

## **BIOSAFETY IN THE MYCOBACTERIOLOGY LABORATORY**

Thomas M. Shinnick, Ph.D.

Chief Mycobacteriology Laboratory Branch, Centers for Disease Control and Prevention,  
Atlanta, Georgia, USA

Infections with *Mycobacterium tuberculosis* are a proven hazard to laboratory personnel as well as others who may be exposed to infectious aerosols in the laboratory. The risk of infection can be minimized through the application of the appropriate biosafety and containment principles and practices. Clinical specimens from suspected or known cases of tuberculosis are considered potentially infectious and must be handled with appropriate precautions. In the United States, Biosafety Level 2 practices and procedures, containment equipment, and facilities are recommended for non-aerosol-producing manipulations of clinical specimens. Aerosol-generating activities must be conducted in a Class I or II biological safety cabinet. Biosafety Level 3 practices, containment equipment, and facilities are recommended for laboratory activities in the propagation and manipulation of cultures of *M. tuberculosis* because of the increased risk associated with the larger number of bacteria present in a culture.

Currently, the risk of occupational infections from extensively drug-resistant (XDR) strains has not been shown to differ from that of non-resistant *M. tuberculosis* strains. Initially, BSL-2 practices and procedures, containment equipment, and facilities are required for non-aerosol-producing manipulations of clinical specimens. If samples are being received from a known or highly suspected source of XDR TB, BSL-2 with full BSL-3 practices are highly recommended for manipulations of the clinical specimens, including additional personal protective equipment and autoclaving of waste before leaving the laboratory. BSL-3 practices, containment equipment, and facilities with enhancements are required for laboratory activities in the propagation and manipulation of cultures of XDR TB. BSL-3 enhancements must include the use of respiratory protection, the implementation of specific procedures and use of specialized equipment to prevent and contain aerosols, and the autoclaving of laboratory waste before removal from the laboratory.

CDC/NIH Biosafety in Microbiological and Biomedical Laboratories, 5th Edition. (2007)

<http://www.cdc.gov/od/ohs/biosfty/bmb15/bmb15toc.htm>

Interim Laboratory Biosafety Guidance for Extensively Drug-Resistant (XDR) *Mycobacterium tuberculosis* strains. [http://www.cdc.gov/tb/XDRTB/BiosafetyGuidance\\_xdrtb.htm](http://www.cdc.gov/tb/XDRTB/BiosafetyGuidance_xdrtb.htm)