

# **BIOHAZARDOUS AGENTS REQUIRING TTUHSC Institutional Safety Committee (IBC) PROTOCOL REGISTRATION**

**INSTRUCTIONS:** When registering hazardous biological or chemical agents, the IBC Protocol Registration Application form must be completed first. Please contact the IBC administrator in the Research Integrity Office (RIO) for the latest IBC forms in iRIS. For any biological agent found on this list, **Addendum A** of the IBC Registration must **also** be completed and submitted for review.

**DEFINITION:** The IBC defines “biohazardous materials” as all infectious organisms (bacteria, fungi, parasites, prions, rickettsiae, viruses) that can cause disease in humans or cause significant environmental or agricultural impact, in addition to all human or non-human primate tissues, fluids, and primary cell lines, all transgenic animals and plants, recombinant DNA, and all natural or genetically-engineered human and animal cell lines that are pathogenic to humans.

CDC/NIH/USDA “select agents” are highlighted in **green** for quick reference. The federal government decides which agents are at high risk of being used in terrorist activities and refers to them as “select agents”. Select agents can either be pathogens (listed below) or biological toxins. Even though biological toxins are derived from animals and plants, they are included in the highly hazardous chemical list because they have no pathogenic potential. NOTE: All manipulations of select agents at TTUHSC must be in accordance with institutional policy 73.12. You may find the policy at this link: <http://www.ttuhs.edu/HSC/OP/OP73/op7312.pdf>

**NOTE:** The following list should be used as a reference and does not necessarily reflect ALL BSL-2 and higher agents or materials that require IBC protocol approval.

**NOTE:** BSL-1 and non-hazardous biological agents will be exempt from IBC protocol registration, as described above. However, a complete inventory list of biologicals must be submitted to the IBC before any use of these materials will be approved.

**NOTE:** If you are registering for the first time, you should submit a *proposed* biological inventory for the year.

These materials require an approved IBC protocol for possession or use\*

## **HUMAN and non-HUMAN PRIMATE MATERIALS**

- Primary cell lines \*\*
- Blood or blood products
- Fluids surrounding internal organs, the joints, or a fetus and semen or vaginal secretions
- Any body fluids contaminated with visible blood
- Any tissues (unfixed)

- \* Before possession or use of these materials, investigators must have an IBC-approved protocol and either an approved Institutional Review Board (IRB) protocol or an approved IRB exemption. Contact Sponsored Programs for further information.
- \*\* BSL-1 materials are exempt. Contact Laboratory Safety Services (743-2597) for other possible exemptions.

## **BIOSAFETY LEVEL II AGENTS**

BSL II agents are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are *often* available.

## Bacterial Agents

- Acinetobacter baumannii* (formerly *Acinetobacter calcoaceticus*)
- Actinobacillus*
- Actinomyces pyogenes* (formerly *Corynebacterium pyogenes*)
- Aeromonas hydrophila*
- Amycolata autotrophica*
- Archanobacterium haemolyticum* (formerly *Corynebacterium haemolyticum*)
- Arizona hinshawii* - all serotypes
- Bacillus anthracis***
- Bartonella henselae*, *B. quintana*, *B. vinsonii*
- Bordetella* including *B. pertussis*
- Borrelia recurrentis*, *B. burgdorferi*
- Burkholderia* (formerly *Pseudomonas* species) except those listed in BSL III)
- Campylobacter coli*, *C. fetus*, *C. jejuni*
- Chlamydia psittaci*, *C. trachomatis*, *C. pneumoniae*
- Clostridium botulinum*** (neurotoxin producing species), ***Clostridium botulinum neurotoxins***, *Cl. chauvoei*, *Cl. haemolyticum*, *Cl. histolyticum*, *Cl. novyi*, *Cl. septicum*, *Cl. Tetani*, ***Cl. Perfringens epsilon toxin***
- Corynebacterium diphtheriae*, *C. pseudotuberculosis*, *C. renale*
- Dermatophilus congolensis*
- Edwardsiella tarda*
- Erysipelothrix rhusiopathiae*
- Escherichia coli* - all enteropathogenic, enterotoxigenic, enteroinvasive and strains bearing K1 antigen, including *E. coli* O157:H7
- Haemophilus ducreyi*, *H. influenzae*
- Helicobacter pylori*
- Klebsiella* - all species except *K. oxytoca* (RG1)
- Legionella* including *L. pneumophila*
- Leptospira interrogans* - all serotypes
- Listeria*
- Moraxella*
- Mycobacterium* (except those listed in BSL III) including *M. avium* complex, *M. asiaticum*, *M. bovis* BCG vaccine strain, *M. chelonae*, *M. fortuitum*, *M. kansasii*, *M. leprae*, *M. malmoense*, *M. marinum*, *M. paratuberculosis*, *M. scrofulaceum*, *M. simiae*, *M. szulgai*, *M. ulcerans*, *M. xenopi*
- Mycoplasma*, except *M. mycoides* and *M. agalactiae* which are restricted animal pathogens
- Neisseria gonorrhoeae*, *N. meningitidis*
- Nocardia asteroides*, *N. brasiliensis*, *N. otitidiscaviarum*, *N. transvalensis*
- Rhodococcus equi*
- Salmonella* including *S. arizonae*, *S. choleraesuis*, *S. enteritidis*, *S. gallinarum-pullorum*, *S. meleagridis*, *S. paratyphi*, A, B, C, *S. typhi*, *S. typhimurium*
- Shigella* including *S. boydii*, *S. dysenteriae*, type 1, *S. flexneri*, *S. sonnei*
- Shiga-like ribosome inactivating proteins**
- Sphaerophorus necrophorus*
- Staphylococcal enterotoxins**
- Staphylococcus aureus*
- Streptobacillus moniliformis*
- Streptococcus* including *S. pneumoniae*, *S. pyogenes*
- Treponema pallidum*, *T. carateum*

- Vibrio cholerae*, *V. parahemolyticus*, *V. vulnificus*
- Yersinia enterocolitica*

### **Fungal Agents**

- Blastomyces dermatitidis*
- Cladosporium bantianum*, *C. (Xylohypha) trichoides*
- Cryptococcus neoformans*
- Dactylaria galopava (Ochroconis gallopavum)*
- Epidermophyton*
- Exophiala (Wangiella) dermatitidis*
- Fonsecaea pedrosoi*
- Microsporium*
- Paracoccidioides braziliensis*
- Penicillium marneffeii*
- Sporothrix schenckii*
- Trichophyton*

### **Parasitic Agents**

- Ancylostoma* human hookworms including *A. duodenale*, *A. ceylanicum*
- Ascaris* including *Ascaris lumbricoides suum*
- Babesia* including *B. divergens*, *B. microti*
- Brugia* filaria worms including *B. malayi*, *B. timori*
- Coccidia*
- Cryptosporidium* including *C. parvum*
- Cysticercus cellulosae* (hydatid cyst, larva of *T. solium*)
- Echinococcus* including *E. granulosus*, *E. multilocularis*, *E. vogeli*
- Entamoeba histolytica*
- Enterobius*
- Fasciola* including *F. gigantica*, *F. hepatica*
- Giardia* including *G. lamblia*
- Heterophyes*
- Hymenolepis* including *H. diminuta*, *H. nana*
- Isospora*
- Leishmania* including *L. braziliensis*, *L. donovani*, *L. ethiopia*, *L. major*, *L. mexicana*, *L. peruviana*, *L. tropica*
- Loa loa* filaria worms
- Microsporidium*
- Naegleria fowleri*
- Necator* human hookworms including *N. americanus*
- Onchocerca* filaria worms including, *O. volvulus*
- Plasmodium* including simian species, *P. cynomologi*, *P. falciparum*, *P. malariae*, *P. ovale*, *P. vivax*
- Sarcocystis* including *S. sui hominis*
- Schistosoma* including *S. haematobium*, *S. intercalatum*, *S. japonicum*, *S. mansoni*, *S. mekongi*
- Strongyloides* including *S. stercoralis*
- Taenia solium*
- Toxocara* including *T. canis*
- Toxoplasma* including *T. gondii*
- Trichinella spiralis*
- Trypanosoma* including *T. brucei brucei*, *T. brucei gambiense*, *T. brucei rhodesiense*,

*T. cruzi*

--*Wuchereria bancrofti* filaria worms

## Viruses

Adenoviruses, human - all types

Alphaviruses (Togaviruses) - Group A Arboviruses

--Eastern equine encephalitis virus

--Eastern equine encephalomyelitis virus

--Venezuelan equine encephalomyelitis vaccine strain TC-83

--Western equine encephalomyelitis virus

Arenaviruses

--Lymphocytic choriomeningitis virus (non- neurotropic strains)

--Tacaribe virus complex

-- Bunyaviruses

--Bunyamwera virus

--Rift Valley fever virus vaccine strain MP-12

-- Calciviruses

Coronaviruses

Flaviviruses (Togaviruses) - Group B Arboviruses

--Dengue virus serotypes 1, 2, 3, and 4

--Yellow fever virus vaccine strain 17D

-- Hepatitis A, B, C, D, and E viruses

Herpesviruses - except Herpesvirus simiae (Monkey B virus see BSL IV - *Viral Agents*)

--Cytomegalovirus

--Epstein Barr virus

--*Herpes simplex* types 1 and 2

--*Herpes zoster*

--Human herpesvirus types 6 and 7

Orthomyxoviruses

--Influenza viruses types A, B, and C

-- Papovaviruses

--All human papilloma viruses

Paramyxoviruses

--Newcastle disease virus

--Measles virus

--Mumps virus

--Parainfluenza viruses types 1, 2, 3, and 4

--Respiratory syncytial virus

Parvoviruses

--Human parvovirus (B19)

Picornaviruses

--Coxsackie viruses types A and B

--Echoviruses - all types

--Polioviruses - all types, wild and attenuated

--Rhinoviruses - all types

Poxviruses - all types except Monkeypox virus (see BSL III - *Viruses and Prions*) and restricted

poxviruses including Alastrim (*Variola minor virus*), Smallpox (*Variola major virus*), and

Whitepox Reoviruses - all types including Coltivirus, human Rotavirus, and Orbivirus

(Colorado tick fever virus)

Rhabdoviruses

- Rabies virus - all strains
- Vesicular stomatitis virus - laboratory adapted strains including VSV-Indiana, San Juan, and Glasgow
- Togaviruses (see Alphaviruses and Flaviviruses)
- Rubivirus (rubella)

### **BIOSAFETY LEVEL III AGENTS**

BSL III agents are associated with serious or lethal human disease for which preventive or therapeutic interventions *may be* available.

#### **Bacterial Agents**

- Bartonella*
- Brucella* including *B. abortus*, *B. canis*, *B. suis*, *B. melitensis*
- Burkholderia (Pseudomonas) mallei*, *B. pseudomallei*
- Coxiella burnetii*
- Francisella tularensis*
- Mycobacterium bovis* (except BCG strain, BSL II - *Bacterial Agents Including Chlamydia*), *M. tuberculosis*
- Pasteurella multocida* type B - "buffalo" and other virulent strains
- Rickettsia akari*, *R. australis*, *R. canada*, *R. conorii*, *R. prowazekii*, *R. rickettsii*, *R. siberica*, *R. tsutsugamushi*, *R. typhi* (*R. mooseri*)
- Yersinia pestis*

#### **Fungal Agents**

- Coccidioides immitis* (sporulating cultures; contaminated soil)
- Coccidioides posadasii*
- Histoplasma capsulatum*, *H. capsulatum* var.. *duboisii*

#### **Parasitic Agents**

None

#### **Viruses and Prions**

Alphaviruses (Togaviruses) - Group A Arboviruses

- Semliki Forest virus
  - St. Louis encephalitis virus
  - Venezuelan equine encephalitis virus
  - Venezuelan equine encephalomyelitis virus (except the vaccine strain TC-83)
- Arenaviruses (aka South American Haemorrhagic Fever virus; also see BSL IV)

- Flexal
- Lymphocytic choriomeningitis virus (LCM) (neurotropic strains)

Bunyaviruses

- Hantaviruses including Hantaan virus
- Rift Valley fever virus

Flaviviruses (Togaviruses) - Group B Arboviruses

- Japanese encephalitis virus
- Yellow fever virus
- Poxviruses
- Monkeypox virus

## Prions

- Transmissible spongiform encephalopathies** (TME) agents (Creutzfeldt-Jacob disease and kuru agents, (BSE) Bovine spongiform encephalopathy agent)
- West Nile virus

## Retroviruses

- Human immunodeficiency virus (HIV) types 1 and 2
- Human T cell lymphotropic virus (HTLV) types 1 and 2
- Simian immunodeficiency virus (SIV)

## Rhabdoviruses

- Vesicular stomatitis virus
- SAR-associated coronavirus (SARS-CoV)**

## **BIOSAFETY LEVEL IV AGENTS**

BSL IV agents are likely to cause serious or lethal human disease for which preventive or therapeutic interventions are *not usually* available.

### **Bacterial Agents**

None

### **Fungal Agents**

None

### **Parasitic Agents**

None

### **Viral Agents**

Arenaviruses (aka South American Haemorrhagic Fever viruses; also see BSL III)

- Guanarito virus**
- Lassa fever virus**
- Lujo virus**
- Junin virus**
- Machupo virus**
- Sabia**

Bunyaviruses (Nairovirus)

- Crimean-Congo hemorrhagic fever virus**

Filoviruses

- Ebola viruses**
- Marburg virus**

Flaviruses (Togaviruses) - Group B Arboviruses

- Tick-borne encephalitis virus complex (flavi) including Central European tick-borne encephalitis, Far Eastern tick-borne encephalitis, Hanzalova, Hypr, Kumlinge, Kyasanur Forest disease, Omsk hemorrhagic fever, and Russian Spring Summer encephalitis viruses**

Herpesviruses (alpha)

- Herpesvirus simiae (Herpes B or Monkey B virus)
  - Cercopithecine herpesvirus 1 (Herpes B virus)**

Paramyxoviruses

- Equine morbillivirus (Hendra and Hendra-like viruses)**
- Nipah virus**

Poxviruses

--Variola major virus (Smallpox virus)

Hemorrhagic fever agents and viruses as yet undefined

**USDA HIGH CONSEQUENCE LIVESTOCK PATHOGENS AND TOXINS (Non-overlap agents and toxins)**

**Fungal Agents**

--*Mycoplasma capricolum* / M.F38/*M. mycoides capri* (contagious caprine pleuropneumonia)

--*Mycoplasma mycoides mycoides* (contagious bovine pleuropneumonia)

**Viral agents BSL3 and BSL4(Arenaviruses, Arboviruses, Flaviviruses)**

--African swine fever virus

--African horse sickness virus

--Akabane virus

--Avian influenza virus (highly pathogenic)

--Blue tongue virus (exotic)

--Bovine spongiform encephalopathy agent

--Camel pox virus

--Classical swine fever virus

--*Cowdria ruminantium* (heartwater)

--Foot and mouth disease virus

--Goat pox virus

--Japanese encephalitis virus

--Lumpy skin disease virus

--Malignant catarrhal fever virus

--Menangle virus

--Newcastle disease virus (VVND)

--Peste Des Petits Ruminants virus

--Rinderpest virus

--Sheep pox virus

--Swine vesicular disease virus

--Vesicular stomatitis virus (exotic)

**Listed Plant Pathogens**

--*Liberobacter africanus*

--*Liberobacter asiaticus*

--*Peronosclerospora philippinensis*

--*Phakopsora pachyrhizi*

--Plum Pox Potyvirus

--*Ralstonia solanacearum* race 3, biovar 2

--*Schlerophthora rayssiae* var *zeae*

--*Synchytrium endobioticum*

--*Xanthomonas oryzae*

--*Xylella fastidiosa* (citrus variegated chlorosis strain)