

ACCIDENTAL EXPOSURE IN BIOSAFETY LABORATORIES

On April 12, 2004, 146 scientists, physicians, public health specialists, and academics sent an open letter¹ to Boston's mayor and city councilors, voicing opposition to the proposed National Biocontainment Laboratory. The scientists also addressed Boston University and requested that it withdraw its plans to construct the Level 4 facility.

Four main dangers have been identified by those who have expressed concern about the proliferation of laboratories engaged in biodefense research. The concerns relate to the human capacity for error and the lack of government regulation and oversight. Not only is there no single code of practice, standards, or guidelines for laboratories in the United States that conduct research on exotic infectious agents, but there is no national reporting system for laboratory associated exposure, infection or accident. Experts agree that there is significant underreporting of laboratory-acquired disease.

Four main dangers have been identified as follows:

- Risk of accidental infection of laboratory technicians;
- Risk of accidental leak or release;
- Risk of unauthorized entry and theft;
- Risk of outside terrorist attack or sabotage inside.

The United States Health and Human Services publication on Biosafety in Microbiological and Biomedical Laboratories, 4th edition, (CDC) (May 1999) states that the primary hazard to Biosafety Level 4 laboratory personnel comes from respiratory exposure to infectious aerosols, mucous membrane or broken skin exposure to infectious droplets, and auto-inoculation. "All manipulations of potentially infectious diagnostic materials, isolates, and naturally or experimentally infected animals, pose a high risk of exposure and infection to laboratory personnel, the community and the environment."²

Heightened risk comes from the location of Level 3 and Level 4 laboratories in a university complex. Dr. Robert Lamb, a scientist at the University of Chicago, expressed concern that universities will not invest sufficient funds for the huge support staff needed to ensure the safe operation of these laboratories because there is a tendency for academic institutions to cut corners and avoid expenditure. Moreover, medical and microbiological facilities may not be suitably equipped for dealing with aerosolized versions of organisms that they otherwise handle in great safety.³

¹ The letter is entitled "No Place to Hide" and is available (along with a list of signatories) at: <http://www.ace-ej.org/BiolabWeb/Biolabdocs/noplacetohide04-20-04.pdf>.

² Biosafety in Microbiological and Biomedical Laboratories, 4th edition CDC May 1999 at 14

³ Dan Vergano et al, "Anthrax slip-ups raise fears about planned biolabs," USA TODAY, October 14, 2004, quoting Alan Zelicoff.

Lax university compliance with safety rules and procedures was identified with particularity in a Department of Health and Human Services Report issued in March 2004. The Report presented findings from security reviews conducted by the Office of Inspector General at eleven universities during the years 2002 and 2003. The Report concluded that at least half of the 11 universities studied had inadequate procedures to identify persons classified as "restricted" and to prevent their access to the most dangerous biological agents. Five of the universities had inadequate data control and technical support. This was translated into misuse of passwords, inadvertent emailing of sensitive information to outside sources, and non-existent policies for data transmission and storage. As a result of these findings, the National Institutes of Health required institutions receiving grants to register with the Centers for Disease Control and obtain certification.

The rapid proliferation of Biocontainment laboratories will make it even more difficult for an insufficient staff, hastily trained, to monitor compliance with tighter security and safety regulations. The proliferation of such laboratories increases the danger of terrorist infiltration because the laboratories will require staffing by hundreds of new employees. In 2004, Boston College Professor Jeanne Guillemin warned that although efforts will be made to register and check the security backgrounds of all those with access to select agents, over time, it may not be possible to keep track of all those who participated in the testing of such agents

The following list compiles information from a variety of sources.

Accidents⁴

Environmental Releases

- 04/01/02 USAMRIID (Fort Detrick, MD)
Accident Type: Accidental Release, Exposure of Personnel
Agent: Anthrax (BSL-2, 3 and 4)
Description: Researcher tested positive for exposure to anthrax spores, which were also released into adjacent hallway and office.⁵

- 04/02/02 USAMRIID (Fort Detrick, MD)
Accident Type: Accidental Release, Exposure of Personnel
Agent: Anthrax (BSL-2, 3 and 4)
Description: One worker tested positive for anthrax exposure after second leak at USAMRIID.⁶

⁴ Examples of accidents were taken from a table available online at the gene-watch website at: <http://www.gene-watch.org/bubiodefense/pages/accidents.html> (or link directly to <http://www.gene-watch.org/bubiodefense/pages/Accidents1%2027%2005.pdf>) last updated on 1/27/05.

⁵ David Dishneau, "Fort Detrick Worker Tests Postive for Anthrax Exposure," *Associated Press*, 4/19/2002.

⁶ Rick Weiss & David Snyder, "Anthrax Leaks a 2nd Time at Army Lab," *Washington Post*, 4/24/2002, B1.

- 03/01/03 Federal Express (Columbus, OH)
Accident Type: Environmental Release
Agent: West Nile Virus (BSL-2 and 3)
Description: A package containing the West Nile virus exploded in a Federal Express building, exposing workers to possible infection.⁷

- 06/01/03 USAMRIID (Fort Detrick, MD)
Accident Type: Environmental Release
Agent: Brucellosis (BSL-2 and 3), Anthrax (BSL-2, 3, and 4), Ebola (BSL-4) and others.
Description: The U.S. Army unearthed 113 bacteria-containing vials during an excavation to eliminate toxic chemicals and hazardous waste. The vials, which contained live strains of brucellosis and non-virulent anthrax, had been buried between 1955 and 1970.⁸

Intentional Releases

- 2001 (suspected) USAMRIID (Fort Detrick, MD) or Brattelle Memorial Institute (Columbus, OH)
Accident Type: Intentional Release
Agent: Anthrax (BSL-2, 3 and 4)
Description: Anthrax spores used in 2001 mail attacks that killed five persons, contained properties that could only have been manufactured in one of a small number of sophisticated government or corporate laboratories.⁹

Containment and Security Failures

- Mid-2004 NIH Campus in Bethesda, Maryland
Accident Type: Containment Failure
Agent: No specific agent reported
Description: A steam valve from the biological waste treatment tanks failed at Building 41A. The building houses BSL-3 and BSL-4 labs. Major damage was caused and the building was closed for repairs.¹⁰

- 09/04 University of Illinois at Chicago
Accident Type: Containment / Security Failure
Agent: No specific agent reported
Description: Law workers at a BSL-3 facility propped open doors of the lab and its anteroom, a major safety violation. An alarm that should have sounded did not.¹¹

⁷ "Package Carrying West Nile Explodes at Columbus Airport," *Associated Press*, 3/20/2003.

⁸ Lois Ember, "Fort Detrick Cleans Up," *Chemical & Engineering News*, 6/2/2003, p. 12.

⁹ Gary Matsumoto, "Anthrax Powder: State of the Art?" *Science*, Vol. 302, November 28, 2003, p.1492-97. Available at: <http://www.freerepublic.com/focus/f-news/1030042/posts> and <http://cryptome.org/anthrax-powder.htm>.

¹⁰ "Texas A&M Bioweapons Accidents More the Norm than the Exception," The Sunshine Project News Release, 07/03/07. Available at: <http://www.sunshine-project.org>.

¹¹ Id.

- 12/02/03 Plum Island Animal Disease Laboratory, USDA (Plum Island, NY)
Accident Type: Containment / Security Failure
Agent: None Reported
Description: A three-hour power failure undermined containment systems, leading workers to resort to sealing windows & doors with duct tape when the air compressors failed.¹²
- 1998-2004 Oak Ridge National Laboratory (ORNL) (Oak Ridge, Tennessee)
Accident Type: Facility failed to undergo requisite safety measures.
Agent: None Reported
Description: In 1999 the Department of Energy's Inspector General determined that ORNL had ignored NEPA's requirement that Level 3 and Level 4 laboratories undergo environmental review. In 2004 the Inspector General returned to find that despite ORNL's reports to the contrary, it had not undergone a safety inspection by the CDC in more than four years or its required annual Army safety inspection in three.¹³
- 05/07/02 U.S. Department of Agriculture (various sites)
Accident Type: Containment / Security Failure
Agent: None Reported
Description: FBI investigation found that many USDA laboratories that handle select agents are vulnerable to theft, permit unauthorized visitors, and cannot completely account for their pathogen holdings.¹⁴
- 06/18/97 National Institute of Infectious Diseases ("NIID"), Toyama, Japan
Accident Type: Facility deemed a risk to public health and safety
Agent: Various, at a BSL-3 facility
Description: A 1997 inspection of the BSL-3 facilities at NIID, conducted by a BioSafety consultant to the World Health Organization, concluded that there was a "strong possibility that NIID, through its location and activities, could pose an unacceptable risk to public health and safety".¹⁵

Missing Samples

- 08/29/05 Public Health Research Institute at the University of Medicine and Dentistry of New Jersey
Accident Type: Missing Samples
Agent: Bubonic Plague (BSL-3)

¹² Marc Santora, "Power Fails for Three Hours at Plum Island Infectious Disease Lab," *New York Times*, December 20, 2002, p. B1.

¹³ "Biosafety Bites: US Army Builds Biodefense Lab, Neglects to Inspect It", *The Sunshine Project*, 6/28/04. Available at: <http://www.sunshine-project.org/biodefense/bb.html#1>.

¹⁴ "Report Finds Easy Lab Access to Deadly Pathogens," *Reuters*, May 7, 2002.

¹⁵ Dr. Christopher Collins and Dr. David Kennedy, "Report of an Inspection Carried Out at the National Institute of Infectious Diseases Toyama, 1-23-1, Shinjuku-ku, Toykyo 162, on 18 June, 1997" <http://homepage2.nifty.com/sisibata/inspection.pdf>.

Description: Three mice infected with plague were found to be missing from separate cages. Media was not notified for two weeks and FBI could not explain the disappearance.¹⁶

- 01/01/03 Texas Tech University (Lubbock, TX)
Accident Type: Missing Samples
Agent: Plague (BSL-2 and 3)
Description: Scientist Thomas Butler reported the loss of several slides containing plague.¹⁷
- Early 1990s USAMRIID (Fort Detrick, MD)
Accident Type: Missing Samples
Agent: Anthrax, Ebola, and others not listed.
Description: Twenty-seven sets of laboratory specimens of anthrax spores, Ebola virus and other pathogens disappeared in the early 1990s at USAMRIID. The agents were removed without authorization. Their location remains a mystery.¹⁸

Exposures and Infections of Personnel

- 5/15/04-9/15/04 Boston University Medical Center, Clinical Microbiology and Molecular Diagnostics Laboratory (Boston, MA)
Accident Type: Infection of Personnel
Agent: Tularemia (BSL-2 and 3)
Description: Three scientists infected with tularemia over five-month period, while dozens more exposed. Incidents not discovered or reported for over six months.¹⁹
- 06/11/04 Children's Hospital and Research Center (Oakland, CA)
Accident Type: Exposure of Personnel
Agent: Anthrax (BSL-2, 3 and 4)
Description: Southern Research Institute inadvertently sent live (rather than dead) anthrax samples to researchers in Oakland, resulting in exposure of seven scientists. Problem detected after forty-nine of fifty mice quickly died after inoculation with anthrax samples. No human infections reported.²⁰
- 05/05/04 State Research Center of Virology and Biotechnology (Russia)
Accident Type: Infection of Personnel
Agent: Ebola virus (BSL-4)

¹⁶ "Mice Infected with Bubonic Plague Missing," *Associated Press*, September 15, 2005.

¹⁷ "Scientist Says FBI Tricked Him Charges Filed Over Report of Missing Plague Bacteria," *Washington Post*, 10/19/2003, p.A13.

¹⁸ Rick Weiss and Joby Warrick, "Army Lost Track of Anthrax Bacteria," *Washington Post*, 1/21/2002, p. A1 .

¹⁹ Stephen Smith, "BU Delayed Reporting Potentially Lethal Exposure," *Boston Globe*, January 20, 2005.

²⁰ John Dudley Miller, "US Lab is Sent Live Anthrax," *The Scientist*, June 11, 2004.

Description: Scientist researching Ebola vaccine at a US-funded facility was infected with Ebola and died despite treatment. Infection not reported for several weeks, possibly preventing effective treatment.²¹

- 03/28/04 National Institute of Virology (Beijing, China)
Accident Type: Environmental Release, Infection of Personnel
Agent: SARS (BSL-3 and 4)
Description: Over a two-month period, two graduate students, working in a Level 3 laboratory, acquired SARS, which they transmitted to seven other persons outside the laboratory. One person died and over 200 had to be quarantined.²²
- 02/19/04 USAMRIID (Fort Detrick, MD)
Accident Type: Exposure of Personnel
Agent: Ebola Virus (BSL-4)
Description: Civilian Army researcher possibly exposed to Ebola virus after accidentally pricking herself with a needle that contained the virus while injecting mice as part of a research effort.²³
- 2004 (Philadelphia)
Accident Type: Exposure of Personnel
Agent: Ocular Vaccinia
Description: Lab worker was infected by a unique strain used in an experiment performed partly outside a biosafety cabinet.²⁴
- Late 2004 Medical University of Ohio
Accident Type: Infection of Personnel
Agent: Valley Fever (C. Immitis)
Description: Researcher was infected with Valley Fever and the following summer a serious lab accident occurred that resulted in exposure of one or more workers to an aerosol of the same agent.²⁵
- 12/01/03 Institute of Preventive Medicine, National Defense University (Taiwan)
Accident Type: Infection of Personnel
Agent: SARS (BSL-3 and 4)
Description: Military researcher in a BSL-4 lab was infected while studying the SARS virus, leading to the quarantining of 34 people with whom she came in contact. No additional cases of SARS were reported.²⁶

²¹ Judith Miller, "Russian Scientist Dies in Ebola Accident at Former Weapons Lab," *New York Times*, May 25, 2004.

²² David Brown, "SARS Cases in Asia Show Labs' Risks," *Washington Post*, May 24, 2004.

²³ <http://www.cnn.com/2004/HEALTH/02/19/ebola.exposure/index.html>, Barbara Starr "Researcher Isolated After Possible Ebola Exposure," *CNN*, 2/19/2004.

²⁴ <http://www.cdc.gov/ncidod/EID/vol12no01/05-1126.htm>, "Ocular Vaccinia Infection in Laboratory Worker, Philadelphia, 2004," Center for Disease Control, January 2006.

²⁵ "Texas A&M Bioweapons Accidents More the Norm than the Exception," The Sunshine Project News Release, 07/03/07. Available at: <http://www.sunshine-project.org>.

- 12/03 USDA Laboratory (Beltsville, MD)
Accident Type: Infection of Personnel
Agent: E-coli (0157:H7 strain)
Description: Microbiologist fell into a 30-day coma and almost died after another researcher experimented with potentially deadly strain of E.coli, Four months later, the researcher himself became infected, possibly from the aerosolized 0157:H7 strain of E.coli, but recovered quickly. CDC reports indicated that the researchers had not received specific training in handling that strain of E.coli and did not use a hood when conducting these experiments.²⁷
- Mid-2003 University of New Mexico
Accident Type: Infection of Personnel
Agent: Anthrax
Description: Researcher was jabbed with an anthrax-laden needle. The following year, another UNM researcher was stuck with a needle that contained an unidentified pathogenic agent that had been genetically engineered.²⁸
- 09/05/03 Environmental Health Institute (Singapore)
Accident Type: Infection of Personnel
Agent: SARS (BSL-3 and 4)
Description: Doctoral student handling SARS-contaminated West Nile virus sample in BSL-3 facility is infected with SARS and hospitalized. Laboratory was found to not meet BSL-3 safety standards.²⁹
- 04/05/02 University of Texas Health Science Center (Houston, TX)
Accident Type: Infection of Personnel
Agent: Anthrax (BSL-2, 3 and 4)
Description: Laboratory worker with primary responsibility of handling anthrax specimens was diagnosed with cutaneous anthrax.³⁰
- 05/02 USDA Laboratory (Wyndmoor, PA)
Accident Type: Infection of Personnel
Agent: E- coli (0157:H7 strain)

²⁶ "SARS Alert Likely to be Eased in New Year," *China Post*, 12/20/2003; Center for Disease Control, Taiwan, "A Report on the Laboratory-Acquired SARS Case in Taiwan," 1/7/2004.

²⁷John Dudley Miller "Beltsville E. coli infection was not first." *The Scientist*. 06/30/2005.

²⁸ "Texas A&M Bioweapons Accidents More the Norm than the Exception," The Sunshine Project News Release, 07/03/07. Available at: <http://www.sunshine-project.org>.

²⁹ David Brown, "SARS Cases in Asia Show Labs' Risks," *Washington Post*, May 24, 2004. 04/05/02 University of Texas Health Science Center (Houston, TX) Infection of Personnel Anthrax (Biosafety Levels 2, 3 and 4) Laboratory worker with primary responsibility of handling anthrax specimens was diagnosed with cutaneous anthrax. "Suspected Cutaneous Anthrax in a Laboratory Worker--Texas, 2002," *Morbidity and Mortality Weekly Report*, 4/5/2002, p. 279.

³⁰ "Suspected Cutaneous Anthrax in a Laboratory Worker--Texas, 2002," *Morbidity and Mortality Weekly Report*, 4/5/2002, p. 279.

Description: Two workers in U.S. Department of Agriculture Research Unit fell ill after experimenting with what they thought was a harmless version of E.coli but which was in fact a potentially deadly strain. One worker reported losing 14 pounds but both recovered.³¹

- 12/20/02 Unknown
Accident Type: Infection of Personnel
Agent: West Nile Virus (BSL-2 and 3)
Description: Microbiologist in U.S. laboratory contracted West Nile virus after cutting finger with a scalpel used to perform a necropsy on lab animal.³²
- 08/01/02 Unknown
Accident Type: Infection of Personnel
Agent: West Nile Virus (BSL-2 and 3)
Description: Microbiologist in U.S. laboratory contracts West Nile virus after puncturing skin with a contaminated needle.³³
- 04/01/01 Rocky Mountain Laboratories (Hamilton, MT)
Accident Type: Infection of Personnel
Agent: Plague (BSL-2 and 3)
Description: An unknown number of researchers were infected with plague in during lab research.³⁴
- 2001 Centers for Disease Control (Atlanta, GA)
Accident Type: Infection of Personnel
Agent: Meningitis
Description: Two workers died after being exposed to strains of meningitis that they were studying in the laboratory.³⁵
- 2000 Boston University Medical Center Clinical Microbiology and Molecular Diagnostics Laboratory
Accident Type: Infection of Personnel
Agent: Tularemia
Description: Twelve lab workers were exposed to samples from a patient who caught tularemia and died. No special precautions were taken even though tularemia is one of the three easiest infections to catch in the lab. Ten airborne bacteria alone can cause the disease and in the past, hundreds of lab workers became infected.³⁶

³¹ John Dudley Miller "Beltsville E. coli infection was not first." *The Scientist*. 06/30/2005.

³² G. Campbell, et al. "Laboratory-Acquired West Nile Virus Infections--United States, 2002," *Morbidity and Mortality Weekly Report*, 12/20/2002, p. 1133.

³³ G. Campbell, et al. "Laboratory-Acquired West Nile Virus Infections--United States, 2002," *Morbidity and Mortality Weekly Report*, 12/20/2002, p. 1133.

³⁴ Carlotta Grandstaff, "Hamilton's Health not 'Major' Concern." *Missoula Independent*, Vol.14, no. 45.

³⁵ Council for Responsible Genetics.

³⁶ *Journal of Clinical Microbiology*, vol. 40, p.2278.

- 03/01/00 USAMRIID (Fort Detrick, MD)
Accident Type: Infection of Personnel
Agent: Glanders (BSL-2 and 3)
Description: A microbiologist working at a BSL-3 contracted glanders in lab after accidental exposure. Between 1987 and 1990, two other works acquired infectious diseases at USAMRIID.³⁷
- 06/01/98 Yerkes Primate Center (Atlanta, GA)
Accident Type: Infection of Personnel
Agent: Simian Herpesvirus (BSL-3 and 4)
Description: A research assistant at the Yerkes Primate Center, (Part of NIH Primate Research Program) died six weeks after being exposed to simian herpes virus in the lab.³⁸
- 06/01/98 Yerkes Primate Center (Atlanta, GA)
Accident Type: Exposure of Personnel
Agent: Simian Herpesvirus (BSL-3 and 4)
Description: A second researcher was exposed to possible infection three weeks after first case (see above) at Yerkes Primate Center.³⁹
- 08/01/94 Yale University (New Haven, CT)
Accident Type: Infection of Personnel
Agent: Sabina Virus (currently BSL-4, though not designated as such in 1994)
Description: Yale Virologist contracted sabia virus and subsequently exposed 75 co-workers in the laboratory.⁴⁰
- 1985-87 Washington, DC
Accident Type: Infection of Personnel
Agent: HIV (BSL-2 and 3)
Description: Two researchers who contracted virus in D.C. laboratories became infected after using defective gloves. Exposed through cuts on hands.⁴¹
- 06/01/87 Unknown
Accident Type: Infection of Personnel
Agent: HIV (BSL-2 and 3)
Description: A Researcher became infected with HIV after exposure through "unapparent whole in gloves" (sic). No definite cause was identified.⁴²

³⁷ Arjun Srinivasan et al., "Glanders in a Military Research Microbiologist," 345 *New England Journal of Medicine* 256, 256 (2001); Steve Vogel, "Army Studies Safety at Fort Detrick Lab; Scientists Contracted Potentially Fatal Disease at Biological Defense Center," *Washington Post*, 05/16/00, p.B3.

³⁸ "Fatal Cercopithecine Herpesvirus 1(B Virus) infection following a mucocutaneous exposure," *Morbidity and Mortality Weekly Report*, 47:1073-6, 1083, 1998.

³⁹ "Second researcher may have been exposed to deadly herpes B virus," *Star Tribune*, Minneapolis, MN, 1/1/1998, p.23A.

⁴⁰ M. Barry, M. Russi, L. Armstrong, et al. "Brief report: treatment of a laboratory acquired Sabia virus infection." *New England Journal of Medicine*, 1995; 333:294-6.

⁴¹ "New AIDS Infection in a Lab," *Chicago Tribune*, 10/10/1987, p. 5.

- 2/22/02 Alabama and Michigan
Accident Type: Infection of Personnel
Agent: Neisseria Meningitidis (BSL-2 and 3)
Description: The Journal of the American Medical Association issued a report describing two probable cases of fatal laboratory-acquired meningococcal disease. On July 16, 2000, a 35 year-old microbiologist died in an Alabama hospital. His blood cultures were positive for Neisseria meningitidis, and the biologist had recently worked with the blood culture of a patient subsequently shown to have meningococcal disease. On December 25, 2000, a fifty-two year old Michigan microbiologist died of overwhelming sepsis. His blood cultures were also found to be positive for Neisseria Meningitidis. The Michigan microbiologist had worked on Neisseria Meningitidis in the state public health laboratory for two weeks before becoming ill. Between 1996 and 2000 a total of six cases of probable laboratory-acquired meningococcal disease were detected. Lab scientists were sixty-five times more likely to contract meningococcal disease than the general population of adults aged thirty to fifty-nine.⁴³

Recent Mishaps

- 02/05 University of Iowa
Accident Type: Unauthorized study
Agent: Tularemia
Description: Researchers performed genetic engineering experiments with tularemia without permission. The experiments included mixing genes from tularemia species and introducing antibiotic resistance. The University reported the incident to the NIH but public disclosure was never made.⁴⁴
- 03/02/05 Winnipeg, Canada
Accident Type: Transportation Accident
Agent: Anthrax (BSL-3) and Other Agents
Description: FedEx van carrying samples of anthrax and other infectious agents to the (Canadian) national virology lab was involved in a traffic accident in downtown Winnipeg. The van was broadsided by another vehicle and a hazardous materials team blocked off the area for two hours before determining that the packages containing the agents had not been damaged.⁴⁵
- 03/05 University of North Carolina at Chapel Hill
Accident Type: Exposure of Personnel and containment failure

⁴² Chase, Marilyn. "Worker Gets AIDS Virus from Lab Job," *Wall Street Journal*, 1/4/1998, p.1.

⁴³ "Laboratory-Acquired Meningococcal Disease – United States, 2000," *Morbidity and Mortality Weekly Report*, 2/22/2002. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5107a1.htm> or <http://www.cdc.gov/mmwr/PDF/wk/mm5107.pdf>.

⁴⁴ "Texas A&M Bioweapons Accidents More the Norm than the Exception," The Sunshine Project News Release, 07/03/07. Available at: <http://www.sunshine-project.org>.

⁴⁵ Macafee, Michelle. "FedEx Van Delivering Anthrax to Winnipeg Lab Involved in Accident," *Canadian Press*, 5/03/05. Available online at: <http://cnews.canoe.ca/CNEWS/Canada/2005/03/02/947584-cp.html>.

Agent: Tuberculosis

Description: Lab workers were exposed to tuberculosis when the BSL-3 facility's exhaust fan failed. Due to lab deficiencies, the blower continued to operate, pushing disease-laden air out of a safety cabinet and into the room. An alarm that would have warned of the problem had been turned off. The alarm was inspected and approved by the US Army just one month prior.⁴⁶

- 04/08/05 Meridian Bioscience (Cincinnati, OH)

Accident Type: Distribution Mistake

Agent: Influenza A H2N2 (BSL-2) Recommended to be reclassified as BSL-3

Description: Nearly 5,000 labs were sent test kits containing the 1957 pandemic strain of influenza which killed 1 million to 4 million people. Meridian Bioscience first began sending out the kits in September of 2004 but was not discovered until March of 2005. On April 8, 2005, the Centers for Disease Control and Prevention ("CDC") notified the College of American Pathologists (one of four professional organizations on whose behalf the test kits were sent) asking the organization to inform the labs and tell them to destroy the virus samples.⁴⁷

- 04/14/05 Environmental Science and Research (Porirua, New Zealand)

Accident Type: Infection of Personnel

Agent: Neisseria Meningitidis (BSL-2 and 3)

Description: A British scientist had both legs, her left hand, and some fingers on her right hand amputated after becoming critically ill with meningococcal disease. There was no evidence of accident at the lab but the scientist had been working for three weeks in a laboratory that handles meningococcal bacteria.⁴⁸

- 04/18/05 Corixa Corporation and the Infectious Disease Research Institute Lab (Seattle, Washington)

Accident Type: Infection of Personnel

Agent: Tuberculosis (BSL-2, 3, and 4)

Description: Three laboratory workers at a Seattle BSL-3 lab acquired tuberculosis infections due to a leaky aerosol chamber. The aerosol chamber was manufactured at the University of Wisconsin at Madison and is one of nearly twenty such chambers in existence. One chamber in Fort Collins, Colorado was subsequently tested and found to have a leaky airflow meter. Dr. David McMurray, the inventor of the chamber and a tuberculosis researcher had previously claimed that "the chamber was so safe that there was no need to even locate it in a BSL-3 environment" and that it was "foolproof".⁴⁹

⁴⁶ "Texas A&M Bioweapons Accidents More the Norm than the Exception," The Sunshine Project News Release, 07/03/07. Available at: <http://www.sunshine-project.org>.

⁴⁷ Roos, Robert. "Vendor Thought H2N2 Virus Was Safe, Officials Say," *CIDRAP News*, 4/13/2005. Available at: <http://www.cidrap.umn.edu/cidrap/content/influenza/panflu/news/april1305labs.html>; "Deadly 1957 Strain of Flu Is Found in Lab-Test Kits," *New York Times*, 04/13/2005 A1 p. 17.

⁴⁸ "Scientist Loses Limbs to Meningococcal Disease," *The New Zealand Herald*, 04/14/05. Available at: http://www.nzherald.co.nz/index.cfm?c_id=1&ObjectID=10120376.

⁴⁹ "Faulty Aerosol Chamber Infects Three," The Sunshine Project, News Release, 04/18/05. Available at: <http://www.sunshine-project.org/publications/pr/pr180405.html>.

- Mid-2005 University of Chicago
Accident Type: Infection of Personnel
Agent: Anthrax or plague
Description: Lab worker punctured his skin with an infected instrument bearing a BSL-3 agent.⁵⁰
- October and November 2005 University of California, Berkeley
Accident Type: Exposure of Personnel
Agent: Rocky Mountain Spotted Fever
Description: The University received dozens of samples of what it thought was a relatively harmless organism. The samples actually contained Rocky Mountain Spotted Fever, classified as a BSL-3 agent. The samples were handled with inadequate safety precautions, until the mistake was realized. UC Berkeley never notified the community.⁵¹
- December 2005 Albert Einstein College of Medicine at Yeshiva University (New York, New York)
Accident Type: Exposure of Personnel
Agent: Tuberculosis
Description: Three lab workers were exposed to tuberculosis after experiments in a BSL-3 facility when using a Madison Aerosol Chamber.⁵²
- 02/09/06 Texas A&M University
Accident Type: Infection of Personnel
Agent: Brucellosis (BSL-2 and 3)
Description: Lab Employee infected while cleaning aerosol test chamber. Texas A&M did not file required CDC report until April 10, 2007.⁵³
- 04/03/06 (Confirmed) Texas A&M University
Accident Type: Infection of Personnel
Agent: Q Fever
Description: Three Texas A&M University biodefense researchers were infected with the biological weapons agent Q Fever. Texas A&M officials did not report them to the Centers for Disease Control (CDC), as required by law. Instead, Texas A&M officials covered the infections up until now, illegally failing to disclose them despite freedom of information requests dating back to October 2006. Texas A&M is liable for \$750,000 or more in federal fines (\$1.5 million including the brucella incident) for failure to report, as well as possible charges under the Texas Public Information Act.

⁵⁰ “Texas A&M Bioweapons Accidents More the Norm than the Exception,” The Sunshine Project News Release, 07/03/07. Available at: <http://www.sunshine-project.org>.

⁵¹ Id.

⁵² Id.

⁵³ “Texas A&M Violates Federal Law in Biodefense Lab Infection,” The Sunshine Project, New Release, 4/12/07. Available at: <http://www.sunshine-project.org/publications/pr/pr120407.html>.

- 04/12/06 University of Texas at Austin, Molecular Biology Building
Accident Type: Infection of Personnel
Agent: Hybrid Influenza A (H3N2) with genetic elements of the Avian Influenza virus (H5N1)
Description: A researcher working in a BSL-3 lab was involved in an incident that resulted in the contamination of a lab centrifuge. The incident involved a tube containing the flu virus that broke in the centrifuge. Decontamination procedures had to be taken. It appears that there may have been some cover up and contradicting reports by UT.⁵⁴
- 04/05/06 Tufts University's Cummings School of Veterinary Medicine BSL-2 (Boston, MA)
Accident Type: Exposure of Personnel
Agent: Botulinum Toxin
Description: A test tube containing 1.5 mg of Botulinum Toxin cracked while spinning in a locked gasket-sealed centrifuge. One technician opened the centrifuge to check the tube before the prescribed 30-minute waiting period elapsed. The premature opening of the centrifuge exposed the technician and her colleagues to the toxin. There was no reported illness from this incident.⁵⁵
- 03/20/07 Boston University's Center for Advanced Biomedical Research (Boston, MA)
Accident Type: Maintenance Failure/Oversight
Agent: Medical Waste
Description: Medical waste left in sterilizing machine caused fire in a BSL-3 Lab forcing the ten story building on BU's South End campus to be evacuated.⁵⁶
- 06/30/07 Texas A&M University
Description: The CDC wrote a letter to the university stating that research on select agents must be halted immediately while CDC conducts a "comprehensive review" to see if TAMU meets standards for handling select agents. If the University can't comply, its select agent work could be shut down and transferred to other labs. The university is in the running for a major new agricultural biosecurity lab, the \$450 million National Bio and Agro-Defense Facility. The Department of Homeland Security expects to announce a short list of potential sites for the lab in July 2007. Hammond of the Sunshine Project suggests TAMU's prospects aren't looking so good now. And if the university makes the list, he asks, "What does that say about the safety and security of these facilities?"⁵⁷

⁵⁴The Sunshine Project, January 26, 2007 updated. Available at: <http://www.sunshine-project.org/ibc/bb21.html>.

⁵⁵Boynton, Donna. "Tufts Lab Outlines its Toxin Response Botulinum Release," *Worcester Telegram & Gazette*.

⁵⁶Smith, Stephen. "Medical Waste caused lab fire, BU officials say," *The Boston Globe*, 04/27/07.

⁵⁷Jocelyn Kaiser. "Pathogen Work at Texas A&M Suspended," *ScienceNOW Daily News*, 07/02/07.