

HOW A PUBLIC-PRIVATE PARTNERSHIP TURNED THE TIDE ON EBOLA

A major outbreak of the Ebola virus in West Africa from 2014–2016 infected tens of thousands and captured worldwide attention as it traveled across borders and even made its way to the United States. While rare, Ebola is particularly frightening as it has eluded effective treatment since it first appeared in 1976. Approximately half of those who contract it will die.

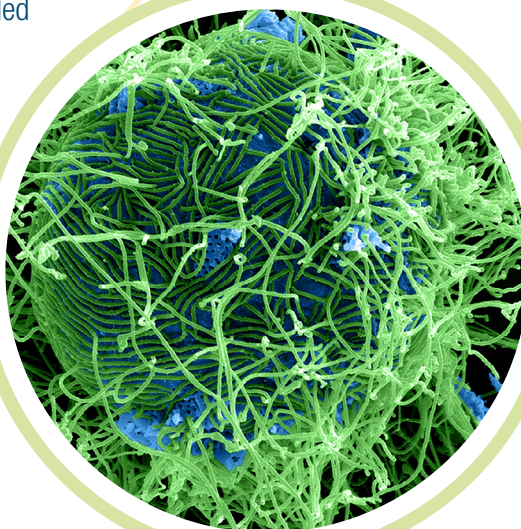
However, in August 2019, a multinational effort — spearheaded by the World Health Organization, the National Institutes of Health (NIH) and the Institut National de Recherche Biomédicale — turned the tide on Ebola. Critical to this effort was the research and drug development efforts of private sector companies and the NIH.

As Ebola spread throughout the Democratic Republic of Congo, early data from a clinical trial showed that two of four drugs being tested — EB3 developed by Regeneron and mAb114 by NIH — were significantly better at treating Ebola and preventing death.

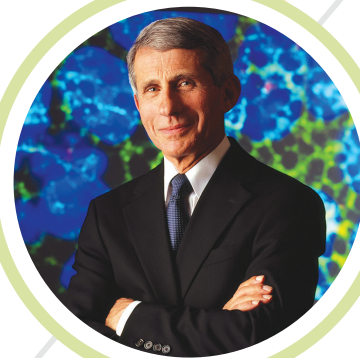
The therapeutics that proved to be effective used monoclonal antibodies, a relatively new approach to fighting diseases. Monoclonal antibodies are man-made proteins that mimic human antibodies in the immune system to help find and attack disease.

According to Dr. Anthony Fauci, director of the NIH's National Institute of Allergy and Infectious Diseases, the idea of using antibodies to counter an outbreak is a relatively new concept that can enable a more rapid response. "We always talk about trying to develop a vaccine, but often a vaccine takes years to develop. And when you're dealing with an outbreak of a new disease, you don't have time to develop a vaccine. Whereas the idea of having a monoclonal antibody that you could rapidly deploy makes your capability to respond very much truncated."

For Tarrytown, New York-based Regeneron Pharmaceuticals, Inc., the systems, science and infrastructure to create an Ebola-fighting antibody were already in place. And in the face of the outbreak in West Africa, the company decided it needed to act. "We thought we had the best



The Ebola virus



Dr. Anthony Fauci, NIAID

TURNING THE TIDE

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technology, and that the world was in dire need, so in September 2014, we took the plunge and started making a cocktail that took advantage of all of our unique technologies to make fully human monoclonal antibodies,” said Regeneron Executive Vice President for Research and Development Neil Stahl.

Regeneron's EB3 uses a triple-antibody approach designed to target the Ebola virus at multiple points, since the virus is known to mutate as it evolves with each outbreak. The antibodies bind to different sites on the virus, which increases its overall effectiveness at blocking a mutated Ebola virus.

“When we got news that the trial stopped because our drug (along with NIH's mAb114) was so effective, we were overjoyed and incredibly moved,” said Stahl.

According to Dr. Fauci, the clinical trial was the “expression of a culmination of years and years of research” and was only possible because of a collaborative public-private effort to save lives.

The development of these new treatments was supported by the Biomedical Advanced Research and Development Authority, a division of the U.S. Department of Health and Human Services tasked with countering chemical, biological, radiological and nuclear threats, as well as pandemic diseases.

“You think back to when you first started doing this literally many years ago. And yet, it was the fundamental basic science that we did along the way, together with our collaboration with private industry and pharmaceutical companies, that led to that moment where you could say definitively that these two interventions worked,” said Dr. Fauci. “The next time we have an outbreak of Ebola, we’re going to have treatments to give to people.”

PHOTOS COURTESY OF OF THE NIH AND REGENERON

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Neil Stahl, Regeneron



Dallas nurse, Nina Pham, leaves NIH after recovering from Ebola in 2014



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