Researchers awarded up to $24 million to develop vaccines and therapies for highly pathogenic Nipah and Hendra viruses

Bethesda, Md. – The Uniformed Services University of the Health Sciences (USU), along with Profectus Biosciences, Inc., the Vanderbilt University Medical Center, Mapp Biopharmaceutical, Inc., and the University of Texas Medical Branch (UTMB), have been awarded up to $24.5 million to advance treatments for the highly lethal henipaviruses, Nipah and Hendra.

The award, to Dr. Christopher Broder, professor and Chair of the Department of Microbiology and Immunology at USU, is a collaborative Center of Excellence for Translational Research (CETR) grant supported by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH). The grant funds will be distributed through the Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc. (HJF) over five years to further the development of countermeasures used for the prevention and treatment of Nipah and Hendra infections in humans. A major focus of the CETR will be on preclinical products that have shown an ability to provide complete pre- and post-exposure protection of animals against Nipah and Hendra infection.

Nipah and Hendra are Biosafety Level-4 (BSL-4) zoonotic pathogens and classified as priority agents by Department of Health and Human Services because they possess the potential for high morbidity and mortality rates and are major threats to public health and economically important livestock. Recently, Nipah was selected by the World Health Organization as an epidemic threat needing urgent research and development action. The deadly virus was included in the WHO R&D Blueprint list of priority pathogens with epidemic potential, and considered agents with the highest risk of being deliberately misused by bioterrorists to cause mass casualties and produce devastating effects to the economy, critical infrastructure and public confidence.

There are no vaccines or treatments approved for human use against Nipah and Hendra, and infection causes high mortality rates in people that range between 50 and 100 percent.

Broder is an internationally recognized virologist, with nearly 30 years of research experience aimed at understanding how viruses infect cells and developing ways to prevent it. Broder’s group have been working on Hendra and Nipah virus for more than 20 years. Previous studies from his laboratory in collaboration with other teams have already made significant translational research breakthroughs including the Hendra virus horse vaccine (Equivac® HeV) marketed by Zoetis, Inc., in Australia following licensing from HJF under the USU-HJF Joint Office of Technology Transfer of the core subunit technology developed in Dr. Broder’s laboratory, and an anti-Nipah/Hendra human monoclonal antibody (m102.4) that has been successfully used on an emergency basis in more than a dozen individuals.
“We are all very excited about this new grant as it combines the two most promising treatments against infection by Nipah and Hendra. One is a vaccine to offer protection from infection and the other approach provides a post-exposure treatment. Each of these measures has shown the ability to completely protect animals from either infection or lethal disease by these deadly viruses,” said Broder. “We are extremely appreciative of the support we have received from NIAID/NIH and look forward to working with them and with our corporate partners to further develop these most promising interventions for human use.”

Broder will work with his long-time collaborator Dr. Thomas Geisbert, professor at UTMB, to evaluate the effectiveness of the countermeasures to be developed, and they will collaborate with John H. Eldridge of Profectus Biosciences, James E. Crowe, Jr. of Vanderbilt University Medical Center, and with Larry Zeitlin, of Mapp Biopharmaceuticals.

“Our group, in collaboration with Broder’s team were the first to report on the promise of both a preventive vaccine and a therapeutic treatment for both Nipah and Hendra infection with a clear potential for transition to real human-use application,” said Geisbert. “It’s not often that research quickly leads to the development of medical countermeasures for people, and such progress typically comes from close collaborations between research groups.”

“We look forward to further advancing the utility of the Nipah/Hendra subunit vaccine developed in collaboration with Dr. Broder,” said Eldridge, chief science officer of Profectus’ vaccine division. “Nipah and Hendra are both highly pathogenic and Nipah in particular is a significant outbreak threat that has been shown capable of transmitting person-to-person. Transitional the effective subunit vaccine into a form that can be stored long-term and rapidly deployed to outbreak areas will be a tremendous advance to prevent widespread human infections.” Profectus is working on the initial development of the human subunit vaccine under a grant from the Coalition for Epidemic Preparedness Innovations and a license from HJF under the USU-HJF Joint Office of Technology Transfer.

“Our group will identify, develop and characterize a host of new anti-Nipah/Hendra human monoclonal antibodies directly from naturally infected human survivors,” said Crowe, who directs the Vanderbilt Vaccine Center. “The human monoclonal antibodies we develop will be used to understand and define the basic mechanisms by which naturally occurring antibodies kill Nipah and Hendra viruses.

“The first findings from the collaborative work by the Broder and Geisbert teams with the m102.4 human antibody extends the growing body of evidence that monoclonal antibodies can provide protection at the early stages of disease with highly dangerous viruses and could be useful during an epidemic,” said Crowe.

The study was conducted in a Biosafety Level (BSL)-4 facility at UTMB’s Galveston National Laboratory (GNL). BSL-4 is a highly-restricted area where scientists wear positive pressure protective suits and study pathogens that cause severe and often fatal diseases. UTMB has one of the only functioning BSL-4 laboratories located on an American university campus.

“The level of protection that the CETR collaborators have shown to date with the vaccine and the human antibody is very impressive. We plan to advance the new antiviral antibodies towards human safety testing as quickly as possible,” said Larry Zeitlin, president of Mapp Biopharmaceutical, Inc.
The center will conduct three interdependent research projects, each supported by two cores. Preclinical evaluation of the anti-viral approaches will be conducted under the direction of Geisbert at the Galveston National Laboratory at UTMB. The production of human monoclonal antibodies for future clinical evaluation will be carried out by Mapp Biopharmaceuticals under the direction of Zeitlin. The grant is NIH Award No. U19 AI142764.

###

About the Uniformed Services University:
The Uniformed Services University of the Health Sciences (USU) is the nation's only Federal health sciences university. USU educates, trains and prepares uniformed services health professionals, officers and leaders to directly support the Military Health System, the National Security and National Defense Strategies of the United States and the readiness of our armed forces. For more information, visit: www.usuhs.edu.