Three Questions to Answer Today

- 1. Are People Getting Sick in Laboratories from What They Are Working With?
- 2. What Were Common Issues Identified in These High Profile Infections?
- 3. Are There Specific Things That Can be Done to Reduce the Risk of a Laboratory-Acquired Infection?

Are People Getting Sick in Laboratories from What They Are Working With?

- Case 1 Cowpox Infection Acquired From Lab Contamination
- Case 2 Texas A&M Researcher Infected with Brucella
- Case 3 Boston University Laboratory Tularemia Cases

Case 1 Cowpox Infection Acquired From Lab Contamination

- Facts:
  - No previous incident/accident reported by researcher
  - Researcher noticed suspicious ulcerated lesion on finger lasting 3 months
  - Biopsied tissue submitted to CDC and identified as rDNA strain of Cowpox stored in Lab's freezer
  - Environmental sampling of lab revealed rDNA strain of Cowpox on surfaces inside lab including freezer

Coxpox

Symptoms

- Cowpox is a viral skin infection caused by the cowpox or catpox virus. This is a member of the orthopoxvirus family, which includes the variola virus that causes smallpox. Cowpox is similar to but much milder than the highly contagious and sometimes deadly smallpox disease. Most human cases of cowpox appear as one or a small number of pus-like lesions on the hands and face, which then ulcerate and form a black scab before healing on their own.

Lesions on Finger

Case 2 Texas A&M Researcher Infected with Brucella

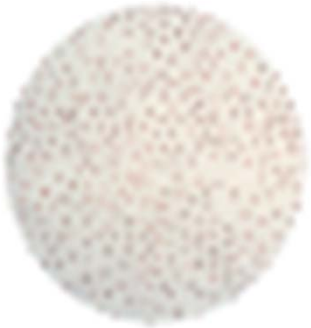
- Facts:
  - February of 2006 researcher is infected with Brucella after cleaning aerosol chamber in Select Agent lab
  - CDC Inspection in July of 2007 Found:
    - Security Issues
    - Training Issues
    - Medical Surveillance Issues
    - Lack of or Inconsistent Implementation of Policy Issues
  - Resulted in 1 million dollar fine and shutting down all Select Agent Research until resolved

Brucella

Symptoms

- Brucellosis: Loss of appetite and weight loss, back pain, head ache, fatigue, fever, feeling ill, muscle aches, profuse sweating, loss or alteration of vision.

Microorganism



Case 3 Boston University Laboratory Tularemia Cases

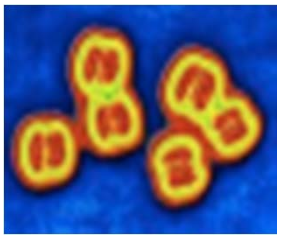
- Facts:
  - Three BU researchers became ill in 2004 after working with what they thought was a BSL2 live vaccine strain of *Francisella tularensis* (LVS Type B) not associated with human disease
  - Testing by CDC revealed that lab samples contained *Francisella tularensis Type A* associated with human disease, requiring BSL3
  - Investigation found: routine failure to comply with BSL2 safety protocols, inadequate “signs and symptoms” in medical surveillance program, authority issues in BU IBC

Francisella tularensis

Symptoms

- Francisella: (Tularemia) Skin ulcers, swollen and painful lymph glands, inflamed eyes, sore throat, mouth sores, diarrhea or pneumonia. If the bacteria are inhaled, symptoms can include abrupt onset of fever, chills, headache, muscle aches, joint pain, dry cough, and progressive weakness.

Microorganism



What Were Common Issues Identified in These High Profile Infections

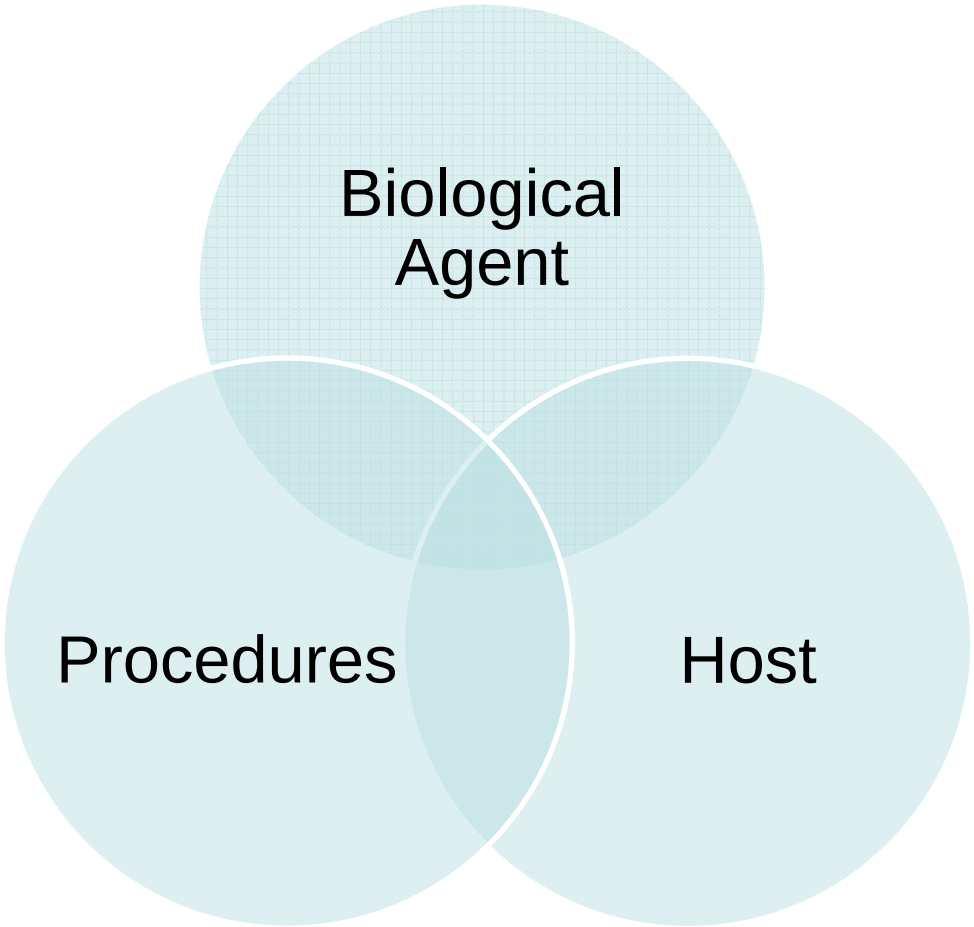
- Risk Assessment for Biological Materials Inadequate
- Existing Policies Not Adequate for Risks or Policies Not Followed
- Training for Staff Incomplete
- Verification Systems for Effectiveness of Biosafety System Not Always Followed
- Reporting of Symptoms Not Always Timely or Consistent to Employee Health

Are There Specific Things That Can be Done to Reduce the Risk of a Laboratory-Acquired Infection?

- Effective Biological Risk Assessment is Most Important Part of Effective Biosafety System
- “Risk assessment is a process used to identify the hazardous characteristics of a known infectious or potentially infectious agent or material, the activities that can result in a person’s exposure to an agent, the likelihood that such exposure will cause a LAI, and the probable consequences of such an infection.”

BMBL 5th Ed.

Risk Assessment Considerations



Objectives

- Prevent a Laboratory-Acquired Infection
- Learn Basics of Biological Risk Assessment Process
- What Can We Learn From High Profile Incidents?
- Practical Understanding of Importance of Good Handling Techniques When Using Biological Materials

Biological Agent

Draft Document
January 16, 2009
Revised March 4, 2009

Environment

Draft Document
January 16, 2009
Revised March 4, 2009

Host

Draft Document
January 16, 2009
Revised March 4, 2009

Case Study Methodology

- Describe Facts
- Put Student in Role of Investigator
- What Are Specific Areas That Directly Apply to Setting Up and Maintaining an Effective Biosafety Management System?

CSI UA

- Facts
  - You are Biosafety Officer
  - Receive call from Campus Occupational Health that several people from same lab have arrived over an 8 hour time with flu-like symptoms. When asked what they were working on, they said a harmless vaccine strain

Minimum Learning Objectives

- Identify Three Core Elements for Biological Risk Assessment
  - What is the specific hazard associated with the agent/material?
  - How can risk of laboratory acquired infection be reduced?
  - What are three key components of a biosafety system? (ventilation, SOP's, training)

Applying Learning Objectives

- Facts:
  - A chemistry professor is using tissue culture to test a chemical indicator for influenza virus. As laboratory safety representative, you have noticed many students doing this work getting “flu-like symptoms” and having to stay home. You suspect something is not right. Where do you start and what specific questions do you ask the PI? What resources are available to you for your investigation?

Applying Learning Objectives

- Facts
  - As laboratory safety representative, you have been asked by the chemistry professor to help her set up a new experiment using Methicillin-Resistant Staphylococcus aureus (**MRSA**).What steps should you take to do conduct a biological risk assessment?

Demonstration

- Objective
  - Seeing graphical evidence using florescence to show how poor technique can create biological and chemical contamination
- How
  - Materials: Gloves, Bench Absorbent Pads, Solvent, Kim wipes, Florescence Powder, Glo Germ Solution, Aerosol Producing Equipment, UV Light, Disposal Bags
- Key Visual
  - Show how material can be easily and invisibly transferred for other to be contaminated

Materials and Methods
Exercise One

Materials	Methods	Objective
1. Powdered Florescence in Small Screw-Top Bottle 2. Powder Transfer Tool 3. Disposable Gloves 4. Lab Bench Absorbent Pads 5. Disposable Wipes 6. Cleaning Solvent 7. Black Light 8. Disposal Bag	1. Student put gloves on 2. Student is asked to take a small amount of powder and place on absorbent pad 3. Student cleans off transfer tool w/solvent 4. Student is asked to take glove off 5. Student hand and measuring tool is shown under black light to observe contamination	1. Seeing graphical evidence using florescence to show how poor technique can create biological and chemical contamination

Materials and Methods
Exercise Two

Materials	Methods	Objective
1. Glo Germ Florescence Solution in Screw-Top Bottle 2. Disposable Gloves 3. Pipettor w/ Disposable Tips 4. Disposable Cups for Solution 5. Lab Bench Absorbent Pads 6. Disposable Wipes 7. Cleaning Solvent 8. Black Light 9. Disposal Bag	1. Student put gloves on 2. Student is asked to take a small amount of solution and transfer to disposable cup with pipettor 3. Student is asked to take glove off 4. Student hand and pipettor is shown under black light to observe contamination	1. Seeing graphical evidence using florescence to show how poor technique can create biological and chemical contamination