



Use this form to assist you to complete risk assessments for hazardous activities and processes. Any serious or ongoing hazards should be reported via [RiskWare](#) to ensure that appropriate corrective actions are tracked and completed.

Faculty/School:	Science/Partner Engagement and Outreach/SOLES	Initial Issue Date: 15/05/2023
		Next Review Date:
Risk Assessment Reference Number:		
Risk Assessment Name:	Kickstart Biology Genetic Change Workshop	
Prepared by:	Eugenia O'Brien, Shang Yu Shueh	
Responsible supervisor/s:	Kristin Anderson	

Identify the activity and the location	Identify who may be at risk This may include fellow workers, students, visitors, contractors and the public
Activity or process: Workshop on genetic change for HSC students and their teachers to be delivered predominantly on campus and occasionally in high school laboratories.	Persons at risk: HSC Biology students and teachers, staff (Eugenia O'Brien, Arisa Hosokawa, Shang Yu Shueh) and University demonstrators
Location: Wet laboratories at the University of Sydney (e.g. LEES, Carlaw – classified as PC1 laboratories)	Risk assessment team (Who was consulted?): Eugenia O'Brien, Shang Yu Shueh, Brian Francisco, Ann Kwan, Safety, Health and Wellbeing team in the Faculty of Science

List of Legislation, Code of Practice, Australian Standards, Guidance Materials used to determine control measures
Work Health and Safety Act 2011

Risk Assessment Methodology
<p>Assessing the risk is a brainstorming exercise, which is most effectively carried out in a team environment with the people required to complete the activity or process. Most activities or processes are broken down into a variety of separate tasks. For each task, consider the hazards, the potential harm or negative outcomes and the conditions required for those negative outcomes to occur.</p> <p>Whenever assessing the health and safety risks associated with a task, always consider the following primary risk factors.</p> <ul style="list-style-type: none"> • The physical activities required to complete the task e.g. repetitive movement, high force, physical exertion, awkward posture • The work environment e.g. lighting, work layout, traffic, thermal comfort, working in isolation • The nature of the hazard itself e.g. working with chemicals, microorganisms, radiation, machinery, potentially violent clients • The individual workers involved, e.g. level of training, skills, experience, health, age, physical capacity <p>The information gathered from the risk assessment process must be used to develop a Safe Work Procedure (SWP).</p>

Task or scenario	Hazard/s	Associated harm, e.g. what could go wrong?	Existing Risk Controls	Current risk rating Use the Risk Matrix	Any additional controls are required? ¹	Residual risk rating Use the Risk Matrix
Paper plasmid construction	Misuse of scissors, paper and tape dispensers	Cuts	Participants will be instructed on safe use and will be supervised.	Low	First aid	Low
Checking for fluorescence with ultraviolet (UV)/blacklight torches	Misdirection of UV light, exposure to UV	UV light pointed towards students' eyes, skin/eye exposure	Blacklight torches are commercially available, not very strong and have a long wavelength. Only demonstrators will operate the blacklight torches. Torches will only be directed towards plates or tubes on benches. Torches will be switched off immediately after use and packed away. Students will be advised not to use the torches. Demonstrators will inform students not to move into the path of the torch light.	Low	Emergency controls	Low
Observing bacterial plates, working with bacteria	Bacteria	Contamination of skin, clothes, benches, environment	Bacteria used are non-pathogenic (<i>Escherichia coli</i> - risk 1). Bacterial plates will be sealed and not opened during lab sessions as photo results will mainly be used. All students (and teachers) will be provided with gloves, gowns and	Low	Emergency controls Work with bacterial cultures to be conducted in a laboratory equivalent to PC1 containment (AS/NZS 2243.3)	Low

¹ Always consider whether or not it is possible to eliminate the hazard or hazardous task altogether. If this is not possible, refer to the [hierarchy of risk controls](#).

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			<p>safety glasses which will be worn for the duration of the lab class. Students and teachers are also required to be wearing enclosed footwear.</p> <p>All equipment in contact with microbes will be destroyed by autoclaving after the activity is completed.</p> <p>Students will be required to wash their hands upon leaving the lab. Surfaces will be cleaned at the completion of the workshop using 70-80% ethanol.</p>		<p>All bacterial waste material and used gloves to be collected into yellow contaminated waste bags and either autoclaved or disposed via 'Clinical Waste' bins.</p>	
<p>Protein purification activity – transferring chemicals (chemicals include buffers with PBS, lyzosome, DNase and imidazole, plus Ni²⁺-NTA solution)</p>	<p>Skin or eye exposure to chemicals</p>	<p>Skin reaction or chemical burn to the eye</p>	<p>Chemicals will be used at a low concentration and are minimal risk.</p> <p>Safety glasses, lab coats and gloves will be worn for the entirety of the workshop.</p> <p>Safety Data Sheets will be made available and all staff will receive training in appropriate handling and disposal of solutions.</p> <p>Participants will work in small groups and will be supervised while using dilute chemicals.</p> <p>Participants will be given clear instructions about using pipettes to transfer chemicals.</p> <p>Chemicals will be stored in stable screw top bottles and will be pipetted into tubes held in racks.</p> <p>The closest eye wash facilities will be located where participants can wash hands/eyes if they get chemicals on them.</p>		<p>Safety stations (safety shower and eyewash) to be checked and operational before work commences.</p>	
<p>Using electrical equipment e.g. centrifuges, spectrophotometers, heat blocks.</p>	<p>Faulty equipment</p>	<p>Electric shock or exposure to moving parts</p>	<p>All equipment is tested and tagged to check for working order. Staff will test equipment and powerpoints while setting up. All</p>	<p>Medium</p>	<p>Emergency controls (outlined in the following pages, e.g. call 000 in case of a medical emergency)</p>	<p>Medium</p>

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			<p>equipment will be deemed fit for purpose.</p> <p>Centrifuges will not spin unless the lid is closed.</p> <p>Powerpoints will not be overloaded with multiple electrical items.</p>		<p>Supervisor to check that centrifuges are balanced before spinning is permitted.</p> <p>Use of double adaptors for GPOs not permitted</p>	
Using heat blocks	Equipment will be set to 37°C, 42°C and 80°C	Burn from hot heat block	<p>Students will be advised to take care around the heat blocks. They will only use heat blocks set to 37°C and 42°C. Demonstrators will handle tubes when they go into and out of the 80°C heat block.</p> <p>First aid can be administered should anyone receive a burn.</p>	Low	First aid – place the burn under running water for 15 minutes.	Low
Using glassware	Glass breakages	Cuts from glass	<p>Participants will be instructed to handle all glassware with care.</p> <p>Any glass breakages will be cleared by staff using a dustpan and brush and using sharps containers for disposal.</p> <p>Participants will be advised to clear any areas in which glass has smashed.</p> <p>First aid/band aids can be administered should anyone receive a cut from a glass breakage.</p>	Low	First aid	Low
Micropipetting	Misuse of micropipettes	Stabbing, poking or breaking the skin with a pipette tip	Students will be given clear instructions on how to handle pipettes and will be constantly supervised while using micropipettes.	Low	First aid	Low

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		Damaging a pipette	Students will be provided with clear instructions about using a pipette, particularly in avoiding over or under winding the dial, always using a pipette tip to load samples and using the plunger slowly and with care.			
Spillages	Slips and falls because of spills	Injury from slipping	The area around a spill will be isolated and cleaned up immediately. Small volumes of liquids will be used and will be held in sturdy bottles and racks.	Low	Emergency controls (outlined in the following pages)	Low
Wearing gloves	Allergy to disposable gloves	Skin reaction to latex, nitrile or vinyl PPE	Participants will be asked if they have an allergy to gloves prior to commencing the workshop. A range of PPE options will be made available if required.	Low	Emergency controls (outlined in the following pages)	Low
Emergency evacuation	Depends on the nature of the evacuation	Depends on the nature of the evacuation	In the case of an emergency on University grounds, the alarms will sound and the guests will be directed to the appropriate emergency evacuation point as instructed by the local emergency responders. Staff will familiarise themselves with the nearest evacuation assembly area using the map in the laboratories.	Low	Emergency controls (outlined in the following pages)	Low



Implementation of Additional Risk Controls				
Additional controls needed	Resources required	Responsible person	Date of implementation	RiskWare Reference
Write the Safe Work Procedure (SWP)	Time (approx 1 hour)	Supervisor		N/A
Train workers to complete process in accordance with SWP	Time – supervisor and workers	Supervisor		N/A

List emergency controls for how to deal with fires, spills or exposure to hazardous substances and/or emergency shutdown procedures
<p>Staff will be guided by the University's instructions for emergency evacuation.</p> <p>In the event of a medical emergency, particularly in the case of a chemical splash in the eye or contact with skin:</p> <ol style="list-style-type: none"> 1. For eyes, check for and remove contact lenses, flush the eye with plenty of cool water for at least 15 minutes, occasionally lifting the upper and lower lid. For skin contact, flush with plenty of water for at least 15 minutes, remove any contaminated clothing or shoes and wash before reuse. 2. Seek medical attention. 3. Notify University staff. <p>In the event of a medical emergency:</p> <ol style="list-style-type: none"> 1. Call Triple Zero (000) and ask for an ambulance 2. Contact the closest first aider 3. If the person is unconscious, send for the closest Automated External Defibrillator (AED) 4. Call Security (9351-3333) 5. Send people to flag and direct the ambulance on arrival

REVIEW			
Scheduled review date	1 year	2 years	3 years
Are control measures in place (YES/NO)			
Are controls eliminating or minimizing the risk (YES/NO)			
Are there any new problems with the risk (YES/NO)			
Reviewed by:			
Actual Review date:			



Risk Matrix.

			Potential Consequences				
			L6	L5	L4	L3	L2
			Minor injuries or discomfort. No medical treatment or measureable physical effects.	Injuries or illness requiring medical treatment. Temporary impairment.	Injuries or illness requiring hospital admission.	Injury or illness resulting in permanent impairment.	Fatality
			Not Significant	Minor	Moderate	Major	Severe
Likelihood	Expected to occur regularly under normal circumstances	Almost Certain	Medium	High	Very High	Very High	Very High
	Expected to occur at some time	Likely	Medium	High	High	Very High	Very High
	May occur at some time	Possible	Low	Medium	High	High	Very High
	Not likely to occur in normal circumstances	Unlikely	Low	Low	Medium	Medium	High
	Could happen, but probably never will	Rare	Low	Low	Low	Low	Medium