



News for the Federal Biorisk Management Policy Community

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Contents

Page 2

Stand-by Science: EPA Helps the Nation Be Better Prepared for Emergency Response cont. from pg. 1

Pages 3-4

FBI and AAAS Host Third Meeting in Science and Security Series cont. from pg. 1

Page 5

HHS supports USG goals at the Biological Weapons Convention Meeting of Experts

Page 6

Evolution of Interactive Learning in the S3 Program

Stand-by Science: EPA Helps the Nation Be Better Prepared for Emergency Response

By Kathy Hall, hall.kathy@epa.gov

EPA researchers are helping to increase the nation's laboratory capacity to support large-scale emergency response operations. Since 2004, EPA researchers have brought homeland security experts together from across the Federal government to develop a compendium of methods to be used for analyzing environmental samples and address site characterization, remediation and clearance following homeland security events.

In 2010, a clam boat off the coast of Massachusetts reportedly dredged up some most unwelcome bounty: World War I era munitions. Shortly after removing the munitions from the catch, two of the crew members came down with symptoms consistent with exposure to exposure to mustard agent, a toxic chemical vesicant fill formerly used in some chemical munitions. While returning the munitions to the ocean, a munition was dropped on the deck, releasing a



black liquid substance. Drops of the substance landed on one deckhand's clothing, and a second deckhand was exposed to fumes. After several hours, both crew members felt ill and were subsequently transported to a local hospital for evaluation. The deckhand who was only exposed to the fumes was evaluated and released. The other deckhand developed small blisters on his forearm and upper thigh. Emergency room personnel recognized their injuries as a potential exposure to sulfur mustard. Sulfur mustard exposure was confirmed by chemical analysis. The

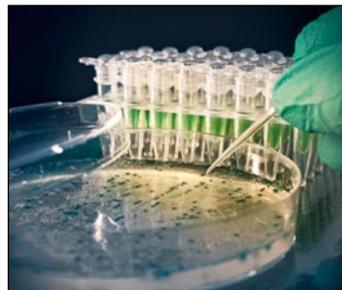
cont. on pg. 2

FBI and AAAS Host Third Meeting in Science and Security Series

By Will So, Ph.D., william.so@ic.fbi.gov

Background

With the increasingly globalized nature and collaborative approach to biological research, scientists and institutions are facing new challenges to their ability to conduct, support or oversee research. Ensuring compliance with differing laws and regulatory requirements and preventing inappropriate use of research knowledge or materials becomes increasingly important. In collaboration



with the Association of American Universities (AAU) and the Association of Public and Land-grant Universities (APLU), the FBI and the American Asso-

ciation for the Advancement of Science (AAAS) hosted a series of three meetings providing opportunities for academic scientists, research administrators, and the security community to build a better relationship and focus on addressing the joint challenges of mitigating biosafety and biosecurity risks. The third and most recent meeting was held in February 2013 and specifically focused on the issues resulting from in-

cont. on pg. 3

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Stand-by Science: EPA Helps the Nation Be Better Prepared for Emergency Response *cont. from pg. 1*

deckhand was successfully treated and released after a period of hospitalization. EPA scientists and engineers assisted with environmental analysis, decontamination and cleanup operations at the contaminated site.

“We knew mustard gas was the target to test for because both clinical symptoms and test results from the crew member were available before any environmental samples even arrived at our laboratory,” said Ernest Waterman, Laboratory Branch Chief at EPA’s New England Regional Laboratory in Chelmsford, MA.

For the clean-up effort, the regional lab was able to perform all the environmental sample testing in-house. However, Waterman says, “Had there been a need to send samples to other labs around the country it would have been important that all the labs use the same method of analysis. At the time, there were no plans in place on how to achieve that, so I think it would have taken some time to ensure that we were, in fact, all going to analyze the samples in the same way. If this had been a large-scale event, we would not have been able to move as quickly as we would have liked.”

To help in such scenarios, EPA homeland security researchers have developed a library of selected methods, the [Selected Analytical Methods for Environmental Remediation and Recovery](#), or SAM for short. The guide helps labs around the country to quickly and efficiently select the appropriate environmental testing and analysis methods to use after a wide-scale event. SAM is part of a research program that for nearly a decade has been helping the nation be better prepared for an accidental or deliberate release of chemical, biological or radiological agents.

Teams of experts worked with EPA reviewing and revising lists of chemical, biological and radiological substances that could cause mass harm. EPA’s focus is to make sure laboratories nationwide have the capability to test for these substances and that similar testing can be performed across all the laboratories, so that lab results can be easily compared.

SAM is not a plan on how to handle an emergency, but rather a library of selected methods that laboratories can use as a guide to run their tests. The testing protocols cover several hundred harmful substances including chemical, radiological and biological material.

“The nice thing about SAM is you can click onto the method and it provides resources that labs can use in a major incident or accident,” said Dr. John Griggs, director of EPA’s National Analytical Radiological Environmental Laboratory in Montgomery, Ala., and coordinator of the radiological section of SAM.

“At regular intervals, we evaluate whether we need to add other radionuclides and then select appropriate methods based on information received from Homeland Security or intelligence. This is an ongoing process.”



In the case of an act of terrorism or other major incident requiring coordinated, large-scale laboratory response, labs need to analyze many samples taken from the air, water, soil, and indoor and outdoor surfaces. Using the selected methods identified through SAM should increase the speed of analysis and improve data comparisons among labs across the United States.

“When an incident produces multiple samples, a large network of labs will be required to conduct the analysis simultaneously,” said Kathy Hall, a health physicist at EPA’s National Homeland Security Research Center in Cincinnati, Ohio and a coordinator for SAM. “What we are looking at is ways we can produce comparable results when we use state and commercial labs to supplement federal labs in performing sample analysis.”

EPA is preparing the 142 private and government labs that are part of the Environmental Response Laboratory Network with a list of selected methods to help keep the sampling and analysis consistent when it’s most important. To access SAM2012, please visit: www.epa.gov/sam. The CDC’s Morbidity and Mortality Weekly Report also describes an account of this incident here: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6216a7.htm>.



FBI and AAAS Host Third Meeting in Science and Security Series

cont. from pg. 1



ADVANCING SCIENCE, SERVING SOCIETY

ternational collaboration. The meeting was held in Washington, DC and included over 65 domestic and foreign participants from research institutions, government, and international and non-profit organizations.

The agenda for the meeting included distinguished speakers on a variety of topics, including: global perspectives on the intersection of science and security; education and workforce development for mitigation of biosecurity risks; establishment of a scientific environment that promotes international scientific partnerships; and suggestions on how to jointly address current concerns and challenges. Specifically, the goals of the February 2013 meeting were:

1. To identify current challenges in addressing safety, security, and ethics while conducting or facilitating biological research with foreign students, faculty, staff, or collaborating partners;
2. To discuss current strategies or needs for promoting a common understanding of biosecurity risks and mitigation measures, and how they relate to safety and ethical risks and mitigation strategies in biological and biotechnological research;
3. To identify strategies for enabling international scientific collaboration within the existing biological sciences and security environment; and
4. To identify ways in which the research community and FBI can work together to address these challenges.

Emerging Themes

There are operational challenges when scientific research is done on a collaborative global scale. Several inter-governmental organizations have initiated activities to harmonize the principles and practices of research integrity or research ethics, but often institutions are forced to identify and resolve problems on a case-by-case basis. Additionally, with the increasingly interdisciplinary nature of life sciences research, there are new layers of complexity to consider.

The group at the meeting discussed the major issues and challenges they faced with respect to international research and the need to address biosecurity and biosafety concerns.

Although researchers are very familiar with designing collaborative scientific projects, they are much less familiar with the process of international collaboration, specifically actions such as preparing and complying with contracts, ensuring the necessary certifications, and implementing the policies and measures to ensure compliance with laws and regulations, both foreign and domestic. Clearly defined roles and responsibilities are fundamental to this process.

Additionally, the background checks that are often required for employment at research institutions are frequently ineffective when vetting foreign scientists. The information that is used for background checks of U.S. citizens is not readily available for vetting foreign scientists who have not spent much time in the United States. Developing common standards of research practice is critical for ensuring that science is conducted in a safe, secure, and ethical manner.

Problems and Suggested Solutions

The participants at the meeting described their experiences and shared both the challenges they have encountered as well as any approaches that their institutions employed to solve some of these problems. These challenges and subsequent approaches are highlighted below.

1. Biosafety, Biosecurity, Ethics, and Research Integrity – Participants highlighted the importance of intent in dual-use research and suggested that biosafety and biosecurity concepts are not well understood or taught in a consistent international manner. Meeting participants suggested increased education about a wide range of risks as a possible approach to this problem. Education could come in a variety of forms (e.g., formal training programs or courses developed by the research institutions, informational resources provided by University Offices of Sponsored Programs, or case studies). Participants stressed the importance of education on the key international legal instruments that affect research efforts to gain a better understanding of international security requirements.



The third and most recent meeting was held in February 2013 and specifically focused on the issues resulting from international collaboration.

cont. on pg. 4

FBI and AAAS Host Third Meeting in Science and Security Series

cont. from pg. 3

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2. Cross-disciplinary Research – With increased collaboration between life science and non-life science research, there are new security risks and vulnerabilities. Specifically, many non-life scientists might not receive the same level of research oversight or education on the mitigation of safety and security risks. To alleviate these concerns, graduate students and postdoctoral fellows from all scientific disciplines could be trained in ethics, responsible conduct of research, laboratory safety and security, and broader security issues.
3. Research Standards and Requirements – It is difficult for institutions and researchers to facilitate international collaborations if research standards or legal requirements between partner institutions or countries are different. Participants suggested that research institutions could develop agreements that detail requirements and policies specific to that institution to enable easier collaboration. The broader scientific community might also promote the development of common standards of research or request the registration of biological materials at U.S. and foreign partner universities.
4. Some Research is More Easily Conducted Overseas – Scientists can circumvent the high cost of U.S. regulations and policies and conduct certain types of research more quickly and with less regulatory burden outside of the United States. Meeting participants suggested that research institutions should increase their oversight and facilitate more regular communication with offices overseas. Additionally, the U.S. government could assess whether regulations contribute to a competitive disadvantage of U.S. research efforts or are an incentive for researchers to circumvent U.S. rules.
5. Background Checks and Vetting of Foreign Entities – Vetting foreign scientists can be very challenging due to dissimilar country criteria and standards. Participants stated that trusted partnerships and discussion with trusted colleagues was one way their institutions addressed this issue. Additionally, the FBI could help scientists and research administrators understand personnel suitability assessments, and research institutions abroad could request further assistance from U.S. government resources in-country.

Suggested Action Items

The challenges of supporting research that involves scientists and research institutions from different countries are complex and require strong communication and coordination among all parties involved. The following suggestions do not indicate source of funding, ease of implementation, or support for carrying out the action items.

The participants indicated that there was a need for additional guidance from either the U.S. government or research institutions. This guidance could include a catalog of relevant international laws and regulations or advice on how to resolve differences in regulations between collaborating countries. Research institutions should develop a clear set of minimum criteria for research infrastructure and educational components that could help support international scientific collaboration with U.S. research institutions.

The U.S. government, research institutions, and relevant trade associations should cooperatively use applied research to develop laboratory safety measures, security practices and ethics training programs. Additionally, the training programs should be assessed using quantitative approaches to measure program effectiveness.

The FBI could also continue to link local law enforcement with research institutions as the situation requires, and the research institutions themselves could develop ongoing evaluations and encourage reporting of questionable behavior. Additionally, the scientific community could develop and self-impose norms and accepted standards of conduct.

Participants demonstrated interest in a better forum to share experiences and lessons learned and also indicated that additional training at the research institutions would be helpful. There should be more communication between research institutions and their relevant offices to ensure that all parties are in full compliance with regulations.

To encourage interaction and discussion, the meeting was held as not-for-attribution. The full text of the summary report can be found here: http://www.aaas.org/cstsp/files/International-Science-and-Security-AAAS-AAU-APLU-FBI_2013.pdf.

HHS supports USG goals at the Biological Weapons Convention Meeting of Experts

By Matthew L. Lim, MD, FACP, Matthew.Lim@hhs.gov

The 2013 Meeting of Experts (MXP) of the Biological Weapons Convention (BWC) took place in Geneva, Switzerland, at the Palais des Nations of the United Nations, from 12-16 August, 2013. One of the chief themes of the MXP was support to international efforts to limit the possibility and impact of accidental or deliberate release of pathogens with the potential to cause harm on a wide scale.

The Biological Weapons Convention (also known as the Biological and Toxin Weapons Convention) is a treaty originally signed in 1972 that currently has 170 States Parties with an additional ten States that have signed but not yet ratified.

The United States was one of the first countries to join the Convention. The BWC is a rare legally-binding agreement that bans all aspects of an entire class of weapons – those using biological agents and toxins – including all stages of research, design, development, storage, deployment, and use. The Convention encourages peaceful uses of biological science and technology, including research necessary for medical, public health, or other beneficial ends.

The Convention holds even greater importance now as, in the last 40 years, the risks posed by biological weapons has increased. Not only has the risk of extremist and other non-state groups gaining access to such weapons increased, but the development of technology and scientific understanding has accelerated, which may increase the chances of the intentional misuse of dangerous organisms.

Furthermore, the growing risk of natural disease outbreaks, such as H5N1 influenza or SARS, places increasing demands on public health at community, national, and global levels, requiring strengthened cooperation and sharing of information and resources. In this regard, the efforts undertaken by BWC Parties to minimize the risk of the proliferation of biological weapons are relevant to improving the overall health security of the global community.

At the 2013 MXP, HHS contributed significantly to the efforts of the United States government to advance U.S. and international objectives in countering biological weapons proliferation and improving global health security.

Under the leadership of the U.S. Department of State, the U.S. delegation highlighted the importance of concrete progress towards a world that is more safe and secure from the threats of dangerous pathogens, not only in the context of preventing deliberate use, but also from natural emergence or accidental release.

Among the notable contributions HHS made was a plenary presentation by CDC's Associate Director for Laboratory Science in the Influenza Division at CDC, Dr. Michael Shaw, on the role CDC has played in improving international preparedness for pandemic influenza. CDC's efforts paid off in 2012 and 2013, when the Center led the U.S. government's development of diagnostic kits and reagents for H7N9 influenza and spear-headed sharing them with many other countries.

Dr. Shaw's presentation was followed by a side event presentation to BWC delegates and interested non-governmental representatives on HHS' efforts to improve international cooperation as part of public health emergency preparedness and response.

Throughout the meeting, HHS participants supported the work of the U.S. delegation as technical experts in the plenary and side events. Among the notable meetings that took place in parallel with the BWC meeting itself were conversations with WHO, other members of the Global Partnership for Countering the Spread of Weapons of Mass Destruction, and numerous other countries that partner with the U.S. in support of nonproliferation and global health security.

The benefits of sustained U.S. diplomatic efforts and outreach became evident as numerous countries listed collaborations with the United States among their global health security achievements.

In 2014, the focus of BWC Parties will include international efforts to support emergency preparedness and response. HHS programs and divisions will continue to lend significant support to U.S. BWC efforts, including on preparedness and response, and to promote U.S. global health security goals in this important multilateral forum.



One of the chief themes of the MXP was support to international efforts to limit the possibility and impact of accidental or deliberate release of pathogens with the potential to cause harm on a wide scale.

Evolution of Interactive Learning in the S3 Program

By Anna Muldoon, MPH, anna.muldoon@hhs.gov

Over time, it became clear that the interactive educational tool was useful for much more than just starting conversations with players.



Since 2011, the S3: Science, Safety, Security program has had significant success using interactive learning tools to engage conference attendees and spread awareness of key biorisk management concepts in the scientific community. With funding from the Office of the Director of National Intelligence, the S3 program was able to develop and rapidly deploy an interactive educational tool focused on biorisk management and policy tools relevant to biological organisms.

Initially, the tool was intended simply to bring conference attendees into the booth area to introduce them to the program. The tool is designed to allow the player to go through the entire trivia set until they get three questions wrong. It does not, however, show the correct answer on the screen. Most conference participants played more than once, with one notable player staying at the booth for an hour to get through the entire set.

Over time, it became clear that the interactive educational tool was useful for much more than just starting conversations with players. Many players had difficulty with a particular topic area included in the trivia and this gave the booth workers the opportunity to engage players on more specific items. For example, one booth participant had never heard of the Biological Weapons Convention or UNSCR 1540. After playing the game and discussing the treaties with a booth worker, she read both and came back the next day to try again. That type of interaction on a topic happened much more frequently than expected.

The interactive kiosk at the booth has become a key feature of the S3 program and we are currently working to transfer the interactive tools



created for the kiosk to the S3 website (www.phe.gov/S3) Given the complete success of using interactive tools in person, there are high hopes for the impact of adding tools to the website.

In addition, the S3 program is working on expanding the range of interactive tools available to increase engagement with website visitors. Trivia and a case study engine are currently available at the S3 kiosk and both are being adapted for the S3 website. The case study engine will give the program the opportunity to teach specific information or skills by working through scenarios, whether online or at the booth kiosk.

It is expected that the S3 program will expand the range of trivia topics, quizzes, and case studies available on the S3 website and kiosk over time. If you or someone in your agency is interested in working on a case study, please email Anna Muldoon at anna.muldoon@hhs.gov or leave a comment on the S3 website at www.phe.gov. The S3 program would like to offer as broad and useful a range of interactive tools as possible and welcomes and feedback or suggestions.

Feedback and Submissions Welcome

We want to hear from you! Please contact Janelle Hurwitz (janelle.hurwitz@hhs.gov) with any comments, suggestions or news ideas for future editions of S3 Newsletter. Feel free to submit general information for inclusion or drafted articles. If you have an idea, we are

happy to work with you in drafting a piece. Articles should be in MS Word format, fewer than 1000 words, with author/contact name and email address. Pictures and diagrams in jpg format are encouraged and welcome. Thank you!