WORK, HEALTH AND SAFETY GUIDELINES FOR TEACHING COURSES
AT THE SCHOOL OF MOLECULAR BIOSCIENCE

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1. INTRODUCTION - PURPOSE OF THE GUIDELINES

Work, health and safety (WHS) plays a central role in providing everyone at The University of Sydney (USYD) with a safe work environment. Currently at the School of Molecular Bioscience (SMB), WHS requirements in teaching laboratories are handled separately for each course by the respective course coordinator leading to a number of different criteria and instructions that can cause confusion to staff and students alike. The aim of this document is to provide uniform guidelines for all undergraduate teaching courses at SMB.

The School WHS committee also acknowledges that an important aspect of our undergraduate teaching is to educate students for their future careers, including the importance of WHS skills and knowledge. The inexperience of most students when handling hazardous chemicals or infectious microorganisms, or performing potentially dangerous experiments makes it even more important that we enforce strict but reasonable safety measures.

The guidelines in this document should be adhered to whenever possible and applicable, and any exceptions should be discussed with the School’s Safety Committee or its representative(s).

Markus Hofer
Chair, SMB School Safety Committee
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2. RISK ASSESSMENTS

Risk assessments (RAs) are a critical component in identifying the risks and hazards in practical courses. A teaching laboratory-specific RA has to be done by the course coordinator for each practical or experiment. This does not include courses taught at the CPC or other locations that have their own RAs in place. To standardize this process, the School Safety Committee has developed a new teaching lab RA form. The form and a detailed guide can be downloaded from the School’s Intranet.

To keep the RAs concise and manageable, it is not required to list and detail every single task in the form. However, all tasks and procedures that could lead to significant injuries, involve hazardous or toxic chemicals, or human pathogens must be listed. Further information and tips preparing the RA can be found on the Intranet.¹

A copy of the completed teaching lab RA form should be emailed to the School’s Safety Officer (Dianne Fisher) and the original should be kept on file with the course coordinator. The RA has to be updated following changes to the practical and should be reviewed every 2 to 3 years.

Importantly, all risks and hazards outlined in the RA and its content must be discussed with the teaching staff and demonstrators involved. The RA should be included in the demonstrator notes but does not need to be included in the course practical manual. Instead, it is recommended that you state the risks and hazards as well as the relevant precautions briefly in the manual at the beginning of each experiment or session. In addition, an ‘alert box’ can be included in the manual. A sample ‘alert box’ is shown below that can be modified to meet the specific requirements.

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Risks and hazards in this practical:

In this practical you will handle hazardous substances and perform the following hazardous tasks / handle the following pathogens: INSERT RELEVANT SUBSTANCES AND TASKS HERE.

You must observe all required safety precautions. Your course-coordinator / demonstrator will give you a safety induction at the beginning of the class that you have to attend. If you miss the safety induction (e.g. you come too late to class) you are not permitted to attend the practical.
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¹ The SMB intranet contains a number of SOPs and risk assessments for research labs that can be used as a guide for completing the risk assessments for teaching labs.
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NOTE: Demonstrators have to discuss all tasks and hazards stated in the teaching lab RA and the relevant precautions with their students at the beginning of each practical. Students that do not attend this part of the practical must not be allowed in the laboratory.

3. GENERAL LABORATORY RULES

The following general laboratory rules should be adhered to wherever possible and apply to all students, demonstrators and staff. Work with some chemicals and microorganisms may require specific or additional safety precautions that are not listed in this document. It is the responsibility of the course coordinator to determine if additional precautions are required or to seek advice if uncertain.

3.1 Personal protective equipment (PPE)

Wearing the correct PPE is one of the most important and effective ways of preventing accidents and reducing the severity of injuries. However, incorrectly used PPE can increase the risk of accidents and their consequences.

The following PPE must be worn in all practicals when handling samples, chemicals or performing lab procedures. Non-compliant students must not be allowed in the laboratory.

- **Lab coat or lab gown:** A lab coat must fit properly and be buttoned up and the sleeves must not be rolled up above the elbow. Students must be instructed to remove the lab coat when leaving the lab. If a lab coat or gown is worn in a practical session involving PC2 organisms, students must be given detailed instructions on how to launder it. Preferably, these coats/gowns are autoclaved prior to students being allowed to remove them from class. If this is not possible, a weekly wash in dilute bleach or active oxygen (e.g. Napisan) is recommended. Any culture spills on coats must be completely disinfected before the coat leaves the lab, or the coat must be autoclaved. Note, a lab gown is preferable for work with PC2 microorganisms.

- **Shoes:** Fully-enclosed, sensible shoes must be worn. Not acceptable are: thongs or sandals, high heels or high platform shoes, or shoes made from absorbent material such as ‘Ugg’ boots.

- **Gloves:** Latex or nitrile gloves must be worn whenever working with hazardous chemicals or pathogens. Gloves need to fit well as loose gloves can cause additional
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hazards. Heat-resistant gloves should be used when handling hot liquids, e.g. molten agar or agarose. Gloves must be removed when leaving the lab, transporting samples to different areas of SMB (use of transport containers) or when using computers and other electronic devices. Gloves should be changed regularly to avoid cross contamination. Also, students need to be reminded not to touch their personal belongings or skin with gloves.

- Safety glasses: Approved safety glasses must be worn whenever handling pathogens or chemicals or performing tasks that pose a particular danger to the eye. This is not necessarily limited to the handling of corrosives and the WHS committee recommends that safety glasses are worn at all times.

3.2 Safety rules

- Eating or drinking in the laboratory is prohibited. This includes storing food and drinks outside a backpack/tote, etc.

- Do not use mobile phones or other personal electronic devices. If use of such devices is required, gloves must not be worn or devices must be protected (e.g. phones kept in a sealed plastic bag). If laptops are required, they (as well as other personal devices) should be kept and used in designated areas only, e.g. a separate bench or on a clearly marked area such as a disposable bench coat. Contaminated electronic devices must be decontaminated or discarded. Please note: personal equipment of students is not covered by the University’s insurance.

- Personal property should be kept in lockers or away from work areas.

- Do not sit on benches or on the floor.

- Long hair should be tied back.

3.3 Emergency procedures

- Show students the location of emergency exits.

- Do not block emergency exits.

- Explain emergency procedures at the first practical session: In case of a fire alarm, evacuate the building as instructed and assemble on the lawn area (Cadigal Green) in front of SMB. All students must report to their demonstrators at the assembly area and any missing student has to be reported to the course coordinator or emergency fire warden. Neither students nor demonstrators must leave the assembly area unless permitted by a fire warden and the course coordinator.
3.4 Reporting of accidents and near-miss incidents

- In case of an accident, inform the local first aid officers and if required emergency services on 000 (internal phones: 0-000).

- All accidents or near-miss incidents must be reported immediately to the course coordinator or their assigned deputy. The coordinator must log the accident or incident on Riskware within 24 hours. If possible, the coordinator should attend the site of accident / near-miss and try to determine the cause.

- Serious accidents should also be reported immediately to the School Safety Officer (Dianne Fisher) and the Chair of the Safety Committee (Markus Hofer).

- If unsure if an accident or near-miss incident is to be reported, please contact the School Safety Officer or the Chair of the Safety Committee.

4. HAZARDOUS CHEMICALS AND SAFETY DATA SHEETS

The use of hazardous chemicals, including radioactive isotopes, in practicals is often unavoidable and may even be desired to train students in the correct safe working procedures. When hazardous chemicals are used in undergraduate courses, the following rules must be adhered to:

- All chemicals, including all non-hazardous substances, should be labelled correctly and in accordance with USYD WHS regulations. A correct label includes the full name (not abbreviated) of the substance(s), hazard pictograms and hazard phrases according to the Global Harmonized System (GHS). For some experiments it may be required that chemicals are not fully labelled (e.g. when students are supposed to identify a substance in an experiment). However, a unique identifier must be attached to the container and a full list of the contents including GHS safety information (e.g. hazard phrases) must be present as a hardcopy in the lab prep room. Demonstrators should know the content of these containers and all required pictograms and hazard phrases must be affixed to the container with the ‘unknown’ substance.

- All hazardous substances must be handled (and stored) as listed in the safety data sheet. Use fume cupboards when required.

- Demonstrators will need to inform students about the potential risks of ‘high risk’ chemicals at the beginning of the class. These have to be included in the RA. A summary of these hazards should be included (e.g. in an ‘alert box’) at the beginning of each practical in the course manual.
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- A list and explanation of the GHS pictograms should be included in the course manual or be made available online (e.g. in an eNotebook).

- Students must have access to all safety data sheets (SDS; formerly material safety data sheet = MSDS). This can be done by providing access to ChemAlert or by uploading the SDS to an eNotebook or another electronic resource. Students must be told where to find this information.

- Note: Special rules and precautionary measures may be required for immune compromised or pregnant students (see also below).

5. HAZARDOUS TASKS AND STANDARD OPERATING PROCEDURES

All tasks and procedures that bear an above-average risk for serious accidents (including those involving toxic or mutagenic/teratogenic substances) should be listed in the RA and be detailed in a standard operating procedure (SOP). A number of standard operating procedures can be found on the School’s Intranet. If no appropriate SOP is present, or if the SOP is not suitable, please contact the School Safety Officer (Dianne Fisher) or the Chair of the Safety Committee (Markus Hofer), as a new SOP may have to be developed or an existing SOP altered. Students should have access to all relevant SOPs (e.g. on a lab computer or by uploading to an eNotebook).

6. HUMAN PATHOGENS AND OTHER MICROORGANISMS

Special precautions such as the use of Class II biosafety cabinets are required when human pathogens or other risk group 2 organisms are used in undergraduate classes. Before introducing new practicals that use human pathogens, please consult with the School’s WHS committee to ensure that the required safety precautions are met.

Also refer to the following for additional information:


- Australian Standards PC2 work practices – AS/NZS 2243.3 (Section 5)
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If (potential) human pathogens or clinical samples are used in a practical, the following statement has to be included in the Unit of Study Outline and/or the course manual (see also RA and below).

| CAUTION: |
| In this unit you will gain experience handling live microorganisms. |
| You must contact the unit coordinator immediately if you have any predisposing medical condition or issues that might be relevant to your participation in the practical sessions. |

7. WASTE DISPOSAL

Appropriate procedures for disposing of waste have to be in place during practical classes. Demonstrators should instruct students at the beginning of each class on how to dispose of waste. Please see also SOPs for radioactive waste or biohazard waste on the School’s Intranet.

8. SAFETY INSTRUCTIONS TO STUDENTS

At the beginning of each practical session all students must be instructed on the hazards and risks (e.g. procedures, chemicals and pathogens). This can be done by qualified demonstrators or duty tutors and should be done as an oral presentation. An online exercise before class alone is not sufficient. The safety instructions should be based on the RAs and cover all items listed in the practical-specific RA.

You may include a short quiz to gauge the students’ understanding of this information (multiple choice or short answer with/without diagrams).

All students must be present at the start of each laboratory session to hear the safety instructions. Students that arrive late may be either excluded from the practical or given a separate safety instruction at the demonstrator’s discretion. If students do not understand the safety instructions or do not pay attention, they are not to be permitted to complete the practical until they can prove an adequate level of knowledge.

It is also recommended to include the relevant sections from the WHS guidelines in the practical manual. Contact the Chair of the SMB WHS committee for a current version in Word format.
9. IMMUNO-COMPROMISED AND PREGNANT STUDENTS

Special care has to be taken if immune-compromised and/or pregnant students are attending classes, in particular if human pathogens and/or hazardous chemicals are used.

Courses that use human pathogens should include a statement in the Unit of Study outline and the course manual as specified above. A similar statement regarding hazardous chemicals could be included in manuals that handle hazardous substances whose use is restricted in case of pregnancy.

9.1 Immune-compromised students in courses using human pathogens

Course coordinators should arrange a personal meeting with students that identify themselves as immune compromised (demonstrators and teaching staff are to inform the course coordinator immediately if a student identifies themselves as being immune compromised). It may be helpful to ask an academic (e.g. the Chair of the Safety Committee) to attend this meeting.

At the meeting (or before) the student should be informed that they do not need to disclose any medical information (e.g. diagnosis) or any other information that is related to their medical condition. Students must not be asked to reveal this information and all information disclosed at this meeting must be treated as confidential.

At the meeting, the student has to be informed that they might be at an increased risk of acquiring an infection. In order to determine if they can be permitted in class, and whether additional precautions are required, they will need to present a statement from their physician. A document containing all pathogens / microorganisms used in class and the exact procedures should be given to the student so that a registered health care professional familiar with the student’s condition can appropriately assess the situation (refer to the end of this document for details). The physician’s statement should include the name of the student and the course, and detail if the student can be permitted in class and whether additional safety precautions are required. The physician’s directions and safety precautions should always be followed to ensure there is no exposure to potential human pathogens.

Note, the statement and its content are confidential and must be archived in a secure location.
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The student must not be allowed to participate in class until this statement has been received and any required precautions have been taken.

If the required safety precautions are not possible or feasible, the course coordinator must contact the Chair or the Safety Committee and WHS services (Jenny Thompson) before allowing/denying access to class.

9.2 Pregnant students

If a student advises you that she is pregnant, please contact the Chair or the Safety Committee and WHS services (Jenny Thompson) to discuss how to proceed before allowing the student to participate in class. It is recommended that you do so even if no risks are obvious.

The course coordinator must ensure that there is no risk of exposure and adverse health effects for pregnant students. The educational value and importance of the practical should not take precedence over safety if the accepted knowledge is that a particular microorganism or chemical is known to be a reproductive hazard. The student’s physician should be consulted if unsure.

Refer also to our WHS guidance on ‘Reproductive hazards’ at: http://sydney.edu.au/whs/guidelines/others/reproductive_hazards.shtml.
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**Information regarding the requirements of a physician’s statement for immune-compromised or pregnant students:**

A physician’s statement may be required for immune compromised or pregnant students attending certain practicals. In order to determine if the student can be allowed to attend a practical or if additional precautions are required, the student’s physician must be provided with the following information:

1) Copy of all relevant sections of the practical manual (e.g. experimental procedures).
2) Detailed list of relevant chemicals (include SDS / MSDS) and microorganisms.
3) Additional information to help the physician to assess the risk (e.g. ‘all microorganisms will be handled inside a biosafety cabinet’)
4) If possible, provide alternative options (e.g. that work is done in groups and that all live microorganisms will be handled by the student’s laboratory partner).

The physician’s statement should include the following information:

1) Name of the student
2) Name of the course
3) That all relevant information has been sighted
4) Statement that the student can / cannot be permitted in class and whether additional safety precautions are required.

**Note:** The statement should not include a medical diagnosis or other personal information.