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**REGULATION OF BIOLOGICAL SCIENCE
IN THE TERRORISM ERA**

By:

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REGULATION OF BIOLOGICAL SCIENCE IN THE TERRORISM ERA

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Introduction

Perhaps no discipline has made (and continues to make) such a profound contribution to humanity as biological science. Unquestionably, the pace and significance of that contribution has steadily accelerated, all the more so in recent years. Most experts believe that revolutionary leaps are yet to come but not far off. Not to be overlooked is that this progress has come with nary a “dark side” – Cassandra prophecies of rampaging mutants have, as yet, not materialized.

A widely-held view within the biological community is that progress is a function of minimal government regulation. Indeed, there is an apparent correlation between the pace of scientific discovery and the freedom of scientists to pursue ideas according to their own experience and creativity without bureaucratic intrusion; whether there a causal relationship or mere coincidence is debatable. It is reasonable to ask, therefore, why policy makers are insisting on greater control over biological science.

The answer focuses on three concerns of the relationship between biology and terrorism. First and most obvious, while terrorists of exceptional training and resources might be able to make and disseminate a biological weapon, the difficulties of doing so may be substantially reduced with ready access to unique and highly refined pathogens, to advanced equipment, and to innovative procedures. Second and somewhat related is that while making a crude weapon may be pedestrian, biological research is increasingly raising possibilities that an individual or small group could develop a disease of such devastation that civilization itself would be fundamentally maimed with attendant risks of economic collapse and political upheaval. Third and quite distinct is that biological research offers the potential to uncover underlying principles of pathogenicity and develop vaccines and other protective measures against a bio-terrorist event; would society be better off by suppressing information because it might be used malevolently?¹

Two unrelated events since Sept. 11th have brought these concerns into sharper relief. First were the anthrax-laden mailings to various political leaders. Although anthrax is readily available in nature, this powder was extraordinarily refined, suggesting that its production was the work of a remarkably advanced laboratory process. Second was the re-creation of the polio virus in a laboratory (discussed *infra*). A crippling disease that had been thought to be eradicated from most of the world and due to be extinguished has suddenly re-arisen, not by natural outbreak, but by scientists’ intentional design.

This paper is not designed to resolve those concerns. Instead, it offers a detailed overview of how the United States regulates biology so that the framework of policy reform can

¹ Nature medicine, *Freedom of Information*, at <http://www.nature.com/cgi-taf/DynaPage.taf?file=/nm/journal/v8/n9/index.html>

be appreciated in context. The United States has no Department of Science, nor is there any agency responsible for overseeing biological science generally.² This anarchic situation is itself a policy, reflecting an appreciation of the need to establish rules in limited contexts without super-imposing government officials over the scientific community. While that policy has much to its credit, it certainly complicates understanding of how the government and science intersect in the United States. This paper is designed to clarify that understanding. It addresses:

- I. Regulatory Oversight of Pathogens
- II. Oversight of Laboratory Safety
- II. Oversight of Bio-Terrorism Prevention and Response
- IV. Oversight of rDNA Research
- V. Oversight of Clinical Testing Involving Humans
- VI. Cloning and Genetic Transfer Experimentation Introduction
- VII. Restrictions on Information Exchanges, Publication of Biological Research

I. REGULATORY OVERSIGHT OF PATHOGENS

As recently as 1995, few legal restrictions applied to domestic transfers of lethal pathogens. The experience of Larry Wayne Harris as well as rising fears of terrorist access to biological weapons precursors provoked passage of the Antiterrorism and Effective Death Penalty Act in 1996.³ The Act authorized the Centers for Disease Control (CDC) to regulate transfers of pathogens of unique interest in terms of their capacity to be used as weapons (the select agents list).⁴ Accordingly, the CDC required that laboratories transferring select agents be registered; a registered laboratory could legally transfer select agents only to another registered laboratory; transfers to non-registered laboratories were prohibited. Registration under that Act, however, was principally a matter of notification: a laboratory was obligated to notify relevant authorities of a transfer to another registered facility and that the transfer itself complied with applicable safety standards. Specific information about particular pathogens that the facility possessed did not have to be reported, not even if they were the subjects of extensive research, so long as they were not transferred. This was not intended to be a strict licensing system but merely a way of overseeing the traffic (slight though it may be) in lethal pathogens.

Although it is still not known (as of this writing) whether a domestic laboratory was the source of the deadly anthrax attacks in 2001, a burgeoning concern over the risks associated with biological terrorism led to enactment of the Public Health Security and Bioterrorism Preparedness Response Act.⁵ The Act authorizes \$1.6 billion to implement state plans and conduct additional preparedness activities, and it addresses other related public health security

² See generally Barry R. Furrow, *Governing Science: Public Risks and Private Remedies*, 131 U. PA. L. REV. 1403 (1983).

³ For a discussion of the events concerning Larry Wayne Harris and the legislative changes that those events engendered, see Barry Kellman, *Legal Measures for Preventing Catastrophe*, 24 HARV. J. L. & PUB. POL'Y 417 (2001).

⁴ 42 biological agents and toxins are listed in Appendix A of 42 CFR Part 72.

⁵ Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Pub. L. No. 107-188 § 201(a) Regulatory Control of Certain Biological Agents and Toxins, *available at* <http://www.asmsa.org/pasrc/pl107188.pdf>.

issues such as additional safety and security measures affecting the nation's food and drug supply, additional safety and security measures affecting the nation's drinking water, and measures affecting the Strategic National Stockpile and development of priority countermeasures to bioterrorism.⁶

A. Facility Registration

The Antiterrorism and Effective Death Penalty Act in 1996⁷ obligated the HHS Secretary to issue rules for listing biological agents that have the potential to pose a severe threat to public health and safety,⁸ and for regulating the transfer of such agents. The Centers for Disease Control (CDC) was authorized to regulate transfers of pathogens of unique interest in terms of their capacity to be used as weapons (the select agents list).⁹ Accordingly, the CDC required that laboratories transferring select agents be registered.¹⁰ By 2001, a burgeoning concern over the risks associated with biological terrorism led to enactment of The Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA Patriot Act) Act of 2001¹¹ which prohibits transfer or possession of a listed biological agent or toxin by a “restricted person.”¹²

⁶ The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (P.L. 107-188, at <http://www.ncsl.org/statefed/health/PL107-188overview.htm>).

⁷ The Antiterrorism and Effective Death Penalty Act of 1996 (April 24, 1996), 42 U.S.C. 262 *et seq.* For a discussion of the events and considerations leading to this enactment, see Barry Kellman, *Biological Terrorism: Legal Measures for Preventing Catastrophe*, 24 Harv. J. L. & Pub. Pol’y 417 (2001).

⁸ In determining whether to list a biological agent, the Secretary, in consultation with scientific experts representing appropriate professional groups, was required to consider the agent’s effect on human health, its degree of contagiousness and methods by which the agent is transferred to humans, and the availability of immunizations and treatments for illnesses that may result from infection by the agent. These regulations should include measures to ensure proper training and appropriate skills to handle such agents; and proper laboratory facilities to contain and dispose of such agents and provide: safeguards to prevent access to listed biological agents for use in domestic or international terrorism or for any other criminal purpose; procedures to protect public safety if there is a transfer or potential transfer of a listed biological agent violation of the established safety procedures and safeguards; and for the appropriate availability of biological agents for research, education, and other legitimate purposes.

⁹ 42 biological agents and toxins are listed in Appendix A of 42 CFR Part 72.

¹⁰ The purpose of registration was to control domestic transfers based upon a permitting system -- a registered laboratory could legally transfer select agents only to another registered laboratory; some transfers were denied because of concerns about the adequacy of the facility proposed to receive the agent. Transfers to non-registered laboratories were prohibited. Registration, however, was principally a matter of notification: a laboratory was obligated to notify relevant authorities of a transfer to another registered facility and that the transfer itself complied with applicable safety standards. Specific information about particular pathogens that the facility possessed did not have to be reported, not even if they were the subjects of extensive research, so long as they were not transferred. This was not intended to be a strict licensing system but merely a way of overseeing the in lethal pathogens.

¹¹ The Patriot Act makes it an offense for any person to knowingly possess any biological agent, toxin or delivery system of a type or in a quantity that, under the circumstances, is not reasonably justified by prophylactic, protective, bona fide research or other peaceful purpose.

¹² A “restricted person” is defined as anyone who: is under indictment for a crime punishable by imprisonment for a term exceeding one year; has been convicted in any court of a crime punishable by imprisonment for a term exceeding one year; is a fugitive from justice; is an unlawful user of any controlled substance; is an alien illegally or unlawfully in the US; has been adjudicated as a mental defective or has been committed to any mental institution; is an alien who is a national of a country as to which the Secretary of State has made a determination (that remains in effect) that such country has repeatedly provided support for acts of international terrorism; or has been discharged from the Armed Services of the United States under dishonorable conditions. A “restricted person” is not permitted to ship or transport interstate or foreign commerce, or possess in or affecting commerce, any biological agent or

More recently, The Public Health Security and Bioterrorism and Response Act of 2002¹³ add new requirements for the HHS Secretary to consider in listing agents and in preventing unlawful access to agents during transfers.¹⁴ Regulations specified under this Law must “include appropriate safeguard and security requirements for persons possessing, using, or transferring a listed agent or toxin commensurate with the risk such agent or toxin poses to public health and safety (including the risk of use in domestic or international terrorism).”¹⁵ Registered facilities must limit access to listed biological agents and toxins only to those determined by the registered facility to have a legitimate need to handle or use select agents,¹⁶ and the Secretary must be notified if a listed agent is lost, stolen, or released outside a bio-containment area of a facility.¹⁷

B. Enhanced Safety and Security

The Secretary must also provide for the establishment and enforcement of safety procedures, including: (1) proper training and appropriate skills to handle such agents and toxins; (2) proper laboratory facilities to contain and dispose of such agents and toxins; (3) measures to prevent access to such agents and toxins for use in domestic or international terrorism or for any criminal purpose; (4) procedures to protect the public safety in the event of a violation of the safety or security measures; and (5) appropriate availability of biological agents and toxins for research, education, and other legitimate purposes.¹⁸ The Secretary may inspect facilities subject to regulations to ensure their compliance with such regulations, including prohibitions on restricted persons.

toxin, or receive any biological agent or toxin that has been shipped or transported in interstate or foreign commerce, if the biological agent or toxin is listed as a select agent.

¹³ 42 U.S.C. 243 *et seq.* New considerations for listing agents include the availability and effectiveness of pharmacotherapies as well as immunizations to treat and prevent any illness resulting from infection by the agent or toxin, the needs of children and other vulnerable populations, and consultations with groups with pediatric expertise. The Secretary must establish and enforce safeguard and security measures to prevent access to listed biological agents and toxins for use in domestic or international terrorism or any other criminal purpose.

¹⁴ The Law further provides comparable regulatory authorities to the Secretary, Department of Agriculture for the possession, use or transfer of listed biological agents and toxins that present a severe threat to plant or animal health or animal or plant products and includes provisions to facilitate coordination and cooperation between the Department of Agriculture and the Department of Health and Human Services with respect to agents or toxins that are regulated by both agencies.

¹⁵ Persons (facilities) and individuals who possess, use or transfer listed biological agents and toxins agents must register with the Secretary, Department of Health and Human Services. Registered facilities that transfer a select agent to any person one knows or has reasonable cause to believe has not registered could be fined or imprisoned up to five years or both. Also, whoever knowingly possesses a select agent for which the person has not obtained a registration shall be fined or imprisoned for up to five years.

¹⁶ The Public Health, Security and Bioterrorism Preparedness Act, H.R. 3448, 107th Cong § 351A(e)(2)(A). Facilities should promptly submit the names of such individuals to the Secretary of Health and Human Services and the Attorney General who shall promptly use criminal, immigration, national security and other electronic databases available to the federal government to check if the individual is a “restricted person.”

¹⁷ In the Joint Explanatory Statement of the Committee of Conference, the Managers stated that the primary goals of the new provisions in the Law are to “ensure the prompt reporting to the Federal government of possession of select agents (including by those who were in possession prior to April 15, 1997, the effective date for reporting transfers of select agents), to increase the security over such agents (including access controls and screening of personnel), and to establish a comprehensive and detailed national database of the location and characterization of such agents and the identities of those in possession of them.”

¹⁸ *Bioterrorism Act* § 201(b) Regulation of Transfers of Listed Agents and Toxins, available at <http://www.asmsa.org/pasrc/pl107188.pdf>.

The Secretary and appropriate federal, state and local law enforcement agencies must be promptly notified in the event of a theft or loss of listed agents and toxins or in the event of a release of agents outside the proper bio-containment area. If the Secretary finds that the release poses a threat to public health or safety, s/he must take appropriate action to notify authorized emergency response authorities. On an annual basis, the Secretary will report to Congress the number and nature of notifications received relating to theft or loss and to releases.¹⁹

C. Enhanced Restrictions on Access

Entities having registered facilities must limit access to select agents; only persons that the entity determines to have a legitimate need to handle or use select agents may have access. An even more overt imposition of law enforcement concerns is the Act's requirement that the entity submit such individuals' names to the HHS and the Attorney General who will check relevant criminal, immigration, national security and other electronic databases as to whether the individual is a restricted person as defined in section 175b of Title 18 of the US Code or is reasonably suspected by any federal law enforcement or intelligence agency of committing a crime, knowing involvement with domestic or international terrorism or crime, or being an agent of a foreign power.²⁰ The Attorney General must promptly notify the HHS Secretary who, in turn, must notify the entity about whether an individual is granted or denied access. Denial of access privileges may be appealed pursuant to a stipulated review process that includes provisions to ensure that classified or sensitive law enforcement information is not compromised during those reviews.

D. Enhanced Reporting Obligations

Title II of the new Act, *Enhanced Controls of Dangerous Biological Agents & Toxins*, substantially broadens the regulatory obligations for laboratories working with select agents. Indeed, its objective far exceeds oversight of the movements of pathogens; its objective is to establish a national database for dangerous pathogens and to monitor their distribution and use.

Facilities that register their possession and use of listed agents and toxins must provide "information regarding the characterization of listed agents and toxins to facilitate their identification, including their source; and safeguard and security requirements for registered persons."²¹ The new law requires that any entity *possessing* select pathogens²² report to the

¹⁹ *Bioterrorism Act* § 201(k) Reports, available at <http://www.asmsa.org/pasrc/pl107188.pdf>.

²⁰ Section 175b was enacted on 26 October 2001 in the Patriot Act (PL 107-56) and prohibits restricted persons from possessing, using or transferring select agents and includes individuals with criminal felony records, fugitives from justice, aliens illegally in the United States, foreign nationals from terrorism-sponsoring nations, individuals dishonorably discharged from the Armed Services, and individuals adjudicated as mentally defective.

²¹ The Act also establishes a national database to collect registration information including the names and locations of registered facilities; the listed biological agents and toxins they possess, use or transfer; and characterization and source data for listed agents they possess. The purpose of this database is to assist public health and law enforcement officials to identify the origin or source of a listed agent used to cause harm to the public.

²² Under Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (hereafter, *Bioterrorism Act*), Pub. L. No. 107-188 § 201(a) List of Biological Agents and Toxins, the Secretary must establish and maintain a list of each biological agent and toxin that has the potential to pose a severe threat to public health and safety. In deciding which agents or toxins shall be included, the Secretary must consider: (1) the effect on human health of exposure to the agent or toxin; (2) the degree of contagiousness of the agent or toxin and the method by which it is transferred to humans; (3) the availability and effectiveness of pharmacotherapies and immunizations to treat and prevent illness resulting from the infection; and (4) any other criteria including the needs of children and other vulnerable populations. The list may be updated when necessary.

Secretary the names and locations of relevant facilities, the select agents they possess, use or transfer, and information about the characteristics of the select agents.²³ Approximately 190,000 research and diagnostic laboratories, scientists and manufacturers must notify federal authorities whether they have any of 36 listed pathogens that can be used to make biological weapons or components of them that control virulence or toxicity. The new legislation also authorizes the Department of Agriculture (USDA) to develop a list of agriculturally significant biological agents and toxins and, consistent and cooperatively with the HHS, regulate possession, use or transfer of listed biological agents and toxins that threaten plant or animal health or their products.²⁴ It is expected that the USDA will soon add 24 more livestock diseases and possibly more plant pathogens as potential sources for biological weapons.²⁵

Under the new laws, only researchers with a "legitimate need" may have access to the materials, which will be barred to students or researchers from countries considered sponsors of terrorism and to people with felony or drug convictions or with histories of mental illness.²⁶ Thus, unreported possession of select agents is an offense and punishable by up to five years imprisonment²⁷ The obligation to report applies from 90 days following enactment of the bill based on guidance issued by the Secretary within 30 days of enactment and the issuance of a final rule with requirements for registration of facilities in 180 days of enactment; the final rule will take effect after 60 days of the final rule.²⁸

Because innocent breach of this obligation is not a defense, every laboratory must scour through its freezers and other storage sites for such items lest they materialize unexpectedly. For many laboratories, notably associated with universities, collections of pathogens are improperly labeled, complicating the task of conducting a complete inventory. Even those laboratories that are not working with one of the agents or toxins on the list have to file a notification to the Secretary.²⁹ This alone signifies a substantial regulatory change for facilities engaged in biological research: before the new act, only a conscious decision to transfer a select agent provoked a regulatory obligation; now, obligations apply to every research facility without regard to any current choice to engage in regulated activity.

Even a clinical or diagnostic laboratory that might come into possession of a select pathogen temporarily only in order for specimen diagnosis, verification or proficiency testing must report that item unless it promptly either destroys the sample on site or transfers it to a registered facility.³⁰ Congress explicitly rejected any broad exclusion of these facilities.³¹ The

²³ Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Pub. L. No. 107-188 § 201(a) Regulatory Control of Certain Biological Agents and Toxins, *available at* <http://www.asmsa.org/pasrc/pl107188.pdf>.

²⁴ *Id.* § 212

²⁵ See Diana Jean Schemo, *Sept. 11 Strikes at Labs' Doors*, at <http://www.nytimes.com/2002/08/13/science/13RESE.html>

²⁶ *Bioterrorism Act* § 351A(e)(2)(A)

²⁷ *Bioterrorism Act* § 231.

²⁸ *Bioterrorism Act* § 202 (b).

²⁹ 67 FR 51058 DHHS/CDC: Notice of OMB Approval of Data Collection Part V; Notice, (Aug. 6, 2002). The CDC explains, "Asking respondents to declare non-possession is a critical means of ensuring that DHHS is knowledgeable of the potential universe of possessors of regulated agents and is necessary in order to effectively carry out the statutory intent of responsibly governing the transfer, possession, and use of biological agents or toxins." *Available at*, <http://www.asmsa.org/pasrc/selectagent8602.pdf>.

³⁰ American Society for Microbiology Alert on 2002 Select Agent Registration, at <http://www.asmsa.org/pasrc/policylinks.htm>.

Secretary may, in his/her discretion, exempt products that are used in investigational or clinical trials authorized under federal laws, with attention to the time sensitivity of such trials.³²

The Secretary must maintain a national database that includes the names and locations of registered persons, the listed agents and toxins such persons are possessing, using, or transferring, and information regarding the characterization of such agents and toxins. The Attorney General will have access to the database.³³

Nondisclosure obligations apply to reported information concerning (1) the possession, use or transfer of a listed agent; (2) the national database; (3) safeguard and security measures to prevent unauthorized access; (4) notification of any release, theft or loss of a listed agent, (5) an inspection of a registered facility.³⁴ All relevant federal agencies and departments are bound by the nondisclosure obligation.

E. Importation and Interstate Shipment of Etiological Agents

The importation or subsequent receipt of human pathogens and vectors of human disease is controlled by the Public Health Service Foreign Quarantine Regulations.³⁵ Human pathogens or vectors originating in foreign locations must have an importation permit issued by the Centers for Disease Control and Prevention. The importer is legally responsible for assuring that the foreign personnel package, label, and ship the infectious materials according to the Interstate Shipment of Etiological Agents regulations,³⁶ regulations of the Department of Transportation on Transportation of Etiologic Agents³⁷ and the Dangerous Goods Regulations of the International Air Transport Association. An applicant for a permit must be knowledgeable of safe practices and proficient in handling infectious materials, be directly responsible for work with the infectious materials, and reside at the receipt address for the facility where work with the material will occur. The permit application requires the importer to provide characterization information for the material, a description of the objectives of the intended use, and a designation of the biosafety level of the laboratory where the work will occur.

The Centers for Disease Control and Prevention is also regulates interstate shipments of indigenous human pathogens, diagnostic specimens, and biologic products. These materials must be shipped in compliance with the Interstate Shipment of Etiological Agents regulations that specify packaging and labeling requirements and procedures for notification of successful

³¹ See House Congressional Report No. 107-481 to accompany H.R. 3448, May 21, 2002, at page 122.

“Congress permits exemption of such clinical and diagnostic laboratories from registration requirements only if they report the identification of the select agents to the Secretary and either promptly transfer the agent to a registered person or destroy the agent on site in accordance with regulations established by the Secretary.” 67 FR 51058 DHHS/CDC Notice of OMB Approval of Data Collection Part V, Aug. 6, 2002.

³² *Bioterrorism Act* § 201(g), Exemptions are provided consistent with the current select agent transfer rule for products that are or contain select agents and are approved under specific federal laws unless the Secretary determines that additional regulation is necessary for a specific product to ensure protection to public health and safety. The legislation mandates a prompt determination by the Secretary of an exemption within 14 days after the applicant has submitted a complete exemption request and has notified the Secretary that the investigation may proceed as authorized under federal law.

³³ *Bioterrorism Act* § 201(e)(3) Submitted Names; Use of Database by Attorney General, available at <http://www.asmsa.org/pasrc/pl107188.pdf>.

³⁴ *Bioterrorism Act* § 201(h)(1) Nondisclosure of Certain Information, available at <http://www.asmsa.org/pasrc/pl107188.pdf>.

³⁵ 42 CFR Part 71.156.

³⁶ 42 CFR Part 72.

³⁷ 49 CFR Part 173.

delivery or failure of delivery. In accordance with the Public Health Security and Bioterrorism and Response Act of 2002, the CDC is preparing new regulations for the transfer, possession, use, and security of select agents and anticipates issuing an Interim Final Rule on the listing of select agents in coordination with the U.S. Department of Agriculture.³⁸

II. OVERSIGHT OF LABORATORY SAFETY

At the center of the community of agencies that regulate laboratory safety are the National Institutes of Health and related offices with the Department of Health and Human Services under the authority of the Assistant Secretary for Health.

A. The National Institutes of Health

The mission of the NIH and its 27 Institutes and Centers is to promote health-relevant scientific research. It pursues that mission by conducting research in its own laboratories as well as supporting research undertaken outside federal facilities.

1. Research Support

Over 80% of the NIH's resources are distributed in private grants and contracts. Because of its extraordinary financial role, the NIH strongly influences how and why biological research is conducted by developing guidelines that serve as conditions for receiving and retaining support. The basis for implementing these guidelines is the NIH peer review system.

Peer review plays an important role in the NIH's competitive grant application process.³⁹ A scientific review group, composed of experts qualified by training and experience in particular scientific or technical fields, evaluates the scientific and technical merit of grant applications. The group first decides whether the application is deemed worthy of funding under NIH selection criteria. If a majority of members of the group do not recommend the application for approval, then the application does not proceed through the funding process.⁴⁰ Approximately half the applications fall within the likely pool for making funding decisions. For these applications, the group assigns a numerical priority rating as a tool to permit applications to be funded in order of their priority. A staff administrator then compiles a summary statement, which contains the scientific review group's recommendation, the priority score, and a summary of the factors considered on peer review. It also recounts the reviews of the individual peer reviewers, along with a summary of any group discussion. A copy of the summary statement is sent to the principal investigator of the proposed research so that the investigator may submit rebuttal comments.

For approved grant applications with direct costs exceeding \$50,000, the summary statement is sent to the next stage of the review process—conducted by the advisory council for the appropriate institute. The purpose of this second level of review is to choose, from among meritorious projects, those most relevant to the nation's health needs. The advisory council, which includes both scientists and lay community leaders, usually concurs with the peer review determination of merit. In making its recommendation, however, it also takes into account the broad background of research in universities and other institutions, the need to initiate research in new areas and the degree of relevance of the proposed project to the institute's mission.

³⁸ 42 CFR Part 72 Appendix A.

³⁹ 42 U.S.C. §§ 289a, 289a-1.

⁴⁰ See § 289a-1(a)(2).

Without a favorable recommendation from the council, the grant cannot be funded.⁴¹ Upon completion of both levels of review, the Secretary of the Department of Health and Human Services, acting through the institute's director, makes the final decision on whether to fund the proposed project.⁴² The director funds a proposal based on the availability of funds, the proposed research training's relevance to NIA priorities and to the timeliness of the research training, as well as "the perceived scientific quality of the application as judged by initial peer review. A successful applicant is given notice of a grant award and a general description of the funded project is made available to the public.

2. The BMBL

The National Institutes of Health (NIH) first published safety guidelines in 1976, followed by the publication in 1984 of *Biosafety in Microbiological and Biomedical Laboratories* (BMBL).⁴³ The BMBL categorizes infectious agents and laboratory activities into four classes or levels and establishes safety requirements for each level. Compliance with the BMBL requirements is not overtly mandatory – although proposed regulations could soon change this.⁴⁴ The recommended practices, safety equipment, and facility safeguards in these guidelines establish a code of practice that is complied with voluntarily, one that all members of a laboratory community can together embrace to safeguard their colleagues, and to protect the public. Yet, a permit is required for all facilities working with such agents, although clinical laboratories used for research, diagnostic, reference and/or verification purposes need only be certified but do not require a license.⁴⁵

The NIH guidelines include requirements for ensuring containment of recombinant organisms. A series of biosafety levels (BL-1 to BL-4) were established based upon risk. At the highest level (BL-4), nothing that is created should have any possibility of escape nor of coming in direct contact with any laboratory workers.

Title II of the Public Health Security and Bioterrorism Preparedness Response Act⁴⁶ *Enhanced Controls of Dangerous Biological Agents & Toxins*, substantially broadens the regulatory obligations for laboratories working with select agents. The Secretary of Health and Human Services (HHS) is delegated authority to establish and enforce safety procedures, including: (1) proper training and appropriate skills to handle such agents and toxins; (2) proper laboratory facilities to contain and dispose of such agents and toxins; (3) measures to prevent access to such agents and toxins for use in domestic or international terrorism or for any criminal purpose; (4) procedures to protect the public safety in the event of a violation of the safety or security measures; and (5) appropriate availability of biological agents and toxins for research, education, and other legitimate purposes.⁴⁷

⁴¹ See § 284(b)(2)(B)(ii).

⁴² §§ 284(b)(2), 288.

⁴³ Nat'l Center Injury Prevention & Control, Office of Health & Safety, *Biosafety in Microbiological and Biomedical Laboratories* (Jonathan Y. Richmond et al. Eds., 4th ed. 1999). The BMBL has issued instructions for laboratory directors to develop better methods of handling, storing, containing, and sterilizing infectious agents.

⁴⁴ The proposed regulations to implement the BioPreparedness Act make compliance legally binding: the new Appendix F, published in the Federal Register prior to issuance of the proposed regulations, will go into force and effect in February 2003 and will establish the basis for mandatory compliance with this legislation.

⁴⁵ See 42 U.S.C. s262(a)(2000).

⁴⁶ Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Pub. L. No. 107-188 § 201(a), 42 U.S.C. 201 *et seq.* (2002).

⁴⁷ *Id.*

The Secretary may inspect facilities subject to regulations to ensure their compliance with such regulations, including prohibitions on restricted persons. The Secretary and appropriate federal, state and local law enforcement agencies must be promptly notified in the event of a theft or loss of listed agents and toxins or in the event of a release of agents outside the proper bio-containment area. If the Secretary finds that the release poses a threat to public health or safety, s/he must take appropriate action to notify authorized emergency response authorities. On an annual basis, the Secretary will report to Congress the number and nature of notifications received relating to theft or loss and to releases.⁴⁸

B. The OPHS

The NIH has no regulatory authority. The closest official with such authority is the Assistant Secretary of Health (ASH) -- the senior federal official with authority over public health and science as well as clinical preventive services. S/he directs thirteen program offices housing a variety of essential public health activities. Under the ASH authority, the Office of Public Health and Safety (OPHS) oversees the integrity of biological research by establishing an administrative process for responding to allegations of scientific misconduct, conducting oversight review of institutional investigations into alleged scientific misconduct, and monitoring institutional efforts to promote the responsible conduct of research.⁴⁹

There are two offices within OPHS that are potentially relevant to this discussion. The Office of Research Integrity (ORI) monitors institutional investigations of research misconduct and facilitates the responsible conduct of research through educational, preventive, and regulatory activities. The Office for Human Research Protection oversees human clinical testing and other scientific research activities involving human subjects.⁵⁰ In that capacity, it registers and supervises the activities of Institutional Review Boards (IRBs). Also, OHRP provides guidance on ethical issues in biomedical and behavioral research for all projects using HHS funds.

C. OSHA Regulation

The Occupational Safety and Health Administration (OSHA) issues regulations to protect laboratory workers in research laboratories from exposure to carcinogens and other hazardous chemicals, and radionuclides in research laboratories; additional specific requirements apply to HIV and HBV Research Laboratories and Production Facilities.⁵¹ While performance standards are not obligatory -- allowing institutions flexibility to implement a compliance program that is consistent with its specific operational practices -- conduct that is inconsistent with the BMBL resulting in harm may lead to liability. On December 6, 1991, OSHA issued its final regulation on occupational exposure to bloodborne pathogens covering all employees who could be "reasonably anticipated" as the result of performing their job duties to face contact with blood

⁴⁸ *Id.* 201(k).

⁴⁹ See generally Roy G. Spece, Jr. and John J. Marchalonis, Fourth Amendment Restrictions on Scientific Misconduct Proceedings at Public Universities, 11 HEALTH MATRIX 571 (2001).

⁵⁰ 45 CFR, Part 46

⁵¹ Employers must identify tasks and procedures as well as job classifications where occupational exposure to blood occurs--without regard to personal protective clothing and equipment, and must specify the procedure for evaluating circumstances surrounding exposure incidents. Significantly, where a facility fails to follow the guidelines and an accident or release of an agent occurs, the owner will be held liable.

and other potentially infectious materials.⁵² Two years later, OSHA issued the new final rule on personal protective equipment (PPE) requiring implementation of a Chemical Hygiene Plan that establishes standard operating procedures relevant to safety and health considerations, including measures to reduce employee exposures to hazardous chemicals including training on the use of personal protective equipment.⁵³

On November 6, 2000 the Needlestick Safety and Prevention Act was signed into law,⁵⁴ directing OSHA to revise the Bloodborne Pathogens standard to include new examples in the definition of engineering controls; to require that exposure control plans reflect changes in technology that eliminate or reduce exposure to bloodborne pathogens; to require employers to document annually in the exposure control plans consideration and implementation of safer medical devices; to require employers to solicit input from non-managerial employees responsible for direct patient care in the identification, evaluation, and selection of engineering and work practice controls; to document this input in the exposure control plan; and to require certain employers to establish and maintain a log of percutaneous injuries from contaminated sharps.⁵⁵

D. FDA-NCTR

The National Center for Toxicological Research (NCTR) within the Food and Drug and Administration (FDA) conducts peer-reviewed scientific research that supports and anticipates the FDA's current and future regulatory needs. This involves fundamental and applied research specifically designed to define biological mechanisms of action underlying the toxicity of products regulated by the FDA. This research is aimed at understanding critical biological events in the expression of toxicity and at developing methods to improve assessment of human exposure, susceptibility and risk.

The NCTR has four high priority areas. First is counter-terrorism: NCTR conducts fundamental applied research aimed at understanding critical biological events to determine how people are adversely affected by exposure to FDA-regulated products and to develop means by

⁵² 29 CFR 1910.1030, *Occupational Exposure to Bloodborne Pathogens*, became effective on March 6, 1992. The agency concluded that these hazards can be minimized or eliminated by universal precautions, using a combination of engineering and work practice controls, personal protective clothing and equipment, training, medical surveillance, hepatitis B vaccination, signs and labels, and other provisions. The standard limits occupational exposure to blood and other potentially infectious materials since any exposure could result in transmission of bloodborne pathogens which could lead to disease or death. The standard stresses hand-washing and requires employers to provide facilities and ensure that employees use them following exposure to blood. It sets forth procedures to minimize needlesticks, minimize splashing and spraying of blood, ensure appropriate packaging of specimens and regulated wastes and decontaminate equipment or label it as contaminated before shipping to servicing facilities. Employers must provide, at no cost, and require employees to use appropriate personal protective equipment such as gloves, gowns, masks, mouthpieces and resuscitation bags and must clean, repair and replace these when necessary. If engineering and work practice controls do not eliminate exposure, the use of personal protective equipment (e.g., eye protection) is required.

⁵³ Federal Register Vol. 59, No. 66, pp. 16344-16364, April 6, 1994 as it relates to the Occupational Exposure to Hazardous Chemicals in the Laboratory Standard (Lab Safety Standard), 29 CFR 1910.1450 and the Occupational Exposure to Bloodborne Pathogens Standard (Bloodborne Pathogens standard), 29 CFR 1910.1030.

⁵⁴ (Public Law 106-430), see 66 FR 5318, Jan. 18, 2001.

⁵⁵ The new recordkeeping rule, 29 CFR 1904.8, requires that all employers, whether or not they are covered by the bloodborne pathogens standard, record all work-related needlesticks and cuts from sharp objects that are contaminated with another person's blood or OPIM on the 300 Log as an injury. If the employee is later diagnosed with an infectious bloodborne disease, the identity of the disease must be entered and the classification must be changed to an illness.

which bio-warfare agents can be rapidly detected. Second is food safety: NCTR is engaged in the discovery and development of new technologies aimed at detecting and eliminating the hazards of foodborne contaminants. Third is new technologies: NCTR develops innovative new technologies to enable FDA officials to make science-based regulatory decisions. Fourth is medical product safety: NCTR provides scientific findings for pre-market review and product safety assurance.

III. BIO-TERRORISM PREVENTION AND RESPONSE

For many years, regulation of biological activities has been within the domain of the Department of Health and Human Services (HHS); regulation of especially dangerous pathogens has been within the domain of the CDC which itself is within HHS' domain. A certain comfort level has been established both because of long familiarity and because HHS' mission is to promote health – a mission that is obviously in accord with the work of most biological scientists. Precisely because of this mission, HHS is ill-suited to be the federal agency primarily responsible for preventing terrorist misuse of biological agents. That is primarily a national security or law enforcement function. Its principal motifs entail circumscribing unfettered freedom of action in certain spheres while increasing the government's access to and control of information – motifs that are substantially at odds with a mission of promoting basic scientific research to the goal of improving human health and welfare.

To address this mis-match, it may be appropriate either to transfer some of HHS' responsibilities to a different department that is better suited to pursue national security or to authorize such a department to establish national priorities and policies while leaving HHS to implement those policies. In this context, the creation of the Department of Homeland Security has raised a troubling issue for the biological community. It is not that the creation of this new federal authority is viewed as unnecessary or inappropriate; concerns have arisen as to the transfer of responsibilities from Health and Human Services to the Department of Homeland Security. Under current law, The CDC and the National Institutes of Health (NIH), both part of HHS, now administer most biodefense programs, including support for state and local public health preparedness and research on threats to human health.⁵⁶ Under the new proposal, for some public health and medical activities, DHS would assume direct responsibility; for other activities, DHS would be responsible for setting goals and providing strategic direction but would rely upon HHS to implement and operate the activities on a day-to-day basis.⁵⁷

Given that the new Department will have important intelligence, threat, and vulnerability-related information necessary for the identification of program priorities, it has been argued that the new Department should develop our national strategic plan for bioterrorism activities and identify our most urgent national priorities, including priorities for programs at HHS.⁵⁸ Some of the functions that the President proposes be transferred to DHS include: oversight of select

⁵⁶ Robert Ross, *House Panel backs keeping HHS in charge of bioterrorism preparedness*, at <http://www1.umn.edu/cidrap/content/bt/bioprep/news/dhsleg.html>.

⁵⁷ Statement by Claude A. Allen, Deputy Secretary, Department of Health and Human Services on HHS and the Department of Homeland Security before the House Committee on Energy and Commerce, Subcommittee on Oversight and Investigations June 25, 2002

⁵⁸ Testimony of Congressman W.J. 'Billy' Tauzin Chairman -- Committee on Energy and Commerce Before the Select Committee on Homeland Security Regarding H.R. 5005, The Homeland Security Act of 2002, July 17, 2002.

agents and enforcement of controls, responsibilities relating to emergency preparedness and response, and oversight of biological research.⁵⁹ This proposal has generated concerns that transferring bioterrorism preparedness planning and research to the new department would undermine efforts to strengthen the public health system.⁶⁰

A. Select Agent registration and enforcement program

As discussed above, the recently enacted Public Health Security and Bioterrorism Preparedness and Response Act has authorized HHS to promulgate and enforce regulations concerning the possession, transfer and use of select agents. From the perspective of averting the threat of misuse of those agents by terrorists, the HHS and the CDC are arguably not designed to exercise the level of oversight that might be appropriate to the objective of preventing malevolent use of lethal pathogens. Accordingly, the President's bill proposes to transfer to the Secretary of Homeland Security the responsibility to administer the select agents program⁶¹ with the HHS Secretary in a consultative role: HHS will provide DHS with scientific expertise and other technical assistance and make key medical and scientific decisions.⁶²

B. Emergency Preparedness and Response

1. The Office of the Assistant Secretary for Public Health Emergency Preparedness

Among its many initiatives, the 2002 Bioterrorism Act created the HHS Office of the Assistant Secretary for Public Health Emergency Preparedness with responsibility for supervising the Office of Emergency Preparedness, the National Disaster Medical System, the Metropolitan Medical Response Systems, and related HHS emergency management functions. This office was designed and intended to serve as the central coordinator of consequence management activities in the event of a biological attack or act of bio-terrorism. In such an event, it will be imperative to mobilize substantial medical resources, most likely involving specialized expertise. It may also be necessary to exercise special authority with regard to issues such as commandeering of private resources and implementation of quarantines. The question arises as to whether this is a "public health" function or a "national security" function.

In proposing the establishment of the DHS, the Administration asserted that, on balance, it would be preferable to maintain a "seamless integration of national public health and medical emergency management assets with the Nation's new preparedness and response infrastructure at DHS."⁶³ This proposal was not submitted critically of HHS but to reflect the need for coordination among diverse consequence management responsibilities.

2. Certain Public Health-Related Activities

⁵⁹ Statement by Claude A. Allen, Deputy Secretary, Department of Health and Human Services on HHS and the Department of Homeland Security before the House Committee on Energy and Commerce, Subcommittee on Oversight and Investigations June 25, 2002m available at, <http://www.hhs.gov/asl/testify/t020625.html>.

⁶⁰ ASM Outlines Concerns Raised by Biodefense Research Amendment to the National Homeland Security and Combating Terrorism Act of 2002, S. 2452, July 30, 2002, at <http://www.asmsa.org/pasrc/liebermanltr.htm>.

⁶¹ Analysis for the Homeland Security Act of 2002, Title III Chemical, Biological, Radiological, and Nuclear Countermeasures § 302 Functions Transferred, Available at, <http://www.whitehouse.gov/deptofhomeland/analysis/index.html>.

⁶² Statement by Claude A. Allen, Deputy Secretary, Department of Health and Human Services on HHS and the Department of Homeland Security before the House Committee on Energy and Commerce, Subcommittee on Oversight and Investigations June 25, 2002m available at, <http://www.hhs.gov/asl/testify/t020625.html>.

⁶³ *Id.*