

Contents

Purpose of these Local rules	2
Anti-terrorism, Crime and Security Act 2001.....	2
Arrangements.....	3
Visitors	3
General Rules	3
Work with Biological Materials within the School	4
Written schemes of work and risk assessments	4
Designation of work areas	5
Record Keeping	5
Training and supervision	6
Supply and maintenance of equipment:	6
Microbiological Safety Cabinets [MSCs].....	7
Autoclaves	9
Aspirators	9
Sample storage.....	10
Transport of biological materials	11
Waste disposal arrangements.....	13
Code of Practice.....	14
Spillages	15
Accidents	15
Appendix 1: Suggested training of staff, postgraduate students and induction of new staff members	17
Appendix 2: Anti-Terrorism, Crime and Security Act 2001 Schedule 5 List of Pathogens and Toxins	18
Appendix 3: Abbreviations.....	20
Appendix 4: Acknowledgement	21

Purpose of these Local rules

These Local Rules set out the arrangements within the School of Life Sciences to comply with the legislation pertinent to the use of biological materials. They are designed to be read in conjunction with the [University of Essex Biological Safety Policy](#).

These Local Rules apply to all work with biological material carried out within or on behalf of the School of Life Sciences, and to all persons working with or around these materials. For the purposes of this document, 'work' is taken to mean the purchase, handling, use, transportation, storage and disposal of biological material.

Under the Control of Substances Hazardous to Health Regulations 2002 (as amended) and Genetically Modified Organisms (Contained Use) Regulations 2014, all workers handling biological materials are deemed to be employees for the purposes of health and safety legislation only.

Anti-terrorism, Crime and Security Act 2001

A range of pathogens and toxins are subject to additional controls under the Anti-Terrorism, Crime and Security Act 2001. These are listed in Schedule 5 to the Act, included here in Appendix 2.

This Act requires the notification of certain agents and toxins to the Home Office, prior to acquisition and use in the laboratory.

Planned Work with any of the pathogens or toxins listed below should be notified to your local Biological Safety Officer in the first instance. You should provide the following information:

- Name of pathogen/toxin
- Quantity if a toxin is used
- Location of use
- Who will be handling the substance?

This information will be passed to Workplace Health, Safety and Wellbeing for notification to the Home Office. The facilities will be inspected by local Counter-terrorism Security Advisers (CTSAs), and advice given on how to meet the required security standard for that Schedule 5 substance. As a minimum this will often require:

- Material to be protected from unauthorised access by at least one robust security measure (security standard doors, storage cabinets, padlocked freezers, etc)
- Ability to move substances or upgrade security in the event of an increased threat level
- Provision of appropriate security plans
- Personnel security measures
- Inventories of stocks to be kept and updated when a substance is used or destroyed

Arrangements

Visitors

Visitors are defined as non-School employees, including contractors, who may be allowed to enter laboratories. Whilst in laboratories, visitors must be provided with personal protective equipment (PPE) in accordance with CoPs and be supervised at all times. No children under the age of 12 are permitted in any research laboratories under any circumstances [*University General Regulation 7.14* <https://www.essex.ac.uk/-/media/documents/about/governance/general-regulations.pdf>]. Young people aged between 12 and 17 may only be admitted with the specific approval of the Head of School. A specific risk assessment must be completed for their visit. Special rules govern the exposure of children and young people to workplace hazards and the UBSA must be consulted in advance of any such visit.

Maintenance staff, service engineers and contractors are not permitted to enter laboratories unless they have a valid Permit to Work. The only exception to this will be Patrol Officers conducting security checks out of hours. Maintenance staff, service engineers and Patrol Officers are required to have attended the Biohazard Awareness Training sessions provided by Life Sciences.

General Rules

Academic supervisors must ensure that all those working with biological materials are aware of all aspects of these Local Rules and Code of Practice. A hard copy must be made available to those involved in working with registered schemes. A copy of the risk assessment relevant to their particular work must also be shown to the researcher who must read it and sign to state that they have understood its content.

All academic supervisors must ensure that all workers are competent to work at the level required and that they receive appropriate training. A written record of training received must be maintained (see 'Record Keeping').

Work with Biological Materials within the School

Note: The University of Essex does not have facilities to work with Hazard Group 3 or 4 materials. Storage of viable samples of, or research with HG3 or HG4 organisms is therefore not permitted under any circumstances.

The Hazard Group assigned to the material being worked with is only intended as a guide to their containment requirements, for example working with Group 2 biological materials requires a minimum of CL2. The detailed risk assessment will determine the final containment level required.

All work within the School of Life Sciences carried out on viable material derived from human or primate tissues is required to be handled within a Class II microbiological safety cabinet

All workers handling biological materials are required to wear the PPE as specified within the relevant risk assessments, within approved supplies. Appropriate supplies are available from Life Sciences Stores.

- Laboratory coats: The School only approves Howie-style lab coats for use within laboratories potentially handling biological agents. These would normally be white, but other colours are designated for specific uses.
- Gloves: Latex gloves are not permitted for any work within the School. Only nitrile or neoprene gloves manufactured and tested to the accepted standards can be used (usually EN ISO 374-1:2016 Type A or B for chemical risks and tested against micro-organisms risks).
- Safety glasses: Safety glasses manufactured or tested to the correct standards must be used where specified on a risk assessment. If goggles or face shields are specified, please consult with safety staff before purchasing.

Written schemes of work and risk assessments

The School must be informed of all new proposals for work involving biological materials, or the revision of any existing schemes prior to initiation of work. All approved proposals should be submitted to the UBSA in the first instance on the current forms available online.

On submission, schemes will be given a unique scheme number that should be quoted on all relevant documentation and correspondence.

Schemes of Work that require formal HSE notification will require additional paperwork to be completed, and in some circumstances may incur charges imposed by the regulators.

All work with biological material must be conducted in areas designated as suitable. The transportation of hazardous biological or potentially infected material between laboratories is allowed provided an appropriate method is used and a risk assessment has been undertaken.

All preparation work with biological agents that may produce an aerosol must be carried out within a Class II MSC which, for HG2 organisms, must be in a CL2 facility. MSCs must not be confused with laminar flow hoods which are also called clean air workstations. Samples should only be removed from an MSC inside sealed containers. Work thereafter must only be undertaken in the designated area identified on the scheme of work.

Designation of work areas

Laboratories working with biological agents must clearly display biohazard and “no unauthorised entry” signage to all entry doors. All designated areas must be approved by the UBSA.

Only laboratories and research groups listed below can be authorised to carry out research at CL2:

Laboratory	PI(s) or Facility
2.07A	Dima Svistunenko
3.07	Graham Underwood, Michael Steinke, Michelle Taylor
3.21	Antonio Marco, Patrick Varga-Weiss, Joaquin de Navascues
3.25	Boyd McKew, Alex Dumbrell
4.09	Stathis Giotis
4.19	Philippe Laissue
4.25	Metodi Metodiev, Philip Reeves
4.27	Cell culture facility, centrally managed
5.04	Cell culture facility, centrally managed
5.16	Ralf Zwacka, Andrea Mohr, Vassiliy Bavro
5.20	Greg Brooke, Vladimir Teif, Angela Pine
6.19	Brandon Reeder, Marcus Edwards

All other laboratories are restricted to research using Hazard Group 1 organisms only

Record Keeping

The UBSA keeps copies of all applications to HSE and of the RAs for CL2 work. Copies are made and given to Project Supervisors. The School must keep records that are relevant to the School’s work; these may be in written or electronic format. Such records enable the HoS to provide evidence of compliance with statutory regulations and University duties and to assess the adequacy of the School’s arrangements for the management of GM safety.

Record keeping will be devolved to several individuals reflecting their roles within the School and University. The following personnel should keep records as appropriate:

HoS

- Appointment of DHSO
- Appointment of DBSO

DHSO

- A list of laboratory CoPs currently in operation
- A list of all containment laboratories and their category
- Commissioning and maintenance records of autoclaves, microbiological safety cabinets and air-handling systems used in laboratories if not kept elsewhere in the University
- Copies of accident and incident reports for the laboratories if not kept elsewhere in the University

DBSO

- A list of currently active projects and current copies of local rules
- All records kept by past supervisors who have now left the School

PIs

- All RAs relating to current and past projects
- A list of all workers currently engaged on the project

- Training records for all workers
- Laboratory CoP where applicable

UBSA

- Copies of all RAs and notifications made to HSE.
- Original applications for all risk assessments or schemes of work
- All agendas and minutes from BH&GMSG meetings
- UP to date BH&GMSG membership list

Training and supervision

All those working with biological agents must be familiar with this document and with correct procedures for use of laboratory facilities and equipment. In addition, if using micro-organisms, they must be trained in good microbiological technique. If this experience has not been gained elsewhere then they must be formally trained in safe techniques for handling micro-organisms, disinfection procedures and the use of microbial safety cabinets. A documented record of all training must be kept. New staff/students should not be allowed to work on any scheme or with pathogens or potentially infectious material until they have been correctly trained on a scheme of work and received the appropriate training in the safe execution of procedures and manipulations involved in that project.

The Project PI is responsible for ensuring that those persons under his/her supervision are instructed in the nature of potential hazards and in the practical use of special procedures, techniques and safety equipment. Inexperienced workers must be closely supervised, and alternative supervision arranged in the event of the absence from the University of the principal PI. Such workers must be informed of their alternate supervisor. The closeness of supervision is dependent on the level of training of staff or students working under the project supervisor. Supervisors should not assume competence until it has been demonstrated.

Cleaners and maintenance staff must receive appropriate instructions to ensure the safety of themselves and others. Refresher training should be given to all cleaning and maintenance staff allocated to Life Sciences every two years or where a change of usage dictates.

Supply and maintenance of equipment:

Central air handling and ventilation systems including systems maintaining negative pressure zones

Supply, installation, maintenance and testing of these systems is the responsibility of the Estate Management Section. It is the responsibility of the School to use these systems correctly in accordance with established procedures and report all issues promptly.

Local air handling equipment, cabinets, hoods or similar ("LEV")

Purchasing of such systems is managed centrally to ensure that the equipment complies with the correct UK and international standards and guidance, and also complies with the School's established specifications.

- All recirculating Class II microbiological safety cabinets should be of the A2 type and be constructed to the associated specifications. If types with other airflow patterns are required by the planned work, this must be established by an approved risk assessment, and some provision made for the increased costs they often incur.
- It is expected that all new Class II microbiological safety cabinets will be equipped with double HEPA filtration on their exhaust outlets, whether recirculating by design or ducted.

It is the responsibility of the School to ensure the maintenance and efficient performance of all containment equipment used for microbiological work in accordance with COSHH. Equipment will undergo a minimum of annual safety testing and servicing by an independent external contractor as per established protocols. This will include a pre-service fumigation cycle where necessary, based on the recorded usage

of each item.

Microbiological Safety Cabinets [MSCs]

A microbiological safety cabinet is a ventilated enclosure intended to offer protection, to the user and the environment, from aerosols generated when handling biological agents or material.

The standard for the design, siting and testing of safety cabinets is specified in British Standards documents:

- BS 5726 1992 2 & 4, dealing with installation and selection, maintenance and use
- BS EN 12469 2000 [replacing BS 5726 parts 1 & 3], dealing with performance criteria & testing.

Air discharged from a MSC to the atmosphere must always be HEPA filtered. Microbiological safety cabinets are not designed to protect the user from all hazards, e.g. radioactive, toxic or corrosive hazards, and the exhaust HEPA filters will not remove these types of contaminants from the exhaust air. Particular care must be taken when using materials with such additional hazards to ensure these are not discharged into the laboratory.

There are three types of MSC cabinet generally available on the market:

MSC CLASS I - a cabinet with a front aperture through which the operator can carry out manipulations inside the cabinet. It is constructed so that the operator is protected, and the escape of airborne particles generated within the cabinet is controlled by means of an inward airflow through the working front aperture with HEPA filtration of the exhaust air. This type of MSC will not provide any protection for the product and is suitable for work with all categories of biological agent, except HG4.

MSC CLASS II - a cabinet with a front aperture through which the operator can carry out manipulations inside the cabinet. It provides both worker and product protection. The escape of airborne particles generated within the cabinet is controlled by means of an inward airflow at the front of the cabinet, which is filtered before circulation within it, while the down flow of HEPA filtered air over the working surface protects the work. This type of MSC is also suitable for work with all categories of biological agent, except HG4, though the degree of protection afforded to the operator can be compromised more readily than with a Class I MSC.

MSC CLASS III - a cabinet in which the working area is totally enclosed providing maximum protection for the operator, the work and the environment. Incoming and outgoing air is HEPA filtered. Access to the interior of a Class III cabinet is provided by use of arm-length gloves attached to ports in the front panel of the unit. The use of Class III cabinets is usually confined to work with biological agents in HG4.

The effectiveness of the microbiological safety cabinet depends on:

- good design to the correct standards
- suitable siting, installation and commissioning
- correct use by trained workers
- ongoing maintenance and testing

Design

There are numerous manufacturers of MSCs within UK. It is important that the cabinet conforms to British Standard BS EN 12469: 2000.

Installation

Extract systems

The use of cabinets ducted directly to atmosphere via a dedicated extract system is preferred. Ducted cabinets must be fitted with automatic anti-blow back systems downstream of the filters to prevent air flowing back into the cabinet. If it is necessary to have more than one cabinet ducted via the same extract system, then a thimble system will be required to avoid the possibility of any back leakage. Cabinet manufacturers and suppliers can advise on these

Recirculating cabinets

All of the Class II MSCs within the School's research laboratories are of the recirculating type. A recirculating cabinet must be fitted with double HEPA filters on the exhaust, which may be installed in Containment Level 2 facilities providing there are no other hazardous contaminants in the discharged air.

Please be aware that the cabinets within the STEM 2.1 Teaching Laboratory are attached to extract ducting, but still recirculate a proportion of the air in the same way as our non-ducted cabinets.

Siting

Cabinets must be sited so as to minimise disturbance of the airflow at the front of the cabinet. Particular care should be taken with recirculating cabinets. Key considerations when siting a cabinet are:

- Doors and windows which open
- Draughts caused by ventilation and air conditioning units.
- Pedestrian traffic routes.
- Location of other MSCs or fume cupboards.

The UBSA must be consulted about any new installation of a Class II cabinet intended to be used at CL2.

Commissioning

When an MSC is installed the following commissioning tests must be carried out after siting.

- HEPA filter aerosol challenge test.
- KI Discus operator protection factor test [OPFT].
- Volumetric airflow rate and airflow patterns.

Correct use

The inward airflow that is drawn through the working aperture of open-front cabinets (Class I and II) can be disturbed by, for example, sudden movements of the arms of the operator and turbulence around the equipment placed inside the cabinet. Therefore, please observe the following:

- Keep the amount of equipment in the cabinet to a minimum.
- Avoid sudden movement of arms and moving hands in and out of the cabinet.
- Do not obstruct any of the air- intake grills at the front or rear of the cabinet as this will affect the air inflow.
- Work as near to the centre of the work area as possible.

Avoid unnecessary traffic in the vicinity of the cabinet and air disturbance in room. Keep doors to room closed.

When work is finished the interior of the cabinet should be cleaned with an appropriate disinfectant and the fans left running for 10 minutes before switching off and closing the front cover or fitting the night door. These must be in place when the cabinet is not in use.

Other equipment that affects safe use:

Centrifuges:

Do not place these inside MSCs unless it is totally enclosed or an 'in use' test has been carried out and containment is not affected by use of the centrifuge.

Bunsen burners or similar:

Their use in safety cabinets is strongly discouraged due to disturbance of air flow and reduction of both operator and product protection, along with a greatly increased fire risk due to the presence of combustible filters. If these are to be used, then an 'in-use' test will be required to establish that protection is not compromised in any way.

Provision of UV light in cabinets

UV is generally ineffective for sterilising the interior of cabinets as radiation is directional and therefore for it to be effective the cabinet must be totally empty. In line with current national and international standards, it is current policy that these NOT be fitted in any Class II cabinets.

If installation is explicitly required by a risk assessment the following requirements must be met:

- UV lighting must be installed in such a manner that it cannot affect performance or durability. Materials of construction must therefore be resistant to the effects of UV.
- There must be an electrical interlock fitted so that the operator cannot be exposed to UV light. Glass fronts to the cabinets MUST be designed to fully block the harmful UV radiation.
- The efficacy of the biocidal activity must be monitored regularly, and the lamp changed when efficacy is reduced, or at predetermined frequency that ensures light is still effective

User training

All users of microbiological safety cabinets must receive appropriate training to the standard syllabus defined by the Department concerned.

Service & Maintenance

The COSHH Regulations, in relation to local exhaust ventilation require thorough examination and testing as part of routine maintenance at intervals not exceeding 14 months. These tests must be carried out by a competent engineer. Cabinets used with HG2 pathogens or unscreened blood MUST be fumigated ahead of servicing.

In addition to the above checks the following checks must be carried out by the operator.

- correct operation of all alarms and indicators
- air velocity inflow readings are within safe limits as set by the manufacturer. For cabinets with digital readout this is normally between 0.7 to 1.0m/second for Class I cabinets and not less than 0.4m/s for Class II cabinets.

Autoclaves

- All autoclaves procured by the School of Life Sciences must be designed, manufactured and installed to the appropriate standard and in compliance with all relevant national and local requirements
- The School of Life Sciences does not normally permit the use of small benchtop autoclaves within individual laboratories. All autoclaving is managed by the Core Services team.
- Biological waste must only be processed using autoclaves that are suitable for the type of waste concerned. Solid waste, for example, must only be processed using autoclaves with the capability of applying a vacuum within their chambers. All autoclaving is managed by the Core Services team.
- All autoclaves within the School of Life Sciences must have a full service contract in place including a minimum of 6-monthly service visits. It will also be a requirement for all such units to undergo annual safety inspections by our insurers.
- All autoclaves being used for waste treatment must have all such treatment cycles validated on an annual basis. Intermediate checks must always be made between validations using appropriate indicators (thermal or biological). Autoclave tape alone cannot be relied upon to show a suitable sterilisation cycle has been completed.
- Core Services will maintain full records of the autoclave cycles carried out.

Aspirators

- All aspirator units or other aspiration systems procured by the School of Life Sciences must be designed, manufactured and installed to the appropriate standard.
- All such units must be fitted with a liquid trap to hold sufficient volume to allow for planned usage plus a safe air space above the liquid. All traps that will be holding biological waste should either contain an appropriate disinfectant or be swapped over daily and the liquid sent for autoclaving.

The tubing used within the system must be resistant to both the material being aspirated and also and disinfectants used

- An in-line aerosol filter must be fitted between the liquid trap and the pump to remove any aerosols generated. These filters should be of the correct design and must be designed to stop air passage if they become contaminated with liquid. **Under no circumstances must these systems be operated without this aerosol barrier in place.**
- Systems should be emptied, maintained and cleaned regularly
- Only plastic aspirating pipettes should be used with biological waste. Traditional fine-tipped glass Pasteur pipettes must not be used.

Sample storage

Liquid nitrogen storage:

- All cryostorage vessels containing either HG2 pathogens, human blood samples or tissue samples must be stored in a secure location, which must always be kept locked when not in use.
- The School is responsible for monitoring that the levels of liquid within the centrally held storage vessels is at a suitable level. As a general policy, such storage vessels should not be held within individual labs to eliminate risks of vessel failure in busy laboratory areas.
- Liquid nitrogen vessels should be used in accordance with established School safety procedures. Special care must be taken when thawing out material from liquid nitrogen storage due to the high risk of the tubes exploding when liquid nitrogen gets inside.
- Only workers who have been trained in safe handling procedures will be allowed to use the liquid nitrogen storage vessels.
- All vessels holding more than 10L of liquid nitrogen will be subject to annual safety inspections by an independent company. In addition, all pressurised vessels will have an annual service and safety check in accordance with current legislation and an appropriate written scheme of inspection for each unit. It is the responsibility of all workers to report any defects with these vessels promptly due to the hazards involved.
- No work with liquid nitrogen in volumes greater than 2L is permitted in any area not equipped with validated oxygen depletion monitoring equipment. For small volumes, this could be a personal unit, but must be a correctly installed hard-wired system for work in larger volumes. All liquid nitrogen storage areas on Level 2 of Life Sciences are so equipped.

Fridges & Freezers

- All fridges or freezers used for storage of biological materials must be lockable if held outside of laboratory areas or is being used to house high hazard or potentially sensitive material such as human tissue.
- If being used to house potentially flammable materials (e.g. extracts in ethanol), fridges and freezers must be designed to be internally spark free.
- To maintain efficiency, increase reliability and reduce the risks of contamination, all fridges and freezers should undergo regular defrost and maintenance cycles as needed.
- It is not recommended to use freezers with automatic defrosting functions for storage of biological materials due to the inherent temperature instabilities that occur within them.
- All fridges and freezers purchased for use within labs should be purchased to a standard that is appropriate for the value, hazard or importance of the materials stored in them. As a general rule, 'domestic' grade units are only suitable for light usage, so more robust 'commercial', 'laboratory' or 'pharmacy' grade units should be used for high value items or hazardous contents.
- You should consider fitting an external temperature monitoring and/or alarm system to critical units. The School has such a centrally managed alarm system in place which is available to all laboratory areas.

Transport of biological materials

Note: The University of Essex does not have facilities to work with Hazard Group 3 or 4 materials. Storage of viable samples of, or research with HG3 or HG4 organisms is therefore not permitted under any circumstances.

Biological material is exempt from transport regulations if it falls into one or more of the following categories.

- Non-pathogenic micro-organisms (wild type)
- Biological material that has been inactivated so it no longer poses any risk of infection
- Where any pathogens present have been inactivated such that they no longer pose any health risk (e.g. fixed material)
- Dried blood on absorbent material
- Environmental samples not considered to pose any risk of infection
- Naked nucleic acid or plasmids

For transport, there are six primary categories for shipment

- Category A Infectious substances affecting humans or humans and animals (UN2814)
- Category A Infectious substances affecting animals (UN2900)
- Category B Biological substances (UN3373)
- Exempt substances
- Genetically modified organisms (UN3245)
- Biological substances which are not dangerous goods

It is beyond the scope of this document to detail all possible packaging, labelling or shipping requirements for packages containing biological materials. Please check the relevant documents or other resources for details or ask for advice from School staff.

Transport of samples around the School:

- Biological materials being transported around the School must be carried in appropriate carriers and with suitable secondary containment in place.
- Whilst school policy is that gloves must not be worn outside of labs, it is recognised that on occasion you may need some PPE to safely transport samples around the building. In this case, you should keep one hand un-gloved to allow you to open doors, call lifts etc. without transferring contamination to surfaces.
- In the event of a spillage, please follow the emergency spillage procedures as specified in your risk assessments and/or scheme of work, or the generalised guidance in this document.

Accompanied sample transport:

- When collecting or delivering biological materials, it is important to pack them in the manner appropriate for the transport being used. Packaging and labelling rules are different for road, rail, sea or air transport.
- It is a legal requirement that packages are correctly labelled with their contents. This includes any hazardous refrigerants being used, such as dry ice. A correctly primed and set up dry shipper is not normally treated as dangerous goods by itself, although the contents may still be.
- If using public transport, you must check the carrier's terms and conditions before travel. Most carriers do not allow transport of hazardous materials, including dry ice, without prior notification.
- If using a private vehicle, please make sure you comply with the requirements of the University's Driving for work policies, and that the vehicle being used is correctly insured. <https://www.essex.ac.uk/staff/activities-health-and-safety/driving-for-work>. It is important to check that your insurance will correctly cover the transport of hazardous goods if necessary.

Unaccompanied shipping:

- When shipping biological materials, it is important to pack them in the manner appropriate for the transport being used. Packaging and labelling rules are different for road, rail, sea or air transport. The courier or transport company you are using will be able to advise. Most will be able to provide you with a packaging checklist.
- Only correctly authorised shipping companies must be used. Not all companies can accept hazardous goods or refrigerated packages.
- It is a legal requirement that packages are correctly labelled with their contents. This includes any hazardous refrigerants being used, such as dry ice. Parcels carrying incorrect labels are very likely to be returned by the courier.
- Dry ice is a hazardous material, classified as UN1845 for transport. It is a requirement that all parcels containing dry ice are notified to the courier before collection.

If a parcel arrives that appears damaged in a way that might have affected the contents, the parcel should be opened within a microbiological safety cabinet so that the sample integrity can be checked safely.

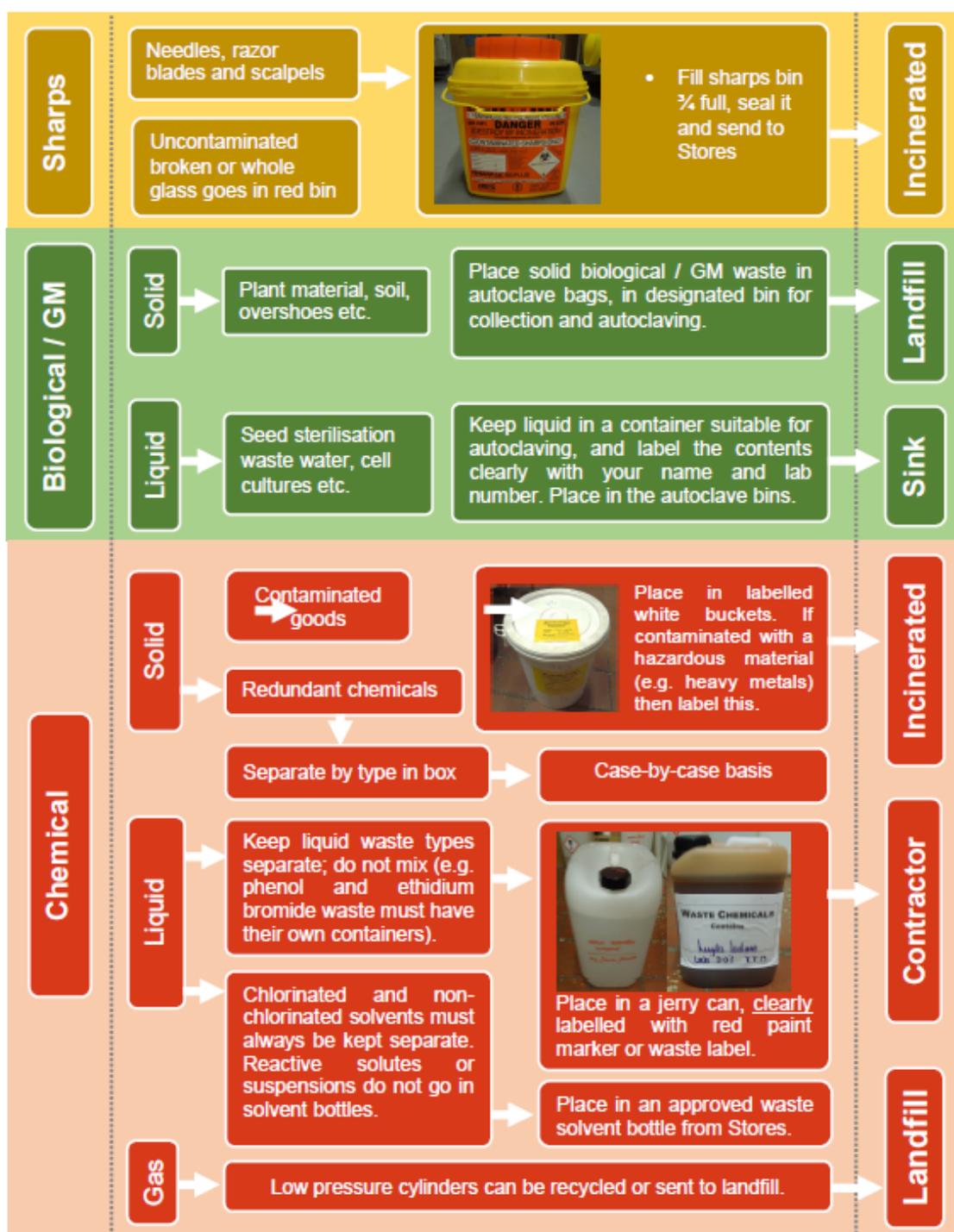
If there is visible leakage, please follow the spillage procedure in this document or your local risk assessments first and report the spillage through the University's normal routes.

Waste disposal arrangements

Hazardous biological waste or any other waste covered by these Local Rules must be autoclaved before disposal. Use of disinfectants for this is not considered to achieve a sufficient kill level for it to be the primary disposal treatment.

The School's accepted waste disposal arrangements for each waste stream are summarised in the figure below. If you require more detail, please consult with our Core Services team.

Laboratory waste disposal handbook



Code of Practice

- 1) No unauthorised access to any laboratory is permitted. Permission to use the facility at any level must be obtained from the PI in charge or their nominee before access is required. This includes postgraduates and undergraduates not usually associated with the laboratory, cleaners, and maintenance staff, visitors, service personnel and contractors.
- 2) All workers must be registered on an approved risk assessment before commencing work.
- 3) Keep workplace and environmental exposure to any biological agent to the lowest reasonably practicable level.
- 4) Exercise engineering control measures at source and supplement with appropriate personal protective equipment where necessary.
- 5) Adequately test and maintain control measures and equipment.
- 6) Testing, where necessary, for the presence of viable process organisms outside the primary physical containment.
- 7) All users must ensure that vessels for disposal are available before starting experimental work. Each person is responsible for providing and cleaning their own materials and equipment. Users should be aware of any disinfection policy for their work. This might include
 - the efficacy of the disinfectant against the organism
 - the correct concentration of the disinfectant
 - the methods specified for routine disinfection
- 8) No equipment may be removed from facilities without prior fumigation, sterilisation or disinfection if needed.
- 9) No unaccompanied or unauthorised visitors or children are allowed within laboratories.
- 10) Contractors or service engineers must not be allowed to enter laboratories without the knowledge of the Technical Services Managers and PI, and a Permit to Work authorisation where needed. Equipment should be fumigated, sterilised or disinfected as appropriate before work is undertaken.
- 11) In compliance with other Codes of Practice mouth pipetting, eating, drinking, smoking, licking of labels, application of cosmetics (apart from hand/barrier cream) and the storage of food and drink for human consumption are expressly forbidden.
- 12) Outdoor clothing should be removed before entering the laboratory. Where this is not possible outdoor clothing should be removed before fully entering the laboratory and kept separately from laboratory coats.
- 13) Laboratory coats are to be worn at all times within laboratories, they should be removed when leaving the laboratory for rest breaks, or to enter non-laboratory areas. Green laboratory coats are a requirement within GM growth facilities, and standard white Howie-style laboratory coats within other areas. Safety glasses and other PPE (e.g. disposable gloves) are to be worn except where an RA shows them to be unnecessary. The School has a policy that all workers within labs must not wear open-toed footwear or footwear with heavily pierced patterns.
- 14) All material for autoclaving should be placed into the grey-lidded boxes provided. These should be clearly marked to identify the laboratory of source.
- 15) On completion of an experiment benches should be wiped down with a suitable disinfectant solution. Virkon should be changed daily, however it changes colour from pink to clear when it is no longer effective.
- 16) All operations that are likely to produce aerosols must be carried out in the appropriate microbiological safety cabinet. Such operations should be identified in the RAs associated with the work.
- 17) Wherever possible use disposable pipettes or automatic pipettes with disposable tips. All pipettes used for handling HG2 cultures must be plugged and after use immersed in disinfectant. ABSOLUTELY NO MOUTH PIPETTING. Hypodermic needles must not be used.
- 18) All cultures must be decontaminated before disposal. This should be done immediately on completion of an experiment.
 - a) Cultures must never be poured down sinks. It is School policy that these be autoclaved before

- disposal, NOT disinfected
- b) Waste materials such as paper towels, gloves, plastic petri dishes and other plastics should be collected in an autoclave bag and be autoclaved.
 - c) Contaminated plastic, glassware and other reusable material must first be disinfected or preferably autoclaved before washing up.
- 19) Wash hands thoroughly before starting and after completing an experiment and always before leaving the laboratory.
- 20) Supervisors must ensure safe and secure storage of recombinant organisms and pathogenic material and must maintain an up-to-date inventory. Storage fridges or freezers should be lockable when outside the containment laboratory.
- 21) All accidents, spillages and breakages must be dealt with immediately. All incidents should be reported to the project supervisor. All accidents should be reported to the DHSO. Spillages of biological material should be dealt with as specified in the RA pertinent to the work undertaken.
- 22) The School reserves the right to withdraw the right of access to laboratories.

Both the GM and Microbiological Laboratory CoP may be adopted for use in the laboratory. If adopted, they may be quoted in RAs; there is no need to re-write them. However, a hard copy must be available in the lab to refer to (preferably attached to the RA) and its whereabouts noted in the RA.

Spillages

Spillages of blood, body fluids or tissue should be mopped up with paper tissues and the soiled tissues and other waste sterilised by autoclaving. The contaminated area must then be treated with Virkon powder for at least 1 hour. The solution should be mopped up with tissues and the tissues then disposed of appropriately.

Large volume liquid spillages - the spread of liquid can be stopped using handfuls of paper tissues. Wearing gloves and eye protection, any recovered liquid, together with the tissues, should be transferred into a bucket. Add 1% Virkon solution. After one hour dispose of to foul drains by flushing down the toilet. Disinfect the toilet using 1% Virkon solution after use.

Personal protective equipment (PPE) to be worn for cleaning spillages:-

- Laboratory coat or coverall
- Suitable disposable gloves
- Safety glasses
- Safety footwear

Lab coats/coveralls and safety glasses should be autoclaved if contamination is suspected; gloves should be disposed of directly into an autoclave bag immediately after use. Any personal clothing, including footwear, which may have become contaminated must be autoclaved and the member of staff will normally be compensated for any loss or damage.

Accidents

Accidental injury from sharp objects may cause cuts, puncture or stab wounds. All sharp objects should be handled with great care and never left lying around.

- Immediately after use, place disposable sharps (hypodermic needles, scalpel blades, lancets) directly in a sharps container. Seal and replace sharps containers when $\frac{3}{4}$ full to prevent overfilling, which increases the risk of contaminated sharps injuries. The School will arrange for the disposal of sharps containers.
- Never re-sheath a hypodermic needle; dispose of syringes with the needle attached. If the needle must be removed, use forceps or another appropriate device to carefully twist off.
- Other sharp equipment (scissors, forceps) should be cleaned, disinfected and/or sterilised as appropriate.

All sharps injuries must be reported to the research supervisor and on the standard accident reporting form.

In the event of a sharps injury

- Gently encourage the wound to bleed while washing under running water. Do not suck.
- Wash with soap and water. Dry and apply washproof plaster.

In the event of contamination with blood or body fluids

- Wash splashes to eyes, nose or mouth with running tap water. Do not swallow.
- Where an obvious risk of infection has occurred, the affected person should seek medical advice urgently. Advice must always be sought where the sharp has been in contact with human tissue or any infected animal.

Appendix 1: Suggested training of staff, postgraduate students and induction of new staff members

Fire, explosion and bomb warnings

Instruction for use of equipment – as appropriate.

- Microbiological Safety Cabinets
- Fume cupboards
- Incubators
- Autoclaves
- Transilluminators
- Any equipment where its misuse has safety implications or where loss of materials or information is a risk.

Good microbiological technique

Storage of samples and pathogenic organisms

Completion of risk and COSHH assessments

This Code of Practice and Local Rules

Accident and incident reporting procedures

Disinfection procedures

Spillage procedures

Waste handling

Storage and access to chemicals and flammable liquids

Fault reporting

Packaging for transport – as appropriate

- Within the building
- Materials sent by public carrier or carried by staff
- Receipt of material from other laboratories
- Containment of contents
- Labelling
- Hazard information for carrier
- Hazard information and instruction for recipient

Workstation ergonomics

Appendix 2: Anti-Terrorism, Crime and Security Act 2001 Schedule 5 List of Pathogens and Toxins

The current Schedule 5 list of materials (last updated October 2012) includes microorganisms, toxins and genetic sequences.

Bacteria

Bacillus anthracis	Burkholderia mallei (Pseudomonas mallei)
Francisella tularensis	Shigella boydii
Brucella abortus	Shigella dysenteriae
Brucella canis	Shigella flexneri
Salmonella paratyphi A, B, C	Vibrio cholerae
Brucella melitensis	Clostridium botulinum
Salmonella typhi	Yersinia pestis
Brucella suis	
Chlamydia psittaci	
Multiple-drug resistant Salmonella paratyphi	
Burkholderia pseudomallei (Pseudomonas pseudomallei)	
Enterohaemorrhagic Escherichia coli serotype O157 and verotoxin producing strains	

Rickettsiae

Coxiella burnetii
Rickettsia rickettsii
Rickettsia prowazekii
Rickettsia typhi (mooseri)

Viruses

Chikungunya virus	Rocio virus
Mobala virus	Influenza viruses (pandemic strains)
Congo-crimean haemorrhagic fever virus	Sabia virus
Monkey pox virus	Japanese encephalitis virus
Dengue fever virus	Sagiyama virus
Mucambo virus	Junin virus
Dobrava / Belgrade virus	SARS Coronavirus
Murray Valley encephalitis virus	Kyasanur Forest virus
Eastern equine encephalitis virus	Sin Nombre virus
Ndumu virus	Lassa fever virus
Ebola virus	St Louis encephalitis virus
Nipah virus	Louping ill virus
Everglades virus	Lymphocytic choriomeningitis virus
Omsk haemorrhagic fever virus	Variola virus
Getah virus	Machupo virus
Polio virus	Venezuelan equine encephalitis virus
Guanarito virus	Marburg virus
Powassan virus	Western equine encephalitis virus
Hantaan virus	Mayaro virus
Rabies virus	West Nile fever virus
Hendra virus (Equine morbillivirus)	Middleburg virus
Rift Valley fever virus	Yellow fever virus
Herpes simiae (B virus)	
Tick-borne encephalitis virus (Far eastern encephalitis, formerly Russian Spring summer encephalitis virus)	

Animal Pathogens

African horse sickness virus	African swine fever virus
Lumpy skin disease virus	Newcastle disease virus

Bluetongue virus	Rinderpest virus
Peste des petits ruminants virus	Goat pox virus
Classical swine fever virus	Sheep pox virus
Rift Valley fever virus	Hendra virus (Equine morbillivirus)
Contagious bovine pleuropneumonia	Swine vesicular disease virus
Rabies and rabies-related Lyssaviruses	Vesicular stomatitis virus
Foot and mouth disease virus	
Highly pathogenic avian influenza (HPAI) as defined in Annex I(2) of Council Directive 005/94/EC	

Toxins

Abrin	Tetrodotoxin
Saxitoxin	Conotoxin
Botulinum toxins	Viscum Album Lectin 1 (Viscumin)
Shiga and shiga-like toxins	Modeccin toxin
Clostridium perfringens epsilon toxin	Volkensin toxin
Staphylococcal enterotoxins	Ricin
Clostridium perfringens enterotoxin	

Notes:

Any reference in this Schedule to a microorganism includes:

- (a) Intact microorganisms.
- (b) Microorganisms which have been genetically modified by any means but retain the ability to cause serious harm to human health.
- (c) Any nucleic acid deriving from a microorganism listed in this Schedule (synthetic or naturally derived, contiguous or fragmented, in host chromosomes or in expression vectors) that can encode infectious or replication competent forms of any of the listed microorganisms.
- (d) Any nucleic acid sequence derived from the microorganism which when inserted into any other living organism alters or enhances that organism's ability to cause serious harm to human or animal health.

Any reference in this Schedule to a toxin includes:

- (a) Any nucleic acid sequence coding for the toxin.
- (b) Any genetically modified microorganism containing any such sequence.

Any reference in this Schedule to a toxin excludes any non-toxigenic subunit.

Appendix 3: Abbreviations

ACDP	Advisory Committee on Dangerous Pathogens
ACoP	Approved Code of Practice
BH&GMSG	Biological Hazard and Genetic Modification Sub-group
CL	Containment level
CoP	Code of Practice
COSHH	Control of Substances Hazardous to Health Regulations
DBSO	School Biological Safety Officer
DHSO	School Health & Safety Officer
DUBSA	Deputy University Biological Safety Adviser
GM	Genetically modified
GMM	Genetically modified micro-organism
GMO	Genetically modified organism
GLP	Good Laboratory Practice
GOSH	Good Occupational Safety and Hygiene
HoS	Head of School
HSE	Health and Safety Executive
LR	Local Rules
LS	School of Life Sciences
MHSW	Management of Health and Safety at Work Regulations 1999
OHA	Occupational Health Adviser
PGs	Post-graduates
PPE	Personal protective equipment
RA	Risk assessment
SACGM	Scientific Advisory Committee on Genetic Modification
UBSA	University Biological Safety Adviser
WW	Workplace Wellbeing

Appendix 4: Acknowledgement

Acknowledgement of the receipt of School Local Rules and Code of Practice for work with biological hazards and human body tissues, fluids and human blood products

I confirm that I have received a copy of the Local Rules and Code of Practice for work with biological hazards and human body tissues, fluids and human blood products in the School of Life Sciences. I agree to work according to the requirements of the University and School as set out in these rules.

Name

Signature

Date

Please return this form to by