OVERVIEW

We understand the inherent risks of working in a biological lab, thus we take all necessary precautions to make sure no personal or environmental harm occurs. Our safety instructions and procedures are described below.

SAFETY CONCERNS

Laboratory Safety: Our project involves the usage of ethidium bromide, a DNA-intercalating agent that may potentially cause carcinogenic or teratogenic effects, as well as the use of UV light, for visualization of gel electrophoresis. The culture media were supplemented with antibiotics, which could be harmful to humans and environments in large doses. We also have to work with an open flame on the benchtop, because we use ethanol lamps to maintain a sterile environment.

Environmental Safety: If biological materials escape from the lab, there is a risk of transferring antibiotic resistance from our engineered strains into other organisms. The ozone used to induce oxidative stress in plants could escape to the environment and endanger animal and plant life.

Pathogens in Lab: We are mainly working with *E. coli* in the lab. *E. coli* has been widely used for molecular cloning and protein expressing purposes, but is also found in the human gut flora. We also work with cyanobacteria which may produce toxins that affect animals and humans. Both bacteria are categorized as Biosafety Level 1.

Chemicals in Lab: We plan to study microcystin degradation. Microcystin is hepatotoxic, it covalently bonds to and inhibit protein phosphatases PP1 and PP2A and can thus cause pansteatitis.

SAFETY PROTOCOL

All the participants received safety training and passed the safety test before start working in the lab area. Additional specific safety protocol include:

1. All lab members wear nitrile gloves, closed-toe shoes, and use eye protection goggle when working with volatile chemicals or UV light.

2. Gloves should be replaced and hands are washed immediately after using ethidium bromide or any of the toxic chemicals.

3. When working with a new reagent or piece of equipment, lab manager or experienced member should always be present to assist.

4. There are designated areas for working with ethidium bromide. These areas are cleaned before and after work.

5. All toxic waste is placed in a specialized container and is picked up and disposed of by Environmental Health and Safety staff.

6. All biohazard waste should be autoclaved before it is disposed of as regulated biological waste.

SAFE LABORATORY CONDITIONS

The laboratory our team relied on is located in the Shanghai Institute of Materia Medica, which has received GLP certificate from China Food and Drug Administration. The laboratory is well equipped and strictly supervised under experienced PI, making it possible to perform all the experiments in a bio-safety manner.