LONDON METROPOLITAN UNIVERSITY

Biological Safety Policy

Document Control Information	
Version control	1.2
Owned by:	Health and Safety Team
Latest amendment on:	05-09-2023
Approved by:	Health and Safety Committee
Approved on:	04-10-2023
Coming into effect on:	04-10-2023
Review date:	September 2025

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1. Introduction

This Policy sets out the arrangements required for safe working with biological hazards at London Metropolitan University.

1.1 Definitions

- **Biological agents:** is a bacterium, virus, protozoan, parasite, or fungus that can be used purposefully as a weapon in bioterrorism or biological warfare
- **BSC:** Biological Safety Committee
- **BGMSC:** Biological and Genetic Modification Safety Committee
- **Biohazard:** micro-organisms, agents, pathogens, viruses, cell cultures, parasites, human or animal tissue including blood, urine and other body products or plant material which gives rise to a risk of infection, allergy or toxicity
- **GM:** Genetic Modification.
- **GMOs:** Genetically Modified Organisms
- **Organisms:** any individual **living** thing that can react to stimuli, reproduce, grow, and maintain homeostasis. It can be a virus, bacterium, protist, fungus, plant or an animal.
- **SAPO:** Specified Animal Pathogen Order 2008.
- **PHO:** Plant Health (England) Order 2015.
- **UBSO:** University Biological Safety Officer

1.2 Scope

This procedure applies to all work [1] involving biological material (e.g. micro-organisms, cell cultures, parasites, human or animal tissue) including blood, urine and other body products or plant material which gives rise to a risk of infection, allergy or toxicity.

This policy applies to all work which involves the handling, storage, transport and waste disposal of biological agents at the London Met University. Activities undertaken during work placements in external health care facilities are not covered by this policy. This policy also does not cover contact with blood/bodily fluid through first aid/cleaning activities.

No-one may commence any activity involving GMOs[2] (including but not limited to, their use; culture; storage; transport; destruction; or disposal) or introduce GMOs into the environment without first consulting with the Health & Safety team, undertaking a

[1] Work means work means handling, use, transportation and storage of biological material

[2] The *Genetically Modified Organisms (Contained Use) Regulations 2014* regulates the safe use of genetically modified organisms (GMOs) in containment. The regulations cover both the human health and environmental risks from work involving genetically modified micro-organisms which includes modified cell cultures. For larger GMOs (i.e. animals and plants) these regulations only cover the risks to human health with the environmental risks being covered by provisions in the Environmental Protection Act (EPA) and its sub-ordinate regulations, the *Genetically Modified Organisms (Risk Assessment)(Records and Exemptions) Regulations*. Releases to the environment and marketing of GMOs are also covered under the EPA by provisions in the *Genetically Modified Organisms (Deliberate Release) Regulations*. Taken together, all of these Regulations implement, within Great Britain, the EC Directives on the contained use and deliberate release of GMOs.

risk assessment of the activity that has been reviewed by BGMSC and registering with the Health & Safety team. No project involving such work may be started until written authorisation has been obtained from the BGMSC.

Currently there is no license under SAPO, or PHO undertaken within the University. No-one may commence licensed work, including HTA, without obtaining the necessary license, ethical approval and explicit consent from the BSC.

School/Department is required to set up a BGMSC or BSC for GMO or/and licensed work.

Details on the requirement for, and obtaining, ethics approval are available here: https://student.londonmet.ac.uk/your-studies/mphil--phd-professional-doctorates/research-ethics/

For information on the control of *Legionella* please refer to Control of Legionella in water systems procedure: Legionella Policy

2. Roles and responsibilities

2.1 Deans of School

- Overall responsibility for ensuring this policy is adhered to within their areas of responsibility
- Ensure that there are systems in place for the review, approval and notification of work at the initial stages (and in some instances throughout the) project
- Ensure there are systems in place to meet and review training needs.
- Appointment of a School Biological Safety Officer (BSO) – See Appendix A for specific role and responsibilities.

2.2 Principal Investigators\ Practical Demonstrators

A principal investigator or practical demonstrator is the initiator of a project\ practical and is the named applicant on the original project application. This person will usually be a member of staff and is directly responsible at all times for the safe execution of the work in progress.

The responsibilities of Principal Investigators are to:

a) Undertake risk assessments for hazardous activities including the handling of any hazardous waste, or disinfectants used in their laboratory
b) Obtain the necessary permission from School Management for each new or changed project involving Schedule 5 materials[3] that they are involved with including ethics approval (where required).
c) Ensure that all aspects of the work with any Schedule 5 pathogens/toxins or relevant materials are securely controlled.

[3] Acquisition, storage and use of a specified form of an item on the *Anti-Terrorism, Crime and Security Act 2001* Schedule 5 will require notification to the Home Office, inspection by a police Counter-Terrorism Security Advisor, and compliance with more stringent biosecurity requirements.

d) Classify all biohazards for which they are responsible in the prescribed manner, as described below, and to keep an up-to-date inventory of the biohazards.
e) Ensure that all workers in their groups are familiar with the local rules and the correct use of the laboratory equipment and are trained in the handling of the biohazards involved.
f) Ensure that all workers in their groups are registered for the work (i.e. identified in the risk assessment) and the list of registered workers to be managed by School (eg Science School Technical Manager) and shared with Health & Safety team.
g) Inform the Health & Safety team if workers change their projects, and when workers leave.
h) Report to the Health & Safety team any changes in the nature of the work carried out by their groups.
i) Inform the Health & Safety team when a project has finished.
j) Ensure that all workers in the laboratory observe local rules.
k) Be responsible for the day-to-day cleanliness of the laboratory, and its physical security and for the safe storage of biohazards in the laboratory. If such organisms [4] are sent outside the University, it is the Principal Investigator's responsibility to ensure that a proper assessment is carried out and that they are transported appropriately.
l) Ensure that the Health & Safety team is promptly informed of any accidents in the laboratory.
m) Ensure that adequate training is given to everyone involved in their research projects and that changes are notified.
n) Provide safety information for Permits to Work which are required by maintenance staff and contractors before they may enter any area where work with biological agents is taking place.

2.3 Lab Users (Staff and Students)

- Adhere to University and local rules.
- Report accidents/incidents and near misses to their line-manager/ supervisor
- Do not use any equipment, substance or safety device unless they are deemed competent to do so, having received adequate training and instructions from the appropriate member of staff.
- Be familiar with the actions to take in the event of an emergency.

2.4 Health & Safety Team

- Provision of guidance and advice on biological risk management
- The Health & Safety team audits Schools on their holdings and liaises with the National Counter Terrorism Security Office (NaCTSO) and CTSAs regarding work with and the secure design of premises holding scheduled material.

[4] Naked DNA is not covered by the Regulations, and it is much easier to send or arrange to receive naked DNA rather than the GMO.

2.5 Estates

- Provision of adequate and suitable waste disposal
- Provision of Thorough Examination and Testing of Microbiological Safety Cabinets
- Sharing of the relevant maintenance records and reports.

2.6 Occupational Health

- Deliver the Health Surveillance Program and related health advice upon request.

2.7 Third Party Users

- Third party users of LMU laboratories (eg collaborators and visiting researchers) must ensure that they have all of the necessary safety arrangements, notifications and licenses (etc.) in place.
- LMU staff should review the proposals for work by third parties to ensure that the facilities are suitable for the work to be undertaken.

3. Biological Hazards

The required degree of containment for micro-organisms varies depending on the hazard group to which the micro-organisms belong. Some micro-organisms have evolved mechanisms which enable them to infect and cause disease. It is possible to classify them on the basis of hazard to human health into four broad hazard groups (HG).

Classification	Description
Hazard Group 1	Unlikely to cause disease.
Hazard Group 2	May cause disease, low hazard, spread unlikely, and prophylaxis/treatment available.
Hazard Group 3	Severe disease possible, hazardous, spread possible, prophylaxis/treatment available.
Hazard Group 4	Causes severe disease, serious hazard, and high risk of spread, prophylaxis/ treatment not normally available.

Consequently, good laboratory practice, occupational safety and hygiene and containment principles aim to reduce the risk of infection and transmission.
Some HG2 agents have been identified as presenting an enhanced risk, meaning that these agents should **always** be handled in a microbiological safety cabinet. Examples include *Legionella pneumophila, Neisseria meningitidis* and *Vibrio cholera* (incl. El Tor.).

The Advisory Committee on Dangerous Pathogens (ACDP) produces and periodically updates *The Approved List of Biological Agents*, which classifies many commonly used micro-organisms into hazard groups.

This document should be referred to **before** starting any work involving micro-organisms. Any micro-organisms that are not listed are **not automatically assigned to HG1**, these must instead be classified by the person undertaking the work. The ACDP document also lists those biological agents in HG3, which are subject to a partial exemption from the minimum containment level requirements of the Control of Substances Hazardous to Health (COSHH) Regulations when particular activities are being undertaken. If there is any doubt in making an allocation, advice should be sought from the Health & Safety team.

Use of genetically modified organisms is also subject to additional regulations, please contact the Health & Safety team if planning to undertake work with GMOs.

3.1 Exposure to infectious diseases

The main modes of transmission of infectious diseases are:

a) Direct physical contact with an infected person, animal or object. Few organisms can penetrate intact skin, but many colonise cuts or wounds or may enter through them and thereby cause infection.
b) Bite or sting from an infected animal or insect.
c) Ingestion of contaminated food or drink.
d) Infection via the eye or the moist mucous surfaces of the respiratory, gastro-intestinal or urogenital tracts.
e) Inhalation of airborne particles.
f) Inoculation wounds, e.g. from contaminated needles, scalpel blades etc.

Any person who wishes to work with any pathogen must consult the Health & Safety team, **before commencement**, for the work to be reviewed and approved. This notification must include the names of all workers involved and a list of all rooms which will be used.

3.2 Notification to the authority

In some circumstances, notifications must also be made to the Health and Safety Executive or other regulatory authorities. The Biological Safety Officer will notify relevant authorities as required. It is the responsibility of the Principal Investigator to provide information set out within this procedure to the Health & Safety team. The Principal Investigator must include the costs of regulatory notification in their project budget.
For example, COSHH Regulations require the University to notify to the Health and Safety Executive of the following:

- First use of biological agents in Hazard Groups 2, 3 or 4 at a particular premises.
- Subsequent use of any of the agents listed in Part V of Schedule 3 to COSHH at a particular premises.

4. Containment

The four hazard groups require increasing levels of containment, designated as

containment levels CL1-4.

Containment describes facilities, procedures and processes that are used to help prevent exposure of people and the environment to the micro-organisms that are being deliberately manipulated either by accident or once work has finished. It is used in combination with good microbiological practices (e.g. aseptic technique) which is designed to prevent cross-contamination of work but also supplements the containment objectives by preventing the spread of contamination.

The University does not currently have any containment level 3 or 4 facilities. HG3 and HG4 pathogens (or materials containing them) must not be brought onto University premises.

Further details on hazard groups and related containment requirements and specifications can be found in Appendix IV.

5. Biohazard risk assessment

Any department wishing to use clinical specimens, human material or possible infectious material for the first time should contact the Health & Safety team. The Health & Safety team should inspect the area before work can proceed. A risk assessment and a disinfection and disposal policy must be in place and disinfectants must be available for use.

Risk assessments are required to be done before any work commences, or for any work involving the possession/use of biological agents, or where there is a risk of exposure to biological agents involved in the work. A risk assessment is used to assess the potential risks to humans, animals, plants or other aspects of the environment arising from the work and determine what controls are required to protect humans and the environment.

Managers and principal investigators are responsible for ensuring that risk assessments are carried out and the controls are fully implemented, regularly monitored and that the assessment and controls are regularly reviewed and revised where required.

For work involving Biological substances, a Risk Assessment (See Scientific Risk Assessment template in the Risk Assessment Policy tab) form must be used.

5.1 Requirements of a risk assessment

Following are some of the key considerations to be taken when completed risk assessments to work safely with biological agents:

1. Identify all foreseeable sources of harm
2. Assess potential risks of harm to people or damage to the environment.
3. Assess the nature and level of risks to people and the environment.
4. Organism(s), agent, animal, bacterium or virus must be sourced from reputable suppliers using an approved procurement method.
5. Consider what quantity/ size is being sourced.

6. Consider the state of the organism/ animal (i.e. dead or alive).
7. Decide on the hazard group.
8. Decide on the containment level.
9. Decide which control measures are necessary to prevent or adequately control exposure and reduce the risks to people, animals, plants and the environment to an acceptable level (controls must be proportionate to the risks).
10. Control measures are based on minimum legal requirements which must always be used plus any additional controls determined to be necessary in the risk assessment.
11. Control measures are needed to ensure that biological agents are safely handled, stored, transported, inactivated and disposed.
12. Plans and procedures are required for incidents and emergencies.
13. Risk Assessments must consider consequences of exposure of vulnerable people (i.e. those with pre-existing medical conditions, young workers, new and expectant mothers) and the controls required to manage these exposures.
14. All workers must be properly informed, trained and supervised to enable them to safely carry out their work.
15. Risk assessments must address all aspects of the work including routine and non-routine work and what to do in emergencies if something goes wrong.
16. Prior permissions where relevant must be obtained from Schools, Biological Safety Committees and regulators.
17. HSE notification and consent is required for work with group 3 and some group 2 biological agents.
18. Specified animal pathogen licences are required for work with serious animal pathogens.
19. Plant health licences are required for work with serious plant pathogens and pests.
20. Is any health surveillance required? Also, consider staff allergies.
21. Put in place monitoring regime for control measures to ensure that they are effective.
22. Risk assessments and control measures must be reviewed regularly (at least every 12 months) and where they are no longer valid or where there are significant changes to the scope or risks of the work.
23. Assess the chemical hazards associated with the material to be worked with. This is particularly relevant with use of sensitising materials (such as those with Risk Phrase R42/R43 or Hazard Phrase H334/H317) or food allergens[5].

[5] Further information on respiratory sensitisers, skin sensitisers and food allergens is available at the following links:
http://www.hse.gov.uk/asthma/substances.htm
http://www.hse.gov.uk/skin/professional/causes/agentstable1.htm
https://www.food.gov.uk/allergy

Risk assessments must be carried out by competent persons and approved by the appropriate manager or principal investigator. The work must be categorised on the basis of risks taking into account the biological agents, the type of activity, hazard group, containment level and all the necessary controls required to ensure that the work can be done safely while protecting people and the environment.
Risk assessments must clearly identify all persons at risk.

The Health & Safety team is available to provide advice on risk assessments and help ensure that suitable and sufficient assessments have been made of the risks to human health and safety and to the environment, satisfactory decisions are made about appropriate containment and control measures, and the risk assessment and controls are in accordance with the relevant regulations and guidance.

5.2 Biological Safety Committee

Schools which carry out work involving biological agents may be required to establish a Biological Safety Committee (BSC) (i.e. a standing item in the School H&S Committee). This is mandatory if any liIf a BSC is in place it must be involved in the review and approval of biohazard risk assessments.

5.3 Record Keeping

The risk assessments should be held centrally in each School or Department with an appropriate copy being made available to the site where the particular activity is taking place. Risk assessments must be stored for 40 years as required under COSHH regulations and reviewed from time to time to cater for changes in work activity and whenever new information is available that will affect the assessment. An annual review would be suitable in most cases.

5.4 Good Microbiological Practice

Good microbiological practices (e.g. aseptic technique, housekeeping) when handling micro-organisms have been developed to prevent contamination of the work with other micro-organisms. They also supplement the containment facilities, procedures and processes to limit the spread of microbial contamination and help prevent exposure of people and the environment to the micro-organisms that are being deliberately manipulated either by accident or once work has finished.

Apart from the actual project work with hazardous materials, the safe handling of such materials when being stored, transported or disposed of must be controlled.
Hazardous microbiological specimens should be stored such that their containment cannot be breached accidentally. The following precautions should be adopted:

a) The containers in which hazardous microbiological specimens are housed should be labelled and leak proof, and their outer surfaces decontaminated.
b) Refrigerators and freezers must be labelled with biohazard labels. Refrigerators and freezers not kept in containment facilities must be kept locked at all times.
c) Specimens must not be stored such that they could easily be dislodged and break.

d) Specimens for disposal should be thoroughly thawed before autoclaving or incineration.

5.5 Training

Anyone intending to work in areas where there are microbiological hazards must receive adequate training in both the theoretical and practical aspects of the work. Newly trained people must be given supervision initially and it is the responsibility of the Dean of Department to ensure these training needs are met.

It is also incumbent on the Principal Investigator/Laboratory Manager to ensure that sufficient instruction is given to those people who only need occasional access to microbiological laboratories (e.g. cleaners and maintenance personnel) to ensure that they do not endanger themselves or their colleagues.

A record of training should be kept by the School/Department. Advice on training may be sought from the Health & Safety team.

5.6 Safety Signs

The Biohazard sign should be displayed at access points to warn of infectious hazards and must be placed at the entrance to all Containment facilities.

5.7 Immunisation

Effective vaccines are only available for some pathogens. Immunisation is not a substitute for good laboratory or other work practice and is regarded as an additional protective measure against disease and not as the main defence.

Immunisation will be offered to all employees and student groups who are indicated in a risk assessment to be at risk of an occupationally acquired infection for which a safe and effective vaccine is available. The need for immunisations should be identified in job descriptions and individual activity risk assessments.

6. Access Restriction

Access to containment facilities must be strictly controlled and only those with a real need should be allowed to enter. The following arrangements should be invoked:

a) Visitors must be supervised and given the appropriate protective clothing and safety instructions before entering the area.
b) Cleaners and maintenance staff must only be allowed to enter when it is considered safe to do so, for example, when the work situation is such that the possibility of an accident is minimal and may need to be supervised
c) Unauthorised entry must be prevented. In addition to the displaying of safety signs, doors should be closed when work is in progress and locked when rooms are unoccupied.

7. Biosecurity of pathogens and toxins

Acquisition, storage and use of a specified form of an item on the *Anti-Terrorism, Crime and Security Act 2001* Schedule 5 will require notification to the Home Office,

inspection by a police Counter-Terrorism Security Advisor, and compliance with more stringent biosecurity requirements. The Health & Safety team audits Schools on their holdings and liaises with the National Counter Terrorism Security Office (NaCTSO) and CTSAs regarding work with and the secure design of premises holding scheduled material.

All Schedule 5 materials must be kept securely locked, access must be restricted to authorised users only and detailed records must be kept by the Department. Note that pathogens classed as Category A Infectious Substances under carriage of dangerous goods legislation also have elevated biosecurity requirements which will need to be addressed well in advance of transporting this material to or from a University building. Please contact the Health & Safety team for further advice if your work will be affected by these requirements.

8. Human tissue and body fluids

Any work involving Human Tissue and body fluids must be conducted in compliance with the requirements of the Human Tissue Act (HTA) 2004. LMU has Guidance on HTA application to use of Human Tissue available here: https://student.londonmet.ac.uk/your-studies/mphil--phd-professional-doctorates/research-ethics/ . Where required, ethics approval must be sought.

Certain infections can be transmitted by inoculation: when blood or some other body fluids from an infected person get into the tissues (below the skin) of another person. Those at risk will include staff working with infected patients and/or infected tissue/body fluids. Sensible precautions must be taken to protect staff and/or patients from this risk, whilst ensuring that infected patients/ clients or customers receive all the care they need. Infected staff should not be unreasonably restricted in their work activities.

Specific procedure to protect against Blood-bourn infections must be developed by the responsible School.
The infections of greatest concern at present are the hepatitis viruses (particularly hepatitis B (HBV) and hepatitis C (HCV)) and the human immunodeficiency virus (HIV - which gives rise to the Acquired Immune Deficiency Syndrome (AIDS)). There may be other viruses and micro-organisms which may be of concern.

HBV may be present in blood and in some other body fluids. Infection has been transmitted by blood/blood products, shared needles (drug addicts), sharps injuries, sexual contact, bites and contamination of broken skin. There is no firm evidence that infection can be transmitted by blood splash to the eye or mouth. There is no evidence of transmission by air, by casual social contact or by general medical, dental and nursing care. It is important to note that HBV can remain viable for many days in dried body fluids. Note that faeces, nasal secretions, saliva except in dentistry, sputum, sweat, tears, urine and vomit do not give any risk of blood borne viruses, unless they contain visible blood.

By the nature of their occupation, some staff at the University and in the Health Service are known to be at risk of acquiring hepatitis B and C from exposure to blood or blood products, and this is recognised by the designation of hepatitis B and C as Prescribed Industrial Diseases (under the *Social Security Contributions and Benefits*

Act) and must be reported to the HSE. It must be emphasised, however, that the likelihood of infection with hepatitis virus is low.

Protection of people exposed to blood borne pathogens relies virtually exclusively on the rigorous application of good microbiological techniques to prevent percutaneous injuries and mucosal contamination.

Immunisation against hepatitis B can protect staff against the risks of illness and from becoming infectious carriers of hepatitis B and thus a risk to patients during invasive procedures. Any staff that may come into contact with blood and blood products should be immunised and their immune status documented.

The transmissibility of HCV is ten times less than that of HBV and transmission of HIV ten times less again. Nearly all cases of occupational HIV infection have followed injuries with hollow needles contaminated with a substantial amount of blood from known HIV positive patients.

In view of the availability of post exposure prophylaxis for HIV, it is essential to seek advice from the **Needlestick Hotline** available 24 hours a day, every day on 0117 342 3400 (please state location when calling).

8.1 Tissue Samples

All samples must be safely contained in a leak-proof container and this must be enclosed in an outer container, usually a sealed polythene bag. If a specimen is known, or strongly suspected, to be infected with one of the "inoculation risk" viruses such as HIV, HBV or HCV, then the specimens must bear a warning label, stating inoculation risk.

If a specimen is HIV positive it should not be used unless a suitable and sufficient risk assessment has been carried out, prior agreement sought with the relevant management/ technical representatives and the H&S team and only carried out in designated areas at Containment Level 3.

8.2 Venepuncture

Any Staff member intending to undertake venepuncture must ensure that suitable and sufficient risk assessment is in place and approved, which will include detailed procedure. School management and local ethics committees should consider this type of work and develop local procedures to be put in place.

9. Equipment

Equipment in containment facilities must be maintained in a satisfactory working condition. However, before any maintenance or testing is carried out the equipment must be decontaminated (e.g. by disinfection or fumigation and the containment facility made safe).

The Laboratory Manager and laboratory staff should ensure that any maintenance operative is aware of all necessary control measures and ensure that appropriate protective clothing is made available and worn. Only authorised personnel should be

allowed into containment facilities. Arrangements for access for maintenance, cleaning etc. needs to be agreed with the Laboratory Manager (following the Control of Works Policy).

9.1 Microbiological Safety Cabinets (MSCs)

There are three classes of safety cabinet[6] (I, II and III) available for different purposes. Class I cabinets offer adequate protection for the user but no protection for the work. Class II cabinets provide additional protection to the work. In both types of cabinet, the pattern of air flow through the working aperture can be disturbed by:

- A sudden movement of the operator's arms,
- Turbulence induced by equipment in the cabinet,
- People moving near the front of the cabinet and by other air movements in the room or changes in air pressure.

The disturbance of airflow patterns may be more evident in a Class II cabinet than a Class I due to a lower inward air flow. The limitations of both cabinets should be taken into account when deciding which cabinet is suitable.

Whenever purchase is being contemplated, the Health & Safety team should be consulted as to the type to purchase and (include Estates in) the associated installation implications.

The British Standard describes the methods by which MSCs should be tested. Further details on how LMU fulfils its obligations with regards LEV can be found in the Management and Use of LEV Policy.

9.2 Autoclaves

Autoclaves are required to be inspected **annually** by an external, competent authority and maintained. In addition, the sterilising ability of the autoclave should be validated and measured for each load. These arrangements should be put in place, monitored and recoded by the School.

It should be noted that autoclave tape is not a consistent indication of sterilisation adequacy.

10. Health Surveillance

The main objective of health surveillance is to protect the health of the individual employee by detecting as early as possible, adverse changes which may be caused by exposure to activities or substances hazardous to health. Health surveillance should not be necessary for employees working on projects with biological agents in ACDP hazard groups 1 and 2.

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[6] The specifications are contained in BS EN 12469:2000 *Biotechnology – Performance Requirements for Microbiological Safety Cabinets* (11), BS 5726:1979 "*Specification for Microbiological Safety Cabinets*" ref 13 parts 1 & 3 have been withdrawn; part 2 "*Recommendations for information to the exchanged between purchaser, vendor and installer and recommendations for installation*", and Part 4 "*Recommendations for selection, use and maintenance*" are still current.

Risk assessments must identify any requirements which should be discussed with the Occupational Health Service. Requirements will also be reviewed by BSC during the approval process. Once a risk assessment has identified a need for health surveillance, managers can refer employees to the Occupational Health Service by completing a referral form.

Any worker on projects involving micro-organisms and/or genetic modification may request an appointment with the Occupational Health Service if they are concerned about their health in the context of the experiment.

Deans of Schools or other units should seek advice from the Biological Safety Officer, and BSC/BGMSC, if one is in place) or the Health and Safety team and Occupational Health Service as to the necessity of health surveillance for their staff. Due to the long time between exposure and effect of some of the diseases being monitored, health surveillance records need to be kept by the Occupational Health Service for 40 years.

More information can be found on the University's Health Surveillance Policy.

11. Decontamination and disposal

Decontamination is the process whereby microbial contamination of a material is reduced to render it safe to handle. There are two methods of achieving this, disinfection and sterilisation, which should not be confused.

Disinfection refers to a treatment that is designed to **reduce** the potential infectivity of a material to a level that effectively destroys its potential to cause harm. It does not necessarily remove all viable micro-organisms which is instead the aim of a sterilisation process. The choice of which decontamination method to use in any particular situation will depend upon the level of decontamination required and should be determined by Principal Investigators in their activity risk assessment.

Departments must have in place local rules for managing biohazardous wastes including decontamination and disinfection methods. Local Rules may be developed in conjunction with the Sustainability and the Health & Safety team so that consultation can take place during the development of procedures for the safe removal hazardous wastes.

All biologically hazardous waste must be rendered safe before disposal. Waste must be segregated into a number of distinct fractions to satisfy legislative requirements and University environmental policies.

Laboratory Managers should monitor the use of different disinfectants in order to limit chemical incompatibilities, confusion and misuse. Disposal of chemical waste is covered in the COSHH and Waste Policies. These should be referred to as well if the biological waste contains significant quantities of (potentially radioactive or) chemical material.

12. Hazardous Clinical Waste Disposal

12.1 Autoclave waste

A department must establish a clear system to facilitate collection of items for sterilisation from laboratories and the contained and secure storage of these prior to treatment.

12.2 Liquid waste

Liquid waste that has been effectively decontaminated can be classed as non-hazardous. Please refer to the relevant guidance for disposal of these hazardous wastes. **It is recommended that CL3 waste that has undergone chemical disinfection is also autoclaved.**

The remaining liquid container should, where decontamination has been effective, be washed and preferably reused or recycled or disposed of as non-hazardous waste. However, if the container is plastic and has not been decontaminated then it may be packaged and disposed of as hazardous plastic waste

.

12.3 Plastic pipette tips and serological pipettes

Contaminated serological pipettes and pipette tips should not be placed in yellow bags or autoclave bags unless they are packaged in a way that prevents them from piercing the bag.

A preferable method of disposal would be their collection in yellow Bio-bins for direct incineration. These boxes contain an absorbent gel to contain any residual liquid, however care should still be taken, and workers should be trained to ensure that minimal amounts of liquid remain in the waste and that boxes are sealed correctly

Different sized bins exist for tips, serological pipettes and other plastics. The product is available directly from the manufacturer. When purchasing these, staff should ensure that they obtain the “yellow-only” version containing a Bio-matt gel at the bottom to absorb any liquid. These boxes when sealed correctly are UN approved for transportation of infectious waste. Bio-bins should be labelled or tagged with the originating room number, research group name and appropriate European waste code and then transferred to the appropriate bin at the hazardous waste collection point designated.

12.4 Other plastic items

Empty contaminated plastic containers such as culture flasks or contaminated agar plates should be decontaminated and disposed of as non-hazardous waste or recycled/reused where appropriate.

Large amounts of plastic cannot be incinerated in the University at present, and so such contaminated plastic should not be discarded into the yellow bag waste stream for incineration via Estates.

Where incineration is required (for HG-1 solids or empty containers only) arrangements should be made for collection or the Bio-bin disposal route should be

adopted; refer to the previous section. This method must not be used for disposal of liquid wastes by incineration. Bio-bins should be labelled or tagged with the originating room number, research group name and appropriate European waste code and then transferred to the appropriate bin at the hazardous waste collection point.

12.5 Incineration waste

Hazardous/clinical waste should be packaged and sealed in UN approved and marked **yellow/ orange bags**. These should be labelled or tagged with the originating room number, research group name and appropriate European waste code and then be transferred into the yellow bin at the hazardous waste collection point designated for the department by Estates. This waste will be collected and incinerated by a contractor approved to take GM waste and approved by the University.

12.6 Non-hazardous or decontaminated waste for landfill

Non-contaminated waste originating from laboratories may be recycled as for any other recyclable waste. However, if the waste is placed into black bags for landfill, then the bags must be sealed before being placed into the non-hazardous waste stream.

13. Emergency response planning

There must be contingency plans in place for dealing with emergencies involving biological hazards. These arrangements must be understood by all undertaking the work and should be included in the training programme for all new workers.
Emergency arrangements should include provision of protective clothing, material for absorbing liquid spills, utensils for clearing up spillages, disinfectants and plastic bags suitable for autoclaving, etc.

This is likely to include arrangements for responding to spillages (including those with a risk of airborne infection), personal contamination and needlestick injuries.

Emergency procedures must be developed by the responsible School and included/referred to in risk assessments.

14. Transport

Some biological samples, cultures and other materials are considered dangerous goods for transport and strict regulations concerning the **packaging**, **labelling** and **transportation** of such materials apply. Even if the biological materials are not classified as dangerous, they should still be transported in a way that prevents leakages in transit in order to avoid security alerts and unnecessary concern to anyone who may come into contact with leaked material.

The Health & Safety team should be contacted well in advance of transporting biological materials so that further guidance can be sought as necessary.

15. References

- COSHH Regulation https://www.hse.gov.uk/coshh
- ACDP Advisory doc
- http://www.hse.gov.uk/biosafety/gmo/acgm/acgmcomp/
- *EH76 Control of Laboratory Animal Allergy http://www.hse.gov.uk/pubns/eh76.pdf*

Appendix A: University Biological Safety Officer

17.1 Role summary

This is a position of responsibility within the University as a Health & Safety adviser in respect of the high risk hazards of scientific safety with an emphasis on biological safety involving working with researchers across the School/University to implement controls to minimise the risks arising from teaching and research, providing specialist advice in the risk management of laboratory safety, to foster a positive safety culture among laboratory workers and helping ensure legal and policy compliance, participating as a key adviser in relevant audits and inspections to ensure consistency and provide professional expertise, developing and providing support for the Health & Safety team and participating in Health & Safety and BSC/BGMSC meetings and working closely with other members of the University Health & Safety team and relevant statutory agencies.

17.2 Key duties and responsibilities

- Providing advice and support to the Schools Health & Safety Advisor in respect of biological safety and to bring to his/her attention any matters of concern.
- Providing expert and timely biological safety advice on a continuous improvement basis to academic and technical staff in teaching, clinical and research laboratories.
- Raising awareness and competence in respect of the completion of biological risk assessments.
- Taking a role in respect of biological-safety-related incident investigations, identifying actions and monitoring progress against those actions.
- Endorsing the practice of good housekeeping in laboratories by working closely with Departmental Safety Liaison Officers and other relevant colleagues.
- To be a member of the relevant Safety committee and sign off risk assessments confirming the classification of work decided by the Chair of the Biological & Genetic Modification safety Committee in accordance with advice from the Committee.
- In coordination with the Designated Individual for the Human Tissue Act, provide advice on safe storage and transport of biological material.
- In conjunction with the Health & Safety team:
    - Liaise with any external agencies with respect to obtaining necessary permissions and licenses.
    - ensuring the University has suitable biological safety policies, processes and procedures in place to help it remain legally compliant with relevant legislation.
    - communicating changes in biological safety legislation or practice by liaising with departmental technical and academic staff.
    - ensuring that high risk scientific work is registered and suitably controlled in line with legislation and University practice and ensuring that any such register is maintained so that it is both accurate and current.
    - ensuring that visits by regulatory authorities and agencies including the

Health and Safety Executive and Environment Agency are properly co-ordinated and any recommendations are acted upon.

- developing and delivering suitable training where required.
- actively participating in audits, inspections and risk assessments of biological-safety related areas.