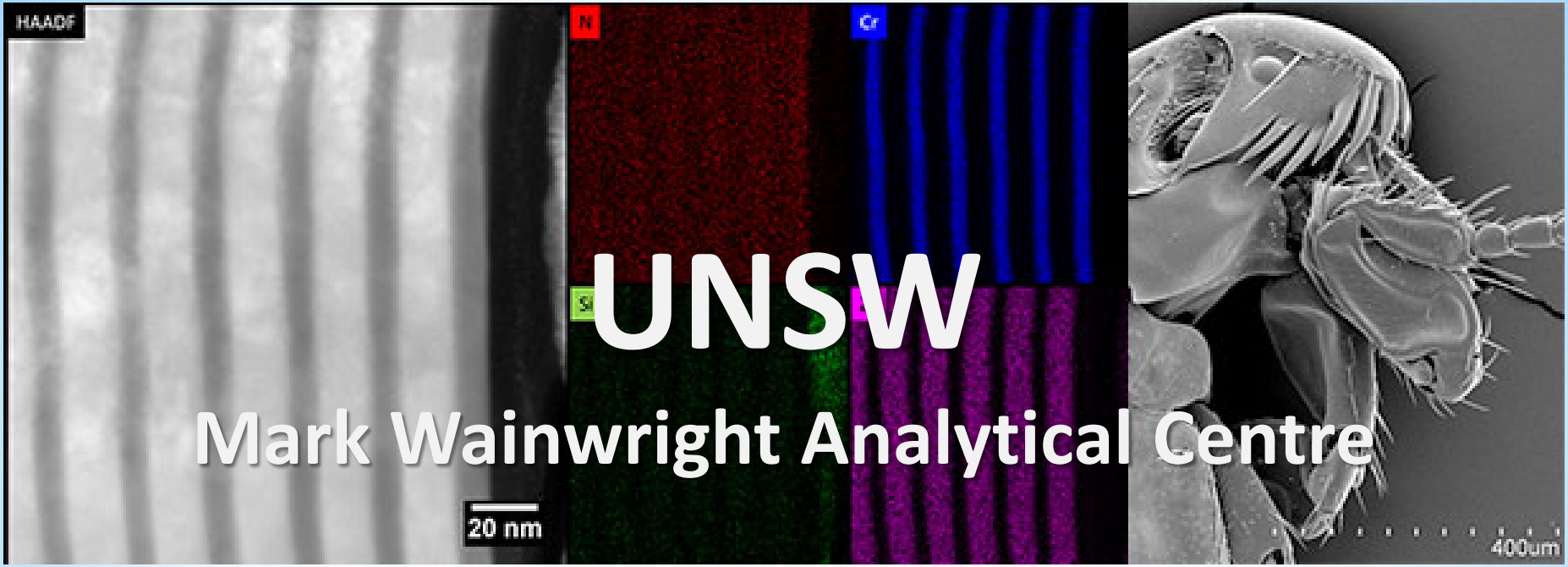


UNSW

Mark Wainwright Analytical Centre

Electron Microscope Unit

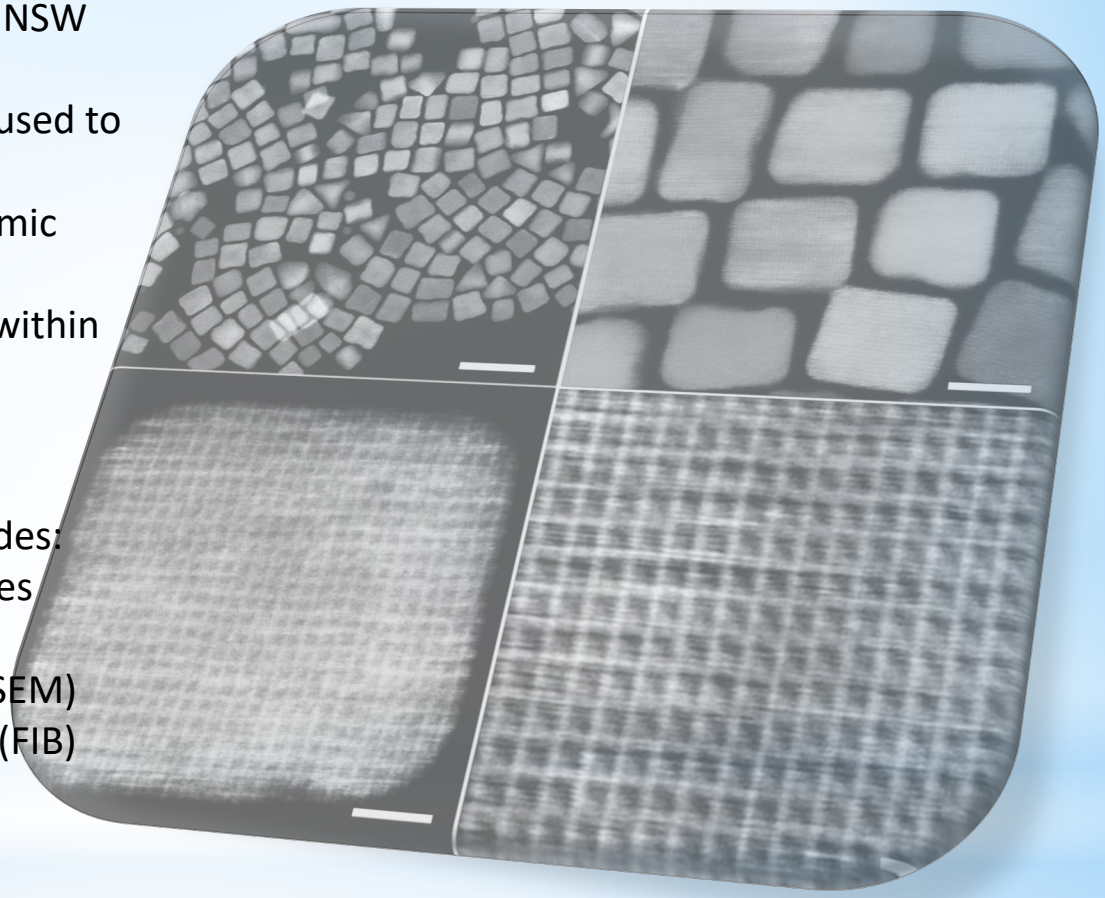
New User Induction

Who are we?

- We are a central research infrastructure unit that provides microscopy and microanalysis facilities to the research community at UNSW and beyond.
- The EMU has instruments which can be used to answer questions such as:
  - Structure of materials down to atomic scales
  - Distribution of chemical elements within materials
  - Crystal structure within materials

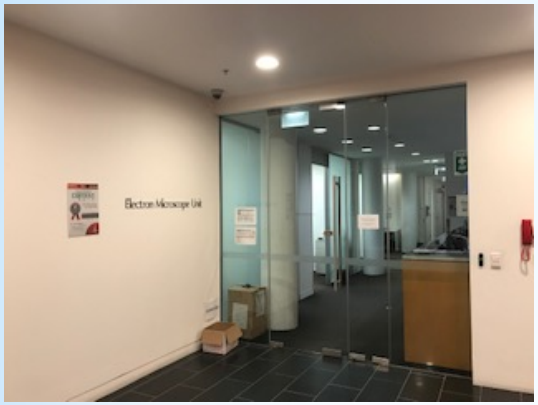
- Our suite of advanced instruments includes:
  - 5 Transmission Electron Microscopes (TEM)
  - 6 Scanning Electron Microscopes (SEM)
  - 3 Focussed Ion Beam microscopes (FIB)
  - 2 Atomic Force Microscopes (AFM)
  - 1 Microprobe (EPMA).

- Our staff are highly experienced and enthusiastic microscopists with expertise in a wide range of samples and applications.



Who are we?

We have three locations on campus:



Basement, Chemical Sciences Building

Basement, Hilmer Building

Level 5, SEB

EMU reception and main office is in the basement of the Chemical Sciences building (F10 on the UNSW map). Most of our instruments are in this location.

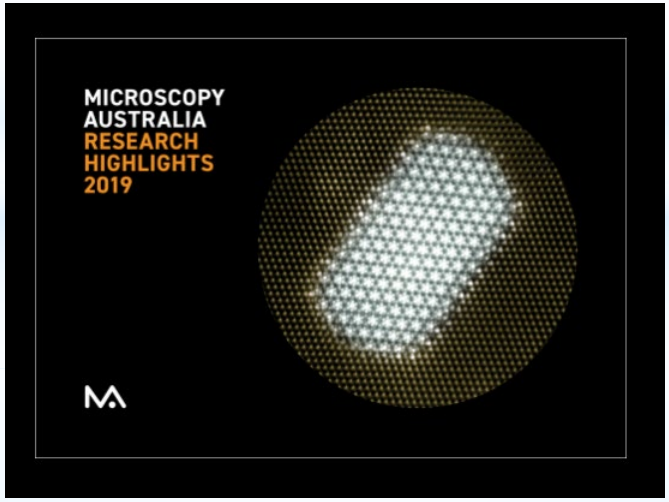
We have some of our TEMs in the basement of the Hilmer Building (E10 on the UNSW map).

The laboratory on level 5 of the SEB is used for specimen preparation of biological samples and also houses the MWAC Cell Culture Facility (E8 on the UNSW map).

Who are we?

MICROSCOPY AUSTRALIA

- We are a founding member of Microscopy Australia
  - This is a consortium of university-based microscopy facilities united by values of collaboration, accessibility, excellence and innovation. Each year, over 3,500 researchers from universities and industry use Microscopy Australia supported instruments and expertise.
  - Microscopy Australia incorporates 9 facilities and 5 linked labs.
  - Microscopy Australia facilities are available to researchers throughout Australia.
  - If you would like more information, please contact the EMU Director.



How the EMU operates.

Training:

- In most cases, the EMU recommends that you learn how to do the microscopy yourself. This is because the person doing the research has the best understanding of the sample and the research question.
- Our training is mostly done on a one-to-one basis and is aligned to the goals of the research project. EMU staff will work with you to create a training plan that includes specimen preparation, instrument operation and data analysis.
- Once the user is able to operate independently, EMU staff continue to be available to provide support and advice.
- There is a new user fee that applies at the time of registration. This entitles the user to training in microscope use, specimen preparation and scientific/technical assistance from EMU staff.

Service microscopy:

- In some cases, the microscopy can be done by EMU staff on behalf of the user. This is most common when there are few samples and there is no-one else in the group who can do the microscopy.

External/commercial work:

- The EMU is open to users who are external to UNSW.
- These users may be trained to use the instruments themselves or have the microscopy done by EMU staff.

How the EMU operates: new user meeting

The purpose of the new user meeting is to discuss the microscopy needs of the project and make a plan for achieving those goals.

The people who need to attend the new user meeting are:

- You (the new user)
- Your supervisor (or a senior member of your research group)
- At least one member of EMU staff

You will discuss:

- The instruments/techniques you will need to use
- Specimen preparation techniques
- Project timetable

MYSCOPE
MICROSCOPY TRAINING

Prior to training on the microscopes, please read through the relevant Microscopy Australia MyScope module and take the quiz. This will help you to understand the techniques you are using and optimise your results.

How the EMU operates: training

EMU users are classified as “trainee”, “independent” and “after-hours”. Booking permissions are controlled via the on-line booking system (ACLS).

Trainee

- You are learning how to use the instrument
- Bookings are made by EMU staff
- You are closely supervised by EMU staff

Independent

- You have completed the training for using the instrument
- You are able to make bookings for yourself during standard business hours (Mon - Fri, 8am to 6pm)
- EMU staff are available for support or to answer questions

After-hours

- You can demonstrate competent and safe use of the instrument over a period of time
- You have completed the after-hours induction
- You are able to make bookings outside standard business hours
- EMU staff are not present

How the EMU operates: training

Training in use of equipment or procedures may only be provided by EMU staff. Users are not permitted to train other users.

During your training you will go through the relevant EMU risk assessment and SWP for the specific instruments and tasks you will be using.

These documents are available in the labs and instrument rooms.

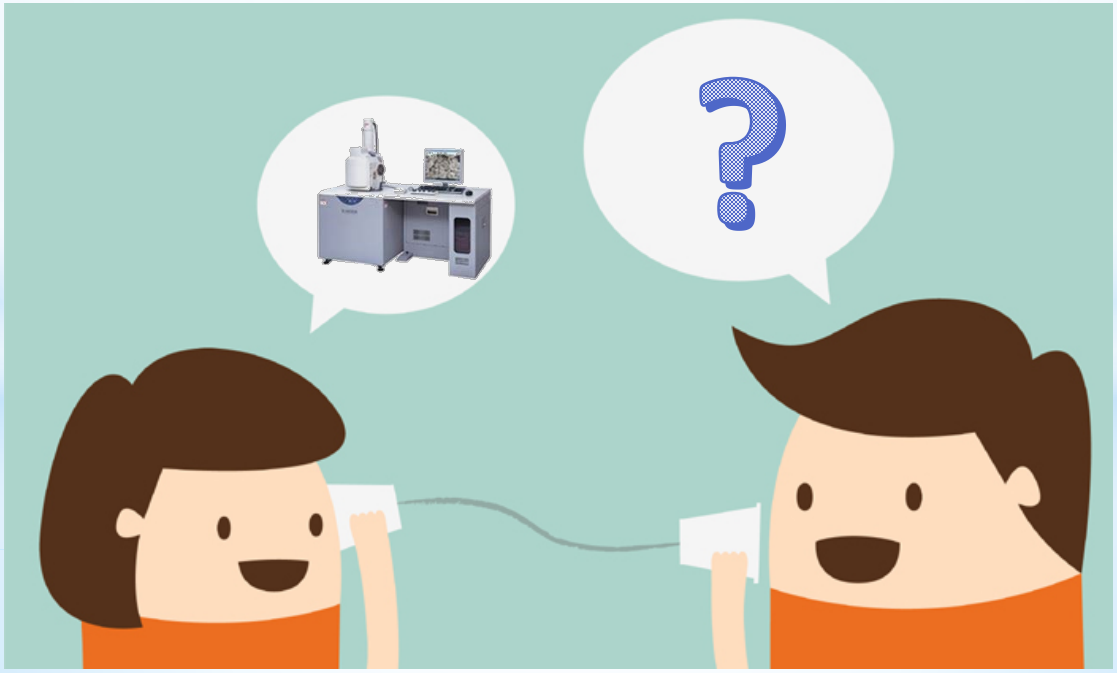
We may ask you to provide us with risk assessments and SWP for your project/sample if it is non-standard.

How the EMU operates: training

Independent access will automatically be cancelled if a user does not use a microscope for over 3 months. To regain independent access, the user must contact an EMU staff member to arrange a ‘refresher’ training session. The refresher training will not necessarily be as long as the initial training.

This is so:

- We can check that you still meet the competency criteria (you still remember how to use the instrument)
- We can discuss whether your project has changed in some way (e.g. new sample type)
- We can tell you about any changes in the instrument since you last used it



How the EMU operates: the booking system

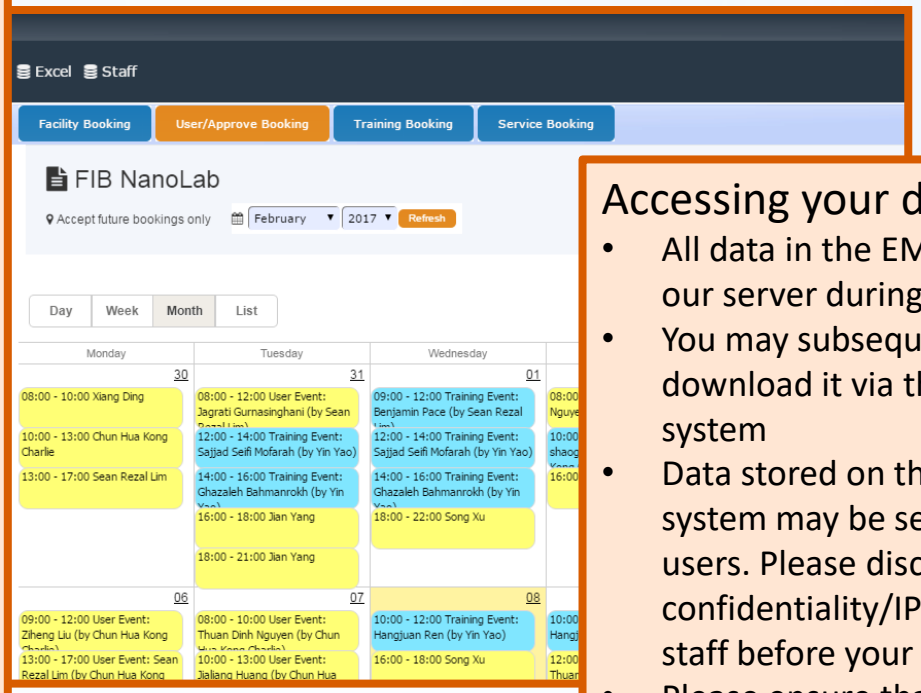
You will be shown how to use the booking system during your training.

The booking system is used for:

- Making/cancelling instrument bookings
- Accessing your images/data
- View/update your profile information, training records and instrument usage

Instrument bookings

- Each instrument has its own calendar
- You will be able to see all bookings on the instrument
- Most instruments are booked by the hour
- Billing is calculated from the booked times – please make sure that records on the booking system are correct by informing staff if your session was changed or not used.
- The system will not allow you to cancel a booking within 24 hours of the session. Please contact EMU staff if you need to cancel a session at short notice.



Accessing your data

- All data in the EMU is saved to our server during your session
- You may subsequently download it via the booking system
- Data stored on the EMU system may be seen by other users. Please discuss any confidentiality/IP issues with staff before your session.
- Please ensure that you download your data soon after your session.

How the EMU operates: Publications

When you publish papers containing work done in the EMU, please include an acknowledgement of the EMU and Microscopy Australia. This helps us to encourage ongoing funding of the unit from university and government funding bodies. This funding is used to invest in instruments and staff.

To acknowledge the EMU:

Please acknowledge us using one of the following templates.

1. Basic template:

The authors acknowledge the facilities and the scientific and technical assistance of Microscopy Australia at the Electron Microscope Unit (EMU) within the Mark Wainwright Analytical Centre (MWAC) at UNSW Sydney.

2. If you used the Talos Arctica Cryo-TEM:

The authors acknowledge the use of the Cryo Electron Microscopy Facility through the Victor Chang Innovation Centre, funded by the NSW government, and the Electron Microscope Unit within the Mark Wainwright Analytical Centre at UNSW Sydney.

EMU Publication Prize:

The EMU is pleased to offer an EMU Publication Prize comprising 2 hours of free microscopy time for each peer reviewed publication that includes the appropriate EMU acknowledgement (see templates above).

Authors of eligible papers should submit a copy of the published paper to the EMU laboratory manager.

The Publication Award will be credited against future EMU use by the author or their UNSW supervisor. It must be used within 12 months.

How the EMU operates: Safety in the microscope rooms

1. Please do not bring food or drinks into the microscope rooms (or the specimen preparation labs).

   Liquids and crumbs can damage the microscopes and other equipment in the rooms. You may leave drink bottles at reception or keep closed food/drink containers in your bag.

2. You must not be in the EMU after-hours if you have not been granted after-hours access.

   Please speak to your trainer if you are having difficulty completing your work during standard business hours.

3. You must not wear headphones/earbuds when working in the specimen preparation labs.

   You should be able to hear what is going on around you (e.g. alarms).

4. You must not use USBs on any computer in the microscope rooms. You must not attempt to upgrade/modify instrument software or access the internet via the microscope computers.

   If you think an upgrade or alteration is required, please speak to EMU staff.

5. You must wear fully enclosed, impermeable footwear when working in the EMU

   If you spill liquid (eg hot tea) on your shoe, would the liquid touch your skin?

6. Please report any instrument problems, hazards, incidents, injuries or issues to EMU staff.

   We need you to help us keep everything working well so that everyone can work effectively and safely.

PPE:

You must wear safety glasses and fully enclosed, impermeable footwear whenever you are in the specimen preparation lab.

You will be advised on any additional PPE required for the tasks you are doing during your training.

For example, if you are using liquid nitrogen, you must wear a face shield, cryo-gloves and a lab coat.

There are two types of gloves mainly used in lab B61.

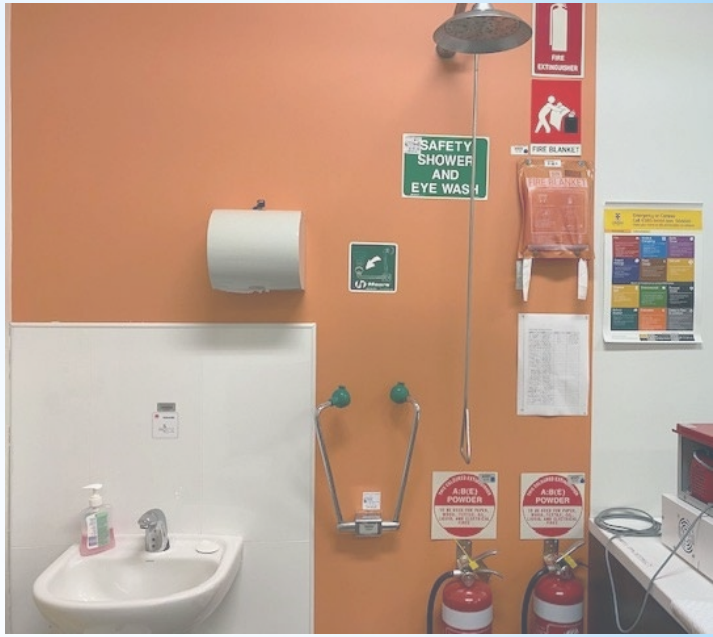
- Blue nitrile gloves (these gloves should be used when working with hazardous materials at the fume hoods)

  *These gloves are protecting **you** from a hazard*

- Clear/white vinyl gloves (these gloves may be used when working at the benches)

  These gloves are protecting your sample

In an emergency:



First, make yourself safe.

If possible, come to find EMU staff or send someone else.

If you are unable to leave the lab or send someone else, press one of the emergency stop buttons next to the lab door – this will alert staff to a problem in the lab.

There is a safety shower and eyewash station near the entrance of the lab.

There is a fire extinguisher and fire blanket near the entrance of the lab.

UNSW emergency procedures are displayed on posters in the lab.

There is an internal access phone on the bench that can be used to contact security in case of emergency (#56666).

In case of a chemical spill, there are spill kits in the lab.

To find the first aid officer, speak to any member of EMU staff.

If case of an evacuation, please follow the exit signs to get out of the building. Do not use lifts. Assemble as directed by floor wardens. Do not re-enter the building until directed by staff.

Note: there is no after-hours access to B61.

Hazards in the lab:

Do not enter the lab if the red light on the gas panel outside the lab is flashing. Check with EMU staff.

There are hazardous chemicals present. These are all stored appropriately and are used at minimum volumes and concentrations. The hazards include: radioactive, flammable and toxic substances. *Note that nanoparticles are always considered hazardous.*

All work with hazardous chemicals (including your own samples) must be done in the fume hood with the sash lowered as much as possible.

There are several compressed gas cylinders in the lab. These are restrained to prevent injury. Do not attempt to move any gas cylinder.

There is a CO2 sensor in the room. This will alarm if the levels of CO2 increase.

The gas panel will alarm if the lab ventilation fails or if the power supply to the lab is interrupted.

Access to the lab is proximity card controlled and is limited to approved users. Unapproved user may only enter the lab in the company of an EMU staff member.

Do not use a piece of equipment or chemical unless you have been trained by a member of EMU staff.

Waste:

All used disposable gloves must be placed into the contaminated waste bins.

All chemical waste must be disposed of in the appropriate, specifically labelled container.

Paper towels and plastic pipettes should be disposed of in the contaminated waste bins after use.

Broken or cracked glassware must be disposed of in the specific broken glass bin. Please inform staff if any glassware breaks so that we can make sure it is replaced.

If you are unsure about how to dispose of any waste, please check with EMU staff.

WASTE CATEGORY:	Chemical Waste: Aqueous	
SPECIFIC HAZARD: 	• < 1% Glutaraldehyde • < 1% Paraformaldehyde • < 1% Sodium cacodylate • < 1M Sodium hydroxide • < 1% Sodium acetate	• < 1% Poly-l-lysine • < 1% Phosphotungstic acid • Aspartic acid • < 1% Thiocarbohydrazide • < 1% Hydrogen peroxide
WASTE GENERATOR:	Electron Microscope Unit (Lab Manager: Katie Levick, x56391)	
DATE:		
BUILDING:	Chemical Sciences (F10)	
ROOM:	Laboratory B61	

Welcome to the EMU

Our mission is to help you achieve your research goals by giving you access to advanced instrumentation and experienced staff.

Please do not hesitate to speak to us if you have any questions or concerns at any point in your work in the EMU.

Good luck with your project!