MedicalXpress

Crucial research in development of promising Ebola virus treatment

August 6 2014

Laboratories at The Scripps Research Institute (TSRI) are investigating antibodies to fight Ebola virus, including the three antibodies recently used to treat two American health care workers infected with the Ebola virus.

The conditions of two Americans have reportedly improved since they received a highly experimental antibody cocktail called ZMapp, supplied by San Diego-based Mapp Biopharmaceutical.

The TSRI laboratories of Professor Erica Ollmann Saphire and Assistant Professor Andrew Ward are studying the structures of these antibodies using techniques called electron microscopy, which creates high-resolution images by hitting samples with electrons, and X-ray crystallography, which determines the atomic structure of crystalline arrays of proteins. Through these images, the team will discover exactly how the immune system molecules bind to the Ebola virus and stop it from functioning, a critical step in drug development.

Ebola virus causes an extremely virulent disease that currently leads to death in 25 to 90 percent of cases. The fast-moving virus is spread via the blood or other bodily fluids of an infected person,

"What we're showing are sites of vulnerability on the surface of the virus," said C. Daniel Murin, a graduate student in the Saphire and Ward labs. "These are the chinks in the armor of the virus and the places were you would want your anti-serum to target."

The ZMapp treatment is still in experimental stages and has not yet been approved for use outside the two recent cases. According to Saphire, ZMapp is one of the best antibody cocktails currently known, but there may still be ways to improve it. She is currently leading a $28 million National Institutes of Health-funded consortium to test antibody cocktails from laboratories around the world, with the goal of finding the best for neutralizing Ebola virus and the many other viruses like it.

An ideal antibody cocktail would ease symptoms and improve the prognosis of infected individuals—it could even work as a preventative measure, protecting healthcare workers before they enter an infected area.

The work on the Ebola virus is part of a larger Vaccine and Global Health Initiative at TSRI, which includes research on HIV/AIDS, influenza and tuberculosis.

Provided by The Scripps Research Institute