

## **Occupational Health and Safety in the Laboratory (Postgraduate Student Edition)**

(covers students doing research in a laboratory. Honours students involved in coursework should read the Undergraduate edition of this guideline.)

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## Introduction and scope of the guidelines

Postgraduate students involved in research within scientific laboratories are exposed to a wide range of hazards. The University of Queensland recognises that postgraduate students are considered to be ‘in training’, and consequently, safe working practices must be adopted and taken seriously when undertaking laboratory activities. The University also recognizes that health and safety awareness is an important skill that students will take to their employer both as employees and as future supervisors.

Health and Safety **induction** of the student as well as **supervision** by the academic supervisor is necessary to ensure that students are not placed at risk, as well as ensuring compliance with the requirements of the Workplace Health and Safety Act, 1995.

These guidelines set forth what are considered good safety practices common to all laboratory operations.

## Who should read these guidelines?

- Honours or Postgraduate Students undertaking research projects in laboratories that involve practices, procedures or the use of substances that could harm the health and safety of students or staff involved in the projects. Honours students doing coursework should follow the Undergraduate guideline;
- Academic supervisors of honours or postgraduate students who have a responsibility for safeguarding the occupational health and safety of students in their charge;
- Heads of Schools and Centres who have a responsibility for implementing and maintaining occupational health and safety standards and practices in laboratories and teaching facilities under their control.

## Responsibilities for Occupational Health and Safety

The *Heads of Schools and Centres* are responsible for implementing and maintaining occupational health and safety standards and practices in laboratories and teaching facilities under their control. To achieve compliance, heads of schools and centres should ensure that:

- Laboratories and equipment provided for research are safe and suitable for the types of work carried out;
- Financial provisions are made for health and safety equipment and materials, as well as the maintenance of occupational health and safety standards;
- Students receive the appropriate information, instruction and training necessary for them to perform their work safely. An induction covering information pertinent to the local area they

will be working in is required;

- Rules and procedures are prepared and enforced for students working in laboratories;
- Disciplinary procedures are developed for students who do not comply with occupational health and safety instructions and University policies and procedures;
- Emergency equipment is provided for research projects and that staff and students are aware of emergency and evacuation procedures;

**Academic Supervisors** are responsible for providing a healthy and safe environment for honours and postgraduate students. The following should be ensured:

- Risk management principles are applied to the research that the students are engaging in. The risk assessment process, including controls to be adopted should be documented by the supervisor and the student;
- Safe work practices are developed and maintained at all times;
- Students receive the appropriate information and supervision necessary for them to carry out their studies safely;
- Students are warned about particular hazards, and how to avoid, eliminate or minimise their exposure to them;
- Proper attitudes towards health and safety are practiced and transferred to the students;
- Students under their control are using safety equipment provided in the correct manner;
- Good housekeeping standards are developed and maintained in the areas under their control;
- All students understand the disciplinary procedures that will be invoked for non-compliance with occupational health and safety instructions and University policies and procedures;
- Accidents and Incidents are recorded on the UQ *Workplace Injury, Illness and Incident Report Form*

**Postgraduate Students** also have responsibilities under section 36 of the Workplace Health and Safety Act, 1995. Students are required to:

- Avoid, eliminate or minimise hazards of which they are aware;
- Comply with all occupational health and safety instructions, University policies and procedures including School or Centre OH&S manuals;
- Make proper use of all safety devices and personal protective equipment;
- Not wilfully place at risk the health and safety of themselves or any other person;
- Seek information or advice where necessary, or when in doubt, before carrying out new or unfamiliar work (this includes operating unfamiliar equipment);
- Wear protective clothing and footwear, as prescribed by the School or Centre Workplace Health and Safety Officer and the supervisor;
- Comply with University policy that food or drink are not to be consumed within the laboratory;
- Be familiar with emergency and evacuation procedures, including the location and use of emergency equipment such as safety showers and eyewash facilities;
- Report any medical conditions or allergies that could put them at risk during the conduct of

- their research to their supervisor;
- Report and record all accidents and near miss incidents.

## The Laboratory

A laboratory can be a place of specialised research, clinical or diagnostic evaluation, teaching and/or learning. Laboratories are commonly used in many scientific disciplines across the University ranging from health sciences to biological and physical sciences. The term laboratory may also equate with a workshop in some engineering areas, as well as animal and plant houses, and insectaries.

## Introducing health and safety to postgraduate students

Each School/Centre must ensure that honours and postgraduate students attend an induction program on commencement of their studies. The induction program should be carried out as soon as possible after the student commences their studies and attendance should be compulsory. It is essential that induction in any practical skills required for the studies is included in the program, and that this practical demonstration/instruction be given before the laboratory work commences.

## Content of the induction program

The induction program should include general health and safety policies and procedures as well as specific safety skills for the techniques required for the research project. The **general health and safety induction** would usually be conducted by the School or Centre Workplace Health and Safety Officer and should include information about:

- University of Queensland and/or School or Centre OH&S policy;
- Health and Safety consultative structure at the University of Queensland;
- School or Centre safety management e.g. Workplace Health and safety officers, representatives, first aid officers, drugs and poisons officer, biosafety/AQIS officer, radiation officer, fire wardens;
- OH&S responsibilities of various persons within the School, including students e.g. with regard to wearing of personal protective equipment, complying with health and safety instructions given by supervisor/s, emergency personnel and first aiders;
- Emergency procedures;
- Incident reporting procedures;
- Personnel safety;
- Building safety;
- Working alone;
- Working after hours;

The induction may also have the WHSO or specialist OH&S staff e.g. biosafety officer,

radiation officer, cover **specific health and safety information** regarding:

- University or School or Centre policies, procedures, guidelines, information sheets, hazard alerts that are relevant to the chosen field of research;
- General laboratory safety;
- Chemical safety;
- Biological safety;
- Radiation safety;
- Use of specialised equipment e.g. autoclaves, centrifuges, HPLC;
- Any specific hazardous procedures and techniques;
- Risk assessment procedures.

Some of these issues may be covered by the laboratory manager or supervisor in more specific detail to the actual laboratory where the student will be working.

It is essential that all postgraduate students attend both a general and specific induction. Records must be maintained at the School or Centre of the type and level of induction attended by each student. This record keeping should extend to the in-house training given to each student in specific laboratory skills and in the use of specialised equipment e.g. scalpel blade removal, handling carcinogens, heating liquids. Confirmation of attendance by the student should also be recorded.

## **Follow-up induction**

The Workplace Health and Safety Act requires that the employer discharges their health and safety obligation through the provision of training, instruction and supervision. The induction program should be seen as the first step in the development of skills by the student. Following the induction program, the supervisor must ensure that the student demonstrates proficiency at the skill(s) required before allowing them to complete the tasks without direct supervision. Changes to established procedures should be verified with the supervisor.

## **Risk Management Process**

The Workplace Health and Safety Act requires that workplaces adopt a risk management approach to ensure that exposure to occupational hazards is controlled. The risk management process includes:

- Identifying hazards;
- Assessing the risk or likelihood of harm;
- Taking action to eliminate or control risks and prevent injury or the onset of disease;
- Evaluating the results and identifying further opportunities for improvement.

Risk management of student research projects that involve practices, procedures or substances that could harm the health and safety of staff or students involved in the projects may need to be undertaken at two levels, depending on the nature of the research carried out.

### **Level 1: Overall risk assessment of research project**

Before commencing their research, each honours or postgraduate student must undertake a risk assessment of the research project, in conjunction with their supervisor. This risk assessment must be documented.

### **Level 2: Assessment of daily experimental work**

Depending on the nature of the research, risk management may also need to be carried out on a daily basis and/or experimental basis to ensure that research students can continue with developing experimental work without compromising their own safety and that of their laboratory companions. Information on the hazards associated with the experiment, including the controls they intend to adopt should be documented.

Field trials require a different assessment, however the risk management process underlies the basis of this assessment.

## ***Conducting a risk assessment***

Risk Management is recognised as an integral part of good management practice. It is an interactive process consisting of steps, which when undertaken in sequence, enable continual improvement in decision making. Risk management is an ongoing process that should be undertaken:

- When any new work is planned e.g. the commencement of new research;
- When a significant change occurs to the work or research project;
- After an incident;
- At regular predetermined intervals.

The Occupational Health and Safety Unit at the University of Queensland provides advice on all aspects of Occupational Health and Safety, including Risk Management. Information and advice is also given in the form of guidelines, policies, hazard alerts and risk management programs which can be found at [www.uq.edu.au/ohs](http://www.uq.edu.au/ohs). Specialist staff at the OH&S Unit and Workplace Health and Safety Officers within Schools, Faculties and Centres can assist with the risk management process.

Adequate record keeping of the risk management process will help demonstrate to the Division of Workplace Health and Safety or in litigation, that you have been actively working to ensure safety at the University. Records must show that the process has been conducted properly including information about the hazards, associated risks and the control measures have been

implemented. Information should include:

- Hazards identified;
- Assessment of the risks associated with those hazards;
- Decisions on control measures to manage exposure to the risks;
- How and when the control measures are implemented;
- Evidence of monitoring and review of the effectiveness of the controls;
- Any checklist used in the process.

The University OH&S Unit has developed an online database for conducting and recording risk assessments for general and chemical risks. This can be accessed by university staff and students only through the following address: [www.risk.admin.uq.edu.au](http://www.risk.admin.uq.edu.au).

Training on the use of the database is available, and dates and bookings can be viewed on the Teaching and Educational Development website at: <http://www.tedi.uq.edu.au/sdh/>

## Laboratory Safety Rules

### General Rules – Building

- In an emergency and during practice evacuations, move quickly and carefully from the laboratory to the external stairwell or nearest emergency exit. Proceed to the designated assembly area and wait there until permission is given to re-enter the building. Never run in the laboratory or along corridors.
- Be aware of the position of exits from all work areas and from all levels of the building;
- Smoking is prohibited in all buildings at the University of Queensland.
- Food and drink (including drinking from water bottles) must not be consumed in laboratories

### *General rules – Laboratory*

- Unauthorised experimentation in the laboratories is strictly forbidden;
- Postgraduates wishing to use the laboratory out of normal work hours must obtain their supervisor and the laboratory managers permission;
- All students must be aware of the conditions required for the safe handling of substances and specimens being handled;
- Be aware of the safety facilities of the laboratory, ie location of safety showers, eyewash stations, fire extinguishers and emergency exits;
- Working spaces are to be kept clean. Broken glass, sharps, and laboratory waste must be placed in the marked bins in the laboratory. No waste is to be left or placed in the sinks, and under no circumstance must waste be placed down the sink, unless authorised to do so. Certain chemicals which are miscible with water can go to sewer. Refer to the Chemical Store web address for details of which chemicals fall under this category;
- Disposable gloves should be placed into yellow bins (Clinical waste bin) which are

specifically marked for such;

- All spillages must be cleaned up immediately after they occur;
- Be aware of burning Bunsen burner by noting a hollow burning sound and/or the absence of a blue cone of unburnt gas;
- Pipetting by mouth is strictly prohibited;
- Handle dissecting equipment with care, store blades covered, secure blades inside the dissecting kit and always remove blade from handle using wall-mounted scalpel blade remover;
- Defective equipment or broken glassware must be reported to the laboratory manager;
- Radioactive sources (e.g. laser, UV radioactive substance or arc lamp) must only be used following the direction and supervision of the supervisor or laboratory manager or radiation safety officer.
- Sitting on laboratory benches is prohibited. Never run in the laboratory or along corridors.
- Exercise care when opening and closing doors to laboratory;
- Cover any open wounds e.g. cuts, dermatitis on hands;
- Always wash hands thoroughly before leaving the laboratory.

## **General rules – Laboratory dress code**

- All students **must** wear covered footwear when working in the laboratory. Thongs, open weave shoes, sandals etc are not appropriate footwear. Students will not be allowed to work in laboratories unless wearing suitable footwear;
- A clean laboratory coat **must** be worn at all times whilst in the laboratory. Alternative protective clothing such as overalls may be specified by the supervisor or lab manager;
- In all laboratories and designated work areas where there is a risk of eye injury (e.g. splash of chemicals to the eye), protective eyewear must be worn at all times during the course of laboratory work;
- Where hearing protection or gloves are required for laboratory work, they must be worn.
- Long hair should be tied back to avoid injury;
- Contact lenses may concentrate chemical fumes in the eye, and should be avoided.

Who pays for and supplies personal protective equipment to students is at the discretion of the School, Section or Centre. For the majority of laboratory work, the supply of a lab coat, eyewear and closed footwear will be the responsibility of the student, but other items of protective clothing (e.g. hearing protection and gloves) may be required for the course.

## ***Immunisation***

- All students should their tetanus immunization is current. If unsure, visit the University Health Service (Cost \$10)
- Students who come in contact with human blood or blood products are strongly advised

to have a course of Hepatitis B immunisation (Cost \$16 x 3).

- Students who are in contact with sheep, goats, cattle, feral animals should have Q Fever vaccination. (Vaccination \$80, skin test \$25, serology \$20)
- Students who are in contact with bats should have rabies immunisation (\$85 x 3).

These services and further advice on immunisation are all available through the University Health Services.

## ***First Aid***

- Report all injuries and illnesses to the supervisor/lab manager. First aid will be administered by trained first aid officers.
- Eye injuries, whether caused by chemicals or mechanical injury or splash with biological material are always serious. The treatment requires immediate and prolonged flushing with water (20 minutes minimum) at the eyewash station. Medical advice should be obtained for an eye injury. MSDS should accompany student if necessary to seek medical treatment.
- In the event of chemical or biological spills on skin, thoroughly wash the affected area with copious quantities of water. Notify supervisor/lab manager immediately. Consult Material Safety Data Sheet (MSDS) to determine appropriate first aid. MSDS should accompany student if necessary to seek medical treatment.
- Sharps injuries – Notify supervisor/lab manager immediately. Wash the wound and encourage bleeding. Seek medical treatment.
- Animal bites – Notify supervisor/lab manager immediately. Wound must be rinsed well. Tetanus immunisation should be up to date;
- If you are feeling unwell or dizzy when participating in an experiment, stop immediately, sit down and notify supervisor/lab manager;
- All accidents must be reported to the supervisor/lab. manager, including cuts and bruises and recorded on the *Workplace Injury, Illness and Incident Report Form*. Non injury causing incidents such as spills, electrical shorts etc must also be reported.

## ***Working Alone***

Work commitments and the need to share facilities may mean that some students need, or choose to work outside of normal working hours. It is the requirement of the University that students follow strict guidelines for working alone when the nature of the work involves potential safety hazards, e.g. use of chemicals or biological material, working with specialised equipment, or electrical hazards.

In these situations, it is a requirement that someone else is present in the area to give emergency assistance if required.

Certain types of work may not be undertaken outside of normal working hours, for example, working with highly toxic chemicals such as cyanide and hydrofluoric acid. It is the laboratory manager and supervisors responsibility to identify when and what activities cannot be performed outside of normal working hours.

## ***Pregnancy***

The University has a responsibility to advise all students of any health and safety risks relevant to their research. Students who are pregnant may be at higher risk from exposure to certain chemicals and other hazards.

Prior to the postgraduate student commencing, the supervisor should advise the student if there is any known risk of exposure to teratogenic or reproductive hazards. This ensures that suitable arrangements or modifications can be made to minimise the student's exposure, if they are known to be pregnant or are trying to fall pregnant. This also applies to males where some substances and hazards are known to affect male reproductive organs.

The following procedures should be in place to manage these types of exposures:

- A risk assessment should be conducted by the student with guidance from the supervisor for all chemicals and other hazards which are to be used during their research;
- Preferably, chemicals which are known to have reproductive, teratogenic or carcinogenic effects should be avoided;
- Should chemicals having effects of a reproductive, teratogenic or carcinogenic nature be used as part of the research, because there is no safe alternative, control measures to reduce exposures to acceptable levels should be employed.
- Controlling exposure to these types of hazards if the student does become pregnant may require discussion with the University Occupational Hygiene Adviser and/or Dr Tony Arklay at the University Health Service.

## **Dealing with accidents**

### **Reporting accidents**

The University OH&S Unit requires that all accidents, incidents and hazards involving staff and students be reported.

#### Accidents

- Seek first aid or medical attention as soon as possible.
- Inform your supervisor as soon as possible

- Complete an accident, injury report form

#### Incidents

- Inform your supervisor as soon as possible
- Complete an accident, injury report form

#### Hazards

- Report all hazards immediately to your supervisor
- Inform the School or Centre OH&S Officer (they may need to complete a hazard report form for action)

Note: Accident and hazard report forms can be obtained from the OH&S Unit web page at the following address: <http://www.uq.edu.au/ohs/>

## **Student Insurance**

### **Student accident insurance**

A personal accident insurance scheme for postgraduate students exists across a number of schools. The insurance cover extends to all hazards to which those postgraduate students are exposed whilst participating in activities related to their studies or research, including field trips. In the event of an injury, the postgraduate student should complete a Postgraduate Student Insurance Claim Form and submit it to the University's Insurance Officer. All claims must be notified within 30 days.

### **Students and Worker's Compensation Insurance**

Students per se (including Honours students) are not covered by the University's Self Insurance cover. However, any person employed by the University e.g. as a tutor, is covered under Worker's Compensation Insurance for accidents arising from their employment.

## **Postgraduate Student Safety Declaration Form**

The supervisor of each postgraduate student is responsible for ensuring that the student receives specific training as appropriate for the research being undertaken.

Please complete the following checklist of issues which have been covered during the

induction.

Student Name: \_\_\_\_\_

Student

No.

Supervisors Name: \_\_\_\_\_

School/Centre: \_\_\_\_\_

**The safe use of the following laboratory equipment has been demonstrated to me:**

<b>Equipment</b>	<b>Yes</b>	<b>No</b>	<b>Does not apply (please tick)</b>	<b>Covered by (S'visor or labmanager's initials)</b>	<b>Date discussed</b>	<b>Signature of student</b>
Autoclaves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Centrifuges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Vacuum apparatus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Stirring and mixing devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Heating devices e.g. Microwaves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Ultrasonicators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Rotovaps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Electrophoresis devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Glassware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Scalpel blades	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Liquid nitrogen dispensing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

<b>Postgraduate Student Safety Declaration Form (cont'd)</b>						
<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Does not Apply (please tick)</b>	<b>Covered by (Supervisor or labmanager's initials)</b>	<b>Date discussed</b>	<b>Signature of student</b>
I am aware of the hazards associated with the chemicals used in this research project, and the requirements to perform risk assessments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I am familiar with access to a      and the use of CHEMWATCH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been made aware of any electrical hazards associated with this lab or research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I am aware of any zoonotic diseases which might be associated with this research project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I am aware of the requirements for transporting biological material to and from the University.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I am familiar with the requirements for working with AQIS material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been advised what vaccinations are required for this work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been demonstrated good laboratory practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been made aware of the safety precautions necessary for unattended experiments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been advised what PPE is required for this research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I am aware that lab coats and closed-in footwear must be worn when in the lab.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I know what to do in the case of an emergency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been explained what procedures are in place for out-of-hours work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
I have been shown the location of the safety showers and eye-wash.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

I have been made aware of the correct waste disposal procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
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**Local OH&S Contacts**

The following OH&S persons are available within the School to assist:

**Workplace Health and Safety Officer/s**

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**Workplace Health and Safety Representatives**

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**First aid officer/s**

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**Radiation officer**

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**School drugs officer**

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**School Biosafety officer (may also deal with AQIS material)**

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**Floor fire warden/s**

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If Contact cannot be made at the local level, the Occupational Health and Safety Unit can be contacted on extension 52365. The following people can be of assistance to you.

Executive Manager Gary Chaplin Ergonomics and  
Rehab Kris Fraser Occupational Hygiene  
(chemicals, noise) Lisa Kelly

Radiation Safety	Mike Williamson
Biological Safety	Jane Easson
Occupational Health	Robyn Buck
General health and safety at Gatton and Ipswich campuses	Gerard Ross

