REVIEW OF THE SCIENTIFIC APPROACHES USED DURING THE FBI'S INVESTIGATION OF THE 2001 ANTHRAX LETTERS

NATIONAL RESEARCH COUNCIL
Board on Life Sciences
Committee on Science, Technology, and Law

OPENING STATEMENT

Alice P. Gast, chair
David A. Relman, vice chair

Good morning. I am Dr. Alice Gast and I am here today with Dr. David Relman as the chair and vice chair of the Committee on the Review of the Scientific Approaches Used During the FBI's Investigation of the 2001 *Bacillus anthracis* Mailings. We are here to announce the release of the committee's report.

After the tragic mailings of letters containing *Bacillus anthracis* in 2001 the FBI began an extensive investigation involving many experts and tremendous resources and ultimately lasting more than eight years. This investigation represented a shift in routine operations of the FBI as it reached out to the scientific community to assist in the development of a nascent field called microbial forensics. Work in this field played a prominent role in this investigation.

Beginning in October 2001, investigators collected biological evidence from a variety of sources and locations in Florida, the DC Region, New Jersey, New York, Connecticut and overseas.

Four letters, commonly referred to as the *New York Post*, Brokaw, Leahy, and Daschle letters, were analyzed in the investigation. No letter was recovered from the AMI facility in Florida and, because of the limited sample amount from the Brokaw letter, limited testing was performed on that material.

The FBI and their contract scientists conducted scientific analyses that focused on identifying the nature of the letter materials and environmental samples, their similarities and differences, and their biological, chemical and physical properties. The type of *B. anthracis* in the letters and infecting the victims was identified as the Ames strain, a strain not commonly found in nature that was first isolated in 1981 from a dead cow in Texas. The Ames strain became widely distributed as a laboratory strain after its initial shipment to the United States Army Medical Research Institute for Infectious Disease, or "USAMRIID". The FBI collected the Ames strain of *B. anthracis* from laboratories around the world and their investigation focused on determining the similarity between the evidentiary samples and this collection.

The FBI connected the letter materials to a particular flask, called Flask RMR-1029 that was housed at USAMRIID.

In September of 2008, the FBI asked the National Academy of Sciences to convene a committee to conduct an independent review of the scientific approaches used during the anthrax investigation. In July of 2009, we brought together a dedicated group of talented experts to begin work on the report you see today. Our committee members were experts in the fields of microbiology, medicine, physical chemistry, statistics, biochemistry, public health, environmental studies, forensic science and jurisprudence.

In the course of our two year study, the FBI provided us with approximately 9,600 pages of materials. With the release of this report, all of these materials are now available to the public. Over the past 19 months, the committee focused its efforts on the review and consideration of these materials along with presentations by FBI and DOJ officials and by scientists whose work informed the investigation.

Despite our repeated requests throughout the study for all relevant material, in November 2010 the FBI identified additional materials for the committee to review and requested the opportunity to brief the committee again. After serious consideration of this request, we agreed to see these materials and hold another committee meeting. This additional information, included in the 9,600 pages, provided greater insight into the scientific organization of the investigation and provided new information about overseas samples. It also resulted in the addition of a new section in the report and a new finding and recommendation.

We would like to make it clear that our study focused on the application of biological, physical and chemical sciences to this investigation by the FBI. We did not review or evaluate the more traditional forensic sciences such as fingerprint, fiber or hair analyses, and we did not consider any of the psychological or behavioral sciences such as linguistics, as used by the FBI in this investigation. Additionally, we were not asked and lacked the expertise to review law enforcement investigative materials. We also were not asked to, and will not offer, any view of the guilt or innocence of any person or persons.

An important aspect of the scientific investigation was the discovery that a fraction of the *B. anthracis* cells in the letter samples showed unusual growth properties. As a result, these cells produced distinctive, so-called "colonies" when grown on a petri dish as illustrated on the cover of our report. When these bacterial colonies with a distinct appearance, or "morphotype", were examined more closely, scientists found that the cells in those colonies had genetic mutations. They realized that these mutations might provide the basis for specific genetic tests that could be applied to other samples collected during the course of this investigation. (We refer to these genetic tests as "molecular assays" in our report). This work was central to the scientific investigation.

While much of our committee's effort was focused on reviewing the scientific investigation of the 2001 Anthrax Letters, an equally important aim has been to help

ensure that future scientific investigations of biological attacks are conducted in the most rigorous, and effective manner possible. We believe that the analysis in our report provides lessons from this case that will benefit the Nation in the event of a future attack.

The key elements addressed in the report are:
1) organization of the FBI's scientific effort;
2) environmental sampling and analysis;
3) physical and chemical analyses of the letter materials;
4) microbiological and genetic analyses of the letter materials;
5) development and analysis of the FBI's repository of *B. anthracis* Ames strain samples; and
6) comparison of the letter materials with the samples in the FBI repository.

The committee's primary finding is:

It is not possible to reach a definitive conclusion about the origins of the *B. anthracis* in the mailings based on the available scientific evidence alone.

In addition to this overarching finding, we would like to highlight some of our more specific findings:

One: The *B. anthracis* in the letters was the Ames strain and was not genetically engineered. (S.1 and Findings 5.1 and 5.2)

Two: Silicon was present in the letter powders but there was no evidence of intentional addition of silicon-based dispersants. (S.4 and Finding 4.3)

Three: Physicochemical and radiological experiments were properly conducted to evaluate the samples for potential signatures connecting them to a source but proved to be of limited forensic value. (S.6 and Findings 4.2 and 4.5)

Four: Multiple distinct colony morphological types, or morphotypes, of *B. anthracis* Ames were present in the letters. Molecular assays of specific genetic sequences associated with these morphotypes provided an approach to determining relationships among evidentiary samples. (S.2 and Finding 5.3, 5.4, 5.5, and 5.6)

Five: The FBI created a repository of Ames strain *B. anthracis* samples and performed experiments to determine relationships among the letter materials and the repository samples. The scientific link between the letter material and flask number RMR-1029 is not as conclusive as stated in the DOJ Investigative Summary. (S.3 and Findings 6.1, 6.2, 6.3, 6.4, 6.5, 6.7, 6.9 and 4.6)

Six: It is difficult to draw conclusions about the amount of time needed to prepare the spore material or the skill set required of the perpetrator. (S.5 and Finding 4.1)

Seven: There was inconsistent evidence of *B. anthracis* Ames DNA in environmental samples that were collected from an overseas site. (S.7 and Finding 3.4)

Eight: There are other tools, methods, and approaches available today for a scientific investigation like this one. (S.8 and Findings 3.3, 6.6, 6.8 and 6.10)

Nine: Organizational structure and oversight are critical aspects of a scientific investigation. The FBI generated an organizational structure to accommodate the complexity of this case and received the advice of prominent experts. (S.9 and Findings 3.1, 3.2 and 3.5)

In addition to these findings, the committee has made two recommendations:

Recommendation 1: A review should be conducted of the classified materials that are relevant to the FBI's investigation of the 2001 *Bacillus anthracis* mailings, including all of the data and material pertaining to the overseas environmental sample collections.

Recommendation 2: The goals of forensic science and realistic expectations and limitations regarding its use in the investigation of a biological attack must be communicated to the public and policymakers with as much clarity and detail as possible before, during, and after the investigation.

Now, we would like to open the floor to take your questions.