SMM HANDBOOK OF WHS REGULATIONS

INFORMATION FOR STAFF, STUDENTS AND USERS

Sydney Microscopy & Microanalysis
Dr Takanori Sato
WHS Officer
Madsen Building F09
The University of Sydney
NSW 2006 Australia

T +61 2 9351 7541
E takanori.sato@sydney.edu.au
www.sydney.edu.au/acmm

New users of the facility will be asked read this booklet and sign the WHS Compliance Form to indicate that they understand the information and will abide by the regulations.

MICROSCOPY AUSTRALIA
FORMERLY AMMRF

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I. EMERGENCY CONTACT DETAILS

Please note: For all external numbers dial 0 first then the number.

Service	Number
Emergency Services (Police/Fire Brigade/Ambulance)	0-000
University Security Service EMERGENCY	9351 3333
University Security Service Enquiries	9351 3487
Poisons Information Centre	0-131 126
Campus Infrastructure & Services Desk	9351 7838
Risk Management Office	9351 2451 9351 5244
Radiation Safety Officer	9351 7722
University Health Service	9351 3484

SMM contacts	Name	Room	Number
Safety Officer	Takanori Sato	F09-01-142	(02) 9351 7541
Laboratory Manager	Eleanor Kable	F09-02-266	(02) 9351 7566
First Aid Officer (Madsen Building)	Vijay Bhatia	F09-01-116B	(02) 9351 7529
Local Fire Warden (Madsen Building)	Matthew Foley	F09-01-128A	(02) 9351 7565
Duty Microscopist (Madsen Building)	Varies		(02) 9351 7567

II. GENERAL SAFETY INFORMATION AND GUIDELINES

1. Emergencies

In case of an emergency, contact any of the listed staff members below

- For first aid, see the first aid officers (contact details on page 2). FIRST AID KITS are found in the Madsen level 2 tearoom (Room 235) and at various laboratory rooms indicated on the evacuation maps displayed across the corridors
- Report safety incidents through the USYD Riskware online system and notify the duty microscopist, safety officer or the laboratory manager
- Report all potential hazards (e.g. floods, faulty electrical equipment) through the USYD Riskware online system and notify the duty microscopist, safety officer or the laboratory manager

In case of a fire

- Use a FIRE EXTINGUISHER if necessary. FIRE BLANKETS can be more efficient if a small fire occurs in a fume hood. DO NOT TAKE PERSONAL RISKS. If a fire extinguisher is used, notify the Safety Officer IMMEDIATELY so that it can be refilled
- If the fire emergency alarm system is activated, you may be required to evacuate the building. The alarm operates in two stages:

1. A BEEPING sound of increasing loudness will be heard. Secure your workplace by turning off all non-vital equipment and securing all dangerous processes. Collect or lock away your personal belongings. Get ready to evacuate
2. A WHOOPING noise and an EVACUATION message will be heard over the system. Move directly to your nearest exit or proceed as directed by a warden. Do NOT use the lifts

- Assembly area during working hours (9am to 5pm) is the Madsen Building car park and after hours in front of Madsen Building (Eastern Avenue). Do not re-enter the building until clearance is provided by the Fire Warden

2. Responsibilities

All staff, students and Users are required to:

- Observe the safety regulations and procedures outlined in this booklet
- Perform a risk assessment (RA) on their projects. Read relevant Safety Data Sheets (SDS) and attach to the RA. Follow all guidelines in the SDS including handling, storage and use of the chemical
- Become familiar with the risk assessment of each equipment and laboratory prior to starting work
- Become familiar with the location and operation of safety devices in the work area
- Not let anyone else into the facility using your key access card
- Contact the safety officer or the laboratory manager if in doubt regarding a safety matter
- Wear personal protection equipment such as safety glasses and gloves where required

3. Discipline

- Any person found damaging or improperly using any safety equipment or defacing safety signs and instructions will be liable to prosecution
- Animals/pets are not allowed in the centre unless the Director has granted special permission (Guide dogs are an exception)
- Unsafe conduct (e.g. skateboarding, bicycling, or playing ball games) is not allowed
- Appropriate dress and covered footwear must be worn at all times. Bare feet or open footwear such as sandals and thongs are not acceptable in the laboratory areas
- Fire exits, corridors, aisles, doorways and stairs must be kept clear at all times
- No eating or drinking is allowed in laboratory areas (entire Madsen F09 Level 1)
- No lab equipment should be taken out of labs, including lab coats and safety glasses
- University regulations prohibit smoking in any building

4. Definition of "Category 1, 2 and 3" at the SMM

Category 1 (Cat 1)

- Cat 1 is the status Users have once they begin a short training course or one-on-one training with an SMM staff member.
- Users are only allowed to work between the hours of 9am and 5pm.
- While using the equipment or the lab, Users must be supervised by their contact person or another staff member.
- Users who attend a New User Meeting (NUM) with a subsequent activated project automatically attain Cat 1 status.
- Initial training is often discussed and organised at the NUM.

Category 2 (Cat 2)

- Users must have successfully completed a Cat 2 assessment with an SMM staff member.
- Users understand that Cat 2 status pertains only to each lab or piece of equipment.
- Users are permitted to work independently during the hours of 9am to 5pm.
- Users are deemed sufficiently competent with equipment use to start up, work safely and responsibly, and shut down unsupervised.
- If a User encounters problems, the Duty Microscopist is to be contacted.
- Users will inform their SMM project contact person/s of any difficulties during instrument sessions, and arrange additional training/revision of skills if required.
- Users will not attempt to train or demonstrate the equipment to others.

Category 3 (Cat 3)

- Users have successfully completed a Cat 3 assessment for the particular equipment.
- Users are allowed 24-hour access only to a particular laboratory or piece of equipment.
- Users are very competent with the equipment, and can solve small problems independently.
- Users comply with the specific WHS issues regarding working after hours.
- Cat 3 Users will not attempt to train or demonstrate the equipment to others, irrespective of their advanced level of competency.

5. Additional safety information

Additional safety information can be obtained from the University of Sydney's Safety Health & Wellbeing website at http://sydney.edu.au/whs/

III. LABORATORY SAFETY RULES

Duty microscopist is the first point of contact for reporting any problems or incidents

- Duty Microscopist (02) 9351 7567

1. Microscope rooms

- Do not go behind the machines unless authorised
- Use approved cryogenic gloves and safety goggles whenever handling liquid nitrogen
- All microscopes are to be left in standard operating conditions after use. This information is available in each of the machines user manuals (beside each machine)
- Dispose of broken glass slide into the designated sharps bin (each room has one). Do not leave them on the work bench or in the general waste bin
- Some microscopes are equipped with a mercury lamp, which is very hazardous if broken. If a mercury lamp explodes, immediately evacuate everyone from the room and shut the door. Notify the safety officer and the duty microscopist immediately. Mercury is most dangerous in the vapour form. Once cooled it can be cleaned up (under supervision) with relative safety.
- All lasers installed on the microscopes are covered and contained. No User is allowed to remove any of these covers. Only trained authorised personnel are allowed remove the laser covers

2. Gas cylinders (typically connected to a microscope)

- Cylinders must be secured before connection to equipment or use
- Cylinder change and regulator connection must be done by the SMM staff after completing the training course “Working safely with gases and cryogenic liquids” (online)

3. Liquid nitrogen storage room (Madsen F09 Room C105A)

- Face shield and cryogenic gloves must be worn when handling liquid nitrogen
- Users can obtain liquid nitrogen from the small/tip-to-pour (<30L) dewars after completing the face-to-face training as part of the microscope operation CAT2 training
- Dispensing from the large 240L dewar to the small portable dewars must be done by the SMM staff after completing the training course “Working safely with gases and cryogenic liquids” (online)

IV. SPECIMEN PREPARATION AREA RULES

Every user that requires access to the following areas must complete a separate face-to-face induction and sign-off process

1. Biological specimen preparation laboratory

Contact personnel for this laboratory

- Naveena Gokoolparsadh Ph. (02) 9351 7642 Madsen Building F09 Room 116

General rules

- Covered footwear must be worn at all times
- Lab coats must be worn at all times (borrow one if necessary)
- Please consider other users and call/email to cancel microtome and CPD bookings you can't keep
- All samples, bottles etc. must be labelled with the name, specimen and date. Unlabelled containers will be discarded
- Use pencil for labelling specimen vials (pens and markers wash off in the solvents)
- Balances are to be kept clean. Wipe up excess chemicals on the pan
- Never use razor blades directly on benching. Use dental wax to dissect tissue out
- Work over moist paper towelling when sawing or filing resin blocks (the dust is harmful)
- Don’t leave anything on the hotplates unattended
- No naked flames are permitted in the lab at any time. Speak to the section staff if you need to use a Bunsen burner

Fume hoods and ovens

- All resin must be polymerised in the oven prior to disposal
- Everything with resin must be in a box, and not unprotected on the oven shelves or floor
- Both fume hoods are to be left on at all times. Please inform the section staff if a fume hood is off or displaying an error message

Chemicals

- No chemicals are to be taken away from the laboratory. All chemicals must be used in accordance with the safety recommendations of the laboratory.
- If you are using a chemical for the first time, please read its Safety Data Sheet (SDS) before using it. The SDS folder is located on the top left shelf next to the door in room 113.
- All procedures involving fixatives, Cacodylate buffer, osmium tetroxide (OsO_4), resin, chloroform and HMDS must be done in a fume hood (including the first 2 changes of solution after OsO_4 fixation).
- All weighing and solution preparation of chemicals classed as 'IRRITANT' or as 'TOXIC' should be performed in a fume hood. Please inform lab staff before preparing a solution using a TOXIC chemical.
- Forceps and embedding moulds must be wiped with ethanol to clean off excess resin.

Chemical spills

- When working with resin (always in the fume hood), cut a small square of bench roll to work on as spilling drops of resin is inevitable. When finished, place the bench roll square in the oven to polymerise.
- Osmium spills (in fume hood) must be covered generously with full cream powdered milk (in fume hood) and the lab staff, along with our safety officer Takanori Sato (ph. 02 93517541), must be informed. Once the osmium is fully reacted with the milk, the soiled area should be wrapped up, labelled and placed in the garbage bin.
- DO NOT attempt to clean an osmium spill that has occurred outside the fume hood! Evacuate the lab and inform a staff member immediately.
- If you spill a solution other than osmium when working in the fume hood, inform lab staff who will replace the bench roll.

Clean-up procedures

- Broken glass must be discarded in the yellow sharps containers.
- Wash hands with soap and water. Don't use solvents.
- If a work area must be left unattended for an extended period of time, please leave a note indicating your name and when you will return.

Glassware

- Glassware must not be removed from the lab.
- For routine work, never mix Osmium solutions in glassware. Use the graduated plastic pipettes to add equal volumes of OsO_4 and buffer.
- Please clean up any glassware that you use in the lab. Either wash it and leave it on the draining rack or place it in a dishwasher draw with the red 'dirty' sign on it.

Fridges and freezers

- Don't store anything you won't use within the next couple of weeks.
- Don't store your solutions on the "SMM Stock Solution" shelf.
- Keep toxic solutions in the left fridge, leaving the right side of the fridge for non-toxic solutions, such as buffers and immuno-chemicals.
- Open the glutaraldehyde or OsO_4 stock bottles in the fume hood ONLY.

Waste disposal

- Anything contaminated with resin (gloves, benching, pipettes, vials) must be polymerised in the oven before disposal.
- Waste epoxy (Epon, Spurr's) resin dilutions (50/50) must be discarded into resin: ethanol waste container provided, before changing to 100% resin (don't polymerise 50/50 resin solutions).
- Waste LR white resin dilutions (50/50) must be discarded into the LR white resin: ethanol waste container provided, before changing to 100% resin (don't polymerise 50/50 resin solutions).
- Waste glutaraldehyde and paraformaldeheyde should be disposed of in the glut/paraformaldehyde waste container, located in the grey cupboard to the left of the fume hoods.
- Waste ethanol and acetone should be disposed of in the ethanol/acetone waste container, located in the grey cupboard to the left of the fume hoods.
- Waste sodium cacodylate should be disposed of in the sodium cacodylate container, located in the grey cupboard to the left of the fume hoods.

- Osmium waste (along with the first two washings after osmium fixation) is put into osmium waste container in the fume hood.
- Uranyl acetate solutions are disposed in uranyl acetate waste container, located below the sink next to the staining area.
- Aqueous lead solutions should be put into lead waste container, located below the sink next to the staining area.
- Ether, chloroform and HMDS should be evaporated in fume hood prior to cleaning container.
- Please consult with lab staff before disposing of any other chemical waste.
- Gloves and consumables should be disposed of only in bins lined with a blue bag.
- The disposal of biological waste material should first be discussed with lab staff and the SMM Safety Officer.

2. Materials specimen preparation laboratory

Contact personnel for this laboratory:

- Huma Bilal Ph. (02) 8627 6683 Madsen Building F09 Room 124

Chemicals

- Anybody handling chemicals (hazardous or dangerous goods) must have completed the USYD working with chemicals course (online)
- No chemicals are to be taken away from the laboratory. All chemicals available in the laboratory must be used in the laboratory under the supervision of the laboratory manager and in accordance with the safety recommendations of the laboratory
- All acids must be stored in the acid cabinet or in the fume hood
- All preparation of chemical solution must be done in the fume hood
- Clearly label all containers used in the fume hood with your name and acid type

Hydrofluoric acid

- Hydrofluoric acid (HF) is highly toxic and requires extreme care. It is currently not permitted for use in the materials specimen preparation laboratory
- Contact the laboratory manager or the materials specimen preparation laboratory staff for more information

Chemical spills

- All major spills must be reported to the duty microscopist and the safety officer
- Major spills must be absorbed with the spill kit. The spill kit also contains a labelled plastic bag to place any absorbed material (do not put broken glass and other sharp objects in there)
- If you spill acid on your skin rinse immediately with tap water for few a minutes, contact a first aid officer

Waste disposal

- There are waste containers under the fume hood. Make sure you use the correct container for each waste type

Clean-up procedure

- Wash hands with soap and water. Don't use solvents
- Clean benches when you finish using them
- If a work area must be left unattended for extended periods, please leave a note indicating your name and when you will return, and clearly label all reagents left at your workspace

3. Cell culture laboratory (Madsen F09 Room 132)

Contact personnel for this laboratory:

- Eleanor Kable Ph. (02) 9351 7566 Madsen Building F09 Room 266

- Users of this lab must complete the Cell Culture Risk Assessment form and await approval from the WHS Committee before proceeding. Please allow a minimum of 5 working days for the processing of

your form. You will be notified by email and provided with the name of a contact person who will show you the procedures in the laboratory.
- Dedicated face-to-face training is required prior to being able to access the room alone without supervision
- Please note that cell cultures, Genetically Modified Organisms (GMOs) and or viruses analysed in this laboratory by other users can pose significant WHS risks, so it is pertinent that you are aware and respect the safety of colleagues and peers whilst working. On occasions there may be temporarily increased WHS risks (such as GMO viruses, for instance). In such cases, appropriate signage will be posted to promote awareness.
- The laboratory must be kept clean at all times to ensure minimum risk of contamination
- Designated lab gown (blue) for cell culture lab should be worn at all times
- Dirty glassware should be rinsed, soaked in bleach solution for 10–15 minutes and placed on the side of the sink to be drained
- The refrigerator is to be used only for solutions associated with your use of the laboratory. We trust that you will use it only for short-term storage (1–2 weeks)
- All chemicals/buffers/solutions must be labelled with your name, identification of chemical/solution, and the date. Unlabelled solutions will be discarded. If opening a bottle of medium/PBS/trypsin make sure it is then aliquoted out or labelled as to when opened and by whom
- There are two biosafety cabinets in the laboratory. The BH2000 biological safety cabinet, biohazard hood, is to be used for general cell culture assays that do not involve the use of carcinogens/toxic chemicals
- The Gelaine Cytosafe, cytotoxic drug safety hood, is to be used when carcinogens/toxic chemicals are employed. These cabinets should be booked online prior to use
- If there is a spill in these cabinets, (including under the grill or walls), it must be cleaned after use and logged into your instrument session. In addition, during work hours (9am to 5pm) you should verbally notify cell culture lab personnel
- Do not adjust the pressure of the CO_2 tank (it should only be at 2–3 psi). If it is running low notify the Duty Microscopist or cell culture contact personnel
- Ensure that there is always water (milliQ or distilled) in the vessel in the CO_2 incubator (note this controls the humidity level for your cells)
- The 5% CO_2 incubator should be opened as little as possible, therefore short experiments such as trypsinisations, short incubations should be done in the other incubator. This will ensure the unnecessary loss of CO_2

4. Molecular preparatory laboratory (Madsen F09 Room 130)

Contact personnel for this laboratory:
- Eleanor Kable Ph. (02) 9351 7566 Madsen Building F09 Room 266

- Bench tops must be left clear after use, and all wastes appropriately disposed of
- All equipment must be booked online prior to use
- Read each instrument manual and risk assessment (RA) before use
- Place gels onto glad wrap first and not directly onto the exposure platform in the gel reader
- Wipe surface of gel reader with distilled water after use, and dry with paper towel
- Clean bacterial spills using 70% ethanol
- Do not leave bacterial plates or cultures for more than 24 hours in the incubators
- Used agar plates must be bagged and autoclaved before disposal
- Any RNA/DNA samples and PCR products can be stored in the -80^{o}C freezer (Room 123) and MUST be clearly labelled with name, date and contents
- Turn off instruments after use, except for the spectrophotometer, which will be left on until the end of the day

V. RISK ASSESSMENT

For cell culture laboratory Users, the cell culture risk assessment (separate link on the SMM website) must be filled out and approved before commencement of any work. This must include all hazardous and toxic compounds accompanied by their SDS and disposal procedures. These must be continually updated throughout your project, i.e. no new compounds or assays to be introduced into the laboratory until approval is given.

All other laboratory Users must submit a generic project risk assessment, listing all chemicals brought into the SMM and proposed disposal and transport procedures. Users without existing risk assessments (RAs) must complete the template project RA (separate link on the SMM website). Projects will not be approved without the provision of such adequate WHS information.

VI. CARCINOGENIC AND HIGHLY TOXIC CHEMICALS

SDS should always be read, understood and supplied before using a new chemical. This information can be obtained from the University of Sydney ChemAlert II online data base or specific vendor websites. Furthermore, SDS for carcinogens and highly toxic chemicals that are commonly used must be provided by Users of the cell culture laboratory.

It is important that all waste is disposed of in a safe and environmentally friendly manner. Do not discard toxic wastes or sharps down sinks or in the bins. They must be discarded in the appropriate waste disposal containers provided. If you are unsure how to dispose of your waste, seek help from any of the contact personnel responsible.

Biohazard waste bags are provided in the appropriate laboratories; these are to be autoclaved prior to putting in general waste. Under no circumstance should toxic substances be placed in these bags or the autoclave. If you are unsure how to dispose of your waste, seek help from any of the contact personnel responsible.

VII. INCIDENT REPORTS

If you have an accident or incident (near miss or potential accident), you must notify the duty microscopist as soon as possible. Contact the campus security service if the incident occurred after regular working hours.

All accidents, injuries, illnesses and near misses are to be reported using the Riskware online system

https://riskware.sydney.edu.au/