

NIH Blue Ribbon Panel for the Risk Assessment of the National Emerging Infectious Disease Laboratory at Boston University Medical Center

Working Group of the Advisory Committee to the Director

Summary of Public Meeting March 13, 2008

The NIH Blue Ribbon Panel for the Risk Assessment of the National Emerging Infectious Disease Laboratory (NEIDL) at Boston University (BU) Medical Center (Blue Ribbon Panel [BRP]), a working group of the Advisory Committee to the Director (ACD) of the National Institutes of Health (NIH), was convened for its first meeting at 8:30 a.m. on March 13, 2008, on the NIH campus, Building 1, Wilson Hall, Bethesda, Maryland. Dr. Adel Mahmoud (Chair) presided. In accordance with Public Law 92-463, the meeting was open to the public from 8:30 a.m. until 2:15 p.m. on March 13, 2008. Notice of this meeting was published in the *Federal Register* on March 11, 2008 (73 FR 13006). Topics covered at this meeting included background on overarching aims and the scope of relevant research; an overview of Federal, State, and municipal requirements; an overview of the legal proceedings to date; an overview of draft supplementary environmental risk assessments; and public comment.

Panel Members

Donald S. Burke, M.D., University of Pittsburgh
Stephen Eubank, Ph.D., Virginia Polytechnic Institute and State University
Vicki S. Freimuth, Ph.D., University of Georgia
George Friedman-Jiménez, M.D., Bellevue Hospital Center
Margaret A. Hamburg, M.D., Nuclear Threat Initiative
Karen A. Holbrook, Ph.D., University of South Florida
Dennis L. Kasper, M.D., Harvard Medical School and Brigham and Women's Hospital
W. Ian Lipkin, M.D., Northeast Biodefense Center and Columbia University
Adel Mahmoud, M.D., Ph.D., Princeton University (Chair)
Mary E. Northridge, Ph.D., M.P.H., Columbia University
Jean Patterson, Ph.D., Southwest Foundation for Biomedical Research
Samuel L. Stanley, Jr., M.D., Midwest Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research and Washington University in St. Louis
Wayne Thomann, Dr.P.H., Duke University/Duke University Medical Center

Ex Officio Members

Steven P. Bennett, Ph.D., U.S. Department of Homeland Security
Peter Highnam, Ph.D., U.S. Department of Health and Human Services (HHS)
Rima F. Khabbaz, M.D., Centers for Disease Control and Prevention

NIH Staff

Amy P. Patterson, M.D., Office of the Director, NIH

Others

Approximately 70 people attended this 1-day BRP meeting.

I. Opening Remarks and Charge to the Working Group

Presenter: Elias Zerhouni, M.D., Director, NIH

Dr. Zerhouni welcomed BRP members and attendees to the inaugural meeting of the BRP, noting that the issues to be discussed go beyond the safety of the BU laboratory to include public policy and perception. He provided a background of the discussions and decisions regarding biodefense research supported by the NIH, including the overarching question of whether biodefense should be managed similarly to nuclear defense or whether an open architecture that relies directly on the talent pool of universities should be used. After an extensive debate, the NIH decided in 2002 that the most effective strategy would be to create an open architecture system that uses the best scientists and that the architecture would be distributed regionally.

Dr. Zerhouni pledged the support of the NIH to the BRP for additional expertise. He encouraged BRP members to express their views openly and honestly, noted that an effective national policy would result from an honest exchange of ideas and expertise, and stated that there are no foregone conclusions. Dr. Zerhouni underlined the importance of coming to the best possible conclusions for the U.S. public and reiterated the need for the BRP's deliberations to be done right, even if speed must be compromised.

II. Call to Order and Overview and Purpose of Today's Meeting/Dr. Mahmoud

Dr. Mahmoud, BRP Chair, called the meeting to order at 8:30 a.m. on March 13, 2008. The charge to the BRP is to provide scientific and technical advice to the NIH regarding the construction and operation of a national biocontainment laboratory at the BU Medical Center. The BRP will provide independent scientific advice regarding the scope of any additional risk assessments that might be necessary and how to engage in effective risk communication, being especially mindful of issues related to the National Environment Policy Act (NEPA) requirements, environmental justice (EJ), and community liaison.

Established as a working group of the standing ACD, the BRP's recommendations will be conveyed to the NIH Director through the ACD. Panel members provide a wide variety of expertise, including infectious diseases, public health, epidemiology, risk assessment, infectious disease modeling, risk communications, biosafety, bioethics, and EJ.

The specific tasks of the BRP will be to:

- Review judicial materials and public concerns
- Consult with technical experts, including the National Research Council (NRC) committee
- Evaluate the adequacy of the scenarios, organisms, methodologies, and assumptions in the supplementary risk assessments
- Consider the adequacy of the available risk assessment and propose additional risk assessments as appropriate
- Provide ongoing advice regarding the conduct of risk assessment studies
- Produce a draft supplementary risk assessment document
- Advise on the final report.

III. NIH Biodefense and Emerging Infectious Diseases: Strategic Overview

Presenter: Michael G. Kurilla, M.D., Ph.D., National Institute of Allergy and Infectious Diseases (NIAID), NIH

To place the issues surrounding operation of the NEIDL within the context of NIAID programmatic efforts, Dr. Kurilla presented a high-level strategic overview of NIAID biodefense programs. His office provides

oversight of the extramural construction program, which is treated administratively similar to the process for awarding individual grants.

The 2002 Blue Ribbon Panel Bioterrorism and Its Implications for Biomedical Research concluded the need for expansion of research capacity, both intellectual and infrastructure. In addition, this panel stated that research with potentially deadly Category A agents (e.g., anthrax, Ebola, smallpox) must be conducted in appropriate containment facilities; however, access to biosafety level (BSL) 3 and 4 facilities is limited and must be expanded. Expansion of the biodefense research capacity through the NIAID extramural construction program includes building comprehensive, state-of-the-art BSL-2, BSL3, and BSL-4 laboratories within two National Biocontainment Laboratories (NBLs), 13 Regional Biocontainment Laboratories (RBLs), 10 Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases (which complement the intellectual needs of this expansion), and 4 new NIH facilities (which complement the infrastructure needs).

Dr. Kurilla reviewed the timeline for the biocontainment construction program and noted the postaward NEIDL milestones. He showed the state of construction of the other NBL—the Galveston National Laboratory at The University of Texas Medical Branch, Galveston, Texas—and pictures of the RBLs completed to date at Colorado State University, Duke University, and the University of Pittsburgh.

IV. National Emerging Infectious Diseases Laboratories at Boston University

Presenter: Mark S. Klempner, M.D., NEIDL, BU

Dr. Klempner presented examples of potential research programs and how the NEIDL facility would support mission-critical collaborative research; he highlighted four scientific programs and reiterated that no classified research will take place at the NEIDL because offensive bioweapons research is illegal.

Emerging antibiotic resistance is increasing in incidence, whereas few new antibacterial agents are being developed. According to CDC statistics, from 1980 to 2003 there was a significant increase in rates of resistance for three bacteria that are of concern to public health officials: methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci, and fluoroquinolone-resistant *Pseudomonas aeruginosa*. In addition, multidrug-resistant tuberculosis and extensively drug-resistant tuberculosis are spreading throughout the world.

Dr. Klempner discussed various methods of combating drug resistance, including a network biology approach, stimulating hydroxyl radical formation, and creating a genomics platform. He also discussed avian influenza (H5N1) and associated lung damage, approaches to filovirus vaccines, Marburg and Ebola viruses, and global and national distribution of West Nile virus. In particular, he noted that West Nile virus, Dengue fever virus, and malaria virus all have a long incubation period in their mosquito host, and only mature mosquitoes transmit disease; therefore, elimination or even slight reductions of the mature vector population will result in dramatic decreases in disease transmission.

When operating, the NEIDL will provide an opportunity for important research collaboration with many laboratories throughout the country.

V. Federal Environmental Policy Requirements Under the National Environmental Policy Act

Presenter: Daniel Wheeland, Director, Office of Research Facilities Development and Operations, NIH

Mr. Wheeland discussed how NEPA requirements affect the construction grant for the NEIDL. As the basic national charter for protection of the environment, the NEPA establishes policy, sets goals, and provides means for carrying out the policy. The purpose of the NEPA is to ensure that Federal agencies understand the potential impacts of their actions, mitigate those impacts where possible, and make

informed decisions. Because the NIH, a Federal agency, is partially funding the construction of the NEIDL, the requirements of the NEPA apply to this construction.

Two documents play a role in applying NEPA standards to the NEIDL. The Environmental Impact Statement (EIS) is a written statement drawing conclusions about how a course of action is likely to affect the environment and analyzing the potential impacts of an action; the NIH conducted an EIS that analyzed potential impacts and mitigation measures associated with its partial funding of the NEIDL. The Record of Decision (ROD) is a concise written record of the NIH's decision based on the EIS; the NIH determined in its early 2006 ROD that the NEIDL posed a negligible risk to the community and that the NEIDL would not have a disproportionate impact on low-income and minority populations.

Areas studied as part of the NEIDL EIS include:

- Social resources
- Economic resources
- Environmental justice
- Visual quality
- Wastewater and water resources
- Biological resources
- Air quality
- Noise
- Transportation
- Historic and cultural resources
- Land use
- Cumulative impacts
- Human health and safety

Beginning in January 2004, more than 2 years of opportunities for public comment have been part of the NEPA chronology for this project.

VI. Review of the Boston University BioLab Under the Massachusetts Environmental Policy Act

Presenter: Deerin Babb-Brott, Massachusetts Environmental Policy Act Office

Mr. Babb-Brott discussed the purposes and processes of the Massachusetts Environmental Policy Act (MEPA) and how the MEPA has been applied to a review of the NEIDL.

The MEPA provides meaningful opportunities for public review of potential environmental impacts and requires that State agencies study the environmental consequences of their actions, including permitting and financial decisions. It also requires that State agencies take all feasible measures to avoid or minimize and mitigate damage to the environment by studying alternatives to a proposed project, evaluating respective impacts, and developing enforceable mitigation commitments that become permit conditions for the project if it is permitted.

The MEPA process begins when the proponent files draft and final Environmental Impact Reports (EIRs) for review. Comments from the public and agencies and relevant information from any other source is considered. A finding of "adequate" or "inadequate" is made; the MEPA does not approve or deny construction. State agencies can act only after the MEPA review has been completed.

In this instance, BU addressed the potential environmental impacts of the NEIDL in a Final EIR, which assessed potential impact to human health and safety using a worst-case scenario risk assessment based on the accidental release of anthrax. Although the Final EIR was deemed "adequate," that finding was overturned in State superior court, which remanded the review to the Environmental Affairs

Secretary, who issued a requirement for a Supplemental Final EIR to incorporate the superior court's decision.

The Environmental Affairs Secretary expects that the NIH, through the BRP, will provide an expert, robust, and disinterested assessment of the potential risk associated with the proposed NEIDL. The MEPA will formally review the submitted NIH materials as part of the Supplemental Final EIR to be submitted by BU.

VII. Boston Municipal Requirements and Safeguards for Biocontainment Laboratories

Presenter: Roger Schwartz, J.D., Boston Public Health Commission (BPHC)

Before his formal presentation, Dr. Schwartz offered a general comment about the importance of working with the community and the resulting good will that occurs. His presentation focused on development of regulations, an overview of the regulations, implementation, and lessons learned. The BPHC operates as the board of health for Boston; the director is a member of the mayor's cabinet. The BPHC's Communicable Disease Control Division is responsible for surveillance and control of communicable diseases within Boston.

The purpose of BPHC regulations is to protect the safety and health of the public, lab workers, and the environment and to increase public confidence in and awareness about laboratory safety. The goal of BPHC medical surveillance for research laboratories is to enhance safety in laboratory settings, particularly those working with high-risk agents, and the surrounding communities through early detection and management of specified illnesses. Reporting to the BPHC is mandatory and covers illness, significant exposures, and unexplained absenteeism; Dr. Schwartz provided details of the reporting requirements. In addition, occupational health officers and designees at each site are required to report specified infections and unusual illnesses to the BPHC, including infections not covered specifically by BPHC guidelines.

Noting that nearly 50 percent of deaths in the United States in the early 20th century were due to infectious diseases and that research has reduced this rate significantly, Dr. Schwartz stated that continued progress requires continued research. The BPHC understands that individual and community safety are key considerations in planning research and related facilities, and Dr. Schwartz observed that local public health is the first and primary responder for incidents in local communities.

VIII. Legal Proceedings: Federal and State

Presenters: David Lankford, J.D., Office of the General Council, NIH, and Seth D. Jaffe, J.D., M.P.P., Foley Hoag LLP

Mr. Lankford

Mr. Lankford explained that three lawsuits have been filed in relation to the funding and construction of the NEIDL: a Federal NEPA lawsuit, a complaint with the HHS Office for Civil Rights with a subsequent lawsuit, and a State lawsuit under the MEPA; he focused his presentation on the Federal NEPA lawsuit.

In May 2006 several Boston residents and two public interest groups sued the NIH under the NEPA; BU joined the lawsuit as a codefendant. The plaintiffs asked the court to declare that the NIH violated the NEPA and to stop the NIH's partial funding of the NEIDL. The plaintiffs allege that the NIH failed to properly assess potential risks of the NEIDL on the public health and failed to consider alternative locations, including less populated areas. However, the heart of the Federal lawsuit is the plaintiff's claims that infectious agents would be released from the NEIDL and would harm the surrounding community. Although the plaintiffs tried to broaden the scope to BSL-3 and below, the court has limited

the case to BSL-4 agents. The plaintiffs also have raised an EJ claim, arguing that the NEIDL's location will have a disproportionate impact on low-income and minority populations.

Although construction on the NEIDL has continued, BSL-4 research will not be conducted until the court decides whether the NIH has complied with the NEPA. If the court determines that the NIH has not complied, the court could deny the conduct of BSL-4 research in the NEIDL pending further environmental review by the NIH; the court also could enjoin use of the rest of the NEIDL.

Investigation of the second Federal action—the complaint filed with the Office for Civil Rights—has been postponed pending completion of the NIH's supplementary assessments and the NEPA lawsuit, due to the likelihood that the NIH's analyses of the risks posed by the NEIDL will be relevant to the discrimination complaint.

Mr. Jaffe

Mr. Jaffe discussed MEPA requirements that are applicable to the NEIDL. State superior court proceedings in July 2006 concluded that the Environmental Affairs Secretary's approval of the Final EIR was arbitrary and capricious; the Massachusetts Supreme Judicial Court affirmed the decision of the superior court in December 2007.

Considerations in the State-level evaluation include the NRC report and a clear discussion of the distinction between BSL-3 and BSL-4 agents. The court is the ultimate referee and might decide that modeling one worst-case scenario may not be enough. The courts think Ebola is like the flu, only worse; therefore, it will be important for the outcome of the court cases that the risks of this facility and the differences in types of risk be clearly communicated.

Although no due date has been established for submittal of the Supplemental Final EIR, once that document has been submitted, the 30-day comment period begins and the Massachusetts Executive Office of Energy and Environmental Affairs has 7 days from the close of the comment period to issue a decision.

IX. Overview of the Draft Supplementary Risk Assessments and Site Suitability Analyses (DSRASSA) for the NEIDL

Presenter: Deborah E. Wilson, Dr.P.H., C.B.S.P., Office of Research Services, NIH

Dr. Wilson presented an overview of the DSRASSA, which was initiated because the Federal judge presiding over the NEPA lawsuit requested information regarding impact on the community should an agent, such as Ebola virus, be released from the NEIDL's potential BSL-4 laboratory. Additional evaluations of the two alternatives sites were conducted to further ensure that equal consideration was given to each. Additional risk assessments were performed to investigate the extent to which an exotic disease agent, if accidentally released from a BSL-4 laboratory, might spread into communities in which the NEIDL might be sited; to compare the impacts on the three sites; and to determine whether there would be disproportionate health impacts on the three EJ communities surrounding the Albany Street (Boston) NEIDL site. A variety of mechanisms were used to engage the public in the development of the DSRASSA so that the risk assessments would reflect community input and concerns.

The DSRASSA contains two primary parts: the qualitative additional site analyses and the quantitative risk assessment evaluations of four complex infectious disease scenarios. Sites selected for comparative analysis were the BU-Albany Street site in Boston, Massachusetts; the BU Corporate Education Center in Tyngsborough, Massachusetts; and the BU Sargent Center for Outdoor Education in Peterborough, New Hampshire. Risk assessment data were derived for three simulated synthetic communities: an urban environment with EJ communities present (Boston), a suburban environment with no EJ communities present (Tyngsborough), and a rural environment with no EJ communities present (Peterborough). The

four diseases chosen for study were Ebola hemorrhagic fever, monkeypox, Brazilian hemorrhagic fever, and Rift Valley fever.

The DSRASSA was prepared as a public document consistent with the NEPA, not as a scientific report; was written at the eighth-grade reading level; and contained many photographs, graphics, charts, and tables to assist the public in reviewing its content. Two agent-based modeling techniques were used: the Agent-Based Explicit Spatial and Temporal model and the Multi-Layer Agent-Based Simulation Tool model. Appendices presented summary statistics, maps of discrete time and spatial spread of disease, and additional detail about the architecture of the more complicated models. Conclusions reported in this document were based on the qualitative analyses that incorporated data from the risk assessments.

X. Discussion With National Research Council Committee Members

Discussants: Gigi Kwik Gronvall, Ph.D., University of Pittsburgh Medical Center, and Gary Smith, D.Phil., University of Pennsylvania School of Veterinary Medicine, New Bolton Center

The NRC review of the DSRASSA included several criticisms, and the BRP had an opportunity at this meeting to discuss those criticisms with two members of the NRC committee. The NRC committee's review of the DSRASSA addressed questions pertaining solely to its scientific adequacy—determining whether the scientific analyses in the DSRASSA were sound and credible, whether representative worst-case scenarios had been used, and whether there exists a greater risk to public health and safety from locating the facility in one or another of the three proposed locations.

Defining “sound” as “free from error” and analyzing “appropriate” as the kind, quality, and quantity of information, the NRC committee found that the DSRASSA was not sound and credible, had not adequately and thoroughly identified worst-case scenarios, and did not contain an appropriate level of information to compare the risks associated with alternative locations. Drs. Gronvall and Smith discussed agent and release scenario concerns and modeling methodology concerns, stating overall that “opportunities were missed in the DSRSSA.”

XI. Environmental Equity and Health

Presenter: Mary E. Northridge, Ph.D., M.P.H., Columbia University and American Journal of Public Health

Dr. Northridge explained that, in this case, EJ relates to the inequitable burden on African Americans and residents of modest economic means. The EJ movement comes from the tradition of the Civil Rights Movement and focuses on living and working conditions and quality of life in communities that have high disease burdens. “Environmental racism” is the charge that community groups might render, whereas “environmental equity and health” is the goal of society.

She suggested some questions for the BRP to ask during its deliberations, including the nature of community or citizen participation; how a transparent, democratic, ongoing process can best be ensured; the role of the NEIDL’s mission in building or contributing to civil society and eliminating social disparities in health; and how city, State, and Federal agencies can work together to advance oversight toward EJ through interdisciplinary engagement.

XII. Public Comment

Dr. Mahmoud requested that public comments be limited to 3 minutes; those wishing to make remarks longer than 3 minutes were requested to provide those remarks in writing to the NIH for inclusion in the official record.

Public attendees offered no comments.

XIII. Panel Discussion

BRP members discussed questions related to its responsibilities to consider BSL-3 issues in addition to BSL-4 issues, responses to the NRC report, and the charge to the BRP.

XIV. Next Steps

Dr. Mahmoud explained that the next steps for the BRP are to conduct indepth analyses and to solicit public comments on the DSRASSA including the NRC's analysis and the requirements of the NEPA. The BRP is a working group of the Advisory Committee to the Director, which means the BRP reports to the ACD, whose meetings are public. Therefore, the ACD's consideration of the BRP's recommendations will be transparent and accessible to the public.

XV. Adjournment

Dr. Mahmoud thanked the BRP members and the NIH staff and adjourned the meeting at 2:15 p.m. on March 13, 2008.

[Note: This summary is based on notes taken at the meeting by a science writer and NIH staff members. More detailed information will be available in the minutes of this meeting; however, the approved March 13, 2008, Blue Ribbon Panel public meeting minutes will not be available until ????. Actions approved by the BRP are considered recommendations to the ACD; therefore, actions are not considered final until approved by the ACD.]

Additional information about this Blue Ribbon Panel can be found at:
<http://www.nih.gov/about/director/acd/index.htm>.

Attachment 1: Roster

NIH Blue Ribbon Panel

Chair

Mahmoud, Adel, M.D., Ph.D.
Professor
Department of Molecular Biology
Woodrow Wilson School of Public and
International Affairs
Princeton University
Lewis Thomas Laboratory, Room 228
Princeton, NJ 08544

Members

Burke, Donald S., M.D.
Dean
Graduate School of Public Health
Associate Vice Chancellor for Global Health
Director
Center for Vaccine Research
Jonas Salk Chair in Global Health
University of Pittsburgh Medical School
Crabtree Hall, Room A624
130 DeSoto Street
Pittsburgh, PA 15261

Eubank, Stephen, Ph.D.
Professor
Virginia Bioinformatics Institute
Deputy Director
Network Dynamics and Simulation Science
Laboratory
Adjunct Professor
Department of Physics
Virginia Polytechnic Institute and State University
Research Building XV, Room 1102
1880 Pratt Drive
Blacksburg, VA 24060

Freimuth, Vicki S., Ph.D.
Director
Center for Health and Risk Communication
University of Georgia
1672 Gober Road
Bishop, GA 30621

Friedman-Jiménez, George, M.D.
Medical Director
Bellevue/New York University Occupational and
Environmental Medicine Clinic
Bellevue Hospital Center, Room CD349
462 First Avenue
New York, NY 10016

Hamburg, Margaret A., M.D.
Senior Scientist
Nuclear Threat Initiative
Seventh Floor
1747 Pennsylvania Avenue, NW
Washington, DC 20006

Holbrook, Karen A., Ph.D.
Vice President for Research and Innovation
Office of Research
University of South Florida
Room 175
3702 Spectrum Boulevard
Tampa, FL 33612

Kasper, Dennis L., M.D.
William Ellery Channing Professor of Medicine
Professor of Microbiology and Molecular
Genetics
Harvard Medical School
Director
Channing Laboratory
Department of Medicine
Brigham and Women's Hospital
181 Longwood Avenue
Boston, MA 02115

Lewis, Johnnye, Ph.D., DABT
Director
Community Environmental Health Program
College of Pharmacy
Health Sciences Center
University of New Mexico
MSC09 5360
1 University of New Mexico
Albuquerque, NM 87131

Lipkin, W. Ian, M.D.
Principal Investigator and Scientific Director
Northeast Biodefense Center
John Snow Professor of Epidemiology
Director
Center for Infection and Immunity
Mailman School of Public Health
Dalldorf Affiliated Research Physician
Wadsworth Center
Professor of Neurology and Pathology
College of Physicians and Surgeons
Columbia University
Room 1801
722 West 168th Street
New York, NY 10032

Murray, Thomas H., Ph.D.
President
The Hastings Center
21 Malcolm Gordon Road
Garrison, NY 10524

Northridge, Mary E., Ph.D., M.P.H.
Professor of Clinical Sociomedical Sciences
Mailman School of Public Health
Columbia University
Room 906
722 West 168th Street
New York, NY 10040

Patterson, Jean, Ph.D.
Scientist and Chair
Department of Virology and Immunology
Southwest Foundation for Biomedical Research
7620 NW Loop 410
San Antonio, TX 78209

Robson, Mark Gregory, Ph.D., M.P.H.
Director
New Jersey Agricultural Experiment Station
Professor of Entomology
School of Environmental and Biological
Sciences
Rutgers, The State University of New Jersey
Martin Hall, Room 104
88 Lipman Drive
New Brunswick, NJ 08901

Stanley, Jr., Samuel L., M.D.
Vice Chancellor for Research
Director
Midwest Regional Center of Excellence for
Biodefense and Emerging Infectious Diseases
Research
Professor of Medicine and Molecular
Microbiology
Washington University in St. Louis
660 South Euclid Avenue
St. Louis, MO 63110

Thomann, Wayne, Dr.P.H.
Director, Occupational and Environmental
Safety
Assistant Research Professor
Duke University/Duke University Medical Center
Nicholas School of the Environment and Earth
Sciences
Environmental Safety Office, Room 131
Research Drive, Box 3914
Durham, NC 27710

Ex Officio Members

Bennett, Steven P., Ph.D.
Weapons of Mass Destruction Bioterrorism Risk
Assessment Program Manager
Biological Threat Characterization Program
National Biodefense Analysis and
Countermeasures Center
U.S. Department of Homeland Security
121 C Street, SW
Washington, DC 20024

Highnam, Peter, Ph.D.
Senior Advisor
U.S. Department of Health and Human Services
Room G644
330 Independence Avenue, SW
Washington, DC 20201

Khabbaz, Rima F., M.D.
Director
National Center for Preparedness, Detection,
and Control of Infectious Diseases
Centers for Disease Control and Prevention
1600 Clifton Road, NE
Mailstop C-14
Atlanta, GA 30333