MedicalXpress

The search for Ebola immune response targets

September 9 2014

The effort to develop therapeutics and a vaccine against the deadly Ebola virus disease (EVD) requires a complex understanding of the microorganism and its relationship within the host, especially the immune response. Adding to the challenge, EVD can be caused by any one of five known species within the genus *Ebolavirus* (EBOV), in the Filovirus family.

Now, researchers at the La Jolla Institute for Allergy and Immunology (La Jolla Institute) and the San Diego Supercomputer Center (SDSC) at the University of California, San Diego are assisting the scientific community by running high-speed online publications of analysis of EBOV-related epitope data being curated in the Immune Epitope Data Base (IEDB), and predicting epitopes using the IEDB Analysis Resource. Sebastian Maurer-Stroh of Bioinformatics Institute, A*STAR, Singapore is also assisting with analysis of the latest outbreak sequences of Ebola proteins.

"These results are the first installment of a series of analysis, whose ultimate goal is to provide a comprehensive overview of the molecular targets of the immune responses to Ebola virus," said Julia Ponomarenko, a senior research scientist at SDSC and UCSD PI of IEDB.

The recent Ebola outbreak in West Africa has now reached historic proportions surpassing 1,900 deaths from 3,500 confirmed or probable cases, prompting the World Health Organization (WHO) to declare an

international public health emergency, according to recent news reports. Outbreaks of EVD have occurred in Africa in the past; however the current epidemic, caused by Zaire Ebolavirus, has been characterized by its unprecedented breadth and rapid spread.

"Clearly, research related to development of therapeutics and a vaccine against EVD is an urgent need, as well-engineered vaccines don't exist at this time; our analysis is aimed at assisting the clinical and scientific communities in fine evaluation of laboratory results with the express intent of improving therapeutic targets or new vaccine development," said Alessandro Sette of the Division of Vaccine Discovery, La Jolla Institute for Allergy and Immunology, IEDB PI.

As of last month, the IEDB reported, in preliminary analysis, 67 T cell (CD4+ and CD8+) and 35 B cell epitopes (linear and conformational), from viruses within the EBOV and Marburgvirus genera. Within EBOV, data are provided for all known species, including Zaire, Sudan, Reston, Bundibugyo, and Tai Forest Ebolavirus. To date, 29 papers have been published that describe experimental data on the epitopes in the Filoviridae family, with 23 papers focused on the EBOV-related epitope data.

Provided by University of California - San Diego