

Biological Research Myths, Urban Legends, and Reality

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Agenda

- Who is ChABSA & ABSA-International
- Background on Biosafety
 - Biological Safety Levels
 - Biological Risk Group
 - Containment Levels
- Facility Design
- Waste Disposal
- Emergency Preparedness
 - Prevention of Release
 - Decontamination
 - Pandemic Response
 - Bioterrorism (prep & response)
- Community Involvement
- Questions



ABSA-International & ChABSA

- **ABSA International (ABSA) was founded in 1984 to promote biosafety as a scientific discipline and serve the growing needs of biosafety professionals throughout the world. Its goals are to provide a professional association that represents the interests and needs of practitioners of biological safety, and to provide a forum for the continued and timely exchange of biosafety information.**
- ABSA International accomplishes these goals by:
- publishing and distributing a quarterly journal, *Applied Biosafety* and a number of other biosafety publications,
- conducting an Annual Biosafety and Biosecurity Conference to keep members informed of current biosafety issues and regulatory initiatives. The conference is preceded by a selection of biosafety professional development courses geared at the beginner and advanced levels.



www.absa.org



ABSA-International & ChABSA



- ChABSA, the Chesapeake Area Biological Safety Association, is an incorporated, non-profit organization that is an affiliate of the **ABSA**.
- ChABSA was established in 1987 by local area members of ABSA with a similar interest in the safety of research using microorganisms and recombinant DNA. The organization benefits from the unique knowledge base found in the MD-DC-VA region, which is host to many universities, federal agencies and biotechnology related businesses of all sizes
- ChABSA members include biosafety officers, researchers, teachers, corporate, academic, and government employees.
- ChABSA is dedicated to expanding biological safety awareness and reducing the potential for occupational illness and adverse environmental impact from infectious agents or biologically derived materials.
- ChABSA fosters and promotes professional and public awareness of biological safety through effective communication. This has become increasingly important in a decade where the use of biological agents or products by terrorists has become a reality.



Biological Safety Levels

- **BSL-1:** This is the basic level, like working with **harmless** germs. Think of it like a regular office, but with some extra safety rules like washing your hands.
- **BSL-2:** This level is for germs that can make you sick, but usually **not seriously**. It's like a dentist's office, where they take extra care with things that might have blood on them.
- **BSL-3:** This level is for germs that can make you **very sick**, sometimes even through the air. It's like a special lab where they work with things like tuberculosis, and they have to wear special masks and clothes.
- **BSL-4:** This is the highest level, for the most dangerous germs that can cause **life-threatening** diseases. It's like a super-secure lab where they work with things like Ebola, and people have to wear full-body suits with their own air supply.



Biological Risk Groups

- **Risk Group 1:** These are microorganisms that are unlikely to cause disease in healthy people. Think of them like the bacteria used to make yogurt.
- **Risk Group 2:** These microorganisms can cause disease in humans, but it's usually treatable and not very serious. A common example is the bacteria that causes strep throat.
- **Risk Group 3:** These microorganisms can cause serious disease in humans, and there might not be good treatments available. Think of things like tuberculosis or some strains of influenza.
- **Risk Group 4:** These microorganisms cause severe, often life-threatening disease in humans, and there are usually no treatments. Ebola virus is an example of a Risk Group 4 organism.



Containment Levels

- **Containment Level 1 (CL1):** This is the most basic level. The facility design is similar to a standard laboratory or office. Work can be done on open benchtops. Think of it like a regular science classroom. Special containment equipment isn't typically required.
- **Containment Level 2 (CL2):** This level requires some additional features. Labs often have designated areas, and work that could create splashes or aerosols is done in a biological safety cabinet (a special enclosed workspace). Handwashing sinks are readily available. Think of a medical testing lab.
- **Containment Level 3 (CL3):** Facilities at this level have more stringent design requirements. Labs are often separated from general access areas, with controlled access. Ventilation systems are more complex, often with directional airflow to prevent the escape of airborne hazards. Biological safety cabinets are used for all work with infectious materials. Think of a lab working with tuberculosis.
- **Containment Level 4 (CL4):**
 - This is the highest level of containment. Facilities are highly isolated, often in separate buildings or zones. Access is strictly controlled, and personnel must wear specialized protective suits with their own air supply. The lab itself is often a sealed "bubble" with its own air handling and decontamination systems. All materials are decontaminated before leaving the lab. Think of a lab working with Ebola virus.

Facility Design Considerations

- Worker Protection
- Biosafety Levels (BMBL, NIH Guidelines)
- cGMP, GLP, etc.
- Waste Treatment
 - In-House
 - POTW
- Neighbors
- Populations
- Power
- Emergency Response



Waste Disposal

- Worker Protection
- Liquid Waste (In-House vs. POTW)
 - Capacity
- Treatment
 - Chemical
 - Heat
- Off-Site
 - Incineration
 - Avoid mixed waste

What happens if systems fail?



Emergency Response

Prevention of Release

- Worker Protection
- Security (select agents and more)
- Facility design and operational flow
 - Location
 - Bioagents (virus, bacteria, animals...)
- HVAC
- Decon
- Response Planning

Emergency Response Decontamination

(not necessarily in order)

- Worker Protection
- Notification
- Securing the Scene
- Mixed vs. Biological
- PPE
- Training
- Environmental Protection



Emergency Response Pandemic

Related Activities

- Worker Protection
- Identification
- Modes of Transmission
- Treatment
- Vaccines
- Risk Groups
- National Special Pathogen System (NSPS)
 - 13 Regional Emerging Special Pathogen Treatment Centers (RESPTCs)



Emergency Response Bioterrorism

Related Activities

- Anticipation
- Development of potential threats (agent, dispersible methods, etc.) followed by appropriate response (e.g. antidote, vaccine, treatment...)
- Biosurety Programs
- Select Agent Program

Communication

- Internal Customers

- Researchers
- Cleaning Crew
- Office Staff
- Visitors
- Collaborators

- External Customers

- Government Agencies
- Community Groups
- Academia
- Media
- Fire/Rescue/Law Enforcement
- LEPC



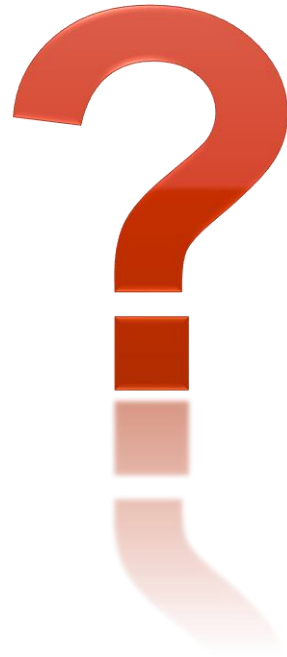
Community Involvement

- Townhall Meetings
- Review Groups
 - IRB
 - IACUC
 - IBC
- ABSA-International/ChABSA
- LEPC



LEPC Interaction

- Know where the biotech facilities are and the associated risk with each (typically not high)
- Coordinate with local HAZMAT responders (private and county)
- Training for responders
- Pre-planning



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