

LABORATORY SAFETY POLICY

1 Introduction

- 1.1 Under the Occupational Safety and Health Act 1994 it is the duty of every employer to ensure, so far as is practicable, the safety, health and welfare at work of all employees and others who may be directly or indirectly affected by its activities. The Act also requires that employers have in place a policy or set of policies regarding health and safety. This documents sets out the University's policy on laboratory safety, including bio-safety.
- 1.2 This policy applies to all laboratory workers, including undergraduate and postgraduate students. The diverse and varied nature of laboratory work means that no policy can cover every situation that may arise; this policy is therefore intended as a general guide only. Individual workers must seek expert advice when they are uncertain of the risks of any new procedures.
- 1.3 While the primary responsibility for health, safety and welfare rests with the University as employer and higher education provider, all persons working or visiting the University have a duty of care over their own and others safety, health and welfare. The University also recognises that it, and its staff, has a special duty of care to students and other inexperienced people who may be using its facilities.
- 1.4 Laboratories, by their very nature and by the nature of the types of work undertaken in them, can pose particular health, safety and welfare risks. This document is intended to give instruction and guidance to all who work in the University's research and teaching laboratories, to ensure that these risks are minimised.
- 1.5 It is the responsibility of each department, where applicable, to ensure that its laboratories are safe places to work, and that staff and students receive appropriate information and training to carry out their duties in such a way as to minimise the risks to themselves and others.
- 1.6 This responsibility requires that risks are identified and measures put in place to mitigate them, including making appropriate arrangements, such as lone working protocols, for staff and student working in laboratories. Supervisors must oversee the work of those in their care and must appoint a deputy whenever they are likely to be absent; it is not sufficient to assume that a dangerous activity would not be attempted.
- 1.7 The University Management Committee, through its Laboratory and Biosafety Advisory Group, is responsible for this policy and will take such steps as it may deem necessary to ensure compliance with it, such as periodic audits and inspections.

- 1.8 This policy sits alongside other University policies, such as that for Research Ethics. Researchers are required to conform to all other policies and procedures of the University at the same time as adhering to this one.

2 General Laboratory Practice

- 2.1 Appropriate training, including in what to do in the case of an emergency, must be given to all staff and students before they are permitted to work in a laboratory, whether or not that work involves them in practical experiments.
- 2.2 Appropriate safety and personal protective equipment must be worn at all times in the laboratory. The appropriate equipment and clothing will depend on the laboratory, but in general, laboratory coats and safety glasses should be worn at all times; other protective wear, such as gloves, respirators and shoes may also be required. Sufficient personal protective clothing and equipment for all those working in laboratories (and any visitors) must be supplied by the department operating the laboratory. In general, laboratory safety wear and other protective equipment should not be worse outside of the laboratory; such clothing and equipment used in certain biohazard labs must not be worn or taken outside the laboratory except for autoclaving and cleaning and the safety procedures in place for this must be followed.
- 2.3 Each laboratory must be fitted with appropriate emergency equipment for dealing with such accidents that might reasonably be expected to occur from time-to-time; such equipment may include spillage kits, eye wash equipment and first aid boxes, but more specialised equipment may be necessary.
- 2.4 Eating, drinking and smoking are forbidden in all laboratories at all times. No food or food or drink may be stored in laboratories, and laboratory glassware must not be used for the preparation or storage of food or beverages.
- 2.5 Always wash your hands before leaving a laboratory and especially before consuming any food or drinking.
- 2.6 Laboratories must be tidy. It is especially important to keep areas in general use, such as sinks, fume cupboards and balances clean and uncluttered. Any equipment or materials used must be cleaned and (if necessary) sterilised, and returned to their normal place of storage after use. Any chemical or other spills, however small, must be cleaned up immediately, following appropriate decontamination procedures, as necessary. All aisles and exits must be kept clear of obstacles at all times.
- 2.7 Chemicals and other hazardous materials, including biomaterials must be properly labelled and appropriately stored; a list of the chemicals and biomaterials stored in each laboratory must be available at all times. The method of storage will depend on the materials concerned. When storing chemicals and other materials, workers should recognise that some are

incompatible with others – thus for example strong mineral acids should not generally be stored with organic compounds.

- 2.8 Laboratory equipment may also be hazardous; examples include: electrical equipment; UV-lamps; centrifuges; solvent stills; and lifting equipment. Such equipment must at all times be used in accordance with the manufacturer's instructions and appropriate steps taken to minimise any risks that may arise from equipment or its use. Laboratory apparatus and other equipment should not be kept on any longer than necessary and irrespective, must always be put into a safe mode while it is not in use.
- 2.9 Laboratories can be noisy environments. Appropriate precautions must be taken to minimise excessive noise and, if necessary, ear defenders provided. Managers must take account of significant noise levels when setting laboratory working times for both staff and students.
- 2.10 When moving about the laboratory, works must be aware of those working around them and must always use approved methods for moving chemicals or other materials and equipment about the laboratory. Thus, for example, Winchestersters of solvents must always be moved using an appropriate carrier.
- 2.11 A risk assessment must be carried out for each laboratory, and where necessary for individual activities undertaken within the laboratory. Risk assessments must be available for inspection at all times, in case of any emergency.

3 Access to Laboratories

- 3.1. Laboratories are potentially hazardous places and access to such facilities is therefore generally restricted to authorised staff and students only. Visitors to University should not enter and laboratories, unless accompanied by an appropriate member staff.
- 3.2 Departments must provide appropriate training to all staff and students using its laboratories, before they are authorised to work in them.
- 3.2 Cleaning staff and other workers often need to entre laboratories unaccompanied and/or outside normal working hours. Such workers will usually have little knowledge of laboratory hazards. It is essential therefore the laboratories are always left in a safe state. The best way to achieve this is by following good laboratory practice guidelines set out above.
- 3.3. The University seeks to ensure that its facilities, including its laboratories, are as accessible as possible to all who can benefit from their use; however laboratories may present particular safety issues for disabled workers or visitors. Access to laboratories by disable staff, students or visitors will be reviewed on a case-by-case basis; as a matter of principle, however, the University will take any reasonable steps at its disposal to facilitate access.

4 Out of hours working

- 4.1 Normal laboratory working hours for laboratories will be set by the department responsible, but will normally be set between 08:30 and 17:30 on Mondays to Fridays, excluding public holidays.
- 4.2 It is generally undesirable for lone workers to be in laboratories and departments should be cognisant of the likelihood of other workers being present in the laboratory and close by (in case of emergency) when setting working hours. If permitted at any time, each department must have a lone worker protocol.
- 4.3 In general experiments should only be undertaken in a laboratory during normal working hours. However, it is recognised that certain experimental work may require various operations to run unattended for periods of time, including overnight. A key principle is to design a system of work that ensures any failure of the equipment or services in use results in the apparatus shutting down safely (fail-to-safety mode). All out of hour's operations must be approved by the Head of Department or his/her nominee, and contact details of the staff member or student running the experiment must be provided, in case of emergency.

5 Bio-safety

- 5.1 Working involving biological materials can only be carried out in appropriately equipped, designated laboratories.
- 5.2 Any work involving biological materials must comply with appropriate legislation and conform to best practice elsewhere. The University's Laboratory and Biosafety Advisory Group should be consulted prior to any such work being carried out.
- 5.3 All biological material should be treated as potentially pathogenic and handled accordingly. All procedures must be performed so as to *minimise the production of aerosols*; specific practices will depend on the work being undertaken, but examples of good practice include:
 - never leave lids off Petri dishes or tubes
 - never leave pipettes on the bench
 - don't cool a hot loop on agar containing bacterial growth
 - sterilise loops in Bunsen flame after use
 - use a rubber bulb when pipetting suspensions of bacteria
 - swab spills of bacterial culture with absolute alcohol or dilute hypochlorite, then inform a member of staff
 - carry out operations with the minimum of air disturbance

- after use all contaminated materials must be sterilised

- 5.4 Workers should be aware of the dangers of allergic response to biological materials, especially dust and debris. Workers should make strenuous efforts to maintain high standards of hygiene and restrict their exposure to potentially allergenic materials. Disposable masks and gloves should be worn as a minimum; certain experiments may necessitate a greater degree of personal protection, such as the use of ventilators and gauntlets.
- 5.5 Allergenic risks must be considered as part of the risk assessment of any working being carried out and workers who have a family or past history (however mild) of asthma, eczema or hay fever should inform their manager or supervisor prior to undertaking any work. Any worker who develops wheezing for the first time (however mild) should visit his or her doctor as soon as possible. The same is true for a worker noticing an unexpected worsening of his or her asthma or hay fever. Any worker developing dermatitis should likewise be seen sooner rather than later. There are various causes, many easily treated, so that an accurate diagnosis and early appropriate treatment is advisable.
- 5.6 Experiments involving the collection or use of human body fluids such as blood and saliva or human tissue (e.g. cheek epithelial cells) should be avoided. Permission for such experiments must be sought from the Laboratory and Biosafety Advisory Group who will need to be satisfied that there is no possibility of cross infection before permission is given.
- 5.7 Special rules govern experiments in genetic manipulation of micro-organisms or the use of genetically modified organisms. In the first instance, proposals for work in this area should be discussed with the University's Laboratory and Biosafety Advisory Group *before* commencing work or obtaining genetically modified material from other laboratories

6 Chemical Safety

- 6.1 This policy provides general only guidelines on chemical safety: it is the responsibility of each worker to determine the potential hazards of any chemicals they intend to use, and any necessary safety precautions, before use. Materials Safety Data Sheets (MSDS) are available on line and/or from the supplier; these data sheets should be consulted before any chemicals are purchased.
- 6.2 A risk assessment must be completed before handling any particularly toxic or otherwise dangerous materials, and adequate control measures put in place to mitigate the risks. The risk assessment must be held securely and be readily accessible in case of any emergency.
- 6.3 Workers should always consider whether a less toxic alternative can be used.

- 6.4 Chemicals and other hazardous materials must be properly labelled and appropriately stored; a list of the chemicals and biomaterials stored in each laboratory must be available at all times. The method of storage will depend on the materials concerned, for example:
- flammable solvents must be kept in fireproof containers
 - poisons must be kept in locked cupboards
 - toxic materials must be stored in a ventilated cabinet
 - incompatible materials should not be stored together
 - temperature sensitive materials should be stored in a spark-proof fridge/freezer
 - never re-use bottles to store different chemicals
- 6.5 The quantity of each chemical held must be kept to a minimum; no more should be held than is practically necessary for the efficient working of the laboratory.
- 6.6 All waste, or otherwise unwanted, chemicals must be disposed of according to prescribed methods. No chemicals should be simply washed down any sinks.
- 6.7 Waste solvents collected, stored and disposed of in an appropriate manner. It is necessary to separate halogenated waste solvents from non-halogenated, because there are special handling and disposal criteria for halogenated solvents.
- 6.8 Care must be taken when handling and disposing of solid wastes materials, such as silica gel or alumina, because of risk of contaminated dust getting into the atmosphere.
- 6.7 Broken glass and other sharp objects must not be thrown in regular waste bins; it must be placed in special containers provided for such purposes.

7 Laboratory Equipment and Apparatus

- 7.1 It is forbidden to use any laboratory equipment or apparatus prior to receiving proper instruction on its safe use.
- 7.2 Other than refrigerators, freezers, incubators and ovens no piece of apparatus should routinely be left unattended while running. If it is necessary for a piece of equipment or apparatus to be left running unattended (such as out of normal working hours), workers must follow procedures set out in Section 4, Out of Hours Working.
- 7.3 All electrical equipment should be regularly tested, to minimise the risk of electrical fires or electrocution.

- 7.4 Gas cylinders must be clearly labelled and stored appropriately. In general no gas cylinders should be left free standing (they must be secured *at all times* against falling), and where possible located against an outside wall.
- 7.5 Microwave ovens should never be used to heat liquids or melt agar and agarose in *closed* vessels. Tops of vessels such as screw-top bottles must be removed before such vessels are used.
- 7.6 All items stored in fridges or freezers should be clearly labelled with the nature of the substance, the name of the owner and the date, and should be kept no longer than is necessary. The label should also indicate any hazard likely to follow from the failure of the refrigeration system. Refrigerators and deep-freezers must be of the spark-proof type. Food and drink may be stored only in laboratory refrigerators.
- 7.8 All equipment must be kept in a good state of repair and serviced regularly. No item of equipment may be repaired or serviced until it has been fully cleaned and decontaminated.

8 Accident Reporting

- 8.1 Accidents to staff, students or visitors involving personal injury requiring first-aid or medical attention must be reported to [**appropriate officer**]. 'Near miss' incidents should also be reported whether or not anyone is injured: learning from 'near misses' can help prevent future accidents.

9 First Aid

- 9.1 Take care not to become a casualty yourself while administering first aid. Be sure to use appropriate protective clothing and equipment where necessary. If you are not a trained first aider, send immediately for the nearest first-aider if one is available. A list of first aiders is available at [**location**].
- 9.2 If the assistance of medical or nursing personnel is required, send for an ambulance immediately by [**best process**].

10 Emergencies

- 10.1 The guidelines set out in this document are designed to help prevent accidents and emergencies from arising; however, from time-to-time such things can happen. All persons using the laboratories should therefore familiarise themselves with what to do in the event of emergencies, such as fires, release of toxic chemicals or biological materials.
- 10.2 No code of practice can cover every emergency that may occur, and different laboratories may have different emergency procedures depending on the nature of the work carried and the materials stored there. Departments must

ensure that appropriate emergency procedures are in place for all laboratories under their control and must ensure that all those working in them are instructed on those procedures.

- 10.3 Whilst many emergency situations can be kept localised, it is possible that a laboratory emergency may impact on the rest of the University; examples include major fires, uncontrolled releases of chemicals or other materials. Departments must therefore to work with [SEG facilities?] to ensure that the University's master emergency plan covers such eventualities and appropriate lines of communication exist to enable plans to be implemented if required.