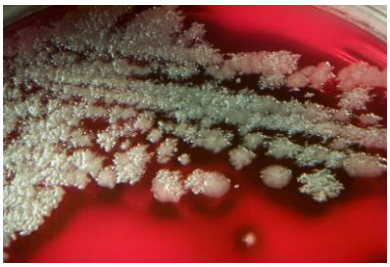
CENTER FOR BIOLOGICAL DEFENSE AT THE UNIVERSITY OF SOUTH FLORIDA

PEACE OF MIND

THE CBD APPLIED RESEARCH LABORATORY

Early recognition of biological agents indicative of a Bioterrorism (BT) event or emerging infectious disease outbreak is essential to institute public health measures. The CBD Applied Research Laboratory, collocated with the Florida Department of Health in Tampa, has established an infrastructure aptly suited for applied and translational interdisciplinary research in biological defense and emerging infectious disease. Established in the year 2000, the CBD Applied Research laboratory is staffed by a team of research personnel with extensive relevant experience in biological defense.



The laboratory occupies over 1800 sq ft of state of the art fully equipped biosafety level 2 laboratory space, the use of three modern well-equipped biosafety level three labs and supports the following research directions:
Sample preparation; Rapid agent detection; Strain molecular typing; Antibiotic susceptibility testing; Test kit validation; Decontamination; and Evaluation and testing of new technologies.

The CBD Applied Research Laboratory has established strong collaborations with state and federal agencies, local, state and national companies, as well as other universities. These collaborations have produced innovative methodologies and technologies for the rapid identification, characterization and decontamination of agents of bioterrorism and emerging infectious diseases. The CBD Applied Research Laboratory supports ongoing collaborations with industry partners, national laboratories and other universities and welcomes new partners with mission objectives similar to the CBD.

Contact Information

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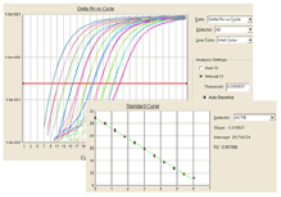
Capabilities and Resources

Core Infrastructure

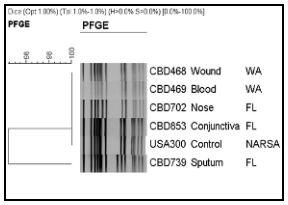
- A bacterial culture collection of over 1400 fully characterized and cryostocked BSL-2 and BSL-3 bacterial strains critical to the accuracy and reproducibility of all research at the CBD.
- Registration in the CDC Select Agent Program
- Secure workspace

Rapid Agent Detection



- Design and testing of novel molecular targets for rapid detection of biothreat agents using multiple real time PCR platforms (LightCycler, ABI7500, SmartCycler)
- Extensive testing to determine specificity and sensitivity of developed molecular assays
- Development of rapid nucleic acid extraction and molecular detection assays for multiple sample types, including suspicious powders, food and clinical

Strain Molecular Typing

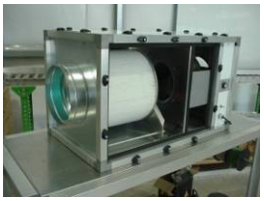


- Production of molecular typing databases for characterization and tracking of biothreat and infectious disease agents
- Multiple typing technologies used:
    - Pulse Field Gel Electrophoresis (PFGE)
    - Ribotyping
    - Multilocus Variable Number Tandem Repeat Analysis (MLVA)
    - SCC *mec* and *spa* Typing for *Staphylococcus*
    - Pyrosequencing

Antimicrobial Susceptibility Testing

- Developed methodologies for the rapid antimicrobial susceptibility testing of *Bacillus anthracis*, *Staphylococcus aureus (MRSA)* and *Salmonella* using the Trek Sensititre
- Ability to test novel antimicrobial compounds on a variety of biothreat agents
- Tests performed on bacterial isolates in our BSL2 and BSL3 collection are MIC (minimum inhibitory concentrations), MBC (minimum bactericidal concentrations), Time-kill studies (one and two compounds), Synergy Assays (Checkerboard), Post Antibiotic Effects and Endospore Germination Inhibition assay.
- Testing of novel biocidal agents for use as surface and air decontaminants

Testing of New Technologies



- Examine prototype equipment and technologies meeting the mission of the CBD
- Tested new instrumentation developed by different companies for the decontamination of air systems.
    - Air sterilizer prototypes using ionization, electrostatic polarizing field and mechanical filtration
    - UVC combined with HEPA filters
    - Binary ionization of peroxide technology (BIT)
    - Prototype system for a tank-less “hot water generator” and UV water sterilizer for military, household and commercial use
    - The antimicrobial effects of instrumentation that combines both Far Infra Red (FIR) technology and standard UV treatment
- Tested new instrumentation developed by different companies for the detection of biothreat agents.
    - Custom aptamer array technology
    - Low frequency microwave circuits
    - UV/Visible spectrum technology