



University of Southern Mississippi

Real-Time Detection of Chemicals and Biological Pathogens in Fluids



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Prevent, Protect, Respond, Recover

Homeland Security Challenge:

Bacterial and viral agents of natural agricultural or bioterror origin can be easily transported and widely dispersed to the population at numerous locations simultaneously. Rapid detection of these threats is of critical importance to food and water safety, public health, and the socio-economic well-being of the nation.

Research Project Solution:

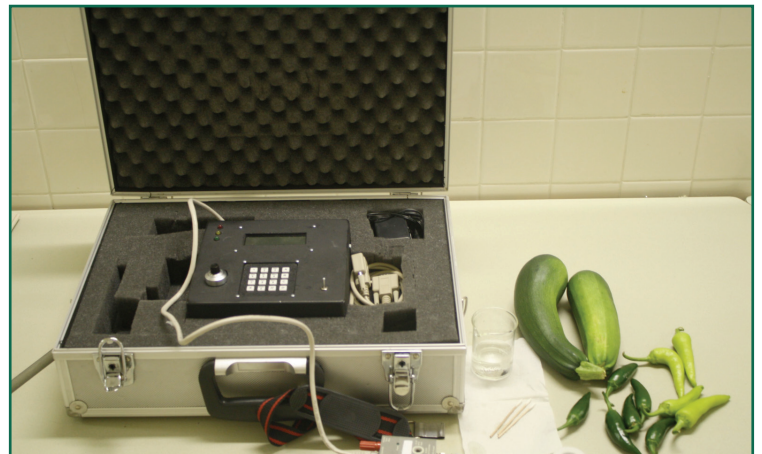
Research is being conducted to develop a field-deployable biosensor capable of detecting specific bacterial and viral agents. The biosensor will be versatile enough to examine water and agricultural samples, as well as suspensions of suspicious solids (e.g., powders such as those of the 2001 anthrax threat). It will be developed for use by first responders or agricultural field agents and will provide actionable information obtained by interpreting the readouts of the sensors.

National Implications:

The biosensor being developed through this research has a wide range of applications for multiple homeland security operations and practitioners. It will be capable of detecting a broad range of bacteria that cause food- and water-borne illnesses and those listed as potential biological weapons. The device can be used to support operations and fill capability gaps in border security, law enforcement, fire and rescue, and other homeland security operations. In addition, federal agencies, such as the Department of Defense, Department of Health and Human Services, Department of Agriculture, and other government entities at the state, local and tribal levels should be able to rapidly deploy this biosensor and obtain timely information with limited user training.



Project researchers examine a sample of tomatoes for Salmonella species using the prototype biosensor.



Agricultural products can be directly tested for the presence of bacterial contaminants both in the field or in a laboratory environment using the biosensor developed in this project.

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SERRI is managed by the Department of Energy's Oak Ridge National Laboratory for the U.S. Department of Homeland Security