pursuing at least two approaches to a Zika vaccine. First, a DNA based vaccine using a strategy very similar to what we employed for another virus, the West Nile virus," Fauci told reporters.

"Second, a live vaccine building on similar and highly immunogenic approaches used for the closely related dengue virus."

Related: What Is the Zika Virus? Your Questions Answered

Both vaccines have already been tested in people and been shown to be safe and to prompt an immune response.

DNA vaccines use little piece of DNA from the germ that the vaccine is protecting against to stimulate the immune system. "Live" vaccines use an actual virus or bacterium that's been damaged so it cannot cause an infection, but will train the immune system to recognize a real infection.

In fact, a vaccine against dengue is being tested in Brazil right now. The same mosquitoes that carry and spread Zika have been spreading dengue virus as well.

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Dengue infects an estimated 400 million people around the world every year. If people get infected twice, the second infection can cause serious and sometimes fatal illness. Dengue hemorrhagic fever can kill 20 percent of victims.

The World Health Organization estimates that 500,000 people are hospitalized with dengue every year. More than 1.5 million cases of dengue were reported in Brazil in 2015. It causes occasional cases in warmer U.S. states, most recently Hawaii.

West Nile was only introduced into the United States in 1999, but it quickly spread to all 50 states as well as Canada and Mexico. Since then, it's infected hundreds of thousands of people, causing severe illness in about 40,000 and killing more than 1,600.

It might be possible to just swap Zika DNA, or a whole Zika virus, into the experimental vaccines, since it's so similar, researchers say.

Photos: Brazil Grapples With Zika

"While these approaches are promising, it is important to understand we will not have a widely available safe and effective Zika vaccine this year and probably not in the next few years, although, we may be able to begin an early phase I clinical trial actually within this calendar year," Fauci said.

That's because it takes years of testing to make sure a vaccine works safely. And then a commercial pharmaceutical company must sign up to make and sell a vaccine -- and companies won't do that unless they can see they won't lose money on the project.

"In the meantime, we have issued a call to the research community to highlight our interest in funding a number of vital areas of research that are specific to the current threat of Zika," Fauci said.

Related: Researchers Seek Market For Ebola Vaccine

NIAID pays for promising research into infectious diseases, so this call is inviting researchers at companies or institutions to send in their ideas. NIAID is hoping for proposals for new vaccines, better tests for Zika, and treatments.

Right now, it's hard to test for Zika because on a quick test it looks just like dengue or chikungunya virus. It takes a special lab to distinguish Zika from its cousins, and that takes time.

"We're now working very hard to come up with a test that will be able to identify if someone has been previously infected with the Zika virus," CDC Director Dr. Thomas Frieden told NBC News.

This delay is making it hard for scientists to say whether Zika is in fact causing a big increase in cases of microcephaly in Brazil. This serious birth defect causes the brain to stop developing properly. Babies can miscarry, they can die at birth or, if they live, they are disabled.

"THIS IS A BRAND NEW VIRUS, SO WE, PRIOR TO THIS TIME, HAVE NOT SPENT ANYTHING ON ZIKA."

Faster, better diagnostic tests would allow researchers to test thousands of people to see how common the virus is and whether women who have babies with microcephaly are in fact more likely to have been infected with Zika virus when they were pregnant.

No one did this kind of research before because Zika only causes very mild symptoms in most people. No one believed it was a threat to human health.

"This is a brand new virus, so we, prior to this time, have not spent anything on Zika," Fauci said. But NIAID has about \$97 million a year for the family of flaviviruses that includes dengue, West Nile and Zika.

"I imagine that this is going to require a considerable amount of resources, but right now, we're just going to fund what comes in with the money we have," Fauci added.

President Barack Obama told NIH this research should be a priority now.

And the WHO meets next week to decide whether Zika poses a global emergency. If it does, that will set off a mechanism for more research, too.

But Dr. Thomas Geisbert, who helps test vaccines at the University of Texas Medical Branch, says the window of opportunity is short. He says interest in an Ebola vaccine waxed and waned until there was an epidemic in West Africa.

"You can sustain interest in a vaccine if it impacts large numbers of people and is a constant problem," Geisbert said.

"For Zika it is probably going to be even harder to sustain interest than Ebola because while Zika infection can very infrequently cause birth defects (which is quite tragic in those cases), there have been no fatal cases and it is not transmitted person to person."

Unless it causes a spike in birth defects more widely, there is unlikely to be a long-term push to develop a Zika vaccine, Geisbert said.

This kind of research should be going on all the time, experts in biological threats say.

"We cannot be caught without adequate tools to handle what is shaping up to be a long fight against emerging infectious disease," said former senator Joe Lieberman and former Pennsylvania governor Tom Ridge, who head the Blue

Ribbon Study Panel on Biodefense. The panel released a report last year predicting new viruses would pop up, as Zika has, and that the U.S. was not properly ready.



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