

# Program Risk Assessment

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**Risk Assessment prepared by:** Liam Mudge, Greg D’Cruz

**Date of Assessment:** 09/02/2024

**Activity Type:** Normal Program Activity

**Reviewed by:** Albert Ferguson

**Date of Review:** 27/02/2024

**Due for next review:** February 2025

<b>Location of Activity:</b>	<b>HAZARDS</b>	<b>Control</b>
<ul style="list-style-type: none"> <li>• Science</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical</li> <li>• Slips/trips/falls</li> <li>• Temperature</li> <li>• Chemical</li> <li>• Shear</li> <li>• Biological</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical isolation</li> <li>• Training/Induction</li> <li>• Supervision</li> <li>• Safe work procedures</li> <li>• Removal of hazard</li> <li>• Specialized equipment</li> <li>• Hand protection</li> <li>• Chemical storage cabinet</li> <li>• Hazardous chemicals register.</li> <li>• Supervision</li> <li>• Lab coat or apron</li> <li>• Spill kit</li> <li>• Eye wash</li> <li>• Eye protection</li> </ul>

Based on the Risk Assessment this activities level of risk is considered:

**VERY LOW**

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## Workflow

Identify the steps involved with carrying out the program, including the location of step, resources & materials required, as well as any specialized personnel required for the step and identify if this is covered by a pre-existing HIRAC report. If more than one hazard exists for a single "step" select the item in the line below. Add additional steps as required.

#	Step	Location	Equipment/Materials	Hazard	Notes
1	Students arrive	Breakout		Slips/trips/falls	Facilitator to induct students in Lab safety and best practice.
2	Students enter laboratory	Science Lab		Other	Facilitator instructs students re: laboratory rules (no eating/drinking/running) and instructs students to don Personal Protective Equipment (PPE): Gloves, lab coats and safety glasses before they go to their station
3	Use of Bunsen burner	Science Lab	Bunsen burner; matches; gas	Temperature	Facilitator to instruct students in correct procedure for operating gas bunsen burners; be mindful of reaching over Bunsen burners and how to operate Bunsen burner safely; work within 20 cm of flame but no closer than 5 cm
4	Working at Lab benches	Science Lab	Tall stools	Slips/trips/falls	Facilitator to caution students Re: the risk of slipping due to the stool's narrow base and being left out away from the bench
5	Handling Biological Material	Science Lab	E.coli plate culture, other biological agents	Biological	Facilitator to alert students to hazard and demonstrate good aseptic technique; students are required to fit PPE including gloves, lab coat and safety glasses
6	Handling hot liquids	Science Lab	Hot tap water	Temperature	Students fit PPE including gloves, lab coat and safety glasses; Silicon mats provided

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<b>7</b>	Handling chemical agents	Science Lab	Students handling laboratory reagents	Chemical	Students fitted with PPE and working aseptically; Facilitator to alert students to ampicillin in media (which is a derivative of penicillin) and people with an allergy to either of those should avoid contact with media
<b>8</b>	Using laboratory measuring equipment	Science Lab	Computer and water	Electrical	Facilitator alerts students to electrical hazard before they start working with water, instructs on correct method for attaining various measurements/sample data.
<b>9</b>	Handling glassware	Science Lab	Glass beaker and conical flask	Shear	Facilitator to alert students to risk of cuts from broken glassware; broken glassware to be disposed of in broken glass waste
<b>10</b>	Electrophoresis	Science Lab	Electrophoresis tanks	Electrical	Facilitator to alert students to hazard and instruct all buffer spilt on bench to be absorbed with paper towel before electrophoresis tanks are to be plugged into mains

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## Chemical Hazards

### Are there any chemical hazards involved with this activity?

If YES, please answer the following form.

Yes

### Chemical Hazard Controls

- I have consulted the Victorian Department of Educations [Guidance Sheet 3 Prohibited and Restricted Chemicals](#).
- Banned and restricted hazardous chemicals will not be used?
- No explosive reactants will be used or explosive products generated.
- I understand the risks of the practical experiment and will undertake this practical in a 'wet area'?
- I have obtained the safety data sheets for reactants and understand the accidental spillage or exposure, emergency response and first aid information?
- Quantities of flammable reactants are kept to minimum and ignition sources are eliminated?
- All hazardous chemicals and decanted products are labelled appropriately?

True  
 True  
 True  
 True  
 True  
 True  
 True

If you answer 'False' to any of the above questions, do not carry out practical experiments until the matter has been resolved.

- I will not carry out the practical experiment if extreme or high chemical risks exist.
- I have considered all chemical exposure routes of the eyes, skin, inhalation, ingestion and injection to be used and generated.
- I have located and linked all relevant MSDSs for Chemicals used in this activity.

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List the chemicals to be used and generated. Identify key hazard information from safety data sheets, control measures to be undertaken and disposal requirements.

Chemical Agent	Concentration	Flammable	Gases Under Pressure	Oxidising	Corrosive	Chronic	Health Hazard	MSDS
Green_Midori Green	1:10,000 dilution of stock	No	No	No	No	May cause injury to liver and kidney	Irritant	<a href="#">Nippon Midori Green Advance DNA Stain_undefined_AUS_EN.pdf</a>
Ampicillin	100 µg/mL	No	No	No	No	No	Irritant	<a href="#">Ampicillin_69-52-3.pdf</a>
Arabinose	0.2 g/mL	No	No	No	No	No	None	<a href="#">Arabinose Lyophilized.pdf</a>
LB Broth	1X	No	No	No	No	No	None	<a href="#">LB Broth.pdf</a>
pGLO	80 µg/mL	No	No	No	No	No	None	<a href="#">pGLO_100209-25-4.pdf</a>
Calcium Chloride	0.05 M	No	No	No	No	No		<a href="#">Transformation Solution Calcium chloride_HRLS01034-2.pdf</a>
								<a href="#">Calcium Chloride Powder MSDS.pdf</a>

Products Generated	Concentration	Flammable	Gases Under Pressure	Oxidising	Corrosive	Chronic	Health Hazard	MSDS

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## Biological Hazards

<b>Are there any chemical hazards involved with this activity?</b> If YES, please answer the following form.	Yes
<b>Biological Hazard Controls</b>	
<ul style="list-style-type: none"> <li>Recommended banned and restricted hazardous biological agents will not be used?</li> </ul>	True
<ul style="list-style-type: none"> <li>Biological agents used are recommended for the age group undertaking the practical experiment?</li> </ul>	True
<ul style="list-style-type: none"> <li>I understand the risks of the practical experiment and will undertake this practical in a 'wet area'?</li> </ul>	True
<ul style="list-style-type: none"> <li>I have obtained relevant safety data sheets for agents being used and understand the accidental spillage or exposure, emergency response and first aid information?</li> </ul>	True
<ul style="list-style-type: none"> <li>All hazardous agents and mediums are labelled appropriately?</li> </ul>	True

If you answer 'False' to any of the above questions, do not carry out practical experiments until the matter has been resolved.

- I will not carry out the practical experiment if extreme or high biological risks exist.
- I have considered all chemical exposure routes of the eyes, skin, inhalation, ingestion, and injection to be used and generated.

List the biological agents to be used and generated.

Identify key hazard information from safety data sheets, control measures to be undertaken and disposal requirements.

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Organism being used	Organism type	State of organism	Drug resistance?	Control measures	Waste treatment	Notes
E.coli K-12 HB101	Bacteria	Lyophilised	No	Use aseptic technique: PPE, sterile equipment, working near Bunsen burner, biological waste segregated, benches wiped down with 70% alcohol	Sterilisation by autoclave	<a href="https://federationuniversity.sharepoint.com/:b/r/sites/FedUni/academic/tafe/Governance/OHS/HSIT%20group%201%20-%20BTS%20and%20Support%20Services/BTS/Plant%20and%20Chem/MSDSs/E.coli%20HB%20101%20Lyophilized.pdf">https://federationuniversity.sharepoint.com/:b/r/sites/FedUni/academic/tafe/Governance/OHS/HSIT%20group%201%20-%20BTS%20and%20Support%20Services/BTS/Plant%20and%20Chem/MSDSs/E.coli%20HB%20101%20Lyophilized.pdf</a>
E.coli K-12 HB101_pGLO	Bacteria	Cultured on LB agar containing ampicillin (100ug/mL)	Ampicillin resistance from pGLO plasmid	Use aseptic technique: PPE, sterile equipment, working near Bunsen burner, biological waste segregated, benches wiped down with 70% alcohol	Sterilisation by autoclave	Facilitator to demonstrate good aseptic technique and proper use of laboratory equipment before students start work. Biological waste bins have been provided as well as personal protective equipment which the students are required to don before they move to their station

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## Risk Assessment Matrix

### Assessing OHS Risks

Risk assessments in matters of Occupational Health and Safety\* are based on 2 key factors:

- The severity of any injury/illness resulting from the hazard(s), and
- The likelihood that the injury/illness will actually occur.

*\*Assessment of risk level based on likely severity and probability of harm*

		LIKELIHOOD			
		Very Unlikely Could happen, but probably never will	Unlikely Could happen, but very rarely	Likely Could happen sometime	Very likely Could happen any time
SEVERITY	Death or permanent disability	MEDIUM	HIGH	EXTREME	EXTREME
	Long-term illness or serious injury	LOW	MEDIUM	HIGH	EXTREME
	Medical attention and short-term incapacity	VERY LOW	LOW	MEDIUM	HIGH
	First aid needed	VERY LOW	VERY LOW	LOW	MEDIUM

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## EXPOSURE

Identify all groups who will be exposed to risks associated with this activity as well as any staff/specialist skills required to deliver this program e.g. Chocolate may require the assistance of some lab technician and personnel trained to operate the 3d printers/CNC machine.

- Program Staff
- Technical Staff
- Students
- Teachers

## HAZARDS

- Electrical
- Slips/trips/falls
- Temperature
- Chemical
- Shear
- Biological
- other

STEM Educator Notes	Reviewer Notes
<ul style="list-style-type: none"> <li>• Broken vessels not used hazard arises in the event of break.</li> <li>• Temp of hot water in lab space is limited to below 60 degrees C to eliminate risk.</li> <li>• Facilitator to demonstrate good aseptic technique and proper use of laboratory equipment before students start work.</li> <li>• Biological waste bins have been provided as well as personal protective equipment which the students are required to don before they move to their station.</li> </ul>	

Based on the Risk Assessment Matrix, identify the level of hazard	<b>LOW</b>
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## RISK CONTROLS

List major hazards identified and their control measures to be implemented.

Hazards	Control	Type	Notes
<ul style="list-style-type: none"> <li>Electrical</li> <li>Slips/trips/falls</li> <li>Temperature</li> <li>Chemical</li> <li>Shear</li> <li>Biological</li> <li>Other</li> </ul>	<ul style="list-style-type: none"> <li>Electrical isolation</li> <li>Training/Induction</li> <li>Supervision</li> <li>Safe work procedures</li> <li>Removal of hazard</li> <li>Specialized equipment</li> <li>Hand protection</li> <li>Chemical storage cabinet</li> <li>Hazardous chemicals register.</li> <li>Supervision</li> <li>Lab coat or apron</li> <li>Spill kit</li> <li>Eye wash</li> <li>Eye protection</li> </ul>	<ul style="list-style-type: none"> <li>Administration</li> <li>Elimination</li> <li>Substitution</li> <li>PPE</li> <li>Isolation</li> </ul>	<ul style="list-style-type: none"> <li>Electrical equipment complies with BTS safety standards.</li> <li>Good housekeeping procedures</li> <li>Instruction process is: verbal/visual instruction, demonstration of safe process, observation/supervision.</li> <li>Broken glass removed and isolated from in use items</li> </ul>

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Notes: Students are verbally/visually instructed on safe and best practice for laboratory activities. The activity is demonstrated, students are then observed in completing procedure safely. All students are then supervised while conducting activities.

Based on the Risk Assessment this activities level of risk is considered.

**VERY LOW**

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## Reference Documentation

List all reference documentation, HIRACs and MSDS forms applicable to this activity. If HIRAC does not already exist, the creation of a new HIRAC may be required.

### HIRACs

- [Laboratory Activities](#)

### MSDSs

- [Nippon Midori Green Advance DNA Stain\\_undefined\\_AUS\\_EN.pdf](#)
- [Ampicillin\\_69-52-3.pdf](#)
- [Arabinose Lyophilized.pdf](#)
- [LB Broth.pdf](#)
- [pGLO\\_100209-25-4.pdf](#)
- [Transformation Solution Calcium chloride\\_HRLS01034-2.pdf](#)
- [Calcium Chloride Powder MSDS.pdf](#)
- [Nippon Midori Green Advance DNA Stain\\_undefined\\_AUS\\_EN.pdf](#)

### Other Activity/Reference Material

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## ***Activity Approval***

This activity has been reviewed and determined that it can be carried out safely. Where risks have been identified appropriately mitigation measures will be implemented.

**Completed By:** Liam Mudge, Greg D’Cruz

**Date Completed:** 09/02/2024

**Reviewed by:** Albert Ferguson

**Date of next review:** February 2025

**Reviewed by supervisor, where high risks are involved.**

## 4. Risk Assessment Signoff

Authorised By: Albert Ferguson	Signature: A. Ferguson	Date: 27/02/2024
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