

## Risk Assessment Form (3)

Must be completed before experimentation.

Student's Name(s) Jude Tomas and Kelvin Cheng

Title of Project \_\_\_\_\_

Regulation of a Temperature-Induced Lipocalin (TIL) by Cold Stress and Epibrassinolide in the Gametophytes of Ceratopteris richardii

**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).  
C-Fern Agar/Liquid C-Fern, Invitrogen SuperScript® III Platinum® One-Step RT-PCR Kit, 24-epibrassinolide, Agarose gel, Wash Solution #1, #2/#3, Elution buffer.
2. Identify and assess the risks involved in this project.  
The aforementioned substances/mixtures may cause eye, skin, and respiratory irritation and can cause gastrointestinal discomfort if swallowed, and there is more than minimal risk that it can be potentially harmful if inhaled, absorbed through skin, or when in contact with the eyes, causing irritation; potentially harmful if swallowed.
3. Describe the safety precautions and procedures that will be used to reduce the risks.  
We will wear gloves, goggles, lab coats, and use the fume hood when necessary. Face masks will be used when handling chemicals that are hazardous with inhalation. Mentor handles safety precaution training, hazardous chemicals, and will assist with the use of potentially harmful equipment.
4. Describe the disposal procedures that will be used (when applicable).  
Hazardous and organic chemicals will be stored in hazardous and organic chemical waste containers to be properly disposed by the Chemical safety officer. Most other chemicals are safe to dispose of down the drain diluted with water according to manufacturer's instructions.
5. List the source(s) of safety information.  
SigmaAldrich  
Thermo Fisher Scientific  
Fischer Scientific  
Carolina Biological Supply

**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.

Terrence Bissoondial

Designated Supervisor's Printed Name

Signature

5/24/2019  
Date of Review (mm/dd/yy)

Research Coordinator of George W. Hewlett High School

Position & Institution

516-425-9991

Phone or email contact information

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

**Risk and Safety:**

Material Safety Data Sheets from US Research Nanomaterials, Cayman Chemicals, Sigma Aldrich, ThermoFisher Scientific, and Carolina Biological were used to assess the hazards of the chemicals that will be used.

**C-Fern Agar/Liquid C-Fern** - more than minimal risk may cause eye, skin, and respiratory irritation and can cause gastrointestinal discomfort if swallowed. Gloves, goggles, lab coats will be worn when handling. <https://www.carolina.com/teacher-resources/Document/msds-basic-c-fern-medium-prepared/tr-msds-basic-c-fern-medium-prepared.tr>

**Acetone**- highly flammable liquid and vapor; more than minimal risk may cause serious eye irritation; toxic to aquatic life; potentially harmful if inhaled or absorbed through skin; potentially harmful if swallowed. Gloves, goggles, lab coats will be worn when handling. Will be disposed according to official regulations by the chemical safety officer of G.W. Hewlett High School.

<https://www.fishersci.com/shop/msdsproxy?productName=AC177170010&productDescription=ACETONE>

**24-Epibrassinolide** - not a hazardous substance or mixture. Nevertheless, safety equipment will be used when administering the substance to the organism. Will be handled with gloves; avoiding skin contact in mind, and safety goggles will be used. Will be disposed of according to manufacturer's instructions and according to official regulations by the chemical safety officer of G.W. Hewlett High School.

<https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=US&language=en&productNumber=E1641&brand=SIGMA&PageToGoToURL=https%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fsearch%3Fterm%3Depibrassinolide%26interface%3DA11%26N%3D0%26mode%3Dmatch%2520partialmax%26lang%3Den%26region%3DUS%26focus%3Dproduct>

**Invitrogen SuperScript® III Platinum® One-Step RT-PCR Kit**- more than minimal risk can potentially harmful if inhaled, absorbed through skin, or when in contact with the eyes, causing irritation; potentially harmful if swallowed. Gloves, goggles, lab coats will be worn when handling. Will be disposed of according to manufacturer's instructions and according to official regulations by the chemical safety officer of G.W. Hewlett High School.

[https://www.thermofisher.com/document-connect/document-connect.html?url=https://assets.thermofisher.com/TFS-Assets/LSG/manuals/superscript\\_onestep\\_qrtPCR\\_man.pdf&title=Product%20Info%20Sheet:%20SuperScript%20III%20Platinum%20One-Step%20qRT-PCR%20Kit](https://www.thermofisher.com/document-connect/document-connect.html?url=https://assets.thermofisher.com/TFS-Assets/LSG/manuals/superscript_onestep_qrtPCR_man.pdf&title=Product%20Info%20Sheet:%20SuperScript%20III%20Platinum%20One-Step%20qRT-PCR%20Kit)

**SYBR Safe® DNA Stain**- nonhazardous; nonetheless, gloves, goggles, lab coats will be worn when handling.

<https://www.thermofisher.com/content/dam/LifeTech/Documents/PDFs/PG1290-PJ8342-CO128458-SYBRsafe-Green-Fact-Sheets-Corp-FHR.pdf>

**1xTBE** has no health effects and is not flammable. Gloves, goggles, lab coats will be worn when handling.

<https://www.fishersci.com/shop/msdsproxy?productName=BP24304&productDescription=1X+TRIS-BORATE-EDTA>

**Ethanol** - more than minimal risk of eye, skin, gastrointestinal, and respiratory irritation, ignition, reaction with oxidizers, and formation of carbon monoxide and carbon dioxide via decomposition. Will be disposed according to official regulations by the chemical safety officer of G.W. Hewlett High School.

<https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=US&language=en&productNumber=E7023&brand=SIGALD&PageToGoToURL=https%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fproduct%2Fsigald%2Fe7023%3Flang%3Den>

**Agarose gel** - more than minimal risk of skin, eye, respiratory, and gastric irritation. Gloves, goggles, lab coats will be worn when handling.

<https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=US&language=en&productNumber=P5472&brand=SIGMA&PageToGoToURL=https%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fproduct%2Fsigma%2Fp5472%3Flang%3Den>

**Wash Solution #1** - more than minimal risk of skin, eye, respiratory, and gastrointestinal irritation, instability caused by excess heat and moisture, and reaction with oxidizing agents. Gloves, goggles, lab coats will be worn when handling. Will be disposed of according to manufacturer's instruction.

<https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=US&language=en&productNumber=W0263&brand=SIGMA&PageToGoToURL=https%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fproduct%2Fsigma%2Fw0263%3Flang%3Den>

**Wash Solution #2/3** - more than minimal risk of eye and gastric irritation. Gloves, goggles, lab coats will be worn when handling. Will be disposed of according to manufacturer's instructions.

<https://www.sigmaaldrich.com/MSDS/MSDS/PleaseWaitMSDSPage.do?language=&country=US&brand=SIGMA&productNumber=W4639&PageToGoToURL=https://www.sigmaaldrich.com/catalog/product/sigma/w4639?lang=en&region=US>

**Elution Buffer**- more than minimal risk of eye and gastric irritation. Gloves, goggles, lab coats will be worn when handling.

<https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=US&language=en&productNumber=C0241&brand=SIGMA&PageToGoToURL=https%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fproduct%2Fsigma%2Fc0241%3Flang%3Den>

### Activities and Devices:

**Agarose Gel Electrophoresis**- more than minimal risk of electric shock. Mentor will oversee use and assist will using device.

**PCR Thermo-cycler**- more than minimal risk of skin irritation and slight burns minor risk of burns to hand/fingers. Mentor will oversee use and assist will using device

Activities

- List of safety info