**Local rules – template**

Please note that this is template which should be reviewed and adapted according to the requirements of each laboratory

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In order to adapt this template to the requirements of your group, please delete any sections/paragraphs that are not relevant to you. Then go to the table of contents line and click the update table icon. Your table of contents should then match the body of the text beneath.

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# **General Standards**

* Safety in laboratories depends on a mixture of common sense and experience. Make yourself aware of the potential hazards in your laboratory. You must receive training before you use any equipment or undertake potentially hazardous work. Safety devices, covers and guards must always be used when provided. Experimental equipment must not be left unattended unless it is safe to do so.
* All visitors and new members of staff will be required to undergo an induction process. Initial Health and Safety induction will be completed by a competent person within one week of starting. Emergency procedures will be covered in the first day by either the line manager or a designated responsible person. The new starter and person providing the induction should both sign the induction form and keep a copy.

* The Control of Substances Hazardous to Health (COSHH) regulations apply to all activities conducted on the premises and before starting any work involving chemicals or biological material, a risk assessment **must** be made and approved by the project leader/Principal Investigator (PI). All members of staff **must** read any assessments made on their behalf and make themselves aware of all the laboratory safety guidance pertaining to these assessments. Further guidance and information on Risk Assessment can be found using the following link:

<https://portal.sgul.ac.uk/she/risk_assessment_coshh_and_checklist/risk_assessments_coshh_and_checklists>

* A list of Group Safety Advisers can be found by following the link: <https://portal.sgul.ac.uk/she/she-information/departmental_safety_advisers>
* Good Laboratory Practice (GLP) must be followed at all times. **Everyone should know where to find a copy of the Local Health and Safety Rules.** All documentation can also be found on the health and safety pages on the portal:

<https://portal.sgul.ac.uk/she/safety-health-and-environment-sh-e-a-z>

Further information on the principles of good practice are available through the HSE website http://www.hse.gov.uk/coshh/detail/goodpractice.htm

* Pipetting: It is absolutely forbidden to pipette anything by mouth. All materials must be pipetted using a safety device.
* Do not eat, drink, smoke or apply cosmetics in any laboratory area or store room.
* Do not work in a cluttered and untidy laboratory. Clear up when you have finished. You are responsible for decontaminating the bench and any equipment you use.
* You should not work on your own in a laboratory out of hours without prior approval from the Principal Investigator, or immediate Line Manager. The SGUL guidance relating to this lone working can be found on the portal: <https://portal.sgul.ac.uk/she/pdfs/copy_of_guidance-on-lone-and-out-of-hours-working-2016.pdf>
* Non-essential electrical appliances should be switched off overnight. If apparatus is left running, you should leave a notice, giving details of the experiment and who to contact in an emergency.

# **Personal Protection Standards**

## **Laboratory Coats:**

* A Howie (side fastening) style laboratory coat with elasticated cuffs must be worn for all laboratory work unless specifically exempted by the risk assessment which must clearly state the reasoning.
* Laboratory coats should be kept or stored separately in the laboratory area and should be changed and laundered regularly. Lab coats can be obtained from room 2.115. Please do not write your name on your labcoat. Dirty lab coats should be returned to the bin in 2.115 – please ensure you remove all pens and equipment from the pockets.
* Laboratory coats must normally be removed (along with any other protective equipment e.g. gloves) before leaving the laboratory

## **Safety Glasses:**

* Safety glasses must be available for all laboratory workers
* Safety glasses should be worn in the following circumstances:
  + - * for all activities presenting a risk of eye splash injury, e.g. dispensing cultures, opening cryovials, working with liquids under pressure (e.g. filtering liquids with syringe)
      * when working with high pressure systems, or glassware operated under vacuum (e.g. removing items from an autoclave)
      * Although there is no specific rules for wearing contact lenses in the laboratory, the general guidance on wearing eye protection where a splash risk injury is identified would still apply. In other words, if there is a need to wear safety glasses you will be protected whether you wear contact lenses or not.
      * It is recommended that a visor is worn for dispensing liquid nitrogen – see policy for use of cryogenic gases/liquid nitrogen for further information.
* Contact lens wearerscan wear them in the laboratory provided eye protection is worn when considered necessary.
* Prescription safety glasseswill provide some splash protection, and adequate for low risk activities where splash injury could occur. However, for higher risk activities (e.g. dispensing strong acids) you should wear 'overspecs' to improve the level of protection.

## **Gloves**

* Disposable gloves should be worn when considered necessary:
  + - * to protect workers against some biological hazards
      * to protect samples from contamination e.g. tissue culture work
      * Disposable gloves should **not** be worn outside laboratories. They should be removed before leaving laboratory areas. Any hazardous materials should be adequately contained (double containment required), presenting no risk to you or others. Where exception to this guidance is claimed, this should be supported by an appropriate risk assessment.
* Disposable gloves must not be used if their use increases the overall risk of harm arising e.g. gloves should NOT be worn when working in close proximity to a naked flame (e.g. using a Bunsen burner when applying aseptic technique for microbial work) as their use increases the chance of burn injuries if the glove melts.
* Unnecessary, excessive wearing of disposable gloves for low risk activities can lead to skin irritation and potentially cause allergy.
* All workers should ensure that they wash their hands thoroughly on removal of disposable gloves.

## **Handwashing**

* Workers should ensure that they wash their hands thoroughly before leaving laboratories.
* Non perfumed handwashing soap is provided for laboratory hand wash stations by Facilities. To ensure handwashing facilities are maintained, when the hand soap pumps are nearing empty, users should log a job with the estates and facilities helpdesk, site services will then provide new soap to the requestor.

## **Footwear**

* Sensible ‘closed shoes’ must be worn in all laboratory areas to properly protect the foot from splashes and sharp objects. Open-toed shoes and sandals are not considered suitable footwear for laboratory areas and must not be worn.

# **General laboratory Safety**

## **Electrical Safety**

* All portable electrical equipment in use in the building should be regularly tested for electrical safety (PAT testing). If you bring in a piece of electrical equipment from outside, it should be PAT tested before use. **Do not use** equipment that is not displaying a current annual PAT test sticker or any other required test records.
* Electrical equipment is covered by the Electricity at Work Regulations (1989), restricting work on electrical equipment to those competent and familiar with the correct electrical procedures. Maintenance is normally carried out by qualified electricians or service engineers. **Do not attempt** to carry out maintenance or repair work on equipment unless you are qualified to do so and only do so if it is disconnected from the electrical supply.
* Never tamper with apparatus using such supplies. Mains electrical supplies can cause fatal shocks, in particular, shocks from 3-phase supplies are usually fatal.

Precautions:

* **Always carry out a basic visual check** before using electrical equipment – look for damaged plugs and cables, exposed wires, damaged or missing covers or casings on the equipment. Also look for evidence of overheating (burn marks or discolouration). If any of these are seen, **do not use it.**
* If there is **water or other liquid** on or around the equipment, do not use it. Never handle any electrical appliance with wet or damp hands.
* All laboratory electrical equipment with a risk of shock raised by close proximity to water e.g. water baths, electrophoresis tanks/power supplies, must be fitted with a residual current detector plug.
* If there are **flammable substances** anywhere near the equipment, do not use it.
* Ensure that the equipment is in a **safe location** e.g. not on the edge of a bench where it could fall or near a sink where it might be splashed.
* Extension leads, particularly multiblock ones, **should not be used** – the equipment should be located near to a socket outlet.
* Make sure **cables are not causing a** **trip hazard** by trailing on the floor, or trailing in liquid or close to anything that make cause damage to them.
* Equipment **must** be operated according to manufacturers’ instructions.
* If the equipment develops a fault during use or you suspect it is not safe to use, **disconnect it** from the supply, mark it **“DO NOT USE”** and **inform your PI, or a safety adviser.**

## **Manual Handling**

Many injuries are caused by manual handling tasks. Following the correct procedure will help avoid them.

* Do not lift or move heavy objects unless you are competent to do so. If in doubt ask for assistance.
* Use lifting aids wherever possible e.g. trolley.
* Where risk of injury is significant then a written risk assessment is required with control measures to ensure that it is acceptable.
* Winchesters and large bottles must never be carried by the cap or neck but always supported in a Winchester carrier outside laboratory areas.
* Staff who regularly lift or move heavy objects must receive appropriate training to enable them to carry out their work safely and be provided with appropriate footwear. Training can be obtained by contacting the SHE office.

### **General guidelines for Basic Manual Handling**

* Plan the lift (get assistance; lifting aids; PPE; protective clothing/gloves).
* Ensure your path is clear including the place where you will be putting the item down.
* Adopt a good posture – feet slightly apart, bending the knees and keeping the back straight when lifting.
* Get a firm grip and keep the load as close as possible to your body.
* Do not twist your trunk, move your feet if you need to turn.

# **Specific Laboratory Hazards**

## **Chemicals**

* Special care must be taken whenever handling lab chemicals. Users should always be familiar with the specific dangers of the chemical they are using and the procedures required for disposal of that chemical and the course of action to take in the event of a spill. Appropriate PPE must be worn **AT ALL TIMES** when handling chemicals in the laboratory.
* Specially designed chemical and biological spill kits have been created to assist users in the event of a chemical spill. Every lab should have a poster which lists where the closest spill kit is located relative to their work area. It is important to familiarise yourself with the location of this kit.

**General Rules for Handling Chemicals**

* If you are not familiar with a substance or particular procedure, you must seek information or advice as to possible hazards. Safety Data Sheets (SDS), which give details of any hazardous properties, together with precautionary measures including storage, how to deal with accidental spillage and disposal are now generally supplied automatically by the manufacturer on delivery of the chemical. However the SDS should always be requested when a chemical is purchased for the first time if it is not provided. Old SDS sheets should be replaced by the most recent version each time a chemical is delivered.
* Hazard is always indicated on bottles of the more recently purchased chemicals but care should be exercised in ensuring that the hazard is known for chemicals whose purchase predated the legislation and thus lack hazard labels.
* Remember that innocuous substances can, on admixture, become dangerous and present explosive or toxic risks. Possible interactions must be considered in the written COSHH assessment of procedure to minimise the risk. Each risk assessment must be approved by the PI and copies of the assessment will be held in the relevant laboratory for use by the laboratory staff involved and also by the PI or a nominated person.
* Care must always be taken in the handling, transfer, storage and disposal of dangerous substances. When transferring material to another container, the new container should be clearly labelled and the hazard defined.
* **Never use or leave containers of unlabelled samples**.

### **Acrylamide Gels**

* The unpolymerised reagents are highly toxic and must be handled with rubber gloves inside a fume cupboard. To reduce risk, users are required to purchase monomer in solution form. All unused stocks of acrylamide should be disposed of appropriately (see chemical disposal below).

### **Carcinogens**

* While most updated chemical catalogues contain carcinogen warnings, in many cases these are based on high, chronic, dose animal experiments and the true risks to humans are not known.
* Institutional records are needed for any worker who receives significant exposure to a carcinogen. The Safety Health and Environment (SHE) office should also be informed.
* Use of carcinogens should be avoided unless it is unavoidable. The COSHH assessment to control risk will usually require the manipulation of carcinogenic powders or electrostatic solids to take place only in a fume cupboard and the wearing of suitable protective clothing including gloves.
* If in doubt about the use of a carcinogen, contact the SHE office

### **Corrosives**

* Strong inorganic acids and particularly alkalis such as sodium or potassium hydroxide solutions can cause serious skin and eye injuries. In the latter case, the action can be so rapid that sight is irreparably damaged before any irrigation can be accomplished.
* When diluting strong acids or caustic pellets, it is important that the reagent is added slowly to a large volume of water and not vice versa to allow control of the production of heat.
* When handling any corrosive substance or liquid gas e.g. liquid nitrogen, goggles or safety spectacles and protective clothing must be worn. Other skin corrosives include phenolic compounds, hydrogen peroxide and bromine.
* **When handling corrosive chemicals it is good practice to always have neutralizing agents available.**
* Corrosive substances must never be placed on high shelves.

### **4.1.4 Explosives**

* **Perchloric acid and perchlorates** are strong oxidising agents and may explode under certain conditions. Because of its inherent problems, the use of perchloric acid is now discouraged. Where its use is essential, always use the minimum quantity and do not allow residues to build up.
* Picric acid is also explosive and must always be kept moist with water to avoid detonation by shock. Metallic salts of **picric acid** and also of **hydrazoic acid** are very unstable and these two acids must be kept away from metal containers or fittings.
* Care must be taken in disposal of **sodium azide** as acidification leads to formation of the odourless but highly toxic hydrazoic acid, while disposal to lead or copper drains may lead to reaction to produce unstable lead or cupric azide respectively unless it is adequately dispersed. Sodium azide is also mutagenic.
* Organic ethers, particularly **diethyl ether**, may build up dangerous levels of peroxide on storage, particularly in sunlight and must always be kept in the dark in coloured glass bottles. For solvent of uncertain age, the peroxide must be removed before use or distillation/concentration (e.g. by filtration through an alumina chromatography column) to avoid risk of explosion.

### **4.1.5 Organic Solvents**

* Many of these are flammable and toxic and exposure to vapour should be minimised.
* Where possible always handle them in a fume cupboard and remember the considerable fire and explosion risks associated with many organic solvents.
* Flammable solvents must be stored in properly labelled flammable solvent cabinets with the doors kept shut.
* It is not acceptable to store non-flammable chemicals or solvents which present other hazards in these cabinets because of the magnified risk.
* Take note that some flammable chemicals present multiple risks
* Hazardous or flammable volatile solvents should be used in a fume cupboard with appropriate personal protection.
* All stocks of solvents and waste solvents are stored in the solvent stores.

### **4.1.6 Sensitising Agents**

* Some compounds and materials can cause sensitisation with increasing severity on subsequent contact and it is particularly important to minimise contact with such agents. Examples include glutaraldehyde and animal fur and dander. Care should be taken that ventilation is adequate to control atmospheric levels which can be checked either locally or by the SHE office. Users should complete the Health Surveillance questionnaire and send it to Staff Health for checks and monitoring.

### **4.1.7 Toxic Volatile Liquids and Gases**

* Toxic gases such as hydrogen cyanide, hydrogen sulphide, hydrogen fluoride and substances such as bromine, pyridine, ammonia which have highly toxic or corrosive vapours must always be dispensed in fume cupboards with appropriate neutralising agents available.

## **Compressed Gases**

* Manual handling of heavy cylinders can lead to various injuries – including back, arm and foot injuries.
* Improper handling of cylinders can cause damage to the cylinder, resulting in violent explosion.
* Leakage of gas can cause danger according to the type of gas (toxic, asphyxiant, flammable, explosive).

**Precautions:**

* Use a gas cylinder trolley to move cylinders
* Do not attempt to move large gas cylinders on your own
* Always wear suitable protective equipment (goggles, sturdy gloves and shoes – ideally steel toe-capped)
* Before using cylinders check that the threads and seatings are free from contamination and that the correct regulators are fitted which will withstand the maximum pressure of the valves. Check that the valves are working correctly by gently opening and closing with the appropriate spanner. Do not use excessive force.
* Ensure that gas cylinders are secured in place at all times using a bench or wall bracket and chains or stand.
* Do not attempt to connect or disconnect cylinders unless you have attended a gas regulators course. If not, find someone who is authorised to change the regulator.
* If you suspect a faulty regulator or pipeline, then do not connect the cylinder. Contact your local safety adviser. Regulators should be of the correct type and must be replaced when over 5 years old.
* Minimise the number of cylinders stored in the lab.
* All cylinders must be kept away from high temperature sources.
* All cylinders must have their valves closed before returning to the supplier.

**Staff should note the significant fire risk associated with levels of oxygen in excess of natural levels.**

**Never use grease or oil on oxygen cylinder valves as they can cause explosion.**

## **Liquid nitrogen/ Dry Ice**

* Contact with extreme cold can cause severe burns to skin
* Accumulation of nitrogen gas will eliminate oxygen and will act as an asphyxiant
* Sudden expansion of liquid nitrogen in a sealed tube (e.g. on exposure to room temperature) can result in violent explosion.

**Precautions:**

* Liquid nitrogen and dry ice should only be used and stored in well ventilated area (NEVER in a cold room) – rooms where liquid nitrogen is stored should be supplied with a low oxygen alarm system.
* Do not allow liquid nitrogen or dry ice to come into contact with the skin - Always wear the necessary protective equipment – cryoprotective gloves, lab coat (fully fastened) or cryoprotective apron, full face visor and appropriate shoes
* Eye protection and gloves must be worn at all times to prevent risk of serious injury to eyes, due to splashing, or to skin (in the form of low temperature 'burns').
* Do not allow liquid nitrogen or dry ice to come into contact with the work surfaces in the laboratory and particularly sinks.
* Do not leave liquid nitrogen vessels or dewars unattended when filling
* When transporting liquid nitrogen it is important to use a properly designed container, even for small quantities. Domestic 'Thermos' type flasks are unsafe and may explode violently on rapid cooling. Whatever the container, it is important that, when the lid is in place, the vapour that is generated inside the vessel can be safely vented - a build-up of gas within a sealed container will eventually cause it to explode; the same is true for solid carbon dioxide - build-up of this gas within a sealed container e.g. "Thermos" flask can also lead to explosion.
* Never travel in a lift with a liquid nitrogen container.

## **Microwaves**

* Care should be taken when using microwave ovens to ensure that there is no possibility of pressure build-up which could lead to an explosion. Lids should only be **placed** on bottles and **not tightened** to ensure that pressure does not build up inside the bottles.

## **Ultraviolet Sources**

* Exposure of skin and eyes to UV radiation can rapidly lead to burns and permanent damage to the eyes

**Precautions:**

* Always ensure that the shielding is in place on the equipment before switching on
* Always wear personal protective equipment i.e. lab coat with sleeves rolled down and throat fastened, gloves and UV blocking full face visor. Make sure you have no exposed skin.
* Keep equipment on for minimum time
* Switch off after use

# **Biological Safety**

* You or your supervisor must complete a risk assessment and standard operating procedures for any proposed work with hazardous biological material before work can commence.
* All biologically hazardous material should be handled at the appropriate containment level; your risk assessment will tell you of the containment level required. This should be forwarded to the Health and Safety Adviser (or Biological Safety Officer for GMO). If your work should be done at containment level 2 or higher, you **must not** start work until the Pathogen Management and Genetic Modification Safety Committee has agreed your procedures and you have had appropriate training.

**General rules for working with biological agents**

* A lab coat and disposable gloves MUST always be worn when handling biological material. These must be removed before leaving the laboratory.
* Wash your hands before leaving the laboratory.
* Be aware of how to disinfect your material.
* Work surfaces should be swabbed with an appropriate disinfectant before and after use (e.g. 70% ethanol or 2% Virkon)
* Contaminated glassware and other non-disposable items should be soaked in appropriate disinfectant solution overnight, rinsed and then put out for washing.
* Minimise the use of sharps. Used sharps should be disposed of in Sharpsafe containers.
* Clean up any spillage immediately using paper towels soaked in appropriate disinfectant.
* Petri dishes etc. for storage, should be wrapped securely and labelled clearly with NAME, DATE and ORGANISM.

## **Exposure control**

### **Inhalation Exposure Control**

* A microbial safety cabinet should be used for activities likely to generate aerosol (e.g. pipetting, vigorous shaking or sonication). This is particularly important for hazardous biological agents that can be disseminated by aerosols.
* A fume cabinet should be considered when using with any volatile solvents.

### **Ingestion Exposure Control**

* Avoid ingestion of hazardous substances by mouth by ensuring that you:
* Apply good hygiene practices by washing hands after removing your laboratory coat and before leaving the laboratory and whenever you suspect your hands have become contaminated. Standard hand wash products are suitable for this and there is no need to use specialist antimicrobial products. Single use paper towels should be available for use.
* Do not pipette by mouth
* Do not eat or drink in the laboratory
* Do not lick labels, chew pencils, chew your nails, etc.
* Do not store food or drink for human consumption in the laboratory or in refrigerators used for laboratory purposes

### **Absorption Exposure Control**

#### **Skin:**

* Wear a laboratory coat (required for bio-containment laboratories 1-3)
* Wear sensible ‘closed’ shoes
* Protect cuts / grazes with waterproof adhesive dressings / plasters
* Use disposable gloves where considered necessary (required for bio-containment level 3)
* Do not touch face when handling biological agents / samples/ chemicals

#### **Mucous Membranes (e.g. eye)**

* Wear eye protection to avoid splash injuries to the eye (**essential** when handling biological agents that can be transmitted via mucous membranes)
* Do not touch face when handling biological agents / samples / chemicals
* Avoid generating aerosols by shaking samples

### **Direct Inoculation**

* Apply safe handling practices when using sharps (e.g. needles / scalpels / use of glass Pasteur pipettes - do not use them until you have received appropriate training. Avoid the use of sharps wherever possible.
* Safely dispose of all sharps in sharps bins to avoid risk of sharps injury to others

# **Equipment**

DO NOT use any equipment that you are not competent to operate or authorised to use. If in any doubt seek assistance before you start. Observe any written warnings, notices or instructions for use including start up, close down, decontamination, storage and transport.

## **Autoclaves**

No worker should attempt to use any autoclave until appropriate training has been received. If used correctly, they should not present a hazard. Operation instructions are posted by each autoclave.

All autoclaves are fitted with safety mechanisms to prevent injury from the high temperatures and pressures.

They should be regularly serviced and inspected.

Hazards:

* High temperatures and pressures
* Containers being autoclaved breaking due to expansion of liquids inside

Precautions:

* Use only borosilicate glass containers for sterilising liquids e.g. pyrex, schott bottles
* When sterilising liquids in screw topped bottles, ensure that the cap is loosened to allow entry of steam and to prevent a build-up of pressure within the bottle.
* Bottles should not be filled more than 2/3 full to ensure that space remains for liquid expansion
* The autoclave is fitted with a thermal lock that should prevent it from being opened until the temperature and pressure are at a safe level. **Do not** attempt to open the autoclave until the open door light is on. Before opening always visually check the gauges to make sure that the pressure and temperature are at a safe level.
* Large volumes of liquid can remain quite hot for a long time after autoclaving so always use gloves for removing hot bottles and flasks from the autoclave.

**For autoclaving waste material:**

* When autoclaving waste material, place bags in a suitable metal container to prevent contamination of the floor of the autoclave by leakage of waste material. Make sure that the bag in which the material is contained will withstand temperatures of 134°C for 20 mins.
* Other material may be autoclaved in sharps containers.
* Make sure that once autoclaved, the bag or sharps container is labelled with lab or lab number of origin and extension number and that it is tagged with a waste tag – see below for disposal of waste. Please contact a member of the core facilities support team for supplies of waste tags. Autoclaved biological waste must also be logged via the waste disposal forms found in the autoclave rooms.

## **Bunsen Burners**

Care must always be taken with Bunsen burners and they must not be lit when flammable solvents are being used. Always check that your colleagues are aware of your procedures and will not be endangered. Never leave Bunsen burners alight after the end of your procedure, and avoid using Bunsen burners fitted with pilot jets which are often inadvertently left on and become a fire hazard. The condition of tubing on Bunsen burners should be checked before each use and if necessary replaced. It should ideally be of the type specifically supplied for this purpose to minimise risk.

## **Centrifuges**

The University has a variety of centrifuges ranging from micro-centrifuges that spin at a few thousand r.p.m. to ultra-centrifuges that spin at up to 100,000 r.p.m. The principles behind centrifuge safety remain the same for all types:

Hazards:

* High energy disintegration of centrifuge parts if improperly balanced or secured.
* Production of aerosols of hazardous substances if damage occurs to tubes or tubes are not sealed properly.

Precautions:

* If you do not know or cannot remember how to operate the centrifuge, please **ask for help before commencing operation.**
* Always balance your samples in the buckets
* Always centrifuge with all of the buckets in the rotor
* If centrifuging more than 2 items, distribute them evenly throughout the buckets
* Where bucket or rotor lids are present, they should be fitted securely before starting the centrifuge
* Bucket or rotor lids must be used if centrifuging hazardous samples
* DO NOT attempt to open the centrifuge lid while the centrifuge is in operation
* If you suspect a spillage has occurred during a run, stop the centrifuge and wait 30 minutes before opening lid to allow aerosols to settle. **Make sure that you put a notice on the centrifuge to prevent others from trying to open it in the interim.**
* Always clean and dry buckets after use
* Decontaminate spillages of hazardous materials appropriately according to your risk assessment.

## **Display Screen Equipment**

* It is mandatory to complete a Display Screen Equipment risk assessment. This form can be completed electronically and returned to the SHE office. (<https://portal.sgul.ac.uk/she/forms-1/SGUL%20DSE%20%20Self-Assessment%20Checklist%20-2011.doc/view>)
* If you feel that you would like your work station set up assessed then please contact the SHE office.
* Eyecare vouchers can be obtained by all staff who use DSE (display screen equipment) and VDU's (visual display units) on a daily basis.  Employees wishing to collect a voucher will need to provide their employee number and complete a DSE risk assessment form and must be returned to the Health and Safety office prior to collection of vouchers.

# **Glassware/Sharps**

* **Definition of a sharp:** An item likely to **penetrate** the skin surface or the side of a plastic bag e.g. sharp glass, scalpel blades, needles, microscope slides, pipettes (all types), pipette tips, syringe bodies, hard plastic, metal, bone fragments, teeth.
* These are common causes of injury. Always ensure that glassware is in good condition with any that is chipped, cracked or broken being disposed of. This is particularly important before any equipment is placed under vacuum. Safety screens or safety cages must be used for enclosing desiccators when these are evacuated.
* Particular care is needed when attaching tubing to glass equipment as this is a common cause of injury.
* Sharps must always be used carefully and put away after use. They must not be left unsheathed on the laboratory bench or in drawers. **NEVER** attempt to re-sheath a needle.

# **Disinfection & Spillage**

## **Disinfection:**

* Effective disinfectants must be available for routine disinfection and immediate use in the event of spillage (see below)
* Appropriate disinfectants must be used according to manufacturer’s instructions (concentration, contact time etc.) to ensure they are effective.
* Work surfaces should be regularly cleaned with an appropriate disinfectant
* All surfaces should be disinfected before any maintenance staff are permitted to work in the area
* All specimen containers, glassware and used equipment should be immersed in a suitable disinfectant before disposal
* Used laboratory glassware and other materials awaiting cleaning and/or sterilisation must be disinfected and stored in a safe manner
* Pipettes, if placed in disinfectant, must be totally immersed

## **Spillage:**

* Effective disinfectants should be available for immediate use in the event of a spillage (small or large).
* If a spillage occurs, keep calm and take any appropriate remedial action.

### **Minor spillage**

A minor spillage involving little splashing and limited to a small area should be handled by:

* applying disinfectant to the spillage (use of powdered disinfectants recommended to minimise generation of splashes)
* leave for an appropriate period
* soak up with an appropriate spill kit or mop up with disposable paper towels if a spill kit is not available
* dispose of paper towels in an autoclave bag for inactivation

### **Major spillage**

* Evacuate and Secure Area

Alert other room occupants to spill – extinguish naked flames - evacuate room – prevent access to area by placing danger sign on door and/or use of hazard warning tape (both should be available in your spillage kit).

Remove Ignition Sources (flammable, oxidising, explosive substances).Shut off gas and electricity supplies from outside the laboratory if possible and if this does not interfere with fume hood operation.

Open windows/ventilate space if possible and appropriate (not for fine powders).

* Where a spillage involves personal contamination:
* Shout for assistance if required, take appropriate action including summoning a first aider (dial ext. 0909), attend A&E
* If a person has become contaminated, remove all contaminated clothing immediately, placing in plastic bag which should be left in lab. Wash contaminated skin with plenty of clean running water for 15 minutes – do not use an abrasive brush. Showers are available in the toilets on all floors.
* Telephone Emergency Services if they are needed to attend to casualties, if the risk seems large, or if the situation is out of control and is likely to cause a major event. Arrange to have SDS sheets and someone knowledgeable about the hazardous material and the location of the spill stand by to advise the Emergency Services.
* Alert a senior safety person or PI.
* Decide if it is appropriate to deal with the spill and if so follow clean-up procedure
* Get Information

Look at the COSHH risk assessment/SDS information if readily available and follow the emergency procedures given there. If this information is not readily available or is insufficient, then follow the guidance given below. However, this is general guidance only.

**If you are unsure, get further advice before proceeding.**

* Choose Appropriate Personal Protection
* Always wear a fastened lab coat, appropriate chemical-resistant gloves and eye protection (spillage kit). Avoid skin contact.
* Wear respiratory protection (spillage kit) if dealing with substances producing fumes or dust. Breathing apparatus (duration 10-15 min or 30 min) is available in some locations for use in hazardous atmospheres but should not be used unless training has been received
* Wear foot protection (spillage kit) if material is spread over the floor.
* Confine or Contain the Spill **-** Contain material by scooping up solids or absorbing liquid with granules or some form of absorbent material (first neutralise acids with sodium hydrogen carbonate) and placing in bag or container for disposal. Use mercury spill kit for mercury spills (all in spillage kit)
* Clean Area -Clean area of spill using plenty of soapy water, rinse with clean water and dry
* Dispose of Waste **-** Once the material is safe and contained, advise the Health and Safety Office before disposing of via the waste chemical route.
* **Report Incident**

In all cases, the accident must be reported on the appropriate form – see section 12 below.

# **Storage and transport**

## **Storage**

The safe storage and disposal of materials and chemicals is a key aspect of safety.

* All hazardous chemicals must be stored with regard to the hazards concerned. If necessary seek guidance from the Health and Safety Adviser.
* Substances listed on the poisons schedule and dangerous drugs list must be stored by registered users in locked cupboards and a record of use and disposal kept.
* Label everything carefully with date, contents and owner. Others will enter your laboratory, and may not be aware of potential dangers.
* Cultures should be stored:
  + in appropriate, clearly labelled, leak-proof containers within the laboratory or nearby as far as reasonably practicable

All samples stored in refrigerators, cold rooms or freezers must be adequately labelled with respect to contents, ownership and dates. Inspection of these items will form part of the laboratory inspection process. It is the responsibility of staff to curate their holdings regularly and to dispose of or transfer ownership of all their stored samples when they leave SGUL.

## **Transport**

All biological or hazardous material must be transported in leak-proof containers when carrying in communal (non-laboratory) areas.

# **Waste disposal**

## **Clinical waste**

* The producer of waste has a Duty-of-Care to ensure that an adequate written description of the waste is given on a Waste Transfer Note to permit its safe handling throughout its route to final disposal
* Under the Duty-of-Care all persons producing or handling any waste are obliged to ensure that it is transferred only to persons or organisations complying with the legislation
* All clinical waste produced must leave SGUL in the correct plastic bags or sharps boxes. All staff have a responsibility to classify and identify any material that they are using, or have used, and ensure that it is disposed of correctly.
* Animal derived cells, etc. should be treated as human clinical waste. Recognisable animal parts should be returned to the BRF for disposal.

**Clinical Waste Bags**

* Clinical waste bags can be purchased from Stores via the AGRESSO ordering system
* Remove clinical waste bags when ¾ full and not weighing more than 6 Kg
* Bags must be sealed by twisting the neck and folding over before circling with the allocated department plastic tags/ties.
* Attach an I.D tag (available from the Jenner Core Support staff on request)
* Label bag with room number and extension number of laboratory of origin

**Sharps Bins**

* Sharps bins can be purchased from Stores via the AGRESSO ordering system
* Securely fasten top section to the bottom container (click into place)
* Safely place all syringes, needles, scalpel, glass/plastic pipettes etc. into the bin
* Securely close lid when ¾ full
* Attach an I.D tag (available from the Jenner Core Support staff on request)
* If leaking, place bin into an approved clinical waste bag and attach a tag
* Label with room number and extension number of laboratory of origin
* There must be no mixing of different categories of waste in primary containers. Mixing is allowed in the secondary container which is the Clinical waste caddies.
* Clinical waste caddies must be kept locked at all times when unattended.
* When transporting clinical wastes, attention should be paid to the health and safety of staff, patients, and visitors, waste disposal operatives and the general community.
* Waste transportation should be in containers used only for that purpose and should be easy to load, empty, clean and lock.
* Bags and sacks containing clinical waste must only be handled by the neck and carried away from the body. Clinical waste bags and sacks must never be thrown.
* Some clinical waste may be discharged to the sewerage system. The sewerage system should not be used as a disposal route without the consent of the Regional Water Authority or Sewerage Authority.
* Disposal of all other clinical waste must be through the recognised systems. Advice on these systems can be sought from the SGUL Health and Safety Adviser.

Further details regarding waste categorisation and disposal is available via the SHE webpage. <https://portal.sgul.ac.uk/she/she-information/laboratory-waste-disposal-guidance-november-2016.pdf>

**DO NOT use clinical waste bags/sharp bins that don’t conform to the correct BI Standard.**

**DO NOT place sharps (including plastic pipettes) in any waste bags**

**DO NOT place clinical waste in black domestic waste bags**

**Pre-treatment prior to disposal**

* Material to be autoclaved must be contained in light blue or white/clear bags with light blue printing, designed to be used in autoclaves at temperatures of 134C;
* All bags should carry an indicator such as autoclave tape to show that they have been subjected to heat treatment. After this, the bags should be placed in ’low level’ clinical waste bags to be disposed of in the usual manner.

# **Disposal**

## **Solid waste:**

* Contaminated solid waste must be disposed of in double autoclave bags before autoclave treatment
* Autoclave bags must not be over filled
* Autoclave bags must not be sealed- leave a gap in the neck of the bag for steam penetration of contents during autoclaving
* Autoclave bags should not be used for uncontaminated laboratory waste
* Autoclave bags must not contain any sharps (pipette tips or plastic serological pipettes)
* Autoclave bags must be transported to the central autoclave facility in robust containers to avoid leakage
* All sharp objects (needles, glass Pasteur pipettes, scalpel blades, etc.) must be placed in sharps containers (obtainable via an internal requisition).

## **Liquid waste:**

Contaminated Liquid waste must either be treated with an appropriate disinfectant and / or autoclaved, before disposal down the sink

## **Specific waste disposal**

### **Caustic Liquids**

Dilute heavily by adding the compound slowly to running water and run to waste. Larger amounts may first require careful neutralisation - if in doubt consult a Health & Safety Adviser.

### **Computer hardware**

Hard drives must be wiped of all material before disposal. The computer unit should be contacted to arrange this. Monitors and printers should be disposed of as for electrical equipment.

### **Electrical Equipment**

All electrical equipment should be decontaminated as appropriate. A decommissioning form should then be completed, signed and attached to the item.

<https://portal.sgul.ac.uk/she/forms-1/decontamination-certificate>

The Health and Safety Office should then be contacted for advice regarding the removal and storage of the item pending its collection by the approved contractor. Generally it will be the end user’s responsibility to contact Sites and Services to arrange for the collection and removal of the item to the storage area.

### **Glass**

All clean glass waste must be placed in the black bins that are either within or are in close proximity to the laboratory; these should be appropriately labelled. If the bin is full, contact the Estates helpdesk to arrange for it to be emptied.

Remove/cover with marker pen labels from chemical bottles that have been cleaned.

### **Harmful, Toxic or Dangerous Chemicals or solid chemical waste**

Contact the SHE Office.

### **Solvents**

* Solvents containing halogen must be collected separately from non-halogenated ones.
* No water-immiscible organic solvents may be passed into the drainage system.
* Collect and store in Winchesters with the appropriate yellow (for scintillant and radioactive solvent waste) or white (for all other waste solvents) label which should show the approximate composition. Labels are available from the Health and Safety Office.
* Small amounts of water-miscible solvent should be diluted with a large amount of water and flushed down the drain. Larger amounts must be stored in labelled Winchesters and the Safety Office contacted to arrange disposal.

# **Action in the event of an accident/incident or near miss - Reporting**

**Sharps injury procedures**

Any person who sustains a cut, sharp or needlestick injury whilst handling waste should immediately –

* encourage bleeding where skin is punctured, stroke blood towards the puncture, do not press directly on it
* wash thoroughly with copious amounts of soap and warm water. **Do not use a scrubbing brush**
* ensure that your Group or Divisional Safety Adviser is informed promptly of the incident. The injured person should complete and send off an accident/dangerous occurrence incident form
* During working hours (08:30-17:00 Monday to Friday) report immediately to:
  + - Occupational Heath
    - Telephone – 020 8725 1661/2 (1661/2 internal)
* Out of working hours (17:00-08:30) and at weekends, evenings and Bank Holidays) contact the Clinical Infection Unit Consultant via A&E.

All accidents and incidents must be reported to the Safety Health and Environment office as soon as possible via the on-line reporting system – available on the SHE page on the internal website (<https://portal.sgul.ac.uk/she/forms-1/accident_form>). In addition, the incident should be reported to the PI or manager responsible for the area.

# **Emergencies**

## **Fire**

## **12.1.1. Precautions**

* All new staff on arrival should have the emergency systems explained to them including the weekly fire alarm test.
* Ovens and hot plates present particular risks and their location should be carefully considered with respect to heat distribution. They should not normally be left on but must be turned off at the mains out of working hours. Nothing must be placed on top of ovens, incubators, refrigerators or freezers as this may impede air flow outlets and cause overheating.
* Many solvents are highly flammable and can ignite or even explode under certain conditions. They must always be handled away from naked flames and high temperature apparatus and normally dispensed in fume cupboards. Direct sunlight should be avoided. Flammable substances must NEVER be heated over a naked flame.
* Remember that water can cause fires via electrical short circuits. All apparatus employing continuous water flow should be plumbed in or must have tubing secured to taps and apparatus with adequate clips. Always ensure waste outlets are raised above the level of the bench or use a gauge so that the flow is visible and that it is not impeded. Tubing must be inspected regularly and replaced periodically.

### **12.1.2 In the Event of Fire**

In the event of a fire

* Alert those in the vicinity.
* Sound the alarm using the nearest alarm call point and evacuate the area as below.
* Dial 0909 to alert reception using the nearest phone without putting yourself at risk.
* Leave the building immediately using the nearest safe fire exit route.
* Report immediately to the assembly point. Do not stand immediately outside the building or fire exit once you have left the building.
* Never use lifts during a fire emergency, always use the fire corridors and staircases. You should always use the nearest fire exit to leave the building.
* Do follow all instructions from fire marshals, emergency officers or the emergency services.
* Do not re-enter the building until you have been advised that it is safe to do so by a member of the emergency team.
* Whenever you hear the fire alarm bell ring continuously in your area, you must leave by the nearest Fire Exit.
* If possible switch off apparatus before leaving the area of the fire and close windows and doors to reduce fire spread.
* As far as is compatible with safety, make sure that all apparatus, including exhaust ventilation equipment, is shut down.
* Fire Marshals and deputies have been appointed for all areas of SGUL. During normal working hours, on the sounding of the Fire Alarm, the Fire Marshalls are responsible for checking their designated areas to ensure that no one has been left behind and that staff have closed doors and windows prior to their evacuation.
* Fire Marshals must quickly ascertain that the areas under their control have been evacuated and, where reasonable, that staff have left the rooms in a safe state. The Fire Marshall must then report to the senior official that the area under their control has been evacuated.
* People working out of hours will have registered with the security officer at reception and will report there in the event of a fire.
* Fire drills will be held periodically.

### **Fire Exits**

* While it is always possible to access staircases in Jenner Wing, the staircase doors are locked overnight and re-entry is prevented for security reasons. Magnetic locks on the fire exit doors, which release only when the fire alarms are sounding could trap people on the staircase in non-emergency conditions. Doors on such staircases are labelled and should not be used out of normal working hours except in an emergency when the fire bells are sounding and the final Fire Exit door will thus be able to be opened. Should the original alarm not operate the exit door, an adjacent green break glass alarm provides an override.

## **First Aid**

The provision of suitable facilities for rendering first aid is a requirement of the First Aid at Work Regulations (1981).

### **First Aiders**

In addition to having the facilities of the Occupational Health Department and the Hospital Accident and Emergency Department, SGUL has a number of trained first aiders. In the event of an emergency where a first aider is required, dial 0909 and inform reception who will alert the duty first aiders. In other emergencies dial 999.

### **First Aid Kits**

It is the responsibility of each group to ensure that any first aid kits are stocked as appropriate. Contact the SHE office for advice on contents and supplies

## **Eye-wash Facilities**

Unless a supply of clean mains tap water and an uncontaminated sink are always available, eye-wash in sealed disposable containers must be provided in laboratory areas and must not be used again once opened. It is the responsibility of individuals in each laboratory to ensure that are within date.

## **12.2.4 Emergency showers**

Are situated in washrooms throughout the building.

# **12.3 Accident reporting**

If you are involved in **any** accident, have a "near miss" or incident; you **must** fill out an Accident/Dangerous Occurrence form. Blank forms should be available from your Group or Divisional Safety Adviser or Radiation Supervisor. Alternatively they can be downloaded from the portal:

[https://portal.sgul.ac.uk/organisation/cs/health-and-safety/forms/organisation/cs/health-and- safety/forms/saf02\_accident\_dangrs\_occ\_rep\_may02-1.doc](https://portal.sgul.ac.uk/organisation/cs/health-and-safety/forms/organisation/cs/health-and-%20safety/forms/saf02_accident_dangrs_occ_rep_may02-1.doc)

* Report all accidents and untoward incidents to your Group or Divisional Safety Adviser or Radiation Protection Supervisor as appropriate.

# **Other Health and Safety Information and Where to Find It**

Mrs Anne Harris Safety Health & Environmental Manager 5166

Dr. Colin Sandiford Safety Co-ordinator 5365

Mrs Angela Peterkin Health and Safety Assistant 5765

Julius Akiyu Radiation Protection Adviser

(Contact Health and Safety Office)

Dr. Ariel Poliandri Genetic Modification Biological Safety Officer 5791

The SGUL safety web site has many useful pages including guidance, forms, policies and codes of practise. The web address for this site is: <https://portal.sgul.ac.uk/she>

***Other Safety Links***

HSE Home Page

<http://www.hse.gov.uk>

European Agency for Safety and Health at Work

<https://osha.europa.eu/>