Risk Assessment Form (3)

Must be completed before experimentation.

Student's Name(s) Samantha Chen and Emma Wang

Title of Project The Creation and Optimization of a Plant Microbial Fuel Cell for Energy Generation with Brassica rapa

To be completed by the Student Researcher(s) in collaboration with Designated Supervisor/Qualified Scientist:
(All questions must be answered; additional page(s) may be attached.)

1. List all hazardous chemicals, activities, or devices that will be used; identify microorganisms exempt from pre-approval (see Potentially Hazardous Biological Agent rules).

   1 liter 10% Sodium hypochlorite, 16 ounces 70% Isopropyl Alcohol, Speedway 3/8" Variable Speed Reversible Drill Model# 45137, PVC Cutter Armour Line Model# RP77131, Autoclave, Bunsen Burner, E.coli k-12

2. Identify and assess the risks involved in this project.

   Sodium hypochlorite is classified as Category 1B skin corrosion, Category 1 serious eye damage and Category 1 acute aquatic toxicity. Isopropyl alcohol is a Category 2 flammable liquid, Category 2A irritant, and Category 3 specific organ toxicity when swallowed. The Speedway 3/8fl Variable Speed Reversible Drill Model #45137 is a power tool that functions at high speed and is connected to electricity, and can cause damage to human tissue or surrounding material if not used with caution, or may result in serious personal injury if instructions are not followed. The PVC Cutter Armour Line Model #RP77131 has a sharp blade, and can cause serious injury if not handled with caution and care. The autoclave functions at high temperatures, and the bunsen burner has a flame; these devices can cause injury if not handled with extreme caution. E.coli k-12 is non pathogenic (BSL-1).

3. Describe the safety precautions and procedures that will be used to reduce the risks.

   When handling these chemicals or devices, a certified research mentor or teacher will be present to supervise, and there will be no food or drink in the working space. When handling sodium hypochlorite and isopropyl alcohol, a lab apron, nitrile gloves and goggles will also be worn to avoid contact with skin and eyes. Hands will also be washed before and after handling the chemical. 70% isopropyl alcohol will be stored in the locked flammable liquids cabinet when not in use. When using using the Speedway drill, goggles, aprons and gloves will be worn to avoid any debris. The device will also be used in a well lit, clutter free area away from any liquids to avoid any potential accidents. The device will be unplugged before any adjustments are made to it, and switches will be in the off position before any handling or movement of the device. Instructions in the user manual will be followed and the cord will be kept away from heat, sharp edges or moving parts, as well as in an area where it will not be a trip hazard.

4. Describe the disposal procedures that will be used (when applicable).

   Excess sodium hypochlorite and excess isopropyl alcohol will be disposed by a licensed disposal plant and the E.coli will be bleached with 10% bleach solution, parafilmed and disposed of. All soil exposed to E.coli k-12 will be exposed to 10% bleach, soaked, sealed and disposed of.

5. List the source(s) of safety information.

   Sigma Aldrich, Home Depot, New England Bio Labs

To be completed and signed by the Designated Supervisor (or Qualified Scientist, when applicable):
I agree with the risk assessment and safety precautions and procedures described above. I certify that I have reviewed the Research Plan/Project Summary and will provide direct supervision.

Alison Huenger	Alison Huenger	10/01/19
Designated Supervisor's Printed Name	Signature	Date of Review (mm/dd/yy)

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Stem research specialist - Manhasset High School	Alison_Huenger@manhassetschools.org
Position & Institution	Phone or email contact information

degrees in chemistry and biology - worked at Stony Brook University Biotechnology camp and part experience of a Chemical engineer

Experience/Training as relates to the student's area of research

Alan Hyun 10/01/19

Samantha Chen and Emma Wang

The Creation and Optimization of a Plant Microbial Fuel Cell for Energy Generation with *Brassica rapa*

From 3 Risk Assessment Continuation

Question 3

For the PVC, gloves, goggles and aprons will be worn to avoid debris. When not in use, the device will be closed and the handle will be held shut with safety clips. Heat-protective gloves, goggles and aprons will be worn while using the autoclave and nitrile gloves, goggles and aprons while using the Bunsen burner, with long hair tied back and no loose articles of clothing worn. All chemicals and devices will be handled with extreme caution. All devices will be turned off and/or put away when not in use. E.coli k-12 is a non-pathogenic, BSL-1 bacteria. Students will be taught sterile technique and proper safety procedures for working with bacteria prior to working with E.coli k-12. Gloves, goggles and aprons will be worn when using the E.coli k-12. Hands will be washed with soap and water before and after experimentation. Surfaces will be sterilized with 10% bleach before and after using the bacteria.