

Induction Kit – Part 1

Chemical Safety in the Laboratory

A. Exempt Laboratories

University laboratories are able to purchase chemicals without the need to obtain prior ERMA approval (a very privileged status), provided the laboratory meets the requirements of the HSNO (Exempt Laboratory) Regulations, 2001.

To meet these requirements you must:

- Know the identity of the Lab Manager and ‘Persons in Charge’ of your Laboratory (Section B below)
- Know how to access and use MSDS databases (Section C below)
- Understand and follow basic Laboratory Safety rules (Section E below).
- Understand and follow the basic rules for storage and handling of the various classes of hazardous chemicals (Induction Kit Part 2)
- Use correct Personal Protective Equipment (Section F below)
- Dispose of chemicals correctly (Section I below)
- Report all accidents and incidents
- Know Emergency Procedures (Section K below)

The HSNO Code of Practice for University and CRI Exempt Laboratories is a HSNO approved method of compliance with the Exempt Laboratory Regulations. The Code of Practice sets out documents called Safe Methods of Use which are a convenient set of rules which you must follow.

You will be given a copy of the General Safe Method of Use as part of the induction and you must observe the mandatory requirements of this Safe Method of Use.

B. Laboratory Managers

One of the requirements of Exempt Laboratories is that each lab has a Lab Manager and in the absence of the Lab Manager there is a “Person in Charge”.

You (as a new staff member or student) are required to know the identity of the Laboratory Manager and who are the ‘Persons in Charge’ for your laboratory.

C. Chemical Hazards and MSDS (Material Safety Data Sheets)

Most laboratory chemicals are potentially hazardous. If you are handling a chemical for the first time or you are unsure of the hazardous properties of a chemical, you must consult the MSDS.

The University of Auckland has two very large databases available on-line via the Library website. These databases are Chem Gold and CCOHS. A separate sheet is available as part of this induction which details how you can access and search these databases.

At a minimum you are expected to be able to access the database, take note of the hazard class, Risk and Safety Phrases and observe directives on the MSDS sheets

There is also a Chemical Safety Website available on the intranet at

<http://www.health.auckland.ac.nz/oeshac>.

which has links to these databases.

D. Chemical Safety Website

The Chemical Safety website (URL above) has all the Safe Methods of Use as well as extra information on disposal, transport and storage of chemicals. The website has additional resource materials on safe handling of chemicals.

E. Basic Laboratory Rules - What is required of you.

You must:

1. Consult MSDS sheets
2. Label all solutions and containers
3. Wear Safety Glasses when handling chemicals
4. Use correct Personal Protective Equipment (ie use correct gloves)
5. Wear laboratory coats
6. Use fume hoods when handling toxic, corrosive and flammable liquids.

You must also:

1. Store all large bottles of flammable solvents in Flameproof cabinets or store bulk solvents in the Dangerous Goods store
2. Segregate chemicals. Acids must be kept away from bases and oxidisers must be stored away from flammable solvents.
3. Know the location of the nearest Spill Kit and how to use it
4. Report all accidents
5. Ask permission of the Lab Manager to work alone after hours.
6. Not undertake unsupervised work with highly hazardous chemicals

F. Personal Protective Equipment

Personal Protective equipment is designed to keep your exposure to chemicals to an absolute minimum. You must:

- Wear a laboratory coat when handling chemicals and the lab coat must be removed when leaving the laboratory areas.
- Safety glasses must be worn when handling any chemicals unless there is a VERY CLEAR indication that there is absolutely no splash hazard (ie using microscope). *NB: In some Departments wearing safety glasses in laboratories is mandatory at all times!*
- Face shields are required when handling cryogenic liquids.
- Wear gloves of appropriate type for the chemicals you are handling (see below). This includes appropriate protection when handling liquid nitrogen.
- Use fume hoods when handling toxic, corrosive and flammable liquids

N.B. Some glove materials are more permeable to solvents than others. It is important that you choose the correct type of glove. Nitrile gloves are often the best choice. If you are unsure consult the glove compatibility charts on the Chemical Safety Website.

G. Fume Hoods

- Fume hoods rely on the internal baffle (at the back near the bottom of the fume hood) having an uninterrupted flow of air. This opening must be kept clear.
- Fume hoods must not be cluttered and definitely not used for storage if they are to function properly.
- The sash of the hood should be kept reasonably low and never left open beyond maximum indicated on the side of the hood. The sash opening on Variable Air Volume (VAV) Fume hoods must also be kept as low as reasonably possible – especially when an experiment is completed.

H. Hazardous Chemicals you are likely to encounter

The following is a guide to commonly encountered hazardous chemicals used in biomedical research. Other departments may have different chemicals and Department and/or discipline specific induction programs will follow.

Formaldehyde:

Formaldehyde is a chronic toxicant and suspected carcinogen. It is also a compound responsible for hypersensitivity reactions. All contact with formaldehyde must be kept to an absolute minimum. Use of gloves and fume hoods is a minimum requirement. Consult the Safe Method of Use for Formaldehyde on the Chemical Safety Website.

Phenol:

Phenol is both highly corrosive and toxic. Not only are chemical burns likely to be severe but will also result in poisoning. Avoid all contact by using

correct gloves. Consult the Safe Method of Use for Phenol on the Chemical Safety Website.

Ethidium Bromide:

Ethidium bromide intercalates with DNA and therefore is highly likely to be mutagenic. Wear gloves when handling EtBr stained gels and buffer solutions. Avoid contamination of bench surfaces, door handles and telephone by removing contaminated gloves. Consult the Safe Method of Use for Ethidium Bromide Spills on the Chemical Safety Website

I. Disposal of Chemicals

- With few exceptions chemicals must be disposed by a licensed chemical waste contractor.
- Flammable solvents, reactive chemicals and heavy metals must never be disposed to sewer.
- Please contact your Laboratory Manager for further details.
- When you leave University or move to a different project you must ensure that any solutions and reagents in fridge/ freezer, cold-room and laboratory shelves associated with your project and not required by your research group leader are disposed before you leave.

J. Accidents/Incidents

- All accidents and incidents MUST be reported immediately to your Lab Manager.
- You must complete the University Accident/Incident form and send to your Operations or Departmental Manager as soon as possible.

K. Coping with an Emergency

- Ensure you know where emergency spill kits are located and how to use these
- If you use a spill kit, inform the laboratory manager immediately so that replacement parts can be procured.
- Report any accident or incident immediately to the Lab Manager (if only to ensure that an Accident/Incident form is correctly completed).
- You must know how to initiate emergency procedure/evacuation in the event of a fire or major chemical spill.
- In the event of a major spill in your lab involving the Emergency Services, be sure that you and the Lab Manager make yourselves available to the Emergency Services in case they require further information.