Exercise 11

Biosafety and Biosecurity

Introduction

History has taught us to improve the working conditions in our laboratory to prevent the occurrence of laboratory acquired infections and/or potential misuse of research products or information. One of these safe guards include the review and monitoring of a research by the Institutional Biosafety and Biosecurity Committee (IBBC) where the it is being undertaken. In our current modern world where information can literally travel at the speed of light, there is much concern of the availability of the results to the public because of potential dual use of every data set. Because of this, a study that has intention for publication maybe require to get a biosafety and/or biosecurity clearance before the study to be conducted. This is to identify that the mitigation steps are effective to lower the risk of problems occurring to acceptable levels.

Objectives:

1. To be able to identify the biosafety and/or biosecurity risk concerns of each study.
2. To be able to recommend mitigations to identified biosafety and/or biosecurity risk.
3. To be able to determine the acceptability of risk of each case study.

Activities:

Each group will be given a study description and location of where the study will be conducted. To help you in developing a risk assessment, answer the following guide questions:

* + What is the risk group classification of the organism used? Refer to Pathogenicity Safety and Data Sheet? Are these human, animal or environmental isolates?
  + What is/are methods used on the organism or biological material?
  + What is the competency of the primary investigator and associates?
  + Is there genetic alteration being conducted?
  + Is the organism a common or foreign to the local environment?
  + What is the peace and order situation around the area of the laboratory?

1. Identify the different types of risk or threat present in each case and recommend one or more mitigation to lower the problem to acceptable levels. Make an overall decision on whether you would allow the research to proceed to experimentation .

**Case 1: wrong organism and procedure**

A teaching laboratory would like to conduct a pathogenicity challenge study involving human isolates of MTB by having cultures inoculated by aerosol to several mice kept in the same laboratory. The primary investigator has an excellent track record as a researcher and proficient in the lab procedures. The laboratory is located in an urban area in the Philippines. Their personal protective equipment is as follows: lab gown, medical face mask, latex gloves and plastic goggles.

**Case 2: Genetic Manipulation**

In an effort to increase the production of botulinum toxin for use in the cosmetic industry (botox) a proposal was sent to a prestigious university with a BSL2 andBSL3 laboratory. There are also a good number of established and highly skilled researchers in the institution that can work on the proposal. The general idea is to isolate the gene for protein toxin botulinum and insert it to a fast growing bacterium of *Escherichia coli* isolated from a human gut sample. Once successful, the GMO *Escherichia coli* be used in industrial scale production. The available personal protective equipment are laboratory gowns and latex gloves.

**Case 3:**

A group of science high school students wanted to conduct an antibiotic resistance profile of *Bacillus anthracis* isolates from Palawan. The laboratory to be used is within their campus in a rural setting and is currently classified as a BSL1 lab. To facilitate learning, the handling and manipulation of the microorganism will be done by the students with the adviser as their lab mentor. The personal protective equipment available are laboratory gown, latex gloves, N95 mask and face shield.

**Case 4:**

In an effort to fast track researches into the Ebola virus, a new BSL4 laboratory is planned to be constructed in the city of Zamboanga. Cultures will be brought in from Africa and the researchers from different corners of the globe, each one with a recognized track record in research of infectious diseases. Only small batches will be used for studies involving genetics, molecular biology and protein enzymology. The personal protective equipment is complete and readily available. The lab is in a single wall compound protected by a local security firm.

**Output:**

* Answers to guide questions
* Listing of identified potential biosafety/biosecurity risk
* Analysis of case study
* Recommendations