Emerging Leaders in Biosecurity Initiative

Class of 2017 Yearbook

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

Emerging Leaders in Biosecurity Initiative

Contents

Cover and Inside Cover Photo Overlay: Swine Flu Strain Virus Particles. Colorized transmission electron micrograph of negatively stained SW31 (swine strain) influenza virus particles. Credit: NIAID

Emerging
Leaders
in Biosecurity
Initiative

For more information, please visit the ELBI website:

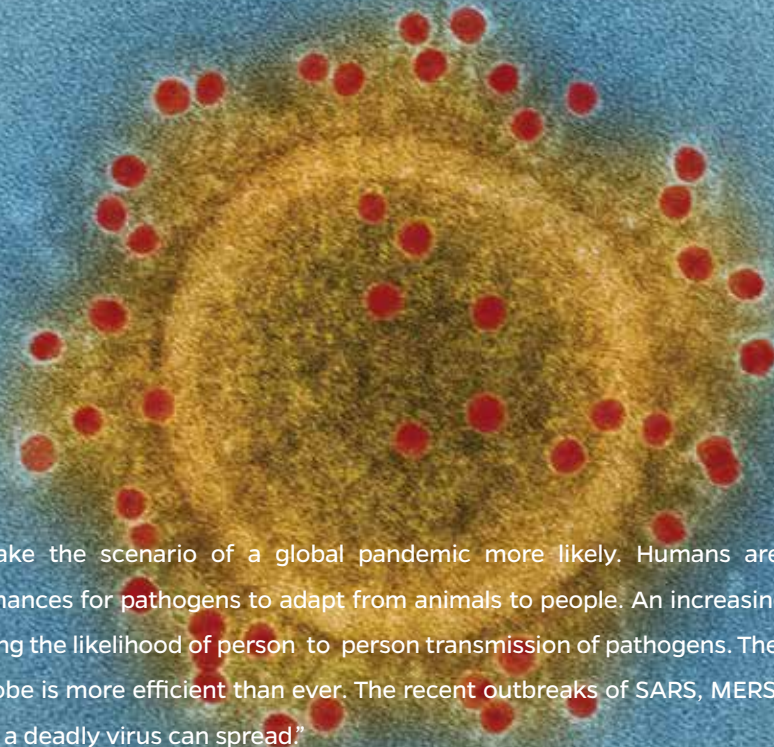http://www.centerforhealthsecurity.org/our-work/emergingbioleaders

JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

**Center for
Health Security**

Open
Philanthropy
Project

"Modern conditions make the scenario of a global pandemic more likely. Humans are encroaching on animal environments, raising chances for pathogens to adapt from animals to people. An increasing share of the planet lives in megacities, heightening the likelihood of person to person transmission of pathogens. The movement of people and microbes around the globe is more efficient than ever. The recent outbreaks of SARS, MERS, and Ebola are only small glimpses of how quickly a deadly virus can spread."

Tom Inglesby and Benjamin Haas

Foreign Affairs

November 21, 2017

Middle East Respiratory Syndrome Coronavirus particle envelope proteins immunolabeled with Rabbit HCoV-EMC/2012 primary antibody and Goat an ti-Rabbit 10 nm gold particles. Credit: NIAID.

Top left of the photo: Colorized transmission electron micrograph showing H1N1 influenza virus particles. Surface proteins on the virus particles are shown in black. Credit: NIAID

Emerging Leaders in Biosecurity Initiative

Thomas Inglesby, Director;
Anita Cicero, Deputy Director, Johns Hopkins Center for Health Security

To the ELBI 2017 Fellows,

Congratulations on completing an extraordinary 2017 fellowship year! It has been wonderful getting to know all of you and seeing you engage so enthusiastically with the issues and with each other during the workshops, research symposium, webinars, dinners, and field trips that took place in DC, Baltimore, and Boston. You are an exceptionally talented group, and we have no doubt that you will continue to rise and make important contributions to the biosecurity field. It was rewarding to see this class embrace the opportunities provided in the fellowship to learn about the many diverse aspects of biosecurity, to take risks and share your views and ideas for overcoming complex biosecurity challenges, and to think critically about existing frameworks for addressing biosecurity.

We are very proud of the growing and vibrant ELBI network, which now includes over 100 individuals representing a great variety of skill sets, from basic and applied research, international policy, medicine and public health, the private sector, national security, journalism and others. This year, with support from the Open Philanthropy Project, the fellowship added new events, more opportunities for peer networking and learning, and greater exposure to senior leaders in the field. We are grateful for the

committed support of our Executive Steering Committee members, who have generously volunteered their time to present their work to the ELBI class, to interact informally with fellows who have sought career advice, and to offer ideas and feedback on ways to continue to grow the ELBI program. And of course we are immensely grateful to the Open Philanthropy Project for having the vision to invest in the development of early career professionals and who share our optimism that this next generation will bring new thinking to bear on current and future challenges posed by biological risks.

It has been gratifying to see that sense of fellowship that has characterized past ELBI classes develop in yours over the course of our year together. As you know, Fellows from this year's class have made strong connections, collaborated on publications, and organized events that have included ELBI alumni. This is exactly the kind of vibrancy and camaraderie that sets ELBI apart, and we are excited to see what you will do next.

Even though your Fellowship year has ended, we hope that you will stay involved and engaged as ELBI alumni by participating in future meetings like the annual Research and Practice Symposium, mentoring future fellows, and continuing to support the field and the program.

All the best, and thank you for your participation!

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, CEO and President, HRL Laboratories, LLC

Stephen Bartlett, PhD, British Defence Staff, Chemical and Biological Threat Reduction

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

Luciana Borio, MD, National Security Council, The White House

Lance Brooks, Division Chief, Cooperative Biological Engagement Program, DoD

Richard Danzig, PhD, JD, Senior Fellow, Johns Hopkins Applied Physics Laboratory

David Franz, DVM, PhD, Principal, SBDGlobal

John Grabenstein, PhD, COL, USA (Ret), Executive Director, Global Health & Medical Affairs, Merck Vaccines

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

Ambassador Bonnie Jenkins, PhD, JD, Founder and President, Women of Color Advancing Peace and Security; and Joint Visiting Fellow, University of Pennsylvania and The Brookings Institution

Lawrence Kerr, PhD, Director, Pandemics and Emerging Threats, HHS

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

Randall J. Larsen, COL USAF (Ret), National Security Advisor, Johns Hopkins Center for Health Security
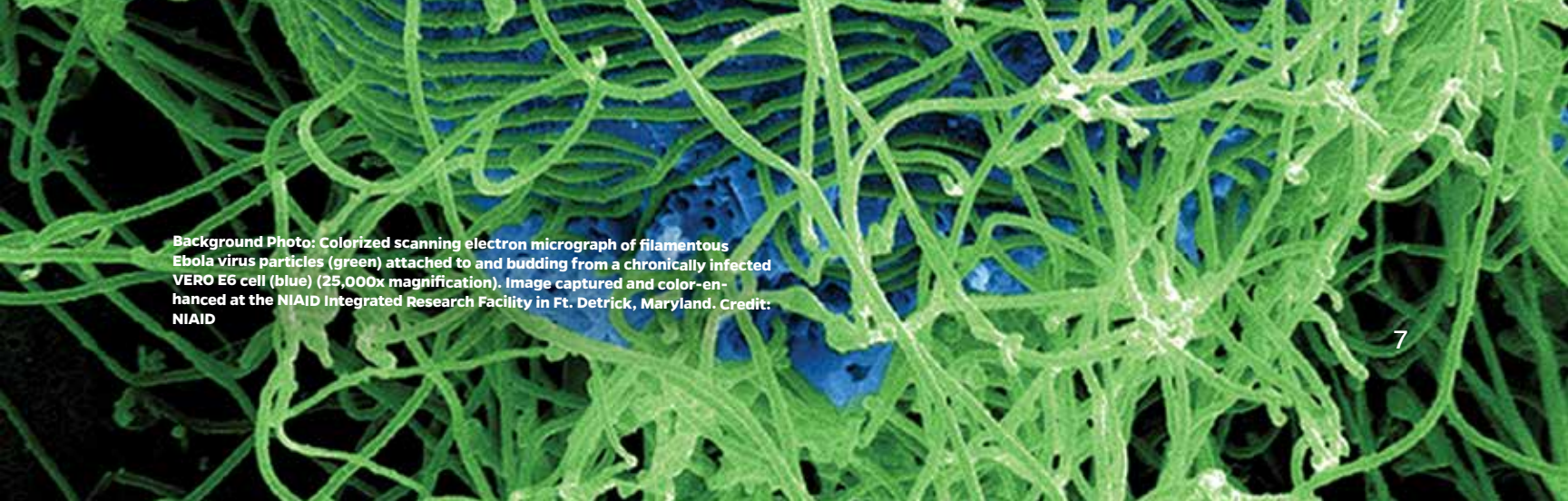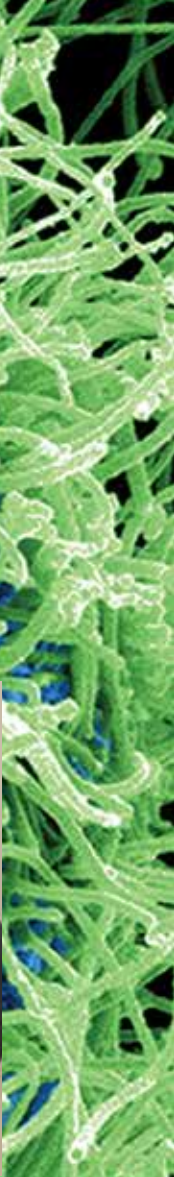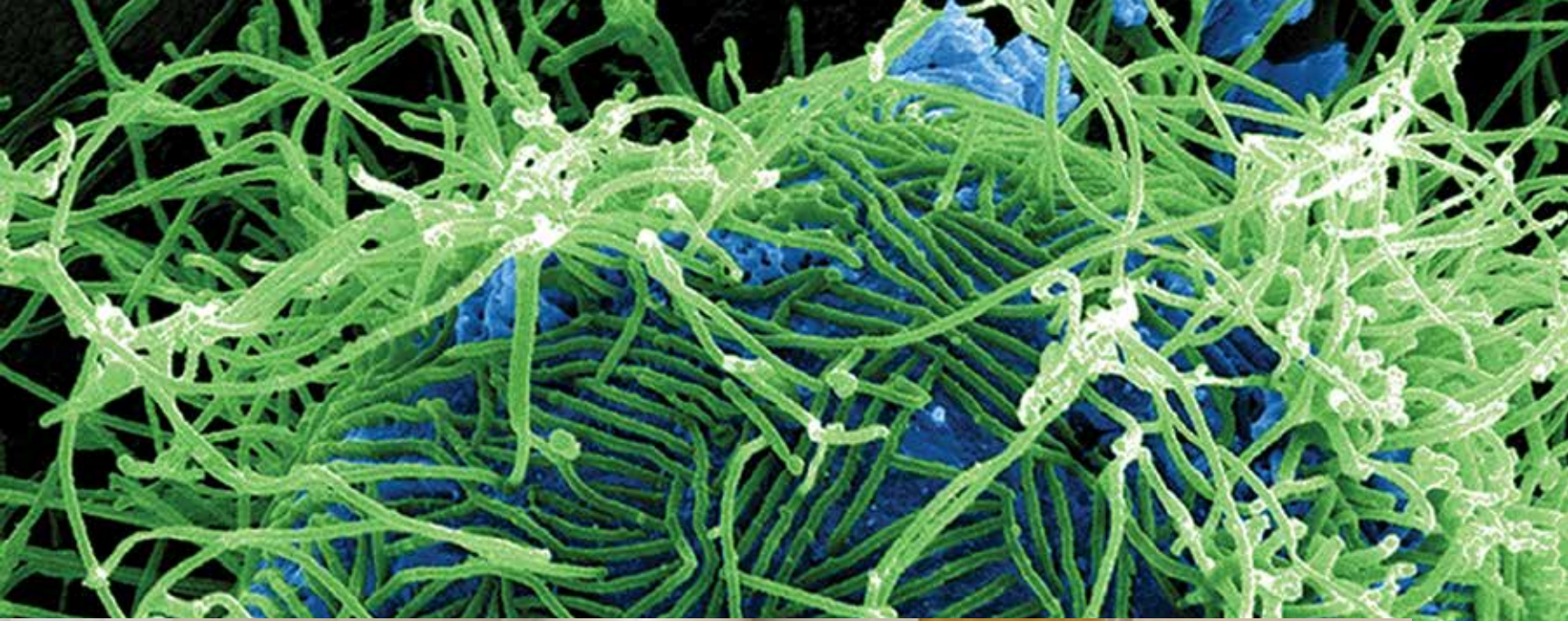
Tara O'Toole, MD, MPH, *Executive Vice President, In-Q-Tel*

Stephen Redd, MD, RADM USPHS, Director of the Office of Public Health Preparedness and Response, and Assistant Surgeon General, CDC

Jaime Yassif, PhD, Program Officer, Biosecurity and Pandemic Preparedness, Open Philanthropy Project

Emerging Leaders in Biosecurity Class of 2017

Class of 2017 Fellows

Martin Adams

Martin Adams works as a Senior Biosecurity Specialist on health systems strengthening projects at Global Scientific Solutions for Health. Based in Baltimore, Maryland, and working with international organizations and governments across the world, GSS-Health provides laboratory mentorship, biosafety and biosecurity assistance, logistics training, and quality assurance solutions to strengthen disease surveillance networks and laboratory diagnosis. Mr. Adams is passionate about measuring and raising the standards of laboratory quality, safety, and security, and this has led to the creation of an electronic audit checklist that is now used internationally by GSSHealth and more than 20 other organizations. For GSSHealth, he has provided training on laboratory audits and biosafety/biosecurity principles to laboratories and ministries in Togo, Benin, Sierra Leone, and Ghana. He has also coordinated a project for a multilateral organization to develop technical specifications and flexible forecasting models for emergency supplies necessary for outbreak response.

Originally form the UK, Mr. Adams holds a master's degree in forensic science from King's College London and has worked in a forensic molecular biology laboratory as well as industry and research facilities in London. He has been with GSSHealth since 2015 and previously spent 6 years living and working in Baku, Azerbaijan, as part of the US Department of Defense's Cooperative Biological Engagement Program. This effort involved the construction of 12 laboratories and the training of more than 150 healthcare professionals. His experience in bench science, program management, and international development give him substantial insight into the challenges of biosecurity in resource-limited settings.

Insert photo on opposite page: Ebola virus isolated in November 2014 from patient blood samples obtained in Mali. The virus was isolated on Vero cells. Credit: NIAID

Aurora Amoah

Aurora O. Amoah, PhD, MPP, MPH, is an experienced health specialist adept at applying advanced skills in health research and evaluation to a wide range of health issues in both the domestic (US) and global health arena. In her current role, Dr. Amoah is supporting research and evaluation on the USAID Applying Science to Improve and Strengthen Systems (ASSIST) project, as well as the Service Delivery Improvement Project with the World Bank Group.

Dr. Amoah was a research scientist at the New York City Department of Health and Mental Hygiene (NYCDOHMH), where she led the evaluation of performance on electronic healthcare quality indicators. She supported the Centers for Disease Control and Prevention (CDC) during the Ebola epidemic in Guinea, leading data-reporting activities in partnership with other international organizations. As the project coordinator of the Region 3 Pediatric Environmental Health Specialty Unit (PEHSU), she managed all aspects of the project from development to implementation and evaluation. Her roles emphasize her ability to build partnerships between international organizations, as well as federal, local, and state departments of health, academic institutions, and children's hospitals across the mid-Atlantic region. She has been funded by both the Environmental Protection Agency (EPA) and the CDC to develop child health prevention programs targeted to low-income families in the District of Columbia.

Dr. Amoah holds a PhD and an MPH from Tulane University School of Public Health and Tropical Medicine, a master's in public policy from the George Washington University Trachtenberg School of Public Policy and Public Administration, and an undergraduate degree in biological sciences from Illinois State University.

Brandy Burgess

Brandy A. Burgess, DVM, MSc, PhD, DACVIM, DACVPM, is currently an assistant professor of epidemiology and infection control in the Department of Population Health, College of Veterinary Medicine; and the Director of Infection Control and Biosecurity at the Veterinary Medical Center, University of Georgia, in Athens, Georgia. She earned her Doctorate of Veterinary Medicine from Colorado State University, followed by a Master of Science degree, internship and residency in large animal internal medicine at the Western College of Veterinary Medicine, University of Saskatchewan, Canada. She then completed a PhD in epidemiology and residency in infection control and biosecurity at Colorado State University. She is a diplomate of the American College of Veterinary Internal Medicine and of the American College of Veterinary Preventive Medicine. Dr. Burgess' current research efforts focuses on four main themes: 1) Investigating the epidemiology and prevention of important potential pathogens in veterinary medicine and public health including the exploration of risk factors and rapid methods for detection; 2) Investigation of occupational risks associated with the training of veterinary personnel and with the practice of veterinary medicine; 3) Development of evidence-based risk management strategies for the prevention and control of important contagious and zoonotic pathogens in veterinary medicine; and 4) Creation of effective communications and learning tools for the education of veterinary personnel and the public.

Marija Cemma

Marija "Masha" Cemma, PhD, is a Canadian Science Policy Postdoctoral Fellow with the Canadian Food Inspection Agency (CFIA). At the CFIA, Dr. Cemma fosters international cooperation, knowledge translation, and exchange among high-containment laboratories with the goal of strengthening preparedness to high-consequence pathogens. Dr. Cemma earned her PhD from the Department of Molecular Genetics at the University of Toronto, supported by scholarships from the Natural Sciences and Engineering Research Council of Canada and the Canadian Institute for Health Research. Her research uncovered various aspects of how mammalian cells defend themselves from bacterial pathogens and included characterization of a novel protein involved in host defense. During graduate studies, Dr. Cemma was selected as a Global Health Fellow with the Duke Program on Global Policy and Governance. As a part of this fellowship, she conducted an internship at the World Health Organization (WHO), where she investigated the strategies implemented by 125 countries to tackle the emerging health crisis of antimicrobial resistance and contributed to the WHO report Worldwide Country Situation Analysis: Response to Antimicrobial Resistance. Dr. Cemma completed her honors biochemistry degree at the University of Toronto.

Christopher Chadwick

Christopher Chadwick is a Global Health Officer in the Office of Global Affairs at the U.S. Department of Health and Human Services (HHS). He advises HHS leadership on key policy issues in the areas of pandemic influenza, biosafety and biosecurity, global health security, and data and sample sharing. He also serves as the project officer for a partnership with the World Health Organization to support the development and sustainability of local influenza vaccine production in developing countries. Prior to HHS, Christopher was a Senior Specialist in Public Health Preparedness and Response at the Association of Public Health Laboratories (APHL). In this role, he provided state and local public health laboratories with policy, advocacy, and technical support regarding Laboratory Response Network (LRN) operations, all-hazards preparedness and response, biosafety and biosecurity, continuity of operations, and partnership building with clinical laboratories and first responders. Christopher also previously served as a research assistant at the Milken Institute School of Public Health at George Washington University, a policy analyst at Sanofi Pasteur, and a laboratory assistant in the Department of Microbiology at Louisiana State University.

Christopher received a Master of Science in Public Health with a concentration in microbiology and emerging infectious diseases from the Milken Institute School of Public Health at George Washington University and a Bachelor of Science in microbiology from Louisiana State University.

Brandon Dean

Brandon Dean, MPH, is the Whole Community Planning Manager for the Emergency Preparedness and Response Program in the Los Angeles County Department of Public Health. After receiving his BA from Brigham Young University in international studies, he went to Tulane University to study international diseases. He arrived in New Orleans just days before Hurricane Katrina. Mr. Dean went on to receive an MPH from UCLA in emergency public health. In more than 10 years with Los Angeles County, Mr. Dean has become a lead planner and analyst, creating, testing, and improving public health and healthcare emergency response policies and plans for a population of 10 million+ people. He has participated in various emergency incidents, including the 2009 H1N1 pandemic, measles and TB outbreaks, the Ebola scare of 2014, and the Aliso Canyon methane release (2016). He has become the department's point person in development and application of mathematical disease modeling for improved planning and responses. He now leads an awesome and nimble team in developing and implementing a whole community planning approach for making emergency health plans real and relevant to community agencies and stakeholders. He served on NIH/NIGMS's Models of Disease Agent Study (MIDAS) Steering Committee for 3 years, advocating for disease tracking and forecasting tools for state and local health agencies. Currently, he is serving as principal investigator on an innovative 3-year CDC research grant to build a process and tool to collectively link hazard assessment, at-risk population mapping, and emergency plan development for use by all local and state health agencies.

Jessica Dymond

Jessica Dymond is a synthetic biologist at the Johns Hopkins University Applied Physics Laboratory who engineers genes and genomes to develop new biological capabilities. Jessica received her PhD from Johns Hopkins University School of Medicine where she worked on the Synthetic Yeast Genome Project in Jef Boeke's laboratory. Following a post-doctoral fellowship at the USDA, Jessica joined APL for a brief time as a post-doctoral researcher and joined the permanent research staff shortly after. Additional interests include emerging technologies, best practices for development and implementation of biotechnologies, and use of synthetic biology in nontraditional settings

Ngozi Erondu

Ngozi Erondu PhD, MPH is currently an Assistant Professor in Health Information at the London School of Hygiene and Tropical Medicine (LSHTM). Her current research involves developing malaria epidemiological profiles with Ministries of Health in sub Saharan Africa and working to improve the use of existing data for better program outcomes. She completed her doctoral training at LSTHM in 2015 in Global Health Development and Epidemiology and has a Masters in Public Health from the University of Hawaii. Prior to joining LSHTM, Ngozi was a Public Health Prevention Fellow at the U.S. Centres of Disease Control and Prevention. She has conducted evaluations of meningitis and polio surveillance systems and provided technical support for the Expanded Programme on Immunisation and Integrated Disease Surveillance and Response in several countries. Ngozi has worked as a Technical Advisor to WHO and governments across sub-Saharan Africa, the Middle East, and South East Asia to strengthen capacities in International Health Regulations. In 2016, she worked as CDC field epidemiologist to support the Ebola outbreak response in Guinea. In 2015, she co-founded a global health consultancy, the Global Bridge Group, which provides data and services to inform and improve global health initiatives. Ngozi is currently an Aspen Institute New Voices Fellow.

Stuart Evenhaugen

Stuart Evenhaugen, MS, has a varied background in delivering risk-informed decision making, strategy development, and analysis to support homeland security and public health policy. Currently, he is the senior risk analyst at the DHS Office of Strategy, Policy, and Plans where he guides the development of risk methodologies to inform the Quadrennial Homeland Security Review. Before this, Mr. Evenhaugen was a policy analyst at HHS/Assistant Secretary for Preparedness and Response (ASPR) in the Office of Policy and Planning. While at ASPR, he worked on analysis supporting the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) Strategy and Implementation Plan, and the Strategic National Stockpile's Annual Review. Prior to joining federal service, Mr. Evenhaugen worked as a strategy consultant supporting the Integrated CBRN Terrorism Risk Assessment (ITRA) at DHS S&T. He completed a master of science degree in general management at the Stockholm School of Economics.

Mary-Margaret Fill

Mary-Margaret Fill, MD, is a Medical Epidemiologist with the Tennessee Department of Health, focusing on communicable disease surveillance and epidemiology. She received her undergraduate degree (BS) in microbiology and a minor in security and intelligence from Ohio State University in Columbus, Ohio. She then earned her doctor of medicine from the Mercer University School of Medicine in 2011, where she was inducted into both the Alpha Omega Alpha Honor Medical Society and the Gold Humanism Society. She completed dual-residency training in internal medicine and pediatrics at Vanderbilt University Medical Center and is board certified in both specialties. Following residency, Dr. Fill served as a member of the Centers for Disease Control and Prevention's Epidemic Intelligence Service as a field assignee with the Tennessee Department of Health. She has worked on foodborne, waterborne, vaccine-preventable, and healthcare-associated disease outbreaks; emerging pathogens (including a deployment to Colombia for CDC's Zika virus response); and analysis of surveillance systems and novel datasets.

J. L. "Clem" Fortman

J. L. "Clem" Fortman is a synthetic biologist with a long-standing interest in biodefense. He is currently a technical analyst for synthetic biology with ANSER, providing support to the Office of the Deputy Assistant Secretary of Defense for Chemical and Biological Defense, where he previously served 2 years as an American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellow. Dr. Fortman is a classically trained microbial physiologist with a PhD in microbiology from the University of Minnesota. He spent 6 years as a postdoc in the University of California, Berkeley (UCB) Department of Chemical Engineering, where he gained his expertise in synthetic biology. He is a founder of the introductory College-Level Experience in Microbiology (iCLEM) program at UCB, an educational outreach program for under-resourced high school students, as well as Lygos, a San Francisco Bay area synthetic biology company. His career in biodefense was stimulated by his time as an enlisted man in the US Army, where he served in a number of different roles including assistant Nuclear, Biological, and Chemical Non-Commissioned Officer for the Headquarters and Service Battery of the 1st Battalion 319th Airborne Field Artillery Regiment.

Jeff Freeman

Dr. Jeff Freeman has more than 10 years experience in disaster and humanitarian response. He recently joined the National Health Mission Area of the Johns Hopkins University Applied Physics Laboratory (APL) as Assistant Program Manager for Health Surveillance. Among other duties, Dr. Freeman has been tasked with building a disaster response program for the lab. In addition to APL, Dr. Freeman is an instructor at Johns Hopkins University where he teaches courses focused on humanitarian response. Dr. Freeman is also a member of the Johns Hopkins Go Team, which provides rapid response capacity for regional and national disasters. Dr. Freeman holds a PhD in Environmental Health and Engineering from Johns Hopkins University, and an MPH in Global Health from Emory University. Prior to Johns Hopkins, Dr. Freeman served as a research fellow in the Emergency Response and Recovery Branch of the United States Centers for Disease Control and Prevention (CDC).

Andrew Herr

Andrew Herr is the CEO of Helicase, an Adjunct Fellow at the Center for a New American Security, and an Adjunct Professor of Security Studies at Georgetown University. Helicase is a leader in human performance enhancement. Andrew directs the Helicase team as it leverages cutting-edge science and technology to enhance mental and physical performance for individuals and groups. With the Center for a New American Security, Andrew focuses on the role of humans in warfare, including the impact of human performance enhancement and human-machine teaming, as well as approaches to effectively develop and integrate emerging technologies into operations. At Georgetown, Andrew teaches about unconventional weapons technologies with a 'hands-on' approach, enabling students to gain first-hand experience relevant to chemical, biological, nuclear, and radiological weapons, additive manufacturing, and human enhancement. Prior to his current positions, Andrew led studies on the future of human performance and biotechnology for the Department of Defense's Office of Net Assessment, trained U.S. Government personnel preparing for deployment to Afghanistan and Iraq, and worked with the Departments of Homeland Security and Energy on emerging technology strategy.

Andrew received Master's Degrees in Health Physics, Microbiology & Immunology, and Security Studies from Georgetown University, where he also completed his undergraduate work in the School of Foreign Service, earned a certificate in Eurasian, Russian, and East European studies, and learned to speak Russian. Andrew's interest in Russia and the former Soviet space led him to study in Russia, travel more than 10,000 miles across the country by train, live with Kazakh nomads who train eagles to hunt, and enjoy roasted lamb in the Turkmen desert.

Patricia Pacheco Hernandez

Patricia Hernandez, PhD, is an engineer and analyst in the Homeland Security and Defense Systems Center and a senior member of the technical staff at Sandia National Laboratories. As a member of the Systems Research and Analysis group, she has worked on a broad range of national security issues, including emergency response and chemical and biological security, using risk and prioritization methodologies. She also briefly served as the lab coordinator for the Ratoma Ebola Diagnostic Center in Conakry, Guinea. Dr. Hernadez has a BSE in mechanical engineering from the University of Michigan and a PhD in bioengineering from the Georgia Institute of Technology. Her graduate work focused on biomaterials and modulating the humoral immune response, specifically in response to the tuberculosis vaccine. She is interested in the effects of advancing biotechnology and the resulting ease of use and access on biosecurity.

Alison Hill

Alison Hill is a Research Fellow at Harvard University and a recipient of the National Institute of Health's Early Independence Award. Her research group develops mathematical and computational models to understand and predict the dynamics of infectious diseases. Particular focuses of her research include HIV/AIDS, viral evolution, and the emergence of drug-resistant infections. In the past, she has also worked on modeling the interpersonal spread of health-related information and behaviors. Dr. Hill received her PhD in biophysics from Harvard and was a joint student in the medical engineering and medical physics program hosted by the Harvard-MIT Division of Health Science and Technology. She was formerly a chair of Harvard's student-run Science Policy Group, and her popular science writing appears on PBS's NOVA. She is interested in the biosecurity issues surrounding emerging infections, including cross-species transmissions, drug-resistant strains, and genetically modified pathogens.

Adrienne Keen

Adrienne Keen is a health and science advisor at the US Department of State. She provides intelligence analysis and advisory services for State Department and senior US government decision makers on emerging health, science, and technology issues to support the development and execution of foreign policy. She has produced assessments on health threats such as Ebola, Zika, Middle East respiratory syndrome (MERS), Nipah virus, plague, and substandard medicines. She concurrently serves as an independent consultant for the WHO Global TB Programme, carrying out technical reviews of tuberculosis surveillance and epidemiology in countries requesting assistance. Prior to joining the State Department, Dr. Keen managed health economics and comparative effectiveness research to support drug regulatory and reimbursement submissions for pharmaceutical companies. Dr. Keen earned her PhD in the mathematical modeling and epidemiology of infectious diseases from the London School of Hygiene and Tropical Medicine, where she studied tuberculosis dynamics and molecular epidemiology in the UK and worked closely with national public health authorities. She obtained her MS in ecology and evolution, conducting research on the population genetics of a maize pest to inform insect resistance management strategies for genetically modified corn. Dr. Keen has other research experience including studies on the drivers of antimicrobial resistance in the environment and the evolutionary history of plant communities.

Daniel Leifer

Daniel Leifer is a physician who is completing a pediatrics residency at Lurie Children's Hospital/Northwestern University. In 2009, he assisted the government's response to the H1N1 "Swine Flu" pandemic while working in the Office of the Science and Technology Adviser to Secretary of State Clinton. In 2015, while working at the Centers for Disease Control and Prevention, he was deployed on a multi-state investigation into an outbreak of influenza-associated parotitis.

He earned his M.D. from University of California, Davis, where he was inducted into the Alpha Omega Alpha honors society. He earned his B.S. in Biology, with Interdisciplinary Honors in International Security Studies, from Stanford University. His undergraduate research project used recently-declassified government documents to investigate the back-channel negotiations that defused the 1970 Cienfuegos Crisis between the U.S. and the U.S.S.R.

Dr. Leifer also has a background in broadcast, print, and digital media. In 2014, he received the American Medical Association Foundation's Johnson F. Hammond, M.D., Physicians of Tomorrow Award for Medical Journalism, as well as the The Doctors Foundation National Young Physicians Patient Safety Award.

Syra Madad

Syra Madad, D.H.Sc., M.Sc., MCP is nationally recognized leader in public health and special pathogen preparedness and response. She is Director, System-wide Special Pathogens Program at New York City Health + Hospitals, the nation's largest municipal health-care delivery system overseeing special pathogen preparedness and response efforts across 11 acute care hospitals and five post-acute/long-term care facilities. She is currently an Assistant Professor in the Graduate Biotechnology/BioDefense Program at the University of Maryland and Core Faculty/Team Lead in the National Ebola Training and Education Center's (NETEC) Special Pathogens Exercise Resource Team. In addition, Dr. Madad was previously Senior Research Fellow in the Behavioral Informatics & Technological Enterprise Studies at the Federal Bureau of Investigation.

Dr. Madad earned her Doctoral degree in Health Science with a concentration in Global Health from Nova Southeastern University, graduating with Alpha Eta Health Science Honor Society status. She obtained her MS in Biotechnology with a concentration in Biodefense and Biosecurity and BS in Psychology from the University of Maryland. Dr. Madad holds numerous professional certifications, licenses and training certificates and has a strong background in academia, teaching in graduate, undergraduate and professional programs with courses ranging from advanced microbiology to bioterrorism and biosecurity. Prior to her current role, Dr. Madad served as the Lead Continuity of Operations Liaison and State Trainer for the BioThreat and Chemical Threat Teams at the Texas Department of State Health Services, Emergency Preparedness Branch. She served on the Ebola and Other Infectious Disease Agent Surge Team and assisted with the Texas state 2014-2015 Ebola outbreak response. In 2015, Dr. Madad was awarded the Ebola Response Team Appreciation Award by the Commissioner of the Texas Department of State Health.

Matthew Moe

Matthew Moe has spent the last ten years as a USG civil servant working across the biodefense enterprise. Most recently, his focus has been on managing the WMD-terrorism intelligence mission as an officer with the US National Counterterrorism Center. Prior to this, he focused on science & technology support to biodefense as program manager for the DHS biological threat characterization program, which provides the USG timely and high-confidence information on the technical characteristics of biological threats to inform planning, preparedness and risk mitigation decisions. Part of this portfolio includes management of the National Biological Threat Characterization Center, the nation's BSL-4 capability to answer national security-related questions on biological hazards.

Before DHS, Matt spent 5 years supporting DoD acquisitions as the lead biodefense evaluator for the Army Test & Evaluation Command. Here, Matt designed, executed, and reported on lab and field test & evaluation events focused on biodefense sensors and platforms. His work led to significant improvements in the way field-to-lab data are correlated. As part of this assignment, Matt spent time detailed to Dugway Proving Ground in their BSL-3 laboratory.

Justin Pahara

Justin Pahara, PhD, is a scientist and entrepreneur building biotechnology companies and products that reduce the barriers to learning and doing genetic engineering. Over the past 5 years, Dr. Pahara's interest has been in understanding what factors underpinned the computer revolution and the democratization of computing and applying that knowledge to biotechnology. This has led to the creation of an emerging ecosystem of interconnected software, hardware, and wetware products. Dr. Pahara believes that genetic engineering is a critical tool that will help humanity solve our most pressing issues and that more people should have access to it.

Dr. Pahara holds a BSc in immunology and infection, an MSc in cell biology from the University of Alberta (Canada), and a PhD in chemical engineering and biotechnology from the University of Cambridge (UK). He was a participant and award holder in the International Genetically Engineered Machines Competition (iGEM), a synthetic biology competition, and also holds a degree in exponential technology from Singularity University at NASA Ames.

James Phillips

Dr. James Phillips, MD is an Emergency Medicine physician and an Assistant Professor at George Washington University Hospital in Washington, DC where he is Director of the Disaster and Operational Medicine Fellowship. Additionally, he serves as Chief of the Section of Disaster and Operational Medicine within the Department of Emergency Medicine. In addition to his academic and teaching roles, he is the Chief Medical Officer for SOS International, LLC and the EMS and Medical Director at the Camp Taji military base in Iraq. He was recently chosen to be a Senior Fellow at the Center for Cyber and Homeland Security housed in the Elliot School of International Affairs at The George Washington University. Dr. Phillips lectures and researches several topics, most notably healthcare workplace violence, disaster medicine and emergency management, medical counterterrorism, and tactical/operational medicine. He is a 2014 graduate of the Harvard Affiliated Disaster Medicine and Emergency Management Fellowship and subsequently Instructor at Harvard Medical School and as an attending physician at Beth Israel Deaconess Medical Center in Boston. In 2016 he was named as the Director of Counterterrorism Medicine in the BIDMC Disaster Fellowship and has lectured on the topic nationally.

Prior to his disaster medicine training, he began his rather unorthodox training experience as a resident in Plastic and Reconstructive Surgery at the University of Michigan. After four years of surgical training Dr. Phillips changed specialties and completed an Emergency Medicine residency at the University of Illinois-Chicago where he received an award as the Outstanding Resident in Research. He graduated as a Top Ten Senior from Oklahoma State University with a dual bachelor's degree in microbiology and molecular genetics before matriculating to the University of Oklahoma College of Medicine. A proud Oklahoman born and raised, his life was personally impacted and heavily influenced by the Oklahoma City Bombings.

Saskia Popescu

Saskia Popescu, MPH, is an infectious disease epidemiologist and infection preventionist with a focus on antibiotic resistance and hospital preparedness. A current biodefense PhD student and presidential scholar at George Mason University, she holds an MPH in epidemiology and an MA in international security studies from the University of Arizona. Ms. Popescu's undergraduate research in classical history and public health focused on the role of disease in Roman military failures. She is currently a research assistant in GMU's biodefense department, managing editor of the Pandora Report, and infection prevention consultant for Phoenix Children's Hospital and Honor Health.

Ms. Popescu has worked as an infection preventionist in both adult and pediatric acute care hospitals and aided in infectious disease outbreak investigations with the University of Arizona and the Arizona Department of Health Services. During her work as an infection preventionist, she managed Ebola response, a 300+ measles exposure resulting in an MMWR article, and bioterrorism preparedness in the hospital system. She is certified in infection prevention, hospital preparedness through FEMA's NIMS, and pandemic preparedness from the DHS Center for Domestic Preparedness. Ms. Popescu's research has focused on roadblocks for non-state actor utilization of bioweapons, antimicrobial resistance, US healthcare vulnerability to infectious disease outbreaks and surveillance. Her research on food security was awarded a Department of Homeland Security Career Development Grant, and her current dissertation research investigates the cultural, economic, and political drivers for infection prevention utilization in the US and applies a political economy lens to address market failures that ultimately translate to poor infection control practices and how that affects American health security.

Betsy Pugel

Betsy Pugel, PhD, has been the Deputy to NASA's Planetary Protection Officer since 2013. Since coming to NASA in 2002, she has enjoyed the range of projects and roles that she has played—from engineer to scientist to project manager. She received her PhD in experimental condensed matter physics. She has 1 patent and 7 invention disclosures. She has received more than 20 NASA awards and the Women in Aerospace Achievement Award for development and implementation of new technology. She has written 2 book chapters.

John Scarbeck

John Scarbeck is an FBI Supervisory Special Agent (SSA) with more than 20 years of experience in domestic and international law enforcement matters, including counterterrorism, critical incident response, and national security policy. He has 15 years of experience leading chemical, biological, radiological, and nuclear (CBRN) response teams. He has served as a member of the Joint Terrorism Task Force (JTTF), has been a WMD coordinator, and has worked joint law enforcement and epidemiological investigations. Mr. Scarbeck helped lead FBI response efforts for Evidence Response Teams at Ground Zero in New York City during and after September 11, 2001. He works with military, national security, law enforcement, public health, and life science communities domestically and internationally. Mr. Scarbeck serves as a United States delegate to the Quadrilateral (Australia, United Kingdom, Canada, and United States) CBR Technical Response Group (TRG) and is working to identify gaps in CBR crime scene capabilities, develop a set of consensus "best practices," establishing a capability for interoperability of quadrilateral response assets for purposes of combating CBR terrorism. Mr. Scarbeck earned a master's degree in biology and a BS in microbiology from Plattsburgh State University, His thesis involved the building of a gene gun apparatus for the biolistic transformation of E.coli and S. cerevisiae. In addition, he has worked for NASA, Moffet Field, California, in space biology and microbial ecology.

Carolyn Shore

Carolyn Shore is director of the Forum on Drug Discovery, Development, and Translation and a senior program officer with the Board on Health Sciences Policy of the National Academies of Sciences, Engineering, and Medicine. Before joining the National Academies, Carolyn was an officer on Pew's antibiotic resistance project, leading work on research and policies to spur the discovery and development of urgently needed antibacterial therapies. She previously served as a foreign affairs officer at the U.S. Department of State, where she led an initiative on open data and innovation-based solutions to global challenges. She also served as the State Department's representative to intergovernmental organizations focusing on food safety, plant and animal health, biosecurity, and agricultural trade policy. Carolyn was an American Society for Microbiology congressional fellow, working on science-based policy related to antibiotic stewardship and other public health issues. She holds a doctoral degree in Microbiology and Molecular Genetics from Harvard University. As a graduate student, she studied anti-malarial drug resistance in Senegal and worked jointly between the Medicines for Malaria Venture, Genzyme Corporation, and the Broad Institute of Harvard and MIT to discover new anti-malarial compounds. Carolyn was awarded a Fulbright Fellowship for work at the University of Queensland in Brisbane, Australia, and a National Institutes of Health Training Grant for postdoctoral work at the University of Iowa.

Sapana Vora

Sapana Vora joined the US Department of State's Biosecurity Engagement Program (BEP) in the Office of Cooperative Threat Reduction (CTR) as a AAAS Science and Technology Policy Fellow in 2015. BEP's mission is to reduce the threat of bioterrorism by preventing terrorist access to potentially dangerous biological materials, dual-use technology, and bioscience expertise, while supporting efforts to combat infectious disease and enhance public and animal health worldwide. Dr. Vora leads a portfolio that includes biosecurity assistance to the Middle East and North Africa. She covers BEP equities in White House–led policy initiatives on biosecurity topics that include biological select agents and toxins and genome editing and synthesis technologies. In addition, Dr. Vora oversees BEP's annual funding cycle and coordinates drafting and clearance of legal agreements necessary for the Department of Defense to conduct CTR activities outside the former Soviet Union. In January 2017, Dr. Vora was promoted to acting deputy team chief. Prior to joining BEP, she was a Mirzayan Science and Technology Policy fellow and research associate at the National Academies of Science, Engineering, and Medicine, where she worked on a consensus study "Ovarian Cancers: Evolving Paradigms in Research and Care" for the Board of Health Care Services at the Institute of Medicine (now National Academy of Medicine). She holds a PhD in Cancer Biology from the University of Chicago and a BS in biology and English from the University of North Carolina at Chapel Hill.

Simon Weller

Simon Weller is a Principal Scientist at Defence Science and Technology Laboratory, part of UK Ministry of Defence (MoD), based at Porton Down. He is currently Project Technical Authority for the MoD Biological Sense research programme, a range of projects which are aimed with developing novel and improved technologies for deployed environmental military biodetection capabilities. He also conducts primary research developing methods which will be able to rapidly retrieve forensic levels of information from biological samples, and methods which can rapidly inactivate biological agents and also stabilise the diagnostic analyte (i.e. DNA, protein). The overarching aim of these programmes is to facilitate safe, high confidence, analysis of samples in austere, field, conditions where there is little or no advanced microbiological containment. In 2014 Dr. Weller was involved in the development of a UK network of Ebola diagnostic laboratories in Sierra Leone and deployed in the first rotation of scientists to a laboratory near Freetown.

Dr Weller received his bachelor's degree in biological sciences from the University of Plymouth, a Master's degree in Plant Pathology from the University of Leeds, a PhD (studying an Agrobacterium induced disease of hydroponic crops) from the University of York, and is a Fellow of the Royal Society of Biology. He previously worked as a Plant Pathologist for the UK Department of Environment, Food, and Rural Affairs (DEFRA). During the 2001 UK Foot-and-Mouth outbreak he spent three months in the field supervising the disinfection of culled farms. During his time at DEFRA he also spent time in Kenya working on an Agrobacterium induced disease afflicting the cut rose industry.

35

Participation in the Meeting of States Parties to the Biological Weapons Convention
December 4-8

Four ELBI members (2 fellows and 2 alumni) were competitively selected to attend the Meeting of States Parties (MSP) to the BWC held at the United Nations in Geneva, Switzerland in December. The ELBI delegation attended the proceedings of the meeting, participated in side events and discussions, and visited the World Health Organization (WHO) where they met with representatives working on biosecurity issues.

ELBI 2017 Year in Review

Spring Workshop, Washington, DC
March 28-30

During the spring workshop, fellows met at the White House and received briefings from the National Security Council and Office of Science and Technology Policy staff; attended a day-long meeting including presentations by and discussion with subject matter experts; and visited NIH and DoD Laboratories at Ft. Detrick in Frederick, MD.

Inaugural ELBI Research and Practice Symposium, Baltimore, MD
July 17-19

The inaugural Research and Practice Symposium brought fellows and alumni together in Baltimore to share their biosecurity research, work, and experiences with ELBI peers. Participants discussed a wide range of topics from infection control to synthetic biology, and they participated in a lively deliberation of global catastrophic biological risks (GCBRs) led by Tom Inglesby. Attendees also had the opportunity to tour the Johns Hopkins Biocontainment Unit (BCU) and learn how the hospital manages patients with highly infectious diseases.
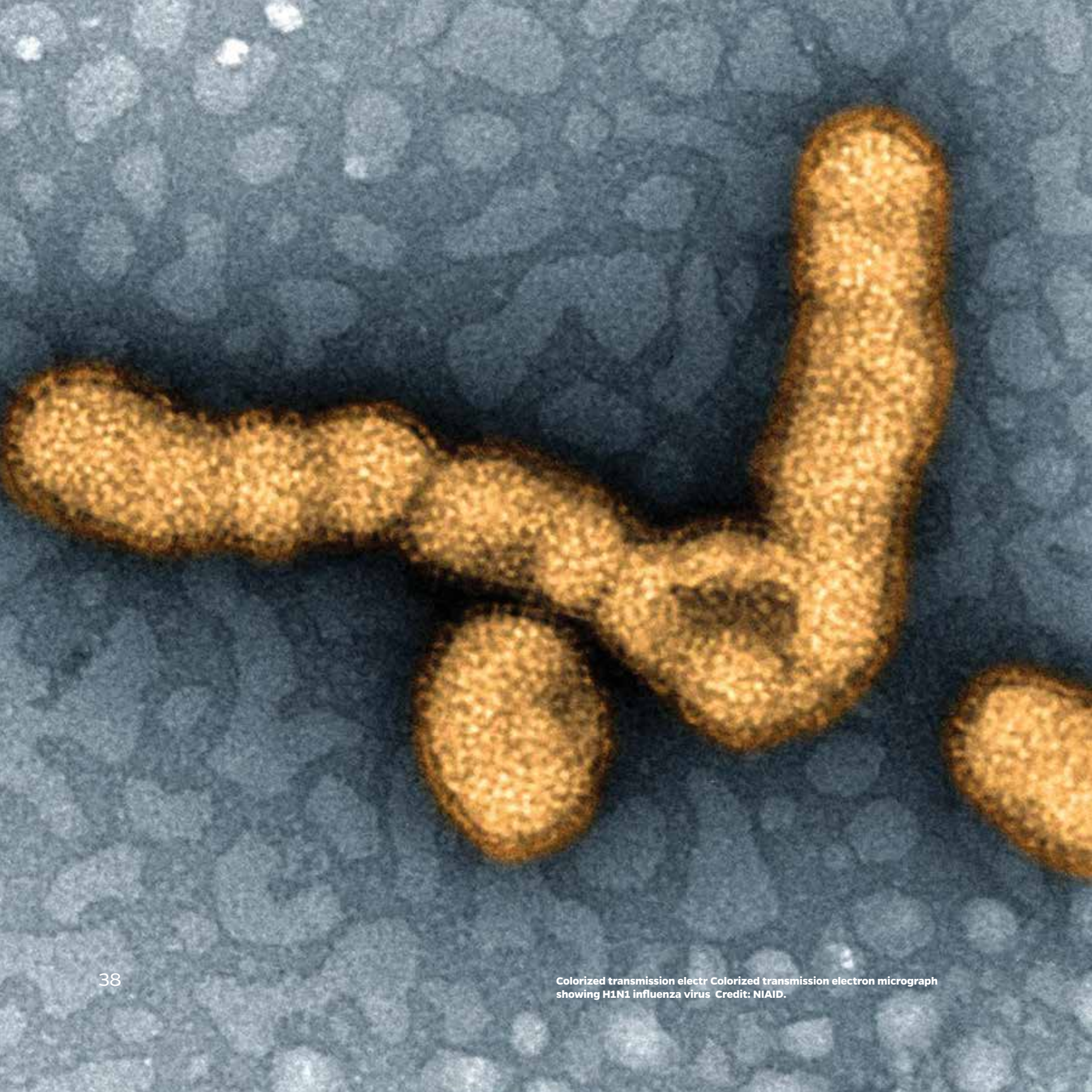
Fall Workshop, Boston, MA
September 12-14

During the fall workshop, fellows traveled to Boston, MA where they attended a day-long meeting with presentations and discussion about synthetic biology, biosecurity from a law enforcement perspective, and potential pandemic pathogens. On day two, the fellows were hosted by ELBI Alumni at Ginkgo Bioworks and the Harvard George Church Laboratory. The workshop closed out with fellows participating in the Viral Storm tabletop exercise.

Alumni Networking

During the year, Alumni in the Washington, DC area gathered twice at The Sovereign in Georgetown for networking happy hours.

Webinars

Fellows and Alumni were invited to attend two seminars this year–offered both in person and via webinar–by Center for Health Security faculty members Dr. Monica Schoch-Spana and Dr. Crystal Watson. Dr. Schoch-Spana discussed Public Archetypes in US Biodefense Policy, and Dr. Watson presented on decision making under the deep uncertainty accompanying a biological weapons attack.

Colorized transmission electr Colorized transmission electron micrograph showing H1N1 influenza virus Credit: NIAID.

"War zones and other fragile state settings are the most difficult places to eliminate epidemics. They're also some of the most likely places for them to begin—as we've seen with Ebola in Sierra Leone and Liberia, and with cholera in the Congo Basin and the Horn of Africa. So, to fight global pandemics, we must fight poverty, too.

It's also true that the next epidemic could originate on the computer screen of a terrorist intent on using genetic engineering to create a synthetic version of the smallpox virus … or a super contagious and deadly strain of the flu.

The point is, we ignore the link between health security and international security at our peril.

Whether it occurs by a quirk of nature or at the hand of a terrorist…a fast-moving airborne pathogen could kill more than 30 million people in less than a year. And they say there is a reasonable probability the world will experience such an outbreak in the next 10-15 years.

It's hard to get your mind around a catastrophe of that scale, but it happened not that long ago. In 1918, a particularly virulent and deadly strain of flu killed between 50 million and 100 million people.

You might be wondering how likely these doomsday scenarios really are. The fact that a deadly global pandemic has not occurred in recent history shouldn't be mistaken for evidence that a deadly pandemic will not occur in the future.

And even if the next pandemic isn't on the scale of the 1918 flu, we would be wise to consider the social and economic turmoil that might ensue if something like Ebola made its way into a lot of major urban centers. We were lucky that the last Ebola outbreak was contained before it did.

The good news is that with advances in biotechnology, new vaccines and drugs can help prevent epidemics from spreading out of control. And, most of the things we need to do to protect against a naturally occurring pandemic are the same things we must prepare for an intentional biological attack."

Bill Gates
Speech at the 53rd Munich Security Conference
February 18, 2017

Johns Hopkins Center for Health Security

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 applications, and advising fellows.

Tom Inglesby, MD, *Johns Hopkins Center for Health Security Director and Professor*

Anita Cicero, JD, *Johns Hopkins Center for Health Security Deputy Director*

ELBI Program Manager: Matthew Watson, *Senior Analyst and Research Associate*

ELBI Deputy Program Manager: Matthew Shearer, MPH, Senior Analyst and Research Associate

ELBI Coordinator: Alison Pack, *Staff Specialist*

ELBI Events: Andrea Lapp, *Director of Events*

ELBI Program Staff: Crystal Watson, DrPH, *Senior Scholar and Assistant Professor*

ELBI Program Staff: Caitlin Rivers, PhD, *Senior Scholar and Assistant Professor*

Special thanks to Gigi Kwik Gronvall, PhD, Senior Scholar; Monica Schoch-Spana, PhD, Senior Scholar; Jennifer Nuzzo, DrPH, Senior Scholar; Tasha King (program and financial administration); and Tanna Liggins, and Maria Jasen (administrative support).

ELBI Alumni

Class of 2012

Angela Fowlkes
Anthony Treubrodt
Ashley Grant
Brendan Thomason
Calvin Siow
Carolyn Hall
David Aaron
Halley Smith
Haroun Habib
Hillary Carter
Jaime Yassif
Jessica Appler
Katharine Hagen
Luis Martínez
Michael Montague
Nicholas Kelley
Patrick Ayscue
Patrick Rose
Rakesh Raghuwanshi
Renee D. Wegrzyn
Sara Roszak
Sheana Cavitt
Stefanie Bumpus
Stephen White
Yuliya Seldina

Class of 2014

Chas Eby
Cindi Corbett
Daniel Grushkin
Darya Pilram
Elizabeth Carter
Ellie Graeden
Gordon Lemmon
Heidi Hamling
Isabelle Goulet
Jacob Schafer
Jessica Tucker
Joseph Buccina
Julia Limage
Kelly Cappio
Kristin Hatcher
Luke Beckman
Marci Wright
Michael Crowley
Michael Patterson
Nathan Hillson
Patrick Boyle
Rebecca Fish
Rebecca Gurba
Reid Harvey
Richard Saint
Ryan Newkirk
Tina Schoenberger
Uri Lopatin

Class of 2015

Alexandra Phelan
Allison Mistry
Amanda Moodie
Amor Menezes
Amy Walker
Andrew Leifer
Andrew Kilianski
Caitlin Rivers
Emily Kelley
Erin Sorrell
Jeff Drocco
John Billington
Judy Kruger
Julia Dooher
Justin Taylor
Kettner Griswold
Kevin Martin
Kim Gajewski
Leremy Colf
Lisa Brown
Malaya Fletcher
Michelle Nalabandian
Nicholas Evans
Patricia Lau
Remi Charlebois
Ryan Stringer
Seth Baum
Victoria Earl

Class of 2016

Wendy Anne Beauvais
Anne Cheever
Francisco Cruz
Genya V. Dana
Cory Davenport
Natalie DeGraaf
Christine Farquharson
Mary Foote
Stephanie Griese
Mark Hansberger
Siddha Hover
Daniel Jackson
Dylan Jones
Mary Lancaster
Gregory Measer
Lianne Parr
Amber Murch
Reid Orth
Megan Palmer
Kristin Post
Hayley Severance
Jen January Therrien
Angela Vasa
Krista Versteeg
Jennifer Weisman
Claire J. Standley
Trevor Hall
Samantha Kasloff