Biological Agent Use Authorization

Description of Project

A. Objectives of project: The main goal of this research is to understand how cells sense and respond to external stimuli that lead to an alteration in behavior and morphology. To address this basic biological question, my lab will be focusing on how the social bacterium, Myxococcus xanthus recognizes nutrient deprivation and initiates a program of gene expression that leads to the formation of a multicellular structure called a fruiting body. Inside this multicellular structure vegetative rod shaped cells differentiate into environmentally resistant myxospores. Specifically, my laboratory will focus on the perception of and the transmission of environmental signals that initiate this process. To carry out this project personnel in my laboratory will be doing experiments that will expose them to radiation and chemical hazards. Potential sources of hazards will include:

1) Exposure to mutagens to isolate mutations, this may expose the researcher to some potential chemical and/or radiation hazards,
2) Exposure to radiation for the purpose of DNA, RNA, and/or protein analysis.
3) Exposure to some chemical hazards for the purpose of DNA, RNA and/or protein purification pruification and analysis.

B. Determination of the real and potential biohazards of the project: The experimental organism, *Myxococcus xanthus*, is a common non-pathogenic Gram-negative soil bacterium and represents no biological hazard. For the purposes of cloning and other molecular techniques only non-pathogenic *Escherichia coli* K-12 strains and non-pathogenic *Saccharomyces cerevisiae* strains will be used. However, this project will expose researchers to some potential radiation and chemical hazards.

C. Description of microbiological practices and laboratory techniques: Standard microbiological techniques will be employed for the culturing, transfer and manipulation of all bacteria cultures. This includes:

1) All cultures will be grown in closed containers
2) Mechanical pipetting devices will be used to transfer cultures, mouth pipetting will be strictly forbidden.
3) Plates containing recombinant material will be autoclaved before disposal.
4) Liquid cultures will be decontaminated by adding 10% bleach and/or commercially available antimicrobial disinfectants.
5) Work surfaces will be decontaminated by using 70% ethanol, commercially available disinfectants and/or dilute detergent.

D. Techniques and methods to assure containment: No special precautions are required because all of the bacteria or yeast strains are non-pathogenic. Standard sterile techniques will be required for the handling of all microbial cultures.

E. Personal protective clothing and equipment: Lab coats, safety glasses, face shields, and gloves will be worn for all experiments involving radioactive and/or chemical hazards. Particulate face masks will be worn when appropriate. Lucite shielding will be used for all experiments involving radioactive hazards.

F. Method of terminal inactivation of biological agent and location of autoclave: All liquid grown cultures will be treated with either 10% bleach and/or commercially available antimicrobials, prior to disposal. All culture plates will be autoclaved to 121 degrees centigrade for 30 min. before disposal. Autoclave indicator tape will used to ensure sterilization. The autoclaves are located in room 270 Hutchison Hall. Radioactive material will be disposed of in appropriately marked containers for either liquid or dry waste and kept behind Lucite shielding. Sharp objects, *e.g.* razor blades, glass, hypodermic syringes etc. will be disposed into appropriately marked sharps containers. A separate radioactive sharps container will be provided.

G. Emergency procedures:

1. Spills, accidental ingestion, inhalation or other incidents: All spills will be immediately cleaned and the contaminated area treated with 10% bleach. The accidental inhalation or ingestion of the bacteria or yeast cultures requires no special precautions because the strains are non-pathogenic.
2. Natural disasters, fire or power failure. No special precautions are required in the case of natural disasters, fire or power failure due to the non-pathogenic nature of the organisms used. Standard emergency procedures will include to contact the PI as soon as the appropriate emergency personnel have been informed.

H. Special requirements for animals: No animal handling will be by done by laboratory personnel.