
SUSPICIOUS
WHITE POWDER
Center for Domestic Preparedness develops inexpensive field test for ruling out Anthrax spores.

Testing Suspicious White Powders

We read with considerable interest the article entitled "Suspicious White Powder" (*HFR*, July/August 2003) authored by a panel of experts under the auspices of Department of Homeland Security's Center for Domestic Preparedness (CDP). That article set out a protocol for helping first responders rule out the presence of anthrax and other agents that accompany threat letters.

The CDP protocol correctly calls for the use of field tests to measure protein and pH to first screen suspicious powders with the objective of determining if more extensive testing of the material would be required. Proteins are found in living materials including biowarfare agents such as anthrax, ricin toxin and botulinum toxin. Conversely, many harmless substances frequently mistaken by citizens as containing potential bioterror agents—such as powdered sugar, drywall dust, cornstarch and many cosmetics—do not contain protein. Thus the presence or absence of protein serves as an effective indicator of whether pathogens or toxins are present in a sample and can help rule out those powders that pose no likely threat to public safety.

Nevertheless, as the company that first developed and brought to market a protein/pH test kit specifically designed, optimized and validated to assess suspicious powders by first responders in a field setting, we offer several cautionary observations about the CDP recommendation that departments assemble their own "homemade" field test kits using off-the-shelf supplies.

The article suggests the use of commercially available protein test strips designed for testing the protein albumin in urine samples. Ultimately, the goal of a screen of suspicious powders is to determine if there is a risk that anthrax spores or other pathogens or toxins are present. Preliminary testing of at least one such strip using spores closely related to anthrax (B. cereus) showed a very weak positive result in the presence of more than 1 billion spores. In contrast, independent laboratory testing of our BioCheck Powder Screening Kit shows a detection limit more than 10,000 times lower than this. (More extensive side-by-side testing will be conducted in the coming months.) Additionally, several common substances (e.g. baking soda) generated a false positive with some of the urine test strips we tested.

Another key limitation of the "make-it-yourself" kit recommended by the CDP is the lack of a positive control to confirm results. A positive control is used to confirm that a negative result for protein is a true negative (to rule out false negatives) and provides the first responder with critical confidence in the result. Protein test strips do not provide a positive control (such a control is included with the BioCheck kit).

Perhaps most importantly, individual departments or jurisdictions do not have the resources to test their homemade kits in either a laboratory or field setting or to implement a quality control manufacturing process. Before launching BioCheck, we field tested it for a year in Washington D.C. in response to more than 50 actual 9-1-1 calls. More than 85% of suspicious substances tested, including cornstarch and sugar, were found not to contain protein, ruling them out as likely to contain bioterror agents. Importantly, it was successfully tested on actual anthrax and an anthrax stimulant by two reputable outside labs. Testing on ricin and other agents is anticipated in the near future.

20/20 GeneSystems' product is now being sold to fire departments and public safety personnel worldwide for under $25 per test. It has been adapted into the standard operating procedures by numerous fire departments and HazMat teams, including Washington D.C., Seattle and Toronto, Canada. The product has also been incorporated into the training programs of the National Center for Security Research and Training at Louisiana State University. The test involves a simple color change with no instrumentation required to read the result. Unlike the urine protein strips, however, the BioCheck Kit was specifically designed for use by first responders for this application.

We offer several cautionary observations about the CDP recommendation that departments assemble their own "homemade" field test kits.

It is critical that emergency service providers have robust, accurate and reliable products to help protect citizens from bioterror attacks and the panic from false alarms.

—Liz Marcus
Director of Marketing
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The CDP Working Group responds:
I am pleased that our nation's emergency responders now have options which will make their important mission—protecting our citizens from biological threats—safer and more efficient. Having taught

fire, police and paramedics the fundamentals of bioterrorism defense and response at the Center for Domestic Preparedness for the past 3–4 years, I had become aware of the desperate need for simple, affordable tools to help HAZMAT teams and other responders differentiate the hoaxes from the real threats.

In December of 2002, we assembled a small group of laboratory and response experts for a one-day brain storming session with the goal of devising a simple, inexpensive system to help responders triage unknown anthrax letter hoaxes. The outcome of our working group's deliberations was a simple, affordable five-step system that we proposed might have significant power to RULE OUT *Bacillus anthracis*, and possibly other biological agents, in letters or packages. We understood that we were working at the very bottom of a complex and highly technical system (see Table 3, p. 30, *HFR*, July/Aug 2003) necessary to DEMONSTRATE THE PRESENCE of *Bacillus anthracis* in an unknown sample. My vision, when I began the project, was that we might devise a simple test kit that would reduce the workload of our responders and the cost to our cities.

We are pleased that, subsequent to our deliberations, then available commercial kits have been improved, new metrics added, validation research conducted and the cost for test kits maintained in a range affordable to many small communities. Tactical units now have the choice of assembling their own triage kits or purchasing available commercial kits, some with greater sensitivity, positive controls or other valuable features. The members of our volunteer working group—none with commercial interest—are proud to have had the opportunity to contribute to the safety and security of all Americans.

—David R. Franz
VP, Chemical & Biological Defense Div.
Southern Research Institute

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We are a 501C3 nonprofit organization that works with fire and emergency services organizations and individuals across Pennsylvania and with the other state and national fire organizations. We would like to reproduce your article "ICS-talkin' 'bout an Evolution" (HFR, *Sept./Oct. 2003). *It was excellant and made several good points that we would like to share with other Pennsylvania fire service leaders. We would also like to receive, if possible, permission to reproduce other important articles as they appear in your magazine.*

—Tom Savage
Executive Director of the Pennsylvania Fire and Emergency Services Institute Harrisburg, Pa.

EDITOR'S NOTE: We've received several similar requests for permission to reprint articles. We're pleased to assist in getting relevant information into the appropriate hands. Please email Executive Editor Keith Griffiths at *kgriffiths@kgbmedia.net* with details regarding the desired use of the material.

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