

Massachusetts General-led consortium focusing on rapid development of Q fever vaccine

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A consortium of academic and industry organizations led by a team from the Vaccine and Immunotherapy Center (VIC) at Massachusetts General Hospital (MGH) has launched a new effort to develop an entirely new type of vaccine against Q fever, an animal-borne disease that has infected a significant number of U.S. troops stationed in Iraq and Afghanistan. Q fever also has been the basis for biological weapons developed by the former Soviet Union and possibly by the regime of former Iraq leader Saddam Hussein. The project is being funded through a \$5.2 million contract from the Defense Threat Reduction Agency (DTRA) of the U.S. Department of Defense.

The award is the next step for an ambitious effort called VaxCelerate, which focuses on rapid development of vaccines against emerging [infectious diseases](#). "The quickening pace at which new infectious diseases appear in humans, and their potential for rapid transmission across the globe, require a new way of developing vaccines for these threats," said Mark Poznansky, MD, PhD, director of the [VIC](#) and principal investigator of the project. "We believe that the latest scientific concepts and technical advances from both academia and industry can be integrated in a new way to more rapidly develop and deploy new vaccines."

The VaxCelerate process integrates cutting-edge technologies from different research organizations and companies into an end-to-end

process for [vaccine development](#). As the project leader, the MGH team aligns the coordinated work of the consortium with real-world requirements for candidate vaccines to move expeditiously into human use. In addition to the MGH VIC, the DTRA-funded VaxCelerate Q fever consortium includes Colorado State University in Fort Collins; EpiVax Corporation in Providence, R.I.; InnatOss Laboratories in Oss, the Netherlands; and Yale University in New Haven, Conn. Additional key efforts during specific program phases will be provided by 21st Century Biochemicals, Marlborough, Mass., and Southern Research Institute in Fredrick, Md.

VaxCelerate collaborators for each [vaccine](#) project are selected for their ability to contribute state-of-the-art approaches that can speed the pace of development and provide rapid clues to the likelihood that a vaccine will be successful in humans. "Each collaborator brings a specific set of technologies and expertise to bear on the development of this new vaccine candidate," said Timothy Brauns, MBA, associate director of VIC. "We will effectively coordinate the efforts of these collaborators to produce a much needed vaccine candidate for expedited advancement into human studies."

Funding for efforts like VaxCelerate has come on the heels of progressive outbreaks of new infectious diseases like SARS, H1N1 influenza, MERS (Middle East Respiratory Syndrome)-CoV and Ebola - infections for which vaccines were never successfully deployed or only were released at the end of an epidemic. Since the late response to the H1N1 flu in 2009, the U.S. government has made major investments in rapid vaccine manufacturing approaches for influenza and has established a number of efforts that can accelerate the pace of development for new vaccines.

The VaxCelerate effort received early funding from the Defense Advanced Programs Agency (DARPA), enabling the consortium to

successfully develop and test a new vaccine for Lassa fever in 120 days, starting only from genomic data on the virus. Two prior VaxCelerate projects demonstrated the proof of principle that the distributed development approach could work for the design of a new vaccine and a so-called live fire demonstration that a new vaccine could be developed and preclinically tested within 120 days of the sequencing of the pathogen genome. The current project focuses on development of an RNA-based vaccine that will promote protective responses against the Q fever bacteria without the potential safety issues that prevent existing [vaccine candidates](#) from receiving U.S. regulatory approval for use in humans.

"I think that the most exciting aspect of this highly coordinated team effort is that it both fits and funds a key mission of VIC at MGH, which is to accelerate the development of vaccines for emerging infectious diseases," says Poznansky, who is an associate professor of Medicine at Harvard Medical School.

Massachusetts General Hospital, founded in 1811, is the original and largest teaching hospital of Harvard Medical School. The MGH conducts the largest hospital-based research program in the United States, with an annual research budget of more than \$760 million and major research centers in AIDS, cardiovascular research, cancer, computational and integrative biology, cutaneous biology, human genetics, medical imaging, neurodegenerative disorders, regenerative medicine, reproductive biology, systems biology, transplantation biology and photomedicine.

Provided by Massachusetts General Hospital

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