Fast Pandemic Detection Tool Ready to Fight Flu

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In a joint effort by national laboratory-, university- and private-sector institutions, researchers are developing new tools for rapidly characterizing biological pathogens that could give rise to potentially deadly pandemics such as Influenza A (H1N1).

The first tool, an automated genotyping system, is a joint effort between Los Alamos National Laboratory, the University of California at Los Angeles (UCLA) School of Public Health, and Agilent Technologies. This system will be utilized in the Global Bio Lab at UCLA and will use high-throughput technology for automated global-public-health surveillance.

The automated genotyping system, built to specification by Agilent Technologies, was delivered to Los Alamos in late May for verification of design and capability testing. The $1.7 million BioCel Automation System was designed in collaboration by Los Alamos and UCLA researchers, and professionals at Agilent's automation solutions division, previously known as Velocity11. The system will be able to automatically determine the genetic sequence of viruses such as influenza hundreds of times faster than any other method available today.

By using this system and future high-throughput tools in pandemic response mode, public-health officials will be able to rapidly and reliably determine the strain of a virus, allowing more time for mitigation or containment strategies to be employed if necessary. Moreover, these

BioCel systems will also be useful in research mode for monitoring animal populations for the emergence of new and potentially deadly pathogens before the pathogens are able to infect humans. The UCLA Global Bio Lab will become part of the High Throughput Laboratory Network (HTLN), which, when built out, will provide an international and interconnected capacity that provides uniformity in testing methods—reducing the potential for errors or confusion arising from variable testing methodologies currently used.

“As the recent outbreak of the swine flu shows, we need to do a much more extensive and thorough job of surveillance,” said Dr. Tony Beugelsdijk, leader of the HTLN project at Los Alamos National Laboratory. “This program will provide the world with the tools for this task.”

Current genetic identification methods require lots of time and manpower. The new genotyping system features two robots and the ability to fully sequence 10,000 or more influenza viruses per year. This makes it much faster and more reliable than current methods, and reduces the amount of manpower necessary to process a large number of samples.

“This system is the next-generation tool to rapidly and accurately test and identify biological pathogens in mass quantities of samples,” said Nick Roelofs, vice president and general manager of Agilent Life Sciences Solutions Unit. “Capable of performing tests 100 times faster than any current method, it will provide reliable, real-time data to the global health community. Given current health concerns about the swine flu, the system addressees an immediate and vital need in the public health arena.”

Later this summer the system will be delivered to UCLA, where researchers will operate the system for public health research and

surveillance, and train others to use the new tool. If necessary, the system has surge capacity and the ability to test samples in response to a pandemic should the need arise.

"The automated genotyping system will vastly increase the speed and volume by which influenza samples are analyzed," added Dr. Scott Layne, professor of epidemiology at the UCLA School of Public Health. "The pace of emerging infectious disease outbreaks in the world is increasing and demands new kinds of technologies be created and applied. These technologies will help us to safeguard public health and save lives."

LANL and UCLA researchers are currently determining protocols for culturing and screening processes that can be used with the high-throughput laboratory. Establishing such protocols is the next step toward making the Global Bio Lab at UCLA fully operational.

Source: Los Alamos National Laboratory (news : web)