

AGENT CLASSIFICATION EXERCISE

Please identify a biological safety level and outline key risk assessment and risk management considerations for one of the proposed projects detailed below. Your response should include consideration of the risk assessment information that you've received during the class, including the following information:

- a) pathogen, recommended Biosafety Level
- b) procedures (proposed experimental procedures and safe work practices, identification of the appropriate disinfectant, etc.);
- c) personnel (safety training and work experience);
- d) protective equipment (clothing and safety equipment/engineering controls);
- e) place (facility design); and
- f) emergency response information (exposures, spills)

1) A laboratory technician has been asked to begin homogenizing rabid goat brains with a blender in the laboratory. He will also transfer aliquots of the homogenate into various containers for different researchers in the Rabies laboratory, which will be used in cell culture experiments.

2) A researcher has been asked to inoculate hamsters with the agent that causes Bovine Spongiform Encephalopathy, which will be sent to her laboratory from England. The hamsters will be maintained until

death, then necropsied to harvest brain and other tissues for isolation of the agent back in the laboratory.

- 3) An epidemiologist has contacted you for assistance with an upcoming field project in Gabon, Africa, where he would like to trap small animals, and harvest their tissues for shipment to a maximum containment laboratory in South Africa. The goal of the field study is to identify a potential reservoir for the Ebola virus.

- 4) A post-doctoral fellow has obtained a brain sample from a Cercopithecine herpesvirus-1 (Herpesvirus simiae, B-virus) positive Rhesus monkey. The monkey was asymptomatic at time of euthanization. The researcher will utilize a hand-made open-air tissue oxygenator that bubbles an O₂ gas mixture through the bath containing the tissue. Tissue samples will be kept viable with this system for 12 hours in order to photograph firing neurons. He will periodically slice the tissue with a microtome and mount slides for photography at the microscope.

- 5) An investigator has proposed recombinant experiments with *Toxoplasma gondii* that will utilize selection markers for drug resistance to pyrimethamine and sulfa drugs. The project will involve both in vitro work to prepare the vector and in vivo work in mice to express the recombinant *T. gondii* and genes of interest. All stages of the parasite will be handled by the lab during the experiment.
- 6) A toxicologist has been asked to assist with the analysis of a new toxin responsible for massive fish kills in mid-Atlantic coastal waterways. The toxin, associated with the dinoflagellate *Pfiesteria piscicida*, has also had effects on humans, with physicians reporting confirmed symptoms that include blurred vision, skin lesions, significant CNS impairment, asthma-like distress, and compromised immunity. These symptoms have been noted in marine biologists investigating the incident and also among citizens observing the biologists from bridges located above the pools of dead fish. Water, fish, soil, and seaweed samples have been collected and will be sent to the toxicologist for help in characterizing the life cycle of the dinoflagellate. Fish and algal bioassays are proposed to examine the effects of the toxin.

- 7) A research group has proposed an experiment involving the use of a recombinant Vaccinia virus containing the HIV gp120 envelope protein. Both in-vitro and in-vivo experiments with mice and rabbits will be performed to generate antibodies in the animals.

- 8) A researcher has proposed to trap mice (*peromyscus*), skunks, raccoons, possum and other small mammals at remote field stations in Rhode Island, Connecticut, and New York for collection of ticks. These animals will also be returned to the University and sampled for the presence of tick-borne diseases (Lyme, *Borrelia*, Ehrlichiosis, and Rocky Mountain Spotted Fever).

- 9) An MPH/Ph.D. student has proposed to isolate Dengue virus from serum of macaques from Sri Lanka (*Macaca sinica*). Samples will be shipped from Sri Lanka to the University for the project. The serum will be added to C6/36 cells, and incubated at 28 C. After 10 days, cells will be mounted on slides, fixed with acetone, and examined for the presence of inactivated Dengue virus antigen.

- 10) The Health Center's Microbiology Lab has announced that they will begin evaluating samples for the presence of Mycobacterium tuberculosis (Mtb). A concerned employee has alerted your Committee that they will be performing this work, which will involve the preparation of acid-fast bacilli (AFT) smears and culturing sputum or other clinical specimens potentially containing Mtb. The employee has requested an evaluation of their laboratory to ensure all possible precautions have been taken to minimize exposure. Use the 5 risk assessment parameters to outline the program components that should be in place before moving forward with this work.

