



## Microorganism Biosafety Levels

All microorganism products distributed by MicroBioLogics® have a biosafety level (BSL) of 1 or 2. MicroBioLogics® adheres to the BSL designation as determined by ATCC® for products where ATCC® supplies the source culture. MicroBioLogics adheres to the BSL designation as determined by the American Biological Safety Association (ABSA) or the Advisory Committee on Dangerous Pathogens (ACDP) for all other strains.

Responsibility for safe handling of biological agents ultimately rests with the user, and all infectious materials should be handled under the supervision of a competent and knowledgeable microbiologist.

Biosafety levels range from BSL-1 to BSL-4. BSL-4 is the most hazardous. Only BSL-1 and 2 are discussed here since MicroBioLogics only provides cultures with these designations.

**BSL-1** organisms have no, or low, risk to individuals and communities. BSL-1 organisms may cause disease in individuals with immune systems that are suppressed or compromised.

Laboratories using BSL-1 microorganisms should follow standard microbiological practices and must have a sink for hand washing and a laboratory bench. Gloves and protective clothing such as lab coats or uniforms are recommended.

**Standard microbiological practices** that should be followed in the laboratory are:

- Restrict access to laboratory when work is being conducted.
- Thoroughly wash hands before leaving the laboratory and after handling viable material.
- Do not eat, drink, store food, smoke or apply cosmetics in the laboratory.
- Tie back or restrain hair.
- Do not insert or remove contacts in the laboratory.
- Do not mouth- pipette.
- Dispose of sharps in a biohazardous, puncture-free container.
- Minimize splashes and aerosols. Wear eye protection when splashes are possible.
- Decontaminate work surfaces at end of work day.
- Decontaminate any spills of viable material.
- Decontaminate biohazardous waste. Follow local, state and federal regulations.
- Place a biohazard sign at the entrance to the laboratory.
- Maintain a rodent and insect control program.
- Train laboratory personnel on safe handling and risks of biohazardous material. Update training yearly.

**BSL-2** organisms pose a moderate risk of individual infection, but low risk of community infection. Laboratories using BSL-2 microorganisms should also follow standard microbiological practices and have a sink for hand washing. In addition follow these safety procedures:



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- Advise all personnel entering the laboratory of potential hazards.
- Provide a biosafety manual defining how to decontaminate biohazardous material.
- Train laboratory personnel on safe handling of biohazardous material.
- Place all hazardous material in a biohazardous container. Ensure that the container does not leak.
- Routinely decontaminate laboratory equipment.
- Do not permit animals or plants in the laboratory.
- Carry out procedures that splash or spray aerosols in a biological safety cabinet or other primary containment equipment.
- Wear gloves and protective clothing such as laboratory coats, gowns or uniforms. Remove gloves and protective clothing before leaving laboratory.
- Wear eye protection when splashes are possible.
- Provide an eyewash station.
- Provide a method for decontamination of laboratory wastes. For example, an autoclave may be used.

More information concerning handling of biohazardous material can be found at the web site of the CDC Office of Health and Safety at [www.cdc.gov/od/ohs/biosfty/biosfty.htm](http://www.cdc.gov/od/ohs/biosfty/biosfty.htm). The booklet, "Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5<sup>th</sup> Edition", can be downloaded at the site. There is also information about safe handling of some microorganism strains in this booklet. Examples are *Cryptococcus neoformans* and *Neisseria meningitidis*.

For further information on regulations governing biohazard waste (sometimes referred to as medical waste) visit the Environmental Protection Agency's Web site at <http://www.epa.gov/ebtpages/wastmedicalwaste.html>. Another helpful site is the web site of the CDC Office of Health and Safety at [www.cdc.gov/od/ohs/biosfty/biosfty.htm](http://www.cdc.gov/od/ohs/biosfty/biosfty.htm). Download the slide set entitled "Laboratory Waste Disposal Guidelines".

### References

CDC: 1999. Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5<sup>th</sup> Edition

[www.cdc.gov/od/ohs/biosfty/biosfty.htm](http://www.cdc.gov/od/ohs/biosfty/biosfty.htm)

Sutton, Scott. 2008. Biological Safety Cabinets. *PMF Newsletter*. 14(7):9-13.

Murray, Patrick, Editor. 2007. Manual of Clinical Microbiology, 9<sup>th</sup> Edition. pp.97-102.

Forbes, B. A., Sahm, D.F., Weissfeld, A. S. 2007. Bailey & Scott's Diagnostic Microbiology, 12<sup>th</sup> Edition. pp.49-58

ATCC®. Biosafety Levels. <http://www.atcc.org/BiosafetyLevels/tabid/660/Default.aspx>.