



CLASS OF 2014 YEARBOOK

Emerging Leaders in Biosecurity Initiative

A competitive fellowship created to identify, develop, and provide networking opportunities for the next generation of leaders in biosecurity.

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EMERGING LEADERS IN BIOSECURITY CLASS OF 2014

This government funded initiative was launched in 2012 under the leadership of the program's Executive Steering Committee with support from the UPMC Center for Health Security and CENTRA Technology, Inc.

For more information, please visit www.emergingbioleaders.org



“We will continue to face new and emerging biological threats that will require the coordinated and concerted efforts of a broad range of domestic and international partners. As we take action to counter these threats, we will work together to advance our own health security and provide for the improved condition of all humanity.”

*President Obama, the National Strategy for Countering Biological Threats
November 23, 2009*

AN OUTSTANDING FELLOWSHIP YEAR

The second class of Emerging Leaders in Biosecurity is an outstanding group. This year’s fellows have an impressive diversity of backgrounds and experiences, and their different perspectives will be crucial for building strong, effective capacity for global biosecurity in the years ahead.

We supported the creation of the ELBI fellowship because we believe in the importance of injecting fresh ideas and bringing new perspectives into the policymaking process. Over the course of this year, our ELBI fellows had some very unique opportunities to interact with senior leaders in public health, defense, homeland security, biopharma, think tanks, and beyond. They walked the halls of the White House, the Pentagon, the CDC, and some of our premiere national laboratories to gain in-depth knowledge of US and global biosecurity and health security efforts. In all of these encounters, they engaged their hosts with stimulating questions and new viewpoints.

We have certainly enjoyed getting to know the 2014 fellows and look forward to following their progression and careers

as they contribute to efforts to secure our country against biological threats. This critical ELBI program works to ensure that our next generation of leaders will be well-connected and prepared for the important work of making our world safer and more resilient to emerging infectious diseases, biological weapons, laboratory accidents, and other biological threats.

Moving forward, we are identifying the 2015 fellowship class, and we will ensure that the ELBI alumni will help to shape and stay engaged with the program in the future. We expect that the fellows will remain closely in touch as they continue to develop their careers in the months and years ahead.

We want to thank our esteemed executive steering committee for their important input and advice about development of this program. We are delighted to be a part of this unique effort and look forward to remaining closely involved with the program as it grows.



ANDREW C. WEBER

*Former Assistant Secretary of
Defense for Nuclear, Chemical,
and Biological Defense Programs*

EMERGING LEADERS IN BIOSECURITY CLASS OF 2014





BUILDING THE NEXT GENERATION OF BIOSECURITY LEADERS

Crystal Boddie, MPH, Program Manager, and Matthew Watson, Deputy Program Manager, UPMC Center for Health Security

The Emerging Leaders in Biosecurity Initiative is a highly competitive program that now includes 2 classes of talented and motivated young professionals in the field. This year, 28 very accomplished applicants joined us from a wide variety of disciplines, backgrounds, and experiences.

Our goal this year was to build on successes with ELBI from the inaugural class of 2012 by providing increasingly unique and valuable opportunities to engage with senior leaders in biosecurity, including those on the front lines of global health security, national security, and public health preparedness.

Through participation in the spring meeting in Washington, DC, the fall meeting in Atlanta, expert video interviews, webinars, online forums, and alumni happy hours, the fellows were exposed to new information, experts, and policy problems. They eagerly contributed innovative ideas in their discussions with leaders and through the ELBI paper competition. They also learned about a variety of professional pathways and opportunities to address important issues in biosecurity, and they exchanged ideas and resources with their peers.

As we look back on this year, we are struck by the camaraderie and rapport that quickly developed among the fellows. This class of fellows brought many different perspectives to the table, resulting in some great conversations and substantive contributions to the national dialogue. We are very impressed with the collective achievements of those chosen to be fellows in 2014, and we have tracked with interest and pride the achievements of our 2012 ELBI alumni.

We are appreciative of the involvement and the many contributions of the initiative's Executive Steering Committee members who provide their support both in guidance to the program and in their time and mentorship at the semi-annual meetings and beyond. We are also very grateful for the wisdom and participation of senior leaders and biosecurity experts who made presentations at the ELBI workshops and who hosted the fellows for on-site tours of government facilities.

We look forward to working with next year's class and are very optimistic for the future of biosecurity with an increasing number of ELBI fellows to lead the charge.

PATRICK BOYLE, PHD

Dr. Boyle leads the development of the Organism Design pipeline at Ginkgo BioWorks, a synthetic biology company that makes and sells engineered organisms. This pipeline provides design tools and synthetic biology expertise to Ginkgo’s Organism Engineers and is an integral part of Ginkgo’s Design, Build, and Test strategy for organism engineering.

Dr. Boyle received his PhD in biological and biomedical sciences from Harvard Medical School in 2012. He received an SB in biology from the Massachusetts Institute of Technology in 2006.



JULIA BROWN, PHD

Dr. Brown is a Presidential Management Fellow at the Defense Threat Reduction Agency, where she serves in the Office of the Chief Scientist in the Research and Development Directorate. Through open innovation and technology scouting, she identifies Counter Weapons of Mass Destruction technologies in the biological sciences, including for applications in biosurveillance, diagnostics, medical countermeasures, and DNA forensics.

Dr. Brown received her PhD in ecology and evolutionary biology from Yale University in 2012. She received her MSc in ecology and evolutionary biology from Yale in 2009 and her BSc in ecology, evolution, and organismal biology from Vanderbilt University in 2007.



JOSEPH BUCCINA, MA

Mr. Buccina is a Senior Associate on the Public Health Strategy and Operations Team at PwC Advisory. In recent years, he worked on the Department of Defense’s Chemical Biological Defense Program 2020 Enterprise Review project and completed an assessment of the Alfred P. Sloan Foundation’s biosecurity grant program. His biodefense and public health projects encompass work with the Department of Defense, the Department of Homeland Security, the Department of Health and Human Services, and the Institute of Medicine.

He previously worked as a regional biosecurity analyst at the Veratect Corporation and as an economic researcher at the Embassy of the Republic of Korea.

Mr. Buccina received his MA in international relations and international economics from the Johns Hopkins University School of Advanced International Studies (SAIS) in 2007. He received his BA in political science from Williams College in 2004.

KELLY CAPPIO, MPH

Ms. Cappio is the Director of Vaccines and Biodefense Policy at the Biotechnology Industry Organization (BIO). Her responsibilities include analyzing domestic and international policies that affect the development and procurement of medical countermeasures, developing industry positions and advocacy messages, and providing subject matter expertise during meetings with Administration officials and members of Congress.

She previously worked in federal government affairs at Sanofi. Ms. Cappio received a master of public health degree from George Washington University in 2011 and a BA in international affairs from the University of Colorado at Boulder in 2005.



ELIZABETH CARTER, MPH

Ms. Carter is a Senior Director at the Chertoff Group, a global security advisory firm that provides consulting, business development, and M&A advisory services for clients in the security, defense, and government services industries. Ms. Carter focuses on assisting clients with counterterrorism strategies, crisis and risk management, and emergency planning and response projects.

Prior to joining the Chertoff Group, Ms. Carter served as Plan Manager for Weapons of Mass Destruction for the New York City Office of Emergency Management, where she was

responsible for the development of hazard-specific emergency plans to respond to chemical, biological, radiological, and nuclear incidents. Ms. Carter spent 9 years in the financial services industry, most recently with Bear, Stearns & Co., where she was a Vice President in High Yield and Corporate Bond Research.

She received her master of public health degree in environmental health sciences from Columbia University in 2010 and a BA in history from Yale University in 1999.



CINDI CORBETT, PHD

Dr. Corbett is Chief of the Bioforensics Assay Development and Diagnostics Section in the Head Monoclonal Antibody Unit of the Public Health Agency of Canada's National Microbiology Laboratory. Her responsibilities include serving as the Director of the Canadian Laboratory Diseases Network, leading the Microbiological Emergency Response Team, and managing operations of the Bioforensics Assay Development and Diagnostic Section of the National Microbiology Laboratory.

She previously held various positions at the National Microbiology Laboratory, including serving as Chief of the Microbial Immunity Section and Head of the Molecular Microbiology Section.

Dr. Corbett received a PhD in microbiology and infectious diseases from the University of Calgary in 2004. She received a BSc in cellular, molecular, and microbial biology from the University of Calgary in 1998.

**MICHAEL CROWLEY, MRES**

Mr. Crowley is the Project Coordinator for the Bradford Non-Lethal Weapons Research Project, where he is responsible for coordinating the organization's research in nonlethal and less lethal weapons used by law enforcement, security, and military forces and nonstate actors. He also is a Senior Research Associate at the Omega Research Foundation and previously held positions at Verification Research, Training and Information

Centre (VERTIC) and the British American Security Information Centre. Mr. Crowley is a PhD candidate at Bradford University, where he primarily explores mechanisms for the regulation of riot control agents, incapacitants, and related means of delivery.

He received his MRes in research studies from Bradford University and a BSc in genetics from Liverpool University in 1987.

CHAS EBY, MA

Mr. Eby was appointed the External Outreach Branch Manager at the Maryland Emergency Management Agency (MEMA) in July 2014, where he will develop strategy and oversee programs that include disaster recovery, public information and outreach, and community and private-sector preparedness. Prior to joining MEMA, Mr. Eby was the Chief Planner for Public Health Preparedness at the Maryland Department of Health & Mental Hygiene (DHMH). While working in the Office of Preparedness & Response at DHMH, Mr. Eby led medical surge, mass fatality

management, communicable disease, and bioterrorism planning; created the office's Health Security Program; and served as State Pandemic Influenza Coordinator during the 2009-10 H1N1 pandemic.

Mr. Eby received a master of arts degree in security studies from the Naval Postgraduate School. He graduated from Boston College with a degree in psychology with premedical concentration.



**REBECCA FISH, MBA**

Ms. Fish is a Senior Policy Advisor to the Deputy Assistant Secretary of Health and Director of the National Vaccine Program Office at the US Department of Health and Human Services. As part of her role, Ms. Fish works on a number of vaccine issues, including the national adult immunization plan, health IT, financing, and public health preparedness. Ms. Fish is a member of the Public Health Emergency Medical Countermeasures Enterprise strategic planning team and the BARDA Influenza Work Group.

Prior to joining HHS, Ms. Fish worked as the Global Head of Medical Countermeasures at GlaxoSmithKline. In this role, she

led the creation of GSK's integrated biodefense strategy across all product teams and developed a national MCM training program to educate internal stakeholders. Ms. Fish also served as the Executive Director of Vaccine Policy at GSK and created and led GSK's first CDC vaccine cross-matrix team. Ms. Fish had a similar CDC role at Merck & Co., Inc., where she was employed for 8 years, and she has substantial federal contracting, reimbursement, and stockpile-related experience.

Ms. Fish graduated with a high honors degree in psychobiology from Mount Holyoke College. She received her MBA from Duke University.

ISABELLE GOULET, PHD

Dr. Goulet is A/Supervisor, Pathogen Border Initiatives, in the Office of Pathogen Security at the Public Health Agency of Canada. She manages the development and implementation of the Single Window Initiative (SWI) in the agency, an item of the Beyond the Border Action Plan. The intent of the SWI is to align regulatory approaches to protect health, safety, and the environment while facilitating trade and supporting economic

growth with more efficient border processes.

Dr. Goulet received a PhD in cellular and molecular medicine from the University of Ottawa in 2011. She received an MSc in cellular and molecular biology from the Université Laval in Quebec City in 2002 and a BSc in microbiology in 2000, also from the Université Laval.



**ELLIE GRAEDEN, PHD**

Dr. Graeden founded and serves as the Director of Strategic Systems Analysis at Gryphon Scientific. She and her team perform complex systems analysis to support the use of quantitative data and computational modeling to inform policy and operational decision making. Related projects have included efforts in support of the Federal Emergency Management Agency to identify and characterize the models used for natural and man-made emergency management and in support of the White House National Security Council to coordinate data-driven decision making at the level of the executive branch for public health emergencies.

In addition, Dr. Graeden has served as the principal investigator on projects modeling the efficacy of medical countermeasures against biothreat agents, performing a threat assessment of biological dual-use research, and performing an analysis of how security screening guidance was applied by synthetic gene providers.

Dr. Graeden received her PhD in biology from the Massachusetts Institute of Technology after earning a bachelor of science in microbiology from Oregon State University, where she graduated magna cum laude.

DANIEL GRUSHKIN, MA

Mr. Grushkin is a fellow at the Woodrow Wilson International Center for Scholars, where he researches the emergent field of synthetic biology. In 2010, Mr. Grushkin cofounded the world's first community laboratory, called Genspace, a nonprofit organization that provides a lab for laypeople and students to learn and innovate with bioengineering. As a journalist, Mr. Grushkin reports on the intersection of biotechnology,

culture, and business for a number of publications, including Businessweek magazine, Fast Company, Scientific American, and Popular Science.

Mr. Grushkin received an MA in fine arts from Brooklyn College in 2009. He received a BA in English literature from the Johns Hopkins University in 1999.



REBECCA GURBA, MA

Ms. Gurba is a WMD Analyst at the United States Strategic Command Center for Combating WMD (USSTRATCOM SCC-WMD). She serves as a liaison between STRATCOM’s intelligence branch and the intelligence community and provides technical biological expertise to operational and medical planners in the combatant commands. She previously worked as a Counter Chemical and Biological Project Manager and a

Counter Biological Warfare Subject Matter Expert at the Defense Intelligence Agency.

Ms. Gurba received an MA in biotechnology from Pennsylvania State University in 2003. She received a BS in biology from Wofford College in 2003.



HEIDI HAMLING, MBA, MA

Ms. Hamling is a Senior Staff Scientist in the Global Security Technology and Policy division of the Battelle Seattle Research Center. Her responsibilities include supporting the Department of Homeland Security and Defense Threat Reduction Agency in emergency response and recovery; leading export control engagement in Thailand, Vietnam, the Philippines, and other

countries; and managing scientific outreach and engagement activities.

Ms. Hamling received an MBA and an MA in international studies from the University of Washington in 2004. She received a BA in French and biology from Cornell University in 2000.



REID HARVEY, DVM

Dr. Harvey recently joined the Centers for Disease Control and Prevention as an Epidemic Intelligence Service Officer with the Enteric Diseases Epidemiology Branch, where he focuses on foodborne and zoonotic diseases. He previously served as Government Liaison for the CSC National Security Programs Global Bio Initiatives Portal, where he led collaborative design sessions with G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction. Prior to that, he served as a Congressional Fellow for Senator Kirsten E.

Gillibrand of New York, working with the American Veterinary Medical Association and the American Association for the Advancement of Science.

Dr. Harvey received his doctor of veterinary medicine degree from the University of Tennessee in 2010. He received a master of public health degree from the University of Tennessee in 2009 and a BA in Hispanic studies from the University of Tennessee in 2006.

NATHAN HILLSON, PHD

Dr. Hillson is the Director of Synthetic Biology at the Fuels Synthesis Division of the Joint BioEnergy Institute (JBEI), where his responsibilities include coordinating and directing the development of the JBEI biological part repository and the characterization and standardization of biological parts. He has also served as a Group Lead for Genomic Synthesis at the DOE Joint Genome Institute and a Biochemist Staff Scientist in the

Physical Biosciences Division at Lawrence Berkeley National Labs. Dr. Hillson completed his postdoctoral fellowship in microbiology at the Stanford University School of Medicine in 2009. He received a PhD in biophysics from Harvard Medical School in 2004 and a BA in physics from Rice University in 1999.



GORDON LEMMON, PHD

Dr. Lemmon is a scientist in the Department of Human Genetics at the University of Utah. In this capacity he develops software and algorithms to perform family-based genomics analysis, utilizing the resources of the Utah Population Database. Previously Dr. Lemmon contributed to the pediatric cancer genome project (St. Jude Children's Research Hospital) and developed software for docking and designing small molecules within protein binding sites (Vanderbilt University). He also

conducted research at Sandia National Laboratory and Lawrence Livermore National Laboratory, where he developed software to help researchers design better DNA signatures as part of the BioWatch program.

Dr. Lemmon received a PhD in chemical and physical biology from Vanderbilt University in 2012. He graduated magna cum laude from Brigham Young University, where he earned his BS in microbiology and bioinformatics.



URI LOPATIN, MD

Dr. Lopatin is the Chief Medical Officer and VP R&D for Assembly Pharmaceuticals, Inc. Prior to Assembly Pharma, he was a Senior Director for Clinical and Translational Research-Liver Disease at Gilead Sciences, a Translational Medical Leader at Roche, and an Associate Director at Schering Plough. He has designed and coordinated preclinical and clinical collaborations, as well as phase I, II, and IV clinical studies of multiple new molecular entities in the pharmaceutical industry.

Dr. Lopatin is board certified in internal medicine and infectious diseases. He trained in infectious diseases at the NIH and received an MD in 2000 from University of Medicine and Dentistry-New Jersey Medical School. He has a BA in biology from Cornell University, where he graduated cum laude.

**MICHAEL PATTERSON, PHD**

Dr. Patterson earned his doctorate from the University of Texas Medical Branch. His dissertation focused on the development of a reverse genetics system for the rescue of a recombinant Machupo virus, a Biosafety Level 4 and select agent pathogen that causes hemorrhagic disease in humans. Using this system, he characterized the virus in vitro and in vivo, leading to the better understanding of the basic growth properties of the pathogen. Using his recombinant system, Dr. Patterson initiated the first reported attempt to rationally attenuate Machupo virus. This research required him to become BSL-4 certified. Concurrent to his doctoral research, Dr. Patterson completed an MPH

at UTMB with a focus on infectious disease epidemiology. His masters work has taken him to Puerto Maldonado, Peru, to investigate influenza and other febrile diseases in civilian populations in the region. His capstone project provided an in-depth review of the Soviet and US bioweapons programs, the bioweapons themselves, and the impact of modern technology and geopolitical environment on preparedness and control of these pathogens.

Dr. Patterson graduated from Whitman College with a BA in biochemistry, biophysics, and molecular biology.

RYAN NEWKIRK, PHD

Dr. Newkirk is a Policy Analyst at the US Food and Drug Administration, where his current responsibilities include food defense vulnerability assessment and modeling research, research related to the prevention of economically motivated adulteration of food, and international and domestic education and outreach aimed at protecting the global food supply. Dr. Newkirk recently completed a food defense, postdoctoral fellowship at the US Department of Agriculture, Food Safety and Inspection Service.

He has also served as the Director of Evaluation and Research at the Heartland Centers for Public Health Preparedness and the West Nile Study Director at the Centers for the Study of Bioterrorism and Emerging Infections.

Dr. Newkirk received a PhD in epidemiology from the University of Minnesota in 2011 and an MPH from Saint Louis University in 2004. He has a BA in biology from Saint Louis University.



**DARYA PILRAM, MPH**

Ms. Pilram recently worked as a field social scientist with the US Department of the Army in Afghanistan, where she conducted primary-source, applied research related to health and human security, strategic planning, government legitimacy and political efficacy, and analysis of government capacity programs and initiatives. Ms. Pilram is a recent fellow with the Office of Naval Research, where she worked as a primary researcher for Continuing Promise in 2011 (USNS COMFORT Mission to Latin America) and Pacific Partnership in 2012 (USNS MERCY Mission to Philippines, Vietnam, and Cambodia).

Ms. Pilram previously served as the health diplomacy assistant to the director of international affairs at the American Society for Microbiology and as a Research Analyst at the Defense Personnel Security Research Center.

Ms. Pilram received her MPH, concentrating in global health, from The George Washington University in 2012. She has a BA in international studies in anthropology and history from the University of California, San Diego.

RICHARD SAINT, PHD

Dr. Saint is a Senior Scientist at the Defence Science and Technology Laboratory in the United Kingdom. In this capacity he is the technical lead, managing projects in the fields of high-throughput sequencing, computational modeling, and structural proteomics. His research investigates mechanisms of pathogenesis leading to the development of medical countermeasures.

Dr. Saint received a PhD in veterinary medicine from the University of Cambridge in 2012 and a BSc in microbiology and infection from the University of Edinburgh in 2007.



**JACOB SCHAFER, MSC**

Mr. Schafer is a consultant for International Medical Corps, a global nonprofit humanitarian disaster relief and development organization that has delivered \$1.4 billion in lifesaving medical care and training to tens of millions of people across 70 countries. Mr. Schafer serves as a subject matter expert for pandemic preparedness and risk reduction, liaising with governments, militaries, the UN system, and private sectors in Africa, Asia, and the Middle East.

He holds an MSc in international health from Queen Margaret University, a BSc in biology and global studies from the University of Wisconsin, and post-certifications in public health during emergencies from Université catholique de Louvain. Based in the Hawaiian Islands, Mr. Schafer spends half his time in the field, having worked in more than 25 countries and responded to several major and minor disasters.

TINA SCHOENBERGER, MS

Ms. Schoenberger is a Strategic Planner assigned to the Defense Threat Reduction Agency/STRATCOM Center for Combating WMD in the J55 Deliberate Plans Department. She is responsible for providing CWMD planning support to the Office of the Secretary of Defense, Joint Staff, Services, Geographical and Functional Combatant Commands, other Department of Defense and federal agencies for campaign, contingency, and crisis action planning. She was a member of the Regional Contingency Team that provided significant contributions in the planning efforts for the removal and destruction of the Syrian chemical weapons. Ms. Schoenberger was then selected to serve as the Military Assistant to the Deputy Director of the Defense Threat Reduction Agency. Ms. Schoenberger served previously at the National Guard Bureau as the Program

Manager for the Analytical Laboratory Systems for the Weapons of Mass Destruction – Civil Support Teams. Ms. Schoenberger was also a biological subject matter expert in the Office of Counterproliferation at the Defense Intelligence Agency. Her operational experience includes a deployment to Iraq with DIA as a member of the Chemical Biological Intelligence Support Teams directly supporting the Iraq Survey Group. Ms. Schoenberger's additional operational experience includes several domestic response missions while acting as the Nuclear Medical Science Officer on the WMD-CST in Louisiana.

Ms. Schoenberger received an MS degree in biology, with a concentration in molecular biology, from Southeastern Louisiana University in 2000. She also has a BS in biology from Southeastern Louisiana University.





JESSICA TUCKER, PHD

Dr. Tucker is currently a Program Director at the National Institute of Biomedical Imaging and Bioengineering, in the National Institutes of Health. In this role, she manages a portfolio of grants to scientists in the area of delivery systems and devices for drugs and biologics. Previously, she served as a Science Policy Advisor in the Office of Policy and Planning in the Office of the Assistant Secretary for Preparedness and Response at the Department of Health and Human Services.

Her efforts included leading interagency work on development, implementation, and evaluation of federal guidance for a synthetic double-stranded DNA screening framework and managing or contributing to a variety of policy activities related to laboratory biosecurity and biosafety.

Dr. Tucker received her PhD in chemical engineering from Carnegie Mellon University and a BSE in chemical engineering from Princeton University.

MARCIENNE WRIGHT, PHD

Dr. Wright is a 2011-2013 AAAS Science and Technology Policy Fellow supporting the Division of Biosafety and Biosecurity in the Office of Policy and Planning, Office of the Assistant Secretary for Preparedness and Response, Department of Health and Human Services. Prior to joining ASPR, Dr. Wright completed a postdoctoral fellowship in the National Biosafety and Biocontainment Training Program at NIH. Her efforts

include facilitating interagency collaboration and coordination on the development, implementation, and evaluation of federal policy on biosafety, biocontainment, and laboratory biosecurity.

Dr. Wright received her PhD in biochemistry and molecular genetics from the University of Alabama at Birmingham in 2009. She has a BA in biology from Williams College.



LUKE BECKMAN

Mr. Beckman manages situational awareness for all domestic Red Cross preparedness, response, and recovery operations. He is responsible for building national capacity and training the Red Cross workforce in situational awareness for all hazards. He is also responsible for directly supporting operations in both tactical and planning capacities. His mission is to answer the questions of “what information do you need to know, what decisions do you need to make with the information, when do you need the information, and how do you need to access that information?” He has responded to and coordinated crisis operations at the local, state, national, and international levels. He deployed to the Philippines immediately following Typhoon Haiyan in November 2013 to coordinate all logistics operations out of the multinational coordination center on Cebu Island.

Mr. Beckman graduated with honors from Stanford University, where he majored in human biology with a focus in global biodefense.

KRISTIN HATCHER, MPH

Ms. Hatcher is the Project Manager at Aspen Medical USA Global Health Office, where she is responsible for advising on health components of Department of Defense strategic health engagements implemented by the Center for Excellence in Disaster Management & Humanitarian Assistance. Ms. Hatcher previously worked as a Research Assistant for the Johns Hopkins International Injury Research Unit and as a Strategic Analyst for Operation Smile.

She received a master of public health degree from the Johns Hopkins Bloomberg School of Public Health in 2012 and a BA in religious studies from the University of Virginia in 2007.

EXECUTIVE STEERING COMMITTEE

Members of the Executive Steering Committee are senior leaders in US and UK biosecurity and biodefense who collectively work or have worked in government, private industry, and academia. Their expertise and experience makes this body uniquely suited to offer guidance to the fellowship as we work to develop the nation’s next generation of leaders in biosecurity.

Parney Albright, PhD, *Former Director, Lawrence Livermore National Laboratory*

RADM Kenneth W. Bernard, MD, USPHS (Ret), *Former Special Assistant to the President for Homeland Security, Health, Security and Biodefense Affairs*

Luciana Borio, MD, *Assistant Commissioner for Counterterrorism Policy, FDA*

Richard Danzig, PhD, JD, *A Director, Center for a New American Security*

David Franz, DVM, PhD, *Principal, SBDGlobal*

John Grabenstein, PhD, COL, USA (Ret), *Senior Medical Director for Adult Vaccines, Merck*

Jo L. Husbands, PhD, *Scholar/Senior Project Director, Board on Life Sciences of the US National Academy of Sciences*

Ambassador Bonnie Jenkins, PhD, JD, *Coordinator for Threat Reduction Programs, US Department of State*

Robert Kadlec, MD, *Former Special Assistant to the President for Homeland Security and Senior Director for Biological Defense Policy, Homeland Security Council, The White House*

Lawrence Kerr, PhD, *Director for Medical Preparedness Policy, National Security Staff; Deputy Director of Global Biological Threats and Senior Bio Advisor*

RADM Ali Khan (Ret), MD, MPH, *Dean, UNMC College of Public Health*

Col. Randall J. Larsen, USAF (Ret), *Founding Director, WMD Center*

Tara O’Toole, MD, MPH, *Former Undersecretary for Science & Technology, DHS*

James B. Petro, PhD, *Principal Director, Chemical and Biological Defense, OASD (NCB/CB)*

Sonja Rasmussen, MD, MS, *Acting Director of the Office of Public Health Preparedness and Response, CDC*

Martin Reynolds, *British Defence Staff, Chemical and Biological Threat Reduction*

Andrew C. Weber, *Former Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs*

EX-OFFICIO MEMBERS:

William P. Hostyn, *Director, Advisory Committees and Programs Office, Defense Threat Reduction Agency*

William O’Donnell, *Director, Intelligence Plans and Resource Integration, Defense Threat Reduction Agency*

Stephen J. Polcheck, *Deputy, Advisory Committees and Programs Office, Defense Threat Reduction Agency*

“Opportunities to have personal contacts with today’s leaders in government and industry provide an added dimension to understanding the challenges and new directions for biosecurity in our rapidly changing world. The ELBI experience is a unique one and of special value.”

*D.A. Henderson, MD, MPH
Distinguished Scholar
UPMC Center for Health Security*





UPMC CENTER FOR HEALTH SECURITY

The UPMC Center for Health Security is an independent nonprofit organization that works to protect people’s health from the consequences of epidemics and disasters and to ensure that communities are resilient to major challenges.

An important part of our mission is to connect diverse and international communities of health and science experts, industry representatives, and government officials to strengthen collective efforts to improve health security.

We do this work through the combined talents of our scholars in science, medicine, public health, national security, law, social sciences, and economics.

Emerging Leaders in Biosecurity Program Staff

While several Center for Health Security staff work on the Emerging Leaders in Biosecurity Initiative on a daily basis, virtually everyone in the Center has helped by providing ideas, contributing to meetings, reviewing papers, and advising fellows.

Center for Health Security Program Staff

Director: Thomas V. Inglesby, MD, *CEO*

Deputy Director: Anita Cicero, JD, *COO*,

Program Manager: Crystal Boddie, *Associate*

Deputy Program Manager: Matthew Watson, *Senior Analyst*

Nidhi Bouri, *former Senior Analyst*

Tasha King, *Chief Financial Officer and Senior Administrator*

Special Thanks: D. A. Henderson, Gigi Kwik Gronvall, Jennifer Nuzzo, Elaine Hughes, Tanna Liggins, Maria Jasen, and Jackie Fox

CENTRA TECHNOLOGY, INC.

CENTRA is a high-technology business providing security, analytic, technical, engineering, and management support to the government and private sectors. It has been delivering services to a wide range of customers in the security, defense, aerospace, and international communities since 1985.

CENTRA staff members have worked tirelessly to provide program support including note-taking at conferences, videography, development of conference reports, hosting meetings, assisting in meeting management, and, in general, pitching in wherever it has been needed. Thanks, Team CENTRA.

CENTRA Program Staff

Program Manager: Donald J. Pruefer, *Analytic Director*

Task Lead: Jacqueline Harned, *Principal Analyst*

Huma Ahmed, *Research Analyst*

Jessica Zappia, *Principal Research Analyst*

Erika Van Erikson, *Subcontract Administrator*

Elizabeth Giardino, *Senior Research Analyst*

Deborah Toy Lew, *Principal Analyst*



EMERGING LEADERS IN BIOSECURITY 2014 EVENTS



SPRING WORKSHOP 2014: BIOSECURITY IN POLICY AND PRACTICE

Matthew Watson, Deputy Program Manager

The spring meeting, held in Washington, DC, was the first opportunity for this class of emerging leaders to meet with their peers, the ELBI program staff, and many current leaders in biosecurity. The fellows’ energy and level of engagement was evident from the start and provided rapid confirmation that we had picked another outstanding class of fellows.

The meeting’s first event was a real treat. The fellows were invited to a private meeting hosted by the White House National Security Council (NSC) and Office of Science and Technology Policy (OSTP). The meeting was held in the stunning Indian

Treaty Room of the Eisenhower Executive Office Building. The fellows were briefed on multiple ongoing issues relating to biosecurity, including the just-announced Global Health Security Agenda and executive action around dual use research of concern (DURC). The fellows gained invaluable insights into the formation and execution of biosecurity policy at the highest levels of government.

The next day, the fellows were introduced to multiple aspects of biosecurity by leaders in the field, including historical context, recent innovations in science and technology, and international

issues. In addition to absorbing the content, the exposure to expert opinions and perspectives, including those of Drs. Russell and Henderson, Ambassador Jenkins, and Col. Larsen, made for an outstanding introduction to biosecurity policy and practice.

The fellows then traveled to Fort Detrick, located in Frederick, Maryland, where they were given tours of the National Institutes of Health (NIH) Integrated Research Facility (IRF), the Biodefense Analysis and Countermeasures Center (NBACC), and the

National Bioforensics Analysis and Countermeasures Center (NBFAC), 3 of the nation’s cutting-edge research facilities and in many ways the heart of the US biodefense enterprise.

We ended on the third day with a tour of the Pentagon and a private meeting between ASD Andrew Weber and the ELBI fellows. Overall, we were impressed with the 2014 fellows and excited to show them diverse aspects of the broad biosecurity field.



SPRING WORKSHOP PROGRAM AGENDA | MARCH 10-13, 2014

March 10 | White House Discussion on Biosecurity

- *Biosecurity Discussion:* Larwrence Kerr, Director for Medical Preparedness Policy, and other White House National Security Council Staff

March 11 | Workshop Day

- *Biological Threats, Past, Present, and Future:* Randall Larsen, Founding Director, WMD Center
- *Panel Discussion: The Intelligence Commuynity and Science & Technology - Challenges and Innovative Approaches*
 - Gigi Gronvall, Senior Associate, UPMC Center for Health Security
 - Jason Matheny, Program Manager, Intelligence Advanced Research Projects Agency (IARPA)
 - Nicole Gomaa, Analyst, Office of the Director of National Intelligence (ODNI)
 - Erik Prentice, Senior Engagement Manager, Proactive WorldWide
- *Panel Discussion: International Biosecurity*
 - Thomas V. Inglesby, CEO and Director, UPMC Center for Health Security
 - Ambassador Bonnie Jenkins, Coordinator for Threat Reduction Programs, US Department of State
 - Lance Brooks, Division Chief, Cooperative Biological Engagement Program, DTRA
 - Richard Williams, Counsellor, Defence R&D, Embassy of Canada

- *Biosecurity—Past Adventures and Future Expectations:*
 - D.A. Henderson, Distinguished Scholar, UPMC Center for Health Security
 - Philip Russell, Former Senior Advisor, Office of the Assistant Secretary for Public Health Emergency Preparedness, US Department of Health and Human Services
- *Networking Dinner for Fellows, Speakers, and Alumni:* Richard Danzig, A Director of the Center for New American Security

March 12 | Site Visit to Fort Detrick, Frederick, MD

- *NIAID Integrated Research Fecility (IRF) Organizational Brief*
 - Peter Jahrling, Director, Chief Scientist
 - Lisa Hensley, Associate, Director of Science
- *IRF Project Presentations*
- *Tour of the NIAID Facility*
- *National Biodefense Analysis and Countermeasures Center (NBACC) and National Bioforensics Analysis Center (NBFAC) Overview and Presentation of Projects*
 - J. Patrick Fitch, Director, NBACC
 - James Burans, Director NBFAC
- *Tour of the NBACC/NBFAC Facility*

March 13 | Pentagon Site Visit and Tour



FALL WORKSHOP 2014: RESPONDING TO URGENT THREATS

Crystal Boddie, MPH, Program Manager

The fall meeting at the Centers for Disease Control and Prevention (CDC) in Atlanta was an ideal chance to hear about a number of pressing issues in biosecurity and public health preparedness, as well as to learn more about the important work that members of the 2014 class are already doing in these areas.

The workshop was generously planned and hosted by the CDC Office of Public Health Preparedness and Response (OPHPR) at the beautiful CDC visitors' center. Topics of discussion ranged from the unfolding Ebola epidemic in West Africa, to antimicrobial resistance, to biosafety issues surrounding recent laboratory accidents and the discovery of smallpox virus stored unexpectedly at the National Institutes of Health (NIH). On day 1 of the workshop, CDC experts shared their time and knowledge throughout the day, and we were honored to have CDC director Dr. Tom Frieden take the time to present and answer questions from our fellows. The workshop day closed with a candid conversation about biosecurity with Assistant Secretary of Defense Andrew Weber and a fascinating discussion at dinner with Helen Branswell, a medical reporter on biosecurity issues for the Canadian Press.

Day 2 of the workshop was designed to showcase the work of the fellows, introduce them to additional leaders in the field, and give them the opportunity to weigh in on biodefense policy

through a Smith Richardson–funded program called Jump Start, led by Randall Larsen.

As part of the fellowship, we sponsored a writing competition and offered the winners an opportunity to present their papers at the fall meeting. Submissions were excellent, and Richard Saint, Patrick Boyle, Michael Patterson, Rebecca Fish, and Chas Eby gave engaging and thoughtful presentations.

On day 2, we were fortunate to hear more in-depth presentations about the CDC and global response to the 2014 Ebola epidemic in West Africa. Other CDC professionals talked to the fellows about ways to address the growing problem of antimicrobial resistance. We finished the workshop with a group discussion about what it will take for the US to improve preparedness for bioterrorism specifically. Randall Larsen posed provocative questions to the group, and the fellows responded with new ideas and a lively discussion.

We are grateful to the CDC for all of the work that went into preparing for this workshop and for the opportunity to work with this fine group of fellows. We look forward to future collaborations and an active alumni network going forward.



FALL WORKSHOP PROGRAM AGENDA | SEPTEMBER 8-9, 2014

September 8 | CDC Workshop Day 1

- *Panel Discussion: Emerging Infectious Disease Threats Facing the US*
 - Jennifer Nuzzo, Senior Associate, UPMC Center for Health Security
 - Scott J. McNabb, Research Professor, Hubert Department of Global Health, Rollins School of Public Health, Emory University
 - Marty Cetron, Director, Division of Global Migration and Quarantine, CDC
 - Michael Shaw, Senior Advisor for Laboratory Science, Office of Infectious Diseases, CDC
- *Tour of the CDC Emergency Operations Center*
- *Red Sky Demonstration:* James Tyson, Situation Awareness Branch Chief, OPHPR, CDC
- *Networking Lunch with CDC Representatives*
- *Panel Discussion: Public Health Preparedness and Innovation*
 - Ian Williams, Branch Chief, Outbreak Response and Prevention Branch, CDC
 - James Tyson
- *CDC Director’s Remarks:* Tom Frieden, Director, CDC
- *Conversation with Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs:* Andrew Weber, ASD
- *Networking Dinner for Fellows and Speakers:* Helen Branswell, Medical Reporter for the Canadian Press

September 9 | CDC Workshop Day 2

- *Welcome:* Sonja Rasmussen, Director (A), Office of Public Health Preparedness and Response
- *Fellows Presentations: Moderated By Matthew Watson*
 - Patrick Boyle
 - Richard Saint
 - Michael Patterson
- *Panel Discussion: Global and Public Health in the Press - Ebola and Other Issues*
 - Elizabeth Cohen, Senior Medical Correspondent, CNN
 - Dave Daigle, Associate Director for Communication, OPHPR, CDC
 - Tom Skinner, CDC Public Affairs Officer
- *CDC Approaches to the Challenge of Antimicrobial Resistance*
 - Michael Bell, Director of Laboratory Safety, CDC
 - Arjun Srinivasan, Associate Director for Health Care Associated Infection Prevention Program, CDC
- *Fellows Presentations: Moderated By Crystal Boddie*
 - Rebecca Fish
 - Chas Eby
- *Biosecurity Issues Seminar for Jump Start:* Randall Larsen, Founding Director, WMD Center

Fellows' Perspectives on Practical Problems in Biosecurity: Winning Paper Abstracts

One of the goals of the Emerging Leaders in Biosecurity Initiative is to elicit fellows' new ideas and proposals for overcoming current and future challenges in biosecurity. To this end, fellows were encouraged to write papers describing an innovative approach to solving an as yet unsolved practical problem in the field. This year, we asked the fellows to choose a topic that addressed a problem in global health security, of which biosecurity is one part.

What follows are the abstracts of the winning submissions.

Applications of Synthetic Biology to the Detection and Remediation of Antimicrobial Resistance and Zoonotic Diseases

Patrick Boyle

The decreasing efficacy of antimicrobial drugs has drawn attention to their large-scale use in livestock, leading to calls for the abolishment of subtherapeutic antibiotic use in animal farming. The agricultural industry has largely resisted this movement, due in part to decreased animal weights and increased levels of animal death and disease observed in regions that have banned the use of antibiotics as agricultural growth promoters. In this context, we consider recent developments in synthetic biology to determine the potential for reducing antibiotic use while also lowering the disease burden in livestock.

We review the current state of the art in synthetic biology applicable to the management of zoonotic bacteria and viruses, outlining key areas for research and development. We also evaluate the existing regulatory framework for these technologies and identify areas that require novel regulatory consideration. Finally, we assess the health security concerns on the deployment of these technologies in the environment and strategies to mitigate perceived risks.

Global Agenda, Local Health: Including Concepts of Health Security in Preparedness Programs at the Jurisdictional Level

Chas Eby

The Global Health Security Agenda’s objectives contain components that could help health departments address emerging public health challenges that threaten the population. As part of the agenda, partner countries with advanced public health systems will support the development of infrastructure in stakeholder health departments. In order to facilitate this process and augment local programs, state and local health departments may want to include concepts of health security in their public health preparedness offices in order to simultaneously build capacity. Health security programs developed by public health departments should complete projects that are closely aligned with

the objectives outlined in the global agenda and that facilitate the completion of current preparedness grant requirements. This paper identifies objectives and proposes tactical local projects that run parallel to the 9 primary objectives of the Global Health Security Agenda. Executing concurrent projects at the international and local levels in preparedness offices will accelerate the completion of these objectives and help prevent disease epidemics, detect health threats, and respond to public health emergencies. Additionally, future funding tied or related to health security may become more accessible to state and local health departments that have achieved these objectives.

A New Business Model for Health Security: The Fierce Urgency of Now

Rebecca Fish

The Global Health Security Agenda seeks to minimize risk against infectious disease threats. This is a collaborative effort among the US government, other nations, and partners with an emphasis on prevention, detection, and response strategies. The increasing risk presented from antimicrobial resistance, emergence of new disease threats, and intentional or accidental release of a pathogen make the timing of this initiative critically important. The focus of this paper is goal 3 of the Global Health Security Agenda, which is Response. Response includes “improved global access to medical and nonmedical countermeasures.” An effective response is predicated on the idea of available countermeasures against a host of threats, a fully engaged stakeholder community, and clear leadership of the preparedness and response enterprise. Unfortunately, there may be limited countermeasures available and a suboptimal response if there is not an improved understanding of

how to incentivize investment and generate more public support for the need to develop medical countermeasures and antibiotics. Existing definitions of “incentives” and “partners” are much too narrowly defined and miss key areas of opportunity. Moreover, the lack of strong, clear, accountable leadership and uncertain funding have added to investor concern and an inefficient use of available resources. Proven business strategies should be used to accelerate private sector investment and national support for health security initiatives. These efforts should be led by a small, diverse “Manhattan Project” type of team. There is a meaningful opportunity to improve response at both the national and global levels, but it requires a new approach to innovation with an emphasis on viable, sustainable business planning and customer marketing strategies.

The Role of Community Involvement in the Establishment and Operation of a High-Containment Biomedical Research Laboratory in Galveston, Texas

Michael Patterson

As newly emerging viruses and other highly fatal or infectious pathogens are discovered, such as severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and influenza A/H5N1, the need for more biosafety-conscious biomedical research facilities has become increasingly clear. Along with naturally occurring pathogen outbreaks, the threat of biological weapons and intentional releases are critical arguments for the construction of additional facilities to ensure the safety of researchers and the general public. Many considerations for where and how these facilities are built need to be taken into account. It has become evident in recent years that strong community engagement and communication programs play a pivotal role in ensuring laboratory acceptance in the local community and surrounding region. As demonstrated in the past decade, a failure to develop

such networks can lead to extensive delays or the abandonment of a laboratory facility. The University of Texas Medical Branch (UTMB) has an active full-suite biosafety level (BSL) 4 high-containment laboratory, making it the only academic institution in the United States with such a resource in operation. Strong community engagement, along with continued interaction and advisement through a community council, has been crucial in allowing UTMB to maintain this unique role in the biomedical research field. This paper describes the ongoing community involvement that has played a major role at UTMB and provides a perspective on how this involvement may be translated to other locations looking to establish their own containment facility, in the United States or around the globe.

Promoting and Exploiting Black Swans: Making the Most of the Unpredictable

Richard Saint

“But there are also unknown unknowns, the ones we don’t know we don’t know.”

The famous words of United States Secretary of Defense Donald Rumsfeld initiated an explosion of thinking about unpredictable events. Two strategies have since emerged, with the first concentrating on improving predictive abilities and the second on building robust systems designed to handle unpredictable events. In both cases, the strategies are focused on adverse unknowns such as outbreaks of infectious disease or terrorist attacks. However, unpredictability is not solely reserved for adverse events; many beneficial discoveries have also been unpredictable. The Black Swan theory of Nassim Taleb labels undirected and unpredicted events as Black

Swans and argues that it is not enough to build robustness against adverse black swans, but it is as important to exploit beneficial ones.

Two of the 9 objectives of the Global Health Security Agenda are to prevent the emergence and spread of antimicrobial drug resistant organisms and to reduce the number and magnitude of infectious disease outbreaks. Both of these objectives require radical advances in antimicrobial research that may well come from beneficial unpredicted events. This paper seeks to build upon robust system thinking with proposals on how to better promote and exploit beneficial black swans when they happen to fly by.



“Ebola is the most recent tragic example of why it is imperative to work together to make the world safer from infectious disease outbreaks...infectious diseases do not recognize borders, and a disease outbreak is just a plane trip away. Strengthening global health security will protect Americans, and protect people from around the world.”

Tom Frieden, MD, MPH, CDC Director

BEHIND THE SCENES IN BIOSECURITY WITH LEADERS IN THE FIELD

INTERACTIVE SEMINARS

During the year, fellows were invited to participate in 2 webinars, one led by Dr. Sheri Fink and the other by Dr. Ken Bernard.



Five Days at Memorial: Life and Death in a Storm-Ravaged Hospital

Sheri Fink, MD, PhD, Correspondent at the New York Times

Dr. Sheri Fink is a Pulitzer Prize–winning journalist and author of *Five Days at Memorial: Life and Death in a Storm-Ravaged Hospital*, a New York Times bestseller. On June 24, 2014, Dr. Fink discussed the issues of disaster preparedness, situational awareness, and lessons learned by applying case studies of the Memorial Medical Center in New Orleans during Hurricane Katrina in 2005 and Bellevue Hospital in New York City during Hurricane Sandy in 2012. She raised the problems of limited resources and infrastructure to support hospitals and health centers and the implications during disasters. She further addressed the multidimensional aspects of ethics, morals, and values among decision makers when faced with catastrophic events.



The Realpolitik of Biodefense Policy

Ken Bernard, MD, Former Senior Political Adviser to the Director-General, World Health Organization

On July 14, 2014, Dr. Ken Bernard provided a 1-hour talk and an interactive discussion to show the behind-the-scenes policymaking process in the biodefense enterprise. Dr. Bernard provided the fellows with inside information about priority setting in biodefense, and he described the politics and government structure that shape our approach to biodefense in the US. Dr. Bernard provided the fellows with practical advice about careers in biosecurity and about his lessons and experiences working in and with government.



VIDEO INTERVIEWS

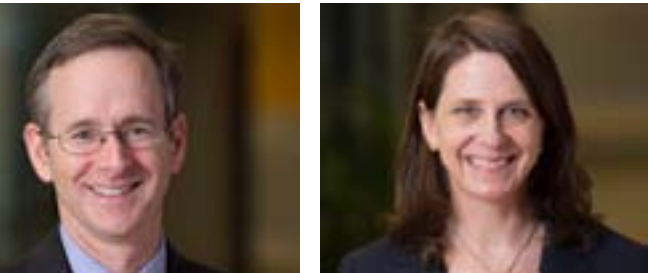
Our 2014 video interview series introduced the fellows to 3 senior leaders who offered observations on science and technology, food security, influenza vaccine development, and biosecurity policy. Each of these experts also described how their respective organizations contribute to US biosecurity, and all noted that the interdisciplinary nature of civilian biosecurity and biodefense makes the ability to work collaboratively across multiple disciplines essential to leadership in the field.

Tara O'Toole, MD, MPH, Former Undersecretary of Science and Technology at the Department of Homeland Security

Michael Osterholm, PhD, MPH, Director, Center for Infectious Disease Research and Policy (CIDRAP)

Dave Franz, PhD, Principal, SBDGlobal

Video interviews with these distinguished experts are available on the Emerging Leaders in Biosecurity website: www.emergingbioleaders.org



AN EXCELLENT ELBI YEAR

*Thomas V. Inglesby, MD, CEO and Director, and Anita Cicero, JD, COO and Deputy Director,
UPMC Center for Health Security*

This past year we had the privilege of welcoming and getting to know the second class of fellows under the Emerging Leaders in Biosecurity Initiative. To a person, this group of fellows is bright, ambitious, intellectually curious, and eager to meet peers and more seasoned mentors engaged in various aspects of the biosecurity field. We were thrilled that the ELBI program attracted such a diverse group, from the fields of biology, biotechnology, public policy, medicine, veterinary medicine, biopharma, journalism, anthropology, the federal government, emergency management, and more. We have learned through our experience in biosecurity that the best way to develop pragmatic policy solutions is to engage a heterogeneous group of professionals from varied disciplines to work together. The field of biosecurity demands this multidisciplinary approach, and EBLI helps those involved to cement lasting professional relationships that serve global and national biosecurity goals.

The importance of developing a connected community of motivated biosecurity professionals was demonstrated several times this year in various high-profile events—including the accidental contamination in a CDC lab of a benign flu sample with a dangerous H5N1 bird flu strain; the discovery of smallpox virus found in a government freezer; the ongoing MERS outbreak; and, of course, the unprecedented Ebola outbreak in West Africa. Each of these incidents present pressing and complicated problems that require not only the involvement and coordination of professionals across US government agencies, but also the expertise of those in academia, public health, science, and communications in and outside of the US. The demand for well-networked biosecurity professionals is also evident in the recently launched Global Health Security Agenda. The ambitious 5-year goals of the GHSA necessitate cooperative action by a diverse group of biosecurity professionals internationally. Expanding ELBI to include fellows from Canada and the UK (and other countries in the future) is important to establishing international relationships between professionals working on the same global issues.

We had an extraordinary class of fellows this year. With the help of the first alumni class, we will continue to grow this network of biosecurity professionals and facilitate the career-long relationships that we hope will give rise to new leaders and creative engagement in the field of biosecurity for years to come.

YEARBOOK CREDITS

The Emerging Leaders in Biosecurity Class of 2014 Yearbook was written, edited, designed, and produced by the UPMC Center for Health Security.

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Jen Dessinger: page 56 (Sheri Fink)

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