Implementation of Biosecurity in United States Laboratories

Select Agent Rule

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Biosecurity

- Legislative drivers
- Legislative requirements
- How institutions meet the legislative requirements

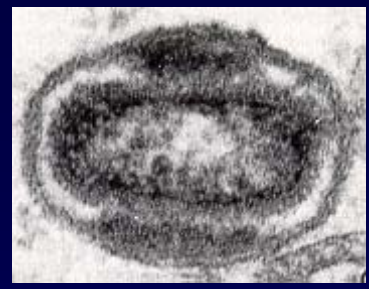
Enacting Legislation for Biosecurity

- Public Health Security and Bioterrorism Preparedness and Response Act of 2002
- Select Agent Rule, 1996, 2002
  - Applies to human, animal, plant agents
  - Requires approval of personnel
  - Requires institutional approval
    - Meet security and safety criteria
    - Ensures record-keeping
    - Allows transfer of materials between approved "entities"

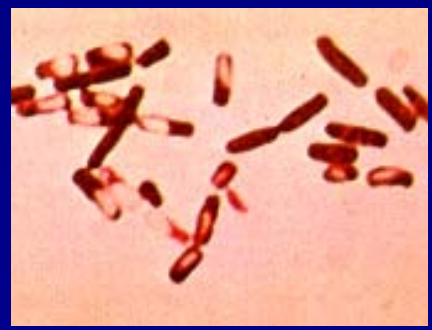
Public Health Security and Bioterrorism Preparedness and Response Act, 2002

"…designed to provide protection against the effects of misuse of select agents and toxins whether inadvertent or the result of terrorist acts against the United States homeland or other criminal acts. The agents and toxins…have the potential to pose a severe threat to public health and safety.

Select Agent Rule



- Initial legislation enacted in 1997
  - Establishes a list of human pathogens (select agents) for regulation
  - Requires registration of facilities
    - Inspections to ensure safety criteria met
  - Accounts for transfer of select agent materials



Public Health Security and Bioterrorism Preparedness and Response Act 2002

- Directed DHHS and USDA to enact legislation to regulate select agents
  - Develop a list of restricted agents
  - Require registration for possession, use, and transfer of agents
  - Require approval of persons
  - Require registration of facilities
  - Agencies must coordinate activities

Possession, Use, and Transfer of Select Agents and Toxins
Timeline

- Governmental Interagency Working Group developed list of agents and toxins affecting humans (Summer 2002)
- Registration of facilities possessing Select Agents and Toxins (Sept. 2002)
- Development of Interim Final Rule (Dec. 2002)
- Rule in effect (Feb. 7, 2003-Nov. 12, 2003)
- Final Rule (Summer 2004)

List of Select Agents and Toxins

Human

- Crimean-Congo haemorrhagic fever virus
- Ebola viruses
- Cercopithecine herpesvirus 1 (Herpes B virus)
- Lassa fever virus
- Marburg virus
- Monkeypox virus
- South American Haemorrhagic Fever viruses (Junin, Machupo, Sabia, Flexal, Guanarito)
- Tick-borne encephalitis complex viruses
- Variola major virus and Variola minor virus (Alastrim)

- *Rickettsia prowazekii*
- *Rickettsia rickettsii*
- *Yersinia pestis*
- *Coccidiodies posadasii*

- Abrin
- Conotoxins
- Diacetoxyscirpenol
- Ricin
- Saxitoxin
- Tetrodotoxin
- Shiga-like robosome inactivating proteins

List of Select Agents and Toxins

Human and Animal

- Eastern Equine Encephalitis virus
- Nipah and Hendra complex viruses
- Rift Valley fever virus
- Venezuelan Equine Encephalitis virus

- *Coccidiodies immitis*

- Botuninum neurotoxins
- *Clostridium perfringens* epsilon toxin
- Shigatoxin
- Staphylococcal enterotoxins
- T-2 toxin

- *Bacillus anthracis*
- *Brucella abortus*
- *Burcella melitensis*
- *Brucells suis*
- *Burkholderia mallei*
- *Burkholderia pseudomallei*
- Botulinum neurotoxin producing species of *Clostirdium*
- *Coxiella burnetii*
- *Francisella tularensis*

Requirements of Select Agent Rule
Registration

"Entity" (institution)

- Responsible Official
- List and location of select agents and toxins
- Safety, security, emergency response, and training plans
- Individuals requiring access to select agents and toxins

Requirements of Select Agent Rule
Registration

- Certificate valid only for specific agents, activities, and personnel
  - modifications must be approved
- Certificate granted once all conditions of Rule are met
- Valid for 3 years

Security Risk Assessment

- Required for Responsible Official; persons owning the facility
- Required for individuals requiring access to select agents or toxins
- “Restricted persons” cannot have access
- Approvals effective for 5 years

Security Risk Assessment

- Forms for personal information
- Fingerprints
- Dept. of Justice searches databases
- Expedited reviews may be requested

Security Risk Assessment

How do we do that?

- Identify person(s) to administer program
- Identify persons who need access to agents
  - Work independently with agents
  - Need independent access to areas where agents can be easily obtained
    - Guards
    - Mechanical support

Responsible Official

- Designated by institution
- Has authority and responsibility for institution's compliance
- Develops and implements
  - Safety plans
  - Security plans
  - Training
- Allows access by authorized personnel only

Responsible Official

- Responsible for transfer of select agents and toxins to approved individuals and institutions
- Reports loss, theft, release of agents and toxins
- Maintains records
- Reports identification of agent in diagnostic specimens

Responsible Official
How do we do that?

- Identify biosafety professional(s)
- All paperwork and records are maintained securely by RO
- Scientists and RO must work closely together
- RO is point-of-contact for all select agent activities

Safety

- Must adhere to safety standards in "Biosafety in Microbiological and Biomedical Laboratories (BMBL)"
- Work with genetic elements must follow "NIH Guidelines for Research Involving Recombinant DNA Molecules"
  - Permission required for:
    - Transfer of drug resistant traits
    - Deliberate recombinates making lethal toxins
- RO must inspect laboratories annually

Security

- Security plan based on risk and vulnerability assessments
- Plan must provide for:
  - Inventory control
  - Housekeeping and maintenance activities
  - Keying procedures (keypads, etc.)
  - Reporting suspicious activities or persons
  - Access controls (areas and containers)
  - Escorted access
  - Removing unauthorized persons

Security

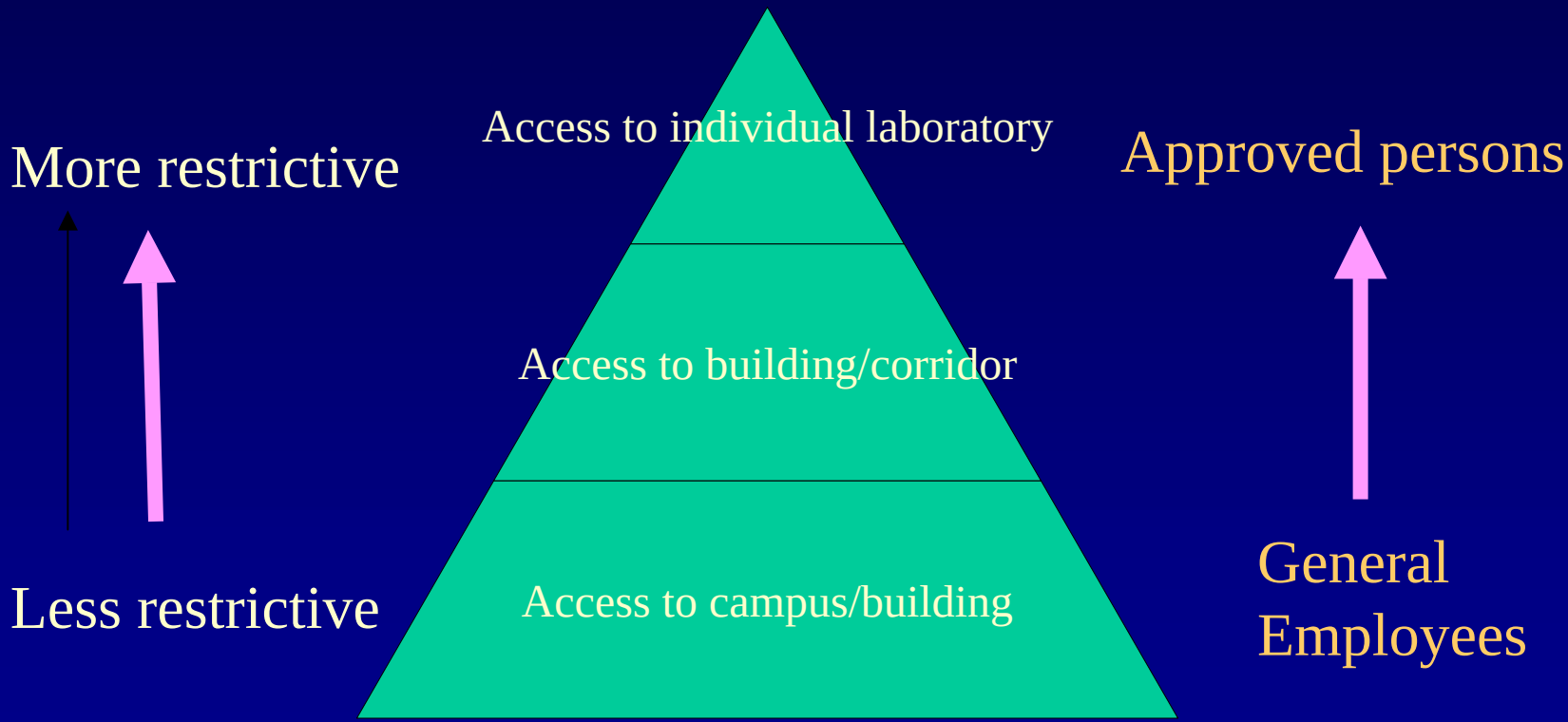
- Plan must be reviewed annually
- Provisions for areas with Select Agents and toxins:
  - Unescorted access only for authorized personnel
  - Allow access with escort for unauthorized personnel
  - Containers must be locked when not in view of authorized personnel
  - Inspection of packages
  - Protocol for transfer within institution
  - Reporting of any compromises to security

Security
How do we do that?

- Institution develops risk assessment and vulnerability assessment
- Institution determines type of security needed
- RO authorizes access of approved individuals to select agent areas
- RO implements security devices to limit access

Security

Approach to access



Emergency Response

- Develop and implement emergency response plan to include:
  - Definition of hazards of Select Agents and Toxins
  - Coordination with responders
  - Lines of authority, communication, etc.
  - Security and control of site
  - Decontamination
  - Emergency alerting and response
  - First aid and emergency medical treatment

Training

- Required for authorized personnel and unauthorized personnel visiting areas
- Required before beginning work; annually thereafter
- Security, safety, and containment training
- Document that training was understood

Training
How do we do that?

- Safety training program
  - Based on BMBL information
  - Institution-specific procedures
  - Delivered by lecture or internet
- Security training program
  - Security program based in institution's security plan and requirements of Select Agent work
  - Develop module (test) to determine understanding
  - Can be internet-based

Transfers

- Required for transfer within US
- Sender must:
  - Be registered
  - Or be clinical (diagnostic) lab transferring to registered lab
- Recipient must:
  - Be registered
  - Complete forms
  - Report if not received within 48 hours
- Report to HHS when destroyed or used up

Records

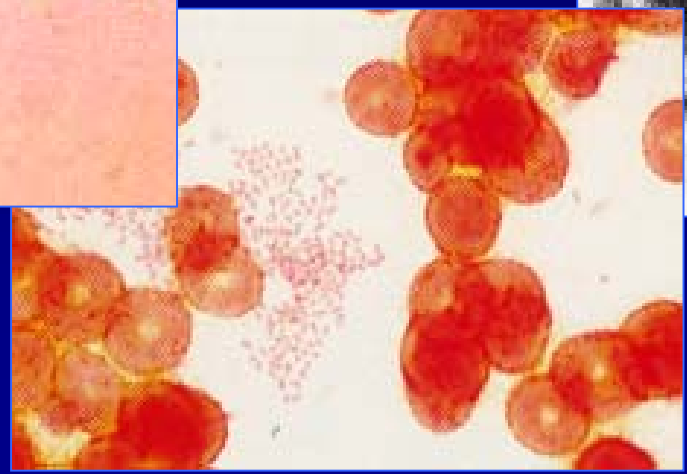
- List of approved individuals
- Accurate, current inventory
  - Name, characteristics, source of agent
  - Quantity (toxins only)
  - Quantity acquired, source, date
  - Quantity destroyed or disposed of
  - Quantity used and dates used (toxins only)
  - Quantity, date, and to whom transferred
  - Select agent or toxin lost, stolen, or unaccounted for
  - Explanation of discrepancies

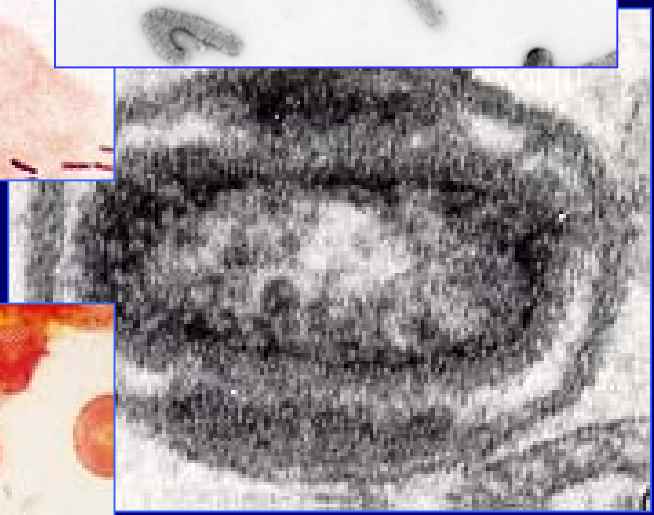
Records

- Access to select agents and toxins:
  - Name of individual
  - Select agent or toxin
  - Date removed from and returned to storage
  - Quantity removed from and returned to storage (toxins only)
- Access to areas:
  - Name of individual
  - Date and time entered and left area
  - Name of individual who escorted unapproved individuals

Inspections

- HHS will inspect with or without cause
- Inspections are performed prior to certificate of registration (USDA)
- Inspections are part of registration (DHHS); not required before certificate issued
- Examines safety, security, training, records, etc.





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