

Rapid Identification Of Deadly Microbes

Brandeis University



Quick response is critically important when dealing with an outbreak of disease or a biological weapons attack.

Rapid identification of deadly microbes is essential for rapid deployment of emergency response plans and minimizing loss of life. Now an invention by a professor at Brandeis University in Waltham, Mass., provides accurate results from samples in less than two hours.

Professor Larry Wangh, Ph.D., and his laboratory colleagues have invented a unique DNA amplification and analysis technique called “Linear After The Exponential (LATE) PCR (Polymerase Chain Reaction).” LATE-PCR is an advanced form of asymmetric PCR which begins by generating double-stranded DNA molecules but then switches to efficient amplification of single-stranded molecules.

LATE-PCR provides significant advantages over traditional PCR techniques that only generate double-stranded DNA molecules, especially its ability to identify multiple types of bacteria or viruses in a single test. The technology was first disclosed in 2002 and was licensed to Smiths Detection, Inc. in 2004. Since that time Smiths Detection has provided

major funding for further THE BETTER WORLD REPORT PART TWO research and development of LATE-PCR. Smiths Detection has engineered a point-of-use instrument, known as the BioSeeq, to enable the use of LATE-PCR outside of the traditional laboratory.

The BioSeeq® is a sophisticated and ruggedized portable device that incorporates automated sample preparation, assay processing and result reporting. Bioseeq® can also be decontaminated by immersion into bleach, making it the ideal platform for use in field locations where spread of disease must be controlled. Initially, Bioseeq® and LATEPCR will be used to monitor and control animal disease outbreaks.

A sample from an animal can be prepared and analyzed on the BioSeeq in under two hours. The veterinarian thereby has the opportunity to take effective action without the risks associated with removing a potentially infected sample from the location.

“Up to five independent tests can be run simultaneously on the BioSeeq, and the LATE-PCR technology has the ability to identify several different infectious agents with a single test.

The list of diseases/infectious organisms for which tests are currently being developed is long, but includes anthrax, tularemia, plague, and orthopox. Multiplex assays for Foot and Mouth Disease and Avian Influenza® are also in an advanced stage of development. LATE-PCR technology will play an increasingly important role in counter-bioterrorism efforts, as well as in detecting and monitoring high contagious animal disease outbreaks.

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