

Summary of recommended biosafety levels for infectious agents/materials



Level	Biological Agent/Material	Practices and Techniques	Safety Equipment	Facilities
BSL-1	Not known to cause disease in healthy adults	Standard microbiological practices	None required	Open bench top sink required
BSL-2	Associated with human disease, hazard = auto-inoculation, ingestion, mucous membrane exposure.	BSL-1 Practices Plus: <ul style="list-style-type: none"> ➤ Limited access ➤ Biohazard warning signs ➤ “Sharps” precautions ➤ Biosafety manual defining any needed waste decontamination or medical surveillance policies 	Primary barriers = Class I or II biosafety cabinets or other physical containment devices used for all manipulations of agents that cause splashes or aerosols of infectious materials; PPE; laboratory coats; gloves; face protection as needed	BSL-1 plus: <ul style="list-style-type: none"> ➤ Decontamination method available
BSL-3	Indigenous or exotic agents with potential for aerosol transmission; disease may have serious or lethal consequences.	BSL-2 Practices Plus: <ul style="list-style-type: none"> ➤ Controlled Access ➤ Decontamination of all waste ➤ Decontamination of lab clothing before laundering ➤ Baseline Serum 	Primary barriers = Class I or II biosafety cabinets or other physical containment devices used for all manipulations of agents; PPE; protective lab clothing; gloves; respiratory protection as needed	BSL-2 Plus: <ul style="list-style-type: none"> ➤ Physical separation from access corridors ➤ Self-closing double door access ➤ Exhausted air (not re-circulated) ➤ Negative airflow into laboratory
BSL-4	Dangerous/exotic agents which pose high risk of life-threatening disease, aerosol-transmitted lab infections; or related agents with unknown risk of transmission.	BSL-3 Practices Plus: <ul style="list-style-type: none"> ➤ Clothing change before entering ➤ Shower upon exiting ➤ All material decontaminated upon exiting facility 	Primary barriers = All procedures conducted in Class III biosafety cabinets or Class I or II biosafety cabinets in combination with full-body, air-supplied, positive pressure personnel suit	BSL-3 Plus: <ul style="list-style-type: none"> ➤ Separate building or isolated zone ➤ Dedicated supply/exhaust, vacuum, and decontamination systems ➤ Other requirements outlined in text

For additional information, consult *Biosafety in Microbiological and Biomedical Laboratories*, U.S. Department of Health and Human Services, 5th edition, 2009