

WHAT DO THE BSL NUMBERS MEAN?

Biosafety Level	Appropriate for Types of Facilities	Applies for Types of Biological Agents	Safety Considerations (see <i>Biosafety in Microbiological and Biomedical Laboratories</i> , 4th Edition, HHS Publication 93-8395, May 1999.)
BSL-1	Educational	Strains of viable microorganisms not known to consistently cause disease in healthy adults.	
BSL-2	Clinical or Diagnostic	Moderate-risk agents that are present in the community and can cause disease of varying severity (for example, testing blood or body fluids of unknown infectivity for hepatitis B or salmonella).	Samples can be handled at the laboratory bench if the potential for producing splashes or aerosols is low. Scientists and technicians must wear splash shields, face protection, gowns, and gloves while using extra care with needles and glass, and they must decontaminate the work area and materials after each procedure. Biological Safety Cabinets (BSCs) are used to work with concentrated cultures or procedures that generate aerosols.
BSL-3	Clinical, Research, or Production	Indigenous or exotic agents that may cause serious or potentially lethal infection and have potential for respiratory transmission by personnel exposure to infectious aerosols (for example, <i>Mycobacterium tuberculosis</i> , the cause of tuberculosis, and <i>Coxiella burnetii</i> , the cause of Q fever).	BSL-3 laboratories are required to include BSCs, controlled double-door laboratory access, and engineering controls, including maintaining negative air pressure relative to the surrounding rooms (so that all air flow is directed into the BSL-3 suites, not out into the surrounding rooms); microfiltration of air; and air-lock buffer zones. As necessary, before an individual can begin work in a BSL-3 laboratory, he or she will be required to undergo special training and receive preventive vaccines. Operational safeguards to ensure that infectious agents are properly contained or destroyed include long-time, high-temperature decontamination of all materials produced in a BSL-3 suite.
BSL-4	Research	Dangerous or exotic agents that have a high risk of a life-threatening disease for which there is no available vaccine or therapy (for example, Ebola virus).	BSL-4 laboratories use all of the safety measures required for BSL-3 and more. A BSL-4 facility requires security measures to control access. Some BSL-4 laboratories may require personnel to use "space suits" with positive-pressure air supply. Decontamination is required of all materials produced in BSL-4 laboratories, either chemical decontamination or decontamination at high temperature for long periods.

There are three operational BSL4 laboratories in the United States, located at the CDC in Atlanta, GA, at Ft. Detrick in Frederick, MD, and in San Antonio, TX. There also is a small BSL4 facility in Bethesda, MD, that is in standby mode and not operational. NIAID is constructing a BSL4 laboratory at its Rocky Mountain Laboratories in Hamilton, Montana (<http://www.niaid.nih.gov/dir/info/bsl4/bsl4faq.htm>) and is funding the construction of two more BSL4 labs: one in Boston, MA, and one in Galveston, TX.