

## TECHNICAL INFO: WHAT KINDS OF MICROBES REQUIRE DIFFERENT BIOSAFETY LEVELS?

### Adapted from:

The American Biological Safety Association: <<http://www.absa.org/resriskgroup.html>>  
CDC Biosafety in Microbiological and Biomedical Laboratories, 4<sup>th</sup> Ed <<http://www.cdc.gov/OD/OHS/biosfty/bmb14/bmb14toc.htm>>

### Microorganism Risk Group Designations

In many countries infectious agents are categorized in risk groups based on their relative risk. Depending on the country and/or organization, this classification system might take the following factors into consideration: [1] Pathogenicity of the organism, [2] Mode of transmission and host range, [3] Availability of preventive measures (e.g., vaccines), [4] Availability of treatment (e.g., antibiotics), [5] Other factors. Below are standards commonly used in the USA (See CDC reference):

- (1) BIOSAFETY LEVEL 1 is suitable for work involving well-characterized agents not known to cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment.
- (2) BIOSAFETY LEVEL 2 is similar to Level 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment.
- (3) BIOSAFETY LEVEL 3 is applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents which may cause serious or potentially lethal disease as a result of exposure by the inhalation route.
- (4) BIOSAFETY LEVEL 4 is required for work with dangerous and exotic agents which pose a high individual risk of aerosol-transmitted laboratory infections and life-threatening disease.

### Selected Microorganisms and Recommended Biosafety Levels

The listings below will identify organisms by their genus &/or species, with parentheses surrounding typical BSL categories appropriate for working with the organism. In some cases we identify common names or conditions in brackets for specific agents. Note that some microorganisms may be listed under more than one BSL category. This usually relates to the media or samples which are being addressed. For instance, working with infected individuals would rate a higher BSL category than would working with small amounts in cultures. Additionally, some agents will have different BSL recommendations by species or sub-group; we do not differentiate those here. This table is in no way a full listing of these agents. Interested readers are recommended to visit the CDC site above for more detail.

**Being on the below list DOES NOT imply that the microorganism will be studied at the NBAF; the list is for informational purposes only.**

#### Bacteria

Anthrax (2/3)  
Brucella (2)  
B pseudomallei [melliodosis] (2/3)  
C psittaci [psittacosis] (2/3)  
Clostridium [botulism, tetanus] (2)  
E coli, cytotoxin producing (2)  
F tularensis [tularemia] (2/3)  
Legionella (2/3)  
L monocytogenes [listeriosis] (2)  
M tuberculosis (2/3)  
Salmonella [non-typhi] (2)  
Salmonella typhi (2/3)  
Y pestis [plague] (2/3)

#### Viruses

Dengue (2)  
Ebola (4)  
Equine Enceph [E,W] (2)  
Equine Enceph [V] (3)  
Hantavirus (2/3/4)  
Hepatitis A,C,E (2)  
Influenza A (2)  
Japanese encephalitis (3)  
Lassa (4)  
Marburg (4)  
Rabies (2/3)  
Retroviruses [HIV/SIV] (2/3)  
Rift Valley Fever (3)

Vesicular Stomatitis (2/3)

West Nile (3)  
Yellow Fever (3)

#### Other

C burnetti [Q fever] (2/3)  
C immitis (2)  
H capsulatum (2/3)  
Prions, animal [Scrapie/CWD] (2)  
Prions, human [CJD/BSE] (2/3)  
Rickettsia, most (2/3)