



News Release

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Scientists Research New Technologies for Rapid, Accurate Detection Capabilities

Seeking new tools to better aid first responders and the Warfighter in the detection of suspicious powders

ABERDEEN PROVING GROUND, Md. – First responders occasionally come across suspicious powders, requiring them to have technology on hand to screen samples and identify whether or not it is a chemical or biological agent. Current technology performs a test to determine whether or not protein exists on the sample, an indication that the sample is live, or active. With this technology, specificity is low, false positives are common and the cost is very high: one test costs \$26.

Researchers at the Edgewood Chemical Biological Center (ECBC) are seeking alternate technology that is more effective and lower in cost. The team evaluated several prescreening technologies and found that while many could be useful for detecting a biological threat, ongoing issues with low specificity and false positives require additional costly research to determine an accurate diagnosis.

During their research of existing technology, ECBC scientists came across a Cara Technology Limited Report (report 30606) which discussed the use of adenosine triphosphate (ATP)-based technology to look for contamination on food surfaces. ATP is one of the main providers of energy to cells, and every reproducible organism has it. Historically, it was thought that spores do not have traceable amounts of ATP on their surface, but recent findings have indicated otherwise.

“This is exciting because it gives us a new avenue to research technologies that can screen suspicious powders much more effectively than what’s currently on the market for first responders,” said James Wright, a chemist with ECBC’s BioSciences Division. “A lot of assumptions were made 50 years ago that aren’t holding up. We’re finding now that we can screen at several orders of magnitude lower than previously thought.”

One of the systems the team chose to evaluate is the 3M Clean Trace Surface ATP technology, which meets the criteria they were looking for: Simple, compact and cost-efficient. Another key component is that the start-up costs are comparable to that of the current technology, but each test is only \$3 a swab. That is 10 percent of the recurring

costs of what is currently used, which is a significant long-term cost savings.

The team will continue to evaluate other ATP-based systems. According to Wright, the goal is identify the right equipment that should be in the hands of first responders or soldiers, and ATP-based technology could be the best tool to augment what is currently on the market. One of the most significant benefits of the ATP technology is that if a test is negative, you know the sample is not a threat. With the current technology, a positive result can occur if any protein is present, even if it is harmless.

“That’s the issue with the current detector. If it’s an innocuous powder that contains protein, it will still read as positive so you have to shut down the area and send the sample to the reference lab—and until the results are provided, the lab or office remains shut down,” said Wright. “Processed or highly refined biological products, like protein powder or powdered creamer, don’t have ATP but do contain protein. So if the ATP test comes up negative, we know that the sample is not active or alive and, from a biological standpoint, we don’t have to worry about it.”

ECBC submitted a second proposal for this work, recently accepted by the Department of Homeland Security, to continue to test the 3M technology against the strict ASTM International standards in a direct comparison to the current technology. The team is hopeful that after this one-year effort, the 3M technology will be fielded to first responders within one to two years.

For more information about ECBC, visit <http://www.ecbc.army.mil/>.

ECBC is the Army’s principal research and development center for chemical and biological defense technology, engineering and field operations. ECBC has achieved major technological advances for the warfighter and for our national defense, with a long and distinguished history of providing the Armed Forces with quality systems and outstanding customer service. ECBC is a U.S. Army Research, Development and Engineering Command laboratory located at the Edgewood Area of Aberdeen Proving Ground, Maryland. For more information about the Edgewood Chemical Biological Center, please visit our website at <http://www.ecbc.army.mil> or call (410) 436-7118.

30