

University of Bristol

Biological Safety and Genetic Modification

Code of Practice

Version: 2003 (revised 2006, 2007, 2010)

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Common abbreviations

BGMSC – Biological and Genetic Modification Safety Committee
CL – containment level
DBSO – Deputy Biological Safety Officer
Defra – Department for the Environment, Food and Rural Affairs (England)
GMO – genetically modified organisms
HG – hazard group
HSE – Health and Safety Executive
OHS – Occupational Health Service
MSC – microbiological safety cabinet
UBSO – University Biological Safety Officer

1. Introduction

The Health and Safety at Work *etc* Act 1974, to which the University is subject as an employer, imposes duties on the University to provide as safe and healthy a work environment for their staff and students as is reasonably practicable. In addition to reading this document, managers, staff and students are also directed to the University of Bristol Health and Safety Organisation guidance document which explains their health and safety responsibilities:

<http://www.bris.ac.uk/safety/policy/organisation/safetyorganisation.pdf>

1.1. Primarily, the precautions contained in this Code of Practice are intended to prevent infection and the spread of infection amongst those exposed to biological hazards, minimise the risks associated with animal work and the spread of environmental contamination. By complying with this Code of Practice, managers, staff and students of the University will meet the requirements of safety legislation issued under the Health and Safety at Work *etc* Act 1974, including (but not limited to) the Management of Health and Safety at Work Regulations 1999 (MHSWR), the Control of Substances Hazardous to Health Regulations 2002, as amended (COSHH), and the Genetically Modified Organisms (Contained Use) Regulations 2000, as amended (GMO(CU)). The health hazards associated with chemical substances, which are also the subject of the COSHH Regulations, are dealt with in separate University safety code of practice and policy documents.

1.2. Whenever the provision of new or refurbished laboratory facilities is planned, the Health & Safety Office must be consulted immediately. This is to ensure that all required safety features are incorporated into the building plans before any building work commences.

1.3. Environmental Harm (animal/plant pathogens, animal by-products and soils)

Some micro-organisms are hazardous to the environment, that is to native plants or animals, and work using such organisms must be also be preceded by an assessment of the risks involved. Work involving plant or animal pathogens, as specified by the Department of Environment Fisheries and Rural Affairs (Defra), (including any genetic manipulation work with material derived from them), non-indigenous plant or animal species, animal by-products (or parts) or soils imported into the UK, can only be undertaken under licences issued from Defra. Details of the specified pathogens and of import requirements for any pathogen or animal by-product are available from the Defra website (also linked from the Health and Safety Office website biological safety pages). The University Biological Safety Officer (UBSO) should be approached for further details **and kept informed of any licences that are being applied for.**

1.4. Biological and Genetic Modification Safety Committee (BGMSC)

BGMSC is a sub-committee of the University Personnel, Health and Safety Committee (PHSC). It is responsible for reviewing risk assessments, approving work and providing advice on all aspects of biological safety within the University including genetic modification, work with pathogens and the use of animals. Details of current members can be found on the Health and Safety Office web site.

- It is to the Deputy Biological Safety Officers (DBSO) from the departments who sit on this committee that initial approaches should be made regarding queries and risk assessment review and approval for new projects. Other members of the BGMSC are appointed by the University and the Trade Unions.
- Membership is reviewed periodically and additional specialist members are recruited or co-opted onto the committee if and when required.
- The BGMSC meets at least once per term and at other times as necessary. Agenda and minutes are posted on the Health and Safety Office website biological safety section and circulated widely. Meetings of the Committee are also open to all staff and students.

1.5. Any person wishing to work with pathogens at the University must apply to the Committee for review of their risk assessment and approval of their work. All employees and students are welcome to consult the Committee on issues relating to biological hazards. The University Biological Safety Officer (UBSO) or any other committee member may be approached to facilitate this.

1.6. Advice on technical problems arising out of this Code of Practice can be sought from the relevant school or unit safety advisor, DBSO or the UBSO. Administrative problems should be discussed within the appropriate school or unit safety management framework if it is a school or unit matter but those of a general nature should be raised with the UBSO.

1.7. If any person has reason whereby they cannot comply with this Code of Practice, they should consult the UBSO or Director of Health and Safety.

2. Hazard Groups and Containment

2.1. 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):

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. The required degree of containment for micro-organisms varies depending on the hazard group to which the micro-organisms belong. The four hazard groups require increasing levels of containment, designated as containment levels (CL) 1-4 (see section 2.4).

Some HG2 agents have been identified as presenting an enhanced risk with a notional 2+ level of containment adopted, meaning that these agents should **always** be handled in a microbiological safety cabinet. Examples include; *Legionella pneumophila*, *Neisseria meningitidis* and *Vibrio cholerae* (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 2-4.

<http://www.hse.gov.uk/pubns/misc208.pdf>

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 COSHH Regulations when particular activities are being undertaken. If there is any doubt in making an allocation, advice should be sought from the UBSO. Use of genetically modified organisms is also subject to additional regulations (see section 9).

2.2. 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.

2.3. Any person who wishes to work with any pathogen must consult the UBSO and BGMSC, **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. In some circumstances notifications must also be made to the Health and Safety Executive.

2.4. Containment Levels (CL)

Further guidance on hazard groups and related containment requirements can be found in the document, “Biological Containment Guidance” available from the Health and Safety Office website:

<http://www.bris.ac.uk/safety/biological/guidance/containment>.

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

2.5. Access Restriction

Access to containment facilities must be 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, e.g. 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 as indicated in section 3.7 below, doors should be closed when work is in progress and locked when rooms are unoccupied.

2.6. COSHH Notifications

COSHH requires the University to notify to the Health and Safety Executive (HSE) the

- 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.

- Consignment of biological agents in Hazard Group 4 from/to a premises.

'First Use' means work with or storage of a biological agent where no such work has been conducted before. Notification will be required where, for example, a new laboratory is set up or exceptionally an existing laboratory has not worked before with any of the agents in one group or another. In practice the majority of laboratories have worked with a number of agents in Hazard Groups 2 and 3 at sometime and notification may not be necessary. Part V of Schedule 3 lists

- *Bordetella pertussis*
- *Corynebacterium diphtheriae*
- *Neisseria meningitidis*

A register of University containment facilities is maintained by the UBSO who should be informed of any additions or deletions as they occur. All notifications will be made by the UBSO following BGMSC approval of such work. Notification must be made 20 working days in advance of an activity starting.

2.7. Human Tissue and Body Fluids

- a) Background: 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 receive all the care they need. Infected staff should not be unreasonably restricted in their work activities.
- b) 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.
- c) Risk of Infection: 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.
- d) 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 small.
- e) General Care: 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. Containment level 2 and the additional precautions required are given in the document, "Biological Containment Guidance", under the heading ACDP CL-2, that is available from the Health and Safety Office website:

<http://www.bris.ac.uk/safety/biological/guidance/containment>.

- f) Immunisation against hepatitis B is available and 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 (see section 4).

- g) 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).
- h) Other 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.
- i) Sterilisation and Disinfection – consult Appendix 6 - Disinfectants
- j) 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.
- k) Cadaver handling and disposal: When there is any risk of contact with blood fluids, single use gloves must be worn and high standards of personal hygiene adopted.
- l) Venepuncture: Gloves must be worn by everyone who takes blood samples. When Vacutainers are used the specimen tube must be removed before the needle is withdrawn from the vein. If the needle-holder becomes visibly contaminated with blood it must be discarded. The person doing the venepuncture is personally responsible for the safe disposal of the needle, clearing up other equipment and ensuring that there is no blood contamination of the environment.
- m) Hazardous Clinical Waste Disposal: Any department wishing to use clinical specimens, human material or possible infectious material for the first time should contact the Health & Safety Office. Health & Safety Office staff should inspect the area before work can proceed. A disinfection and disposal policy must be in place and disinfectants must be available for use (see section 5)
- n) Fixed Tissue Samples: The use of formalin and other fixative agents will denature some micro-organisms, thereby reducing the risk of infection. However, these agents have little or no effect on the causative agents of transmissible spongiform encephalopathies. An assessment on the risk of exposure to the formalin or other agent must be completed. Further information may be obtained from the Control of (Chemically) Hazardous Substances Code of Practice (Reference 14).
- o) **Needlestick Injuries**

In the event of a needlestick injury or contamination incident involving human blood or other body fluids immediate action should be taken as follows

- i. Wash the site liberally with soap and water (without scrubbing)
- ii. Encourage the wound to bleed for puncture wounds. Do not suck the site.
- iii. If the needle stick injury is with unscreened blood or blood products or from a known Hepatitis B or HIV patient then immediately contact the Needlestick Hotline available 24 hours a day, every day on 0117 342 3400 (please state location when calling)
- iv. Dispose of any contaminated sharps safely.
- v. Report the incident immediately to your line manager who will complete an accident report form to be sent to the Health and Safety Office

3. Risk Assessment of Activities Involving Pathogens

3.1. In addition to meeting the specific requirements for the different levels of containment, some general administrative measures need to be implemented in order to achieve the necessary safe working environment and to meet the COSHH Regulations.

3.2. Assessment Record: The COSHH Regulations require all activities involving substances hazardous to health to be assessed and the results recorded. For each activity the assessment should include:

- a) Identification of the micro-organisms involved (see section 2.1)
- b) Potential exposure mechanisms (see section 2.2)
- c) Control and containment procedures (see section 2.4)
- d) Emergency procedures in case of accident (see section 6)
- e) Health monitoring requirements (see section 4)
- f) Training requirements (see section 3.6)
- g) Access by third parties (see section 2.5)
- h) Waste Disposal (see section 5)
- i) Names of people involved in the work and others who might be harmed

3.3. Forms for undertaking risk assessments and for the registration of both workers and projects, for all work with biological material that is pathogenic or might contain pathogens or that is genetically modified are available from the Health and Safety Office website. All project registration forms must be approved by the BGMSC before work can commence.

<http://www.bris.ac.uk/safety/biological/forms/>

3.4. The risk assessments should be held centrally in each school or unit with an appropriate copy being made available to the site where the particular activity is taking place. Risk assessments must be 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.

3.5. Risk assessments for activities where untreated human tissue is involved and activities involving animals or animal facilities are subject to the same requirements for review and approval described above

3.6. Training: Anybody 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 Head of School or other unit to ensure these training needs are met. It is also incumbent on the Head of School 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. Advice on training may be sought from the University Health and Safety Office.

3.7. 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. These signs can be obtained from the Health and Safety Office. Warning lights fitted to the outside of doors to Containment Levels 3 and 4 to indicate when access is forbidden should also be considered.

4. Immunisation and Health Surveillance

4.1. The University is required to offer immunisations to employees and students who may be exposed to pathogens at work where an effective vaccine is available. 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.

4.2. 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. The University immunisation procedures are controlled and administered by the Occupational Health Service. Further details are available at; <http://www.bristol.ac.uk/safety/health/>

4.3. 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. Risk assessments must identify any requirements which should be discussed with the Occupational Health Service. Requirements will also be reviewed by BGMSC during the approval process. Once a risk assessment has identified a need for health surveillance managers and/or School/Unit Safety Advisors can refer employees to the Occupational Health Service by completing a health surveillance referral form available at

<http://www.bristol.ac.uk/safety/health/surveillance/>

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.

4.4. Heads of Schools or other units should seek the advice of the Health and Safety Office and the BGMSC as to the necessity of health surveillance for their staff. Because of 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

5. Decontamination and Disposal

5.1. All biologically hazardous waste must be rendered safe before disposal. See the guidance document “Waste Decontamination and Disposal” for further information

<http://www.bris.ac.uk/safety/biological/guidance/biowaste-gn/>

Disposal of chemical waste and radioactive waste is covered in the associated Codes of Practice or policy documents. These should be referred to as well if the biological waste contains significant quantities of radioactive or chemical material.

5.2. Spillages

All laboratories engaged in work with micro-organisms and/or GMO's must have the following readily available for use in the case of a spillage:

- a) Freshly prepared disinfectant solution for minor bench spillages, etc.
- b) Impregnated cloths (e.g. alcohol/chlorhexidine/biocide) for wiping down contaminated surfaces, centrifuge bowls, etc.
- c) Suitable disinfectant for disinfecting centrifuges and rotors, etc; when impregnated cloths are not suitable.
- d) Spill bag for absorbing and containing larger spillages, prior to treatment with disinfectant.

5.3. Withdrawn; see section 5.1.

5.4. Transmissible Spongiform Encephalopathy

The term transmissible spongiform encephalopathy (TSE) describes a rare and fatal degenerative condition of the central nervous system of humans and other animals. They include Creutzfeldt-Jakob disease (CJD), Scrapie (in sheep) and Bovine Spongiform Encephalopathy (BSE) in cattle. The epidemiology of these diseases suggests that they are caused by transmissible agents. The mechanisms of transmission of the human and animal TSE's are not yet fully understood. It is suggested that they are not transmissible by normal social contact. These agents have been categorised by ACDP as Hazard group 3, but with derogation concerning their containment. Thus, full containment level 3 may not always be necessary. A list of workers exposed to these agents must be kept for 40 years after the end of the last known exposure due to the long incubation period of these diseases.

Decontamination of any material contaminated or suspected of being contaminated by spongiform encephalopathies, e.g. BSE, CJD must be described in the accompanying risk assessment. See the document quoted in section 5.1 for further guidance.

Advice may also be obtained from the Biological Safety Officer. Additional guidance is available from HSE and the Department of Health (see Section 11).

6. Emergency Action

6.1. Contingency Plans: 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.

6.2. Emergency Arrangements must be in place and understood by all staff. They should include provision of protective clothing, material for absorbing liquid spills, utensils for clearing up spillages, disinfectants and plastic bags suitable for autoclaving, etc.

6.3. Spillages with a low risk of airborne infection: Minor spills of biohazardous materials can be mopped up with swabs soaked in disinfectant held with forceps in a gloved hand. For larger spills, it should not be necessary to evacuate the area but inspection of the damage should be delayed for 5-10 minutes to allow any aerosol cloud in the vicinity of the spill to settle. Protective clothing (gown, thick rubber gloves, boots or overshoes) should be worn and the spillage soaked up with disinfectant absorbent granules or other absorbent material soaked in liquid disinfectant. Broken glass should be picked out with forceps before the remaining debris is swept up, after which everything should be placed in a suitable container for disposal. The Health & Safety Office and the DSA should be contacted whenever there is a spill of biohazardous material and a Dangerous Incident form generated.

6.4. Spillages with a significant risk of airborne infection: The area should be evacuated as quickly as possible and isolated. The use of respiratory protective equipment may need to be considered. The spillage itself should be dealt with as indicated in section 5.2 and as described in the risk assessment for the work. It may be necessary to fumigate the area but the method of fumigation must take into account the sealability of the room and be thoroughly risk assessed. A Dangerous Incident form must be raised whenever such a spill occurs.

6.5. Personal Contamination: If there has been any spillage on a person, contaminated clothing should be removed immediately and contamination on the skin removed by thorough washing. Cuts and lesions should be encouraged to bleed and then cleaned using soap and water. Eyes should be irrigated with clean water for at least 10 minutes and must not be rubbed. Medical attention should be sought immediately if there is any possibility of infection. Consideration should be given to the provision of emergency showers in areas where the possibility of major contamination is significant.

Needlestick Injuries

In the event of a needlestick injury or contamination incident involving human blood or other body fluids immediate action should be taken as follows

- i. Wash the site liberally with soap and water (without scrubbing)
- ii. Encouraged the wound to bleed for puncture wounds. Do not suck the site.
- iii. If the needle stick injury is with unscreened blood or blood products or from a known Hepatitis B or HIV patient then immediately contact the Needlestick Hotline available 24 hours a day, every day on 0117 342 3400 (please state location when calling)
- iv. Dispose of any contaminated sharps safely.
- v. Report the incident immediately to your line manager who will complete an accident report form to be sent to the Health and Safety Office

7. Handling of Hazardous Specimens

7.1. Apart from the actual work with hazardous materials, the precautions for which have been detailed in section 2, the safe handling of such materials when being stored, transported or disposed of must be controlled.

7.2. Storage: 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.

7.3. Transportation: 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 person sending the items has a legal responsibility to ensure that the requirements are met and should be trained to carry out these duties. Departments or Schools handling biological materials will have at least one person who has been suitably trained and can advise. Your DSA should be contacted well in advance of transporting biological materials so that further guidance can be sought as necessary.

7.4. Withdrawn.

7.5. Withdrawn.

8. Maintenance of Equipment

8.1. 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 school or unit safety advisor, 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.

8.2. Microbiological Safety Cabinets (MSCs)

There are three classes of safety cabinet (I, II and III) available for different purposes, the specifications for which are contained in BS EN 12469:2000 Biotechnology – Performance Requirements for Microbiological Safety Cabinets (Ref 24), BS 5726:1979 "Specification for Microbiological Safety Cabinets", ref 13 parts 1 & 3 have been withdrawn, Part 2 "Recommendations for information to be exchanged between purchaser, vendor and installer and recommendations for installation" and Part 4 "Recommendations for selection, use and maintenance" are still current. A Class I cabinet offers 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, by turbulence induced by equipment in the cabinet, by 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. Only Class III cabinets which are totally enclosed units are suitable for Group 4 hazards. Whenever purchase is being contemplated, the Health and Safety Office should be consulted as to the type to purchase and the associated installation implications. The British Standard describes the methods by which MSCs should be tested. Cabinets should be serviced after installation and at regular intervals, e.g. every 12 months and the following records kept:

- a) The air in-flow and, for Class II cabinets, down-flow;
- b) The integrity of gaskets, seals and filters using a smoke test or equivalent;
- c) The physical state of the cabinet carcass, anti-blowback valves, ducting fans and discharge stack;
- d) The calibration of flow meters;
- e) The electrical system including alarms and interlocks.
- f) All cabinets should be externally vented. If this is impossible due to the location then the cabinet should have a double HEPA filter on the exhaust and there should be an available method to permit fumigation prior to servicing.
- g) All cabinets must be KI tested annually (6 monthly for CL-3 facilities or where a risk assessment identifies this as necessary, such as in CL-2+ conditions).

8.3. MSCs are maintained and tested by a specialist contractor under a contract arranged by the Purchasing Department. Departments must use this facility rather than making their own arrangements, unless discussed first with the Purchasing Department (testing carried out as part of a first installation is not subject to this requirement, but the contractor must be notified to the Health and safety Office). Records of

servicing and inspection should be held for at least 5 years. It is the owner's (e.g. school) responsibility to ensure that this statutory inspection is carried out within the time limits.

8.4. Ventilation Equipment: Servicing should be on a similar basis to MSCs. Ductless fume cupboards must also be serviced and checked under the same contract described in section 8.1. Estates Services maintain ducted fume cupboards and other local exhaust ventilation systems. Schools and units must ensure that the equipment lists held by Estates Services match current holdings.

8.5. Autoclaves: These 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. It should be noted that autoclave tape is not a consistent indication of sterilisation adequacy. Further guidance is available in the document "Waste Decontamination and Disposal"

<http://www.bris.ac.uk/safety/biological/guidance/biowaste-gn/>

8.6. Plumbed Equipment: Plumbing systems must be properly maintained so that they do not become a breeding ground for micro-organisms, particularly *Legionella sp.* (see below). Estates Services are responsible for the University's control of legionella policy and implementation of this policy. Further information is available from the Estates Services website.

8.7. Withdrawn – see section 8.6

8.8. Withdrawn – see section 8.6

9. Genetic Modification

9.1. The Genetically Modified Organisms (Contained Use) Regulations 2000 (last amended in 2005) 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 1990 (EPA) and its sub-ordinate regulations, the Genetically Modified Organisms (Risk Assessment)(Records and Exemptions) Regulations 1996 (last amended in 1997). Releases to the environment and marketing of GMOs are also covered under the EPA by provisions in the Genetically Modified Organisms (Deliberate Release) Regulations 1992 (last amended in 1997). Taken together, all of these Regulations implement, within Great Britain, the EC Directives on the contained use and deliberate release of GMOs.

The Regulations require that a risk assessment be carried out for all work involving genetic modification and that all workers carrying out such experiments must be registered. The Regulations require that institutions set up a Genetic Modification Safety Committee and appoint a Biological Safety Officer (BSO) to assist and co-ordinate these procedures. Within the University of Bristol, the Genetic Modification Safety Committee is an integral part of the Biological and Genetic Modification Safety Committee (BGMSC). The responsibilities of the University BSO (UBSO) are set out in Appendix 2 – Duties of the University Biological Safety Officer (UBSO) and other Responsible Officers, and the composition and responsibilities of the BGMSC are set out in section 1.4 and Appendix 1 – Duties and Responsibilities of BGMSC

No-one may commence any activity involving GMOs (including but not limited to, their use; culture; storage; transport; destruction; or disposal) or introduce GMOs into the environment without first consulting with the UBSO (or a DBSO), undertaking a risk assessment of the activity that has been reviewed by BGMSC and registering with the Health and Safety Office. No project involving such work may be started until written authorisation has been obtained from the BGMSC.

9.2. Definitions: The Regulations apply to the *construction* or *modification* of a cell or organism by genetic modification; storage, transport and *use* of such a cell or organism, and its *intentional introduction* into the environment.

The Regulations give three examples of techniques that constitute *genetic modification*:

- a) recombinant nucleic acid techniques involving the formation of new combinations of genetic material by the insertion of nucleic acid molecules, produced by whatever means outside the cell, into any virus, bacterial plasmid or other vector system and their incorporation into a host organism in which they do not occur naturally but in which they are capable of continued propagation;
- b) techniques involving the direct introduction into an organism of heritable genetic material prepared outside the organism, including micro-injection, macro-injection and micro-encapsulation;
- c) cell fusion (including protoplast fusion) or hybridization techniques where live cells with new combinations of heritable genetic material are formed through the fusion of two or more cells by means of methods that do not occur naturally.

Self-cloning of micro-organisms is *not* covered by the Regulations, where the resulting organism is unlikely to cause harm to humans, animals, plants or the environment. (The UBSO or a DBSO should be consulted if there is any doubt about the status of particular experiments.)

9.3. Risk Assessment

Principal investigators of projects involving activities that are covered by the Regulations must assess, in consultation with the BGMSC, the risks that might arise during the work. In addition, all GMO's must be assigned to an activity class (Class 1, 2, 3, or 4). It is this activity classification which determines the notification requirements and determines the minimum containment and control measures which must be applied.

Assessment of experiments must be fully documented in a Project Risk Assessment, copies of templates which should be used for this are available on the Health and Safety Office website

<http://www.bris.ac.uk/safety/biological/forms/>

It should be noted that all experiments involving Class 2 or higher GMOs require notification to the Health and Safety Executive prior to start, and payment of a processing fee, as well as authorisation by the BGMSC. The approvals and notification procedure with timescales is documented in guidance available from the Health and Safety Office website

<http://www.bris.ac.uk/safety/biological/guidance/bgm-sc-review-process.pdf>

Comprehensive advice on risk assessment of GMOs is provided in the "Compendium of Guidance from the Scientific Advisory Committee on Genetic Modification" which is available on the web

<http://www.hse.gov.uk/biosafety/gmo/acgm/acgmcomp/>

The UBSO and DBSOs can also always be approached for advice.

9.4. Laboratories

Experiments involving genetic modification may only be carried out in laboratories authorised by the BGMSC and UBSO. There is a list of current authorised laboratories in the University and the people responsible for them from the UBSO. DBSOs also have access to this information.

Each such laboratory must have a single clearly-identified permanent member of staff who is directly responsible and answerable at all times to the UBSO for the cleanliness and security of the laboratory and for ensuring that local rules are strictly adhered to. This person will usually be a principal investigator. The existence of such a person does not discharge the responsibilities of other principal investigators whose groups may work in the same laboratory. Responsibilities are defined in section 9.5.

The person responsible for the laboratory must ensure that Microbiological Safety Cabinets, ventilation systems and high efficiency particulate air (HEPA) filters are maintained and tested as detailed in section 8.

Each laboratory must have written procedural rules, which must include methods for disinfection and disposal of potentially infective material and emergency procedures for dealing with spillages (see section 5). In as far as the samples may be contaminated with radioactivity or chemical hazards, the separate Codes of Practice for disposal of radioactivity and of chemical wastes must also be consulted.

Requests for authorisation to allow genetic modification in a laboratory, or to upgrade a laboratory to a higher level of containment, should be directed to the UBSO. Prior to authority being given, the UBSO and one or more other members of the BGMSC will inspect the laboratory to ensure that it is suitable for the proposed work.

9.5. Responsibilities

A principal investigator is the initiator of a project and is the named applicant on the original Project Application. This person will usually be a permanent member of staff and is directly responsible and answerable at all times to the BSO for the safe execution of the work in progress.

The responsibilities of **principal investigators** are:

- a) To obtain the necessary permission from the BGMSC for each new or changed project involving genetic modification that they are involved with.
- b) To classify all GMOs for which they are responsible in the prescribed manner and to keep an up-to-date inventory of the GMOs.
- c) To report to the UBSO or a DBSO any changes in the nature of the work carried out by their groups.
- d) To inform the UBSO or a DBSO when a project has finished.
- e) To 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 GMOs involved.
- f) To ensure that all workers in their groups are registered for the work. Registration is initiated on-line which generates paper forms which should be printed and signed as indicated on the form. Once completed, signed forms should be returned to the Health and Safety Office. The UBSO or a DBSO must also be informed if the worker handles potentially oncogenic DNA.

<http://www.bris.ac.uk/safety/biological/registration.html>

- g) To inform the UBSO or a DBSO if workers change their projects, and when workers leave.
- h) To ensure that all workers in the laboratory observe local rules.
- i) To be responsible for the day-to-day cleanliness of the laboratory, and its physical security and for the safe storage of GMOs in the laboratory. If such organisms 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. 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.
- j) To ensure that the UBSO is promptly informed of any accidents in the laboratory.

The responsibilities of **individual workers** are:

- a) To ensure that they have read and understood the local rules and have registered with the Health and Safety Office before commencing any genetic modification work, and to be satisfied that they have received adequate training in handling the GMOs they are using.
- b) To undergo any medical investigations required by the risk assessment and arranged with the Occupational Health Service before commencing work.
- c) To ensure at all times that they work safely and observe local rules.
- d) To inform the UBSO or a DBSO of any material change in their project.
- e) To draw the attention of the Occupational Health Service and UBSO to incidents of unexplained illness.

9.6. Health Surveillance

The activity risk assessment and recommendations made by the BGMSC and/or Occupational Health Service may require that workers be interviewed or examined to ascertain that they are healthy and fit to carry out genetic modification experiments. It is unlikely that such an examination would be required for people working at containment level 1 or level 2. However, any registered or potential worker undertaking genetic modification work may request an interview or examination by the Occupational Health Service if they are concerned about their health in the context of the work being performed.

9.7. Working Practices

The following working procedures are the minimum requirements in a laboratory authorised for genetic modification experiments, **and must apply at all times in such a laboratory. (In this list, 'MUST' indicates an ESSENTIAL element of good practice.)**

These are minimum requirements for conduct in a containment level 1 laboratory. There are additional requirements in higher-level containment facilities see Section 2.4.

- a) Laboratory coats or gowns must be worn fully fastened in the laboratory. When working in exhaust protective cabinet, gloves should always be worn. Protective clothing (including gloves) designated for use in a containment laboratory must not be worn outside the facility.

- b) Eating, chewing, drinking, smoking, storing of food and applying cosmetics must not take place in the laboratory.
- c) Mouth pipetting must not take place.
- d) Hands must be disinfected or washed immediately when contamination is suspected, after handling viable materials, and also before leaving the laboratory.
- e) All procedures must be performed so as to minimise the production of aerosols. Special care must be taken when using centrifuges. Laminar flow cabinets must not be used.
- f) Effective disinfectants must be available for immediate use in the event of spillage
- g) Bench tops should be cleaned after use.
- h) Used laboratory glassware and other materials awaiting disinfection must be stored in a safe manner. Pipettes, if placed in disinfectant, must be totally immersed.
- i) All waste material must be rendered non-viable before disposal
- j) Materials for autoclaving must be transported without spillage in robust leak proof containers.
- k) All accidents and incidents must be recorded and the BSO informed.

10. Animal Handling

10.1. The University keeps a variety of animals for teaching and experimental purposes. All animals must be kept in designated areas. These animals may harbour infections, which can be transmitted to humans by contact, bites or aerosols. The following general rules apply:

- a) Animals should be obtained only from an approved and reliable source. Animals bought from abroad must be adequately quarantined unless imported under the Rabies Control Regulations 1994.
- b) Animals must be inspected regularly for signs of disease.
- c) Sick animals should be isolated if possible with careful disposal of faeces and bedding.
- d) Records of sick animals and deaths should be kept.
- e) Animal accommodation must be kept clean and account taken of the animals welfare.
- f) Wild animals and birds must be treated with particular care and be segregated from domestic animals.
- g) Special care must be taken with post mortems and the proper disposal of cadavers and tissues.
- h) People looking after animals should be thoroughly trained in their handling and welfare. They should always wear protective clothing. Respiratory protection must be worn when carrying out any animal handling procedures likely to give rise to allergen exposure.

- i) Risk Assessment. A risk assessment must be completed before work commences. This assessment should include an assessment of injuries e.g. bites, scratches etc. which may be caused by the animals themselves.

10.2. Experimental Infection: This is potentially hazardous, especially during the processes of inoculation, sampling and autopsy of the animals. The requirements for laboratory hygiene, basic facilities and work practices are essentially the same as for the four Containment Levels for laboratory work as described in section 2 and are associated with the Hazard Groups in the same way.

10.3. However, as there are some additional features arising out of the fact that animals are involved, the containment categories are called Animal Containment Levels 1, 2, 3 and 4, *i.e.* simplistically an animal infected with a Hazard Group 2 organism would normally be required to be housed in Animal Containment Level 2 facilities.

10.4. Laboratory animal allergy (LAA) is a relatively common disorder, which develops in some individuals who are exposed to laboratory animals in the course of their work. Surveys have suggested that between 15 and 35% of people who work with laboratory animals have some symptoms while about 10% of workers may develop the more serious symptoms of asthma. LAA is a hypersensitivity or allergic response which may develop as a result of repeated exposure to animal allergens. Common allergens are the proteins from body tissue, excretions and secretions of most mammals, birds and insects. Urine/faeces, hair/fur, dander/animal dandruff, saliva and serum may contain allergenic proteins. Many of the symptoms of LAA are similar to those of hay fever. They include rhinitis (sneezing and running nose), conjunctivitis (sore and runny eyes), skin rashes, and welts on the skin around bites and scratches and asthma. LAA symptoms commonly develop within 6 months of commencing work with animals and in most cases within a 2-year period. However, occasionally symptoms can occur after many years of working with animals.

10.5. Effective techniques to minimise the exposure of staff working in animal facilities to the above allergens include the provision of good ventilation, good washing facilities and the implementation of defined systems of work and the wearing of protective clothing including respiratory protection. These techniques are described in more detail in an HSE document, "EH76 Control of Laboratory Animal Allergy". It is probable that each activity will need a separate assessment and the generalised procedure outlined in section 3.2 will not be sufficient. University guidance on Animal Allergy is reproduced in Appendix 4 – Allergy to Animals Guidance Note.

10.6. A programme of health surveillance is in place, provided by the Occupational Health Service, for all staff working in animal facilities and referred by DSAs. Any member of staff or student who suspects that they are suffering from LAA should report the symptoms to their DSA/manager/supervisor who will be able to refer the individual to the University Occupational Health Service.

10.7. Respiratory Sensitisation: Many different kinds of substances may be respiratory sensitisers, e.g. chemicals, metals and natural substances of animal or plant origin. They can cause an individual's respiratory system to develop a condition which makes it over-react if the substance is inhaled again. The over-reaction is likely to occur at concentrations of the substance which have no effect on unsensitised people. The Occupational Health Service is able to provide further advice and health surveillance as necessary as outlined by risk assessments.

11. References

1. Health and Safety at Work *etc* Act 1974.
2. Control of Substances Hazardous to Health (COSHH) Regulations 2002.
3. The Approved List of Biological Agents 2004 (<http://www.hse.gov.uk/pubns/misc208.pdf>)
4. Protection against blood-borne infections in the workplace: HIV and Hepatitis (ACDP 1996). ISBN 0-11-321953-9 Also see HSE Guidance "Blood-borne viruses in the Workplace" (<http://www.hse.gov.uk/pubns/indg342.pdf>)
5. The management, design and operation of microbiological containment laboratories. ACDP C50 2001. ISBN 0-7176-2034-4
6. Department of Health - Transmissible Spongiform Encephalopathy Agents: Safe Working and the Prevention of Infection (<http://www.advisorybodies.doh.gov.uk/acdp/tseguidance/Index.htm>)
7. Genetically Modified Organisms (Contained Use) Regulations 2000 (as amended 2005)
8. Genetically Modified Organisms (Deliberate Release) Regulations 1992 (as amended 1997).
9. A Guide to the Genetically Modified Organisms (Contained Use) Regulations 2000. ISBN 0-7176-1758-0
10. HSE Guidance Note EH48 - Legionnaire's Disease.
11. BS EN 12469 Biotechnology – Performance criteria for microbiological safety cabinets 2000 (Ref 24) supercedes BS 5726: 1979 - Specification for Microbiological Safety Cabinets. (Parts 2 & 3).
12. The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004 (these are regularly amended. Please consult your departmental trained advisor)
13. Preventing asthma at work. How to control respiratory sensitisers (HSE (L) 55).
14. United Bristol Healthcare Trust - Guidelines for Universal Precautions.
15. [BS EN 12469:2000](#) Biotechnology – Performance Criteria for Microbiological Safety Cabinets.

12. Revision History

2006 and 2007

Minor updates have been made to this document to take account of changes in legislation, URLs, publications and contact information.

2010

- Withdrawal of sections which have been superseded by University guidance documents (referenced in the text)
- Addition of links to updated guidance and policy documents where available
- Removal of old terminology
- Replacement of references to Supervisory Medical Officer with references to Occupational Health Service
- Removal of Microbiological Safety Officer as duties incorporated into those of University Biological Safety Officer with advice from BGMSC and other specialists as required
- Update of sections relating to Health Surveillance and pre-employment questionnaires to take account of revised Occupational Health Service and Personnel Service processes (including as a result of the Equality Act 2010)
- Formatting improvements

Appendix 1 – Duties and Responsibilities of BGMSC

- a) To approve all work with microbial pathogens, tissues and fluids that may contain ACDP Hazard Group 2 and 3 micro-organisms, within the University. To provide advice on risk assessments, containment facilities, decontamination and waste disposal.
- b) To review in detail and in a systematic manner every proposal involving genetic modification and advise on risk assessment, as currently described in the Compendium of Guidance from the Scientific Advisory Committee On Genetic Modification (February 2007) and any more recent HSE recommendations or requirements. The BGMSC will consider whether the proposed classification of the genetically modified organisms (GMOs) involved is consistent with HSE guidelines, whether the containment measures proposed agree with that indicated in the relevant guidance, whether appropriate containment is available, whether the training and experience of those involved are sufficient to carry out the work safely, and whether arrangements for health monitoring, if required, are adequate. To regularly review current projects and the GMOs involved, and check procedures for maintaining inventories of GMOs.
- c) To approve the use of animals that may pose a risk to the health and/or safety of the handler by reason of size, temperament, possible zoonotic infection or allergenicity. This applies whether or not the animals are to be used for procedures regulated by the Animals (Scientific Procedures) Act 1986.
- d) To review, on a regular basis, general laboratory practice in handling GMOs, animal handling and microbial pathogens with regards to safety. To consider all accidents and incidents; to advise the University on the need for further training and to review continually whether experimental procedures are being carried out, so far as is reasonably practicable, in a safe manner. Comments by the BGMSC with regard to the above aspects of a specific proposal should be contained in each notification made to the HSE under the Regulations, where applicable.
- e) To advise on the drawing up of local rules to cover work involving GMOs, safe use of animals and microbial pathogens.
- f) To advise on the design of new laboratories to be used for genetic modification work and microbial pathogens.
- g) The duties and responsibilities of the Chairman of the BGMSC are:
 - I. In consultation with the UBSO (if not chairman), to convene meetings of the BGMSC when necessary, or when requested by another member of the BGMSC. Meetings should occur at least 3 times a year.
 - II. To chair meetings of the BGMSC.
 - III. To organise and co-ordinate risk assessment of experiments.
 - IV. To consult with the other specialists as necessary.

Appendix 2 – Duties of the University Biological Safety Officer (UBSO) and other Responsible Officers

- Biological Safety Officer (UBSO)
 - a) To act as adviser to the University in all matters relating to biological safety including Genetic Modification experiments and the containment of potential hazards, and to provide liaison between the BGMSC and the Health and Safety Committee.
 - b) To liaise with the HSE concerning all genetic modification safety matters and other biological hazards in the University, and to provide HSE with such information as is required by applicable regulations.
 - c) To carry out regular safety inspections and to supervise a regular testing programme for all exhaust protective cabinets and HEPA filters when these are part of the equipment of a containment laboratory. In practice, all safety cabinets in the University of Bristol are regularly tested and maintained and certified by an external contractor.
 - d) To maintain a list of all workers who are involved with genetic modification and/or work with human pathogens or potentially pathogenic material.
 - e) To ensure that local rules are followed.
 - f) To investigate all accidents or incidents in laboratories in which genetic modification is taking place and take what action is necessary. Each accident/incident and the action taken must be recorded, together with the names of the personnel involved.
 - g) To liaise with the Occupational Health Service.
 - h) To ensure that laboratories are appropriately disinfected prior to the entry of maintenance personnel.
- Deputy Biological Safety Officer (DBSO)
 - a) To help with the duties of the BSO and assume responsibility for providing advice regarding project risk assessments within one or more related Departments.
 - b) To deputise for the BSO in their absence.
 - c) To act as adviser to the University in all matters relating to safety of Genetic Modification experiments and the containment of potential hazards where the BSO is the principal investigator.

Appendix 3 – Health and the Worker

- Considerations which may contraindicate a worker engaging in or continuing with work with micro-organisms (including GMOs) include:
 1. relevant medical history (e.g. history of asthma, recurrent infections).
 2. evidence of defective barriers to infection which would contraindicate working with particular agents, such as disorders of skin e.g. eczema and work with Vaccinia virus, respiratory tract and alimentary canal).
 3. Compromised immune system.
 4. treatment with antibiotics, especially those used in the experimental programme, or the therapeutic use of steroids.
 5. some forms of self-medication which may influence the chances of infection.
- Workers are advised to consult the Occupational Health Service if there is any reason to believe that risk has been, even temporarily, increased due to changes in their medical condition, e.g. (d) and (e) above.
- Incidents of unexplained illness should be drawn to the attention of the Occupational Health Service and to the worker's GP by the worker. The Occupational Health Service will take appropriate action and consider:
 1. whether the symptoms in any way related to the material being handled
 2. whether any other workers had the same symptoms
 3. whether an accident occurred in which the worker was involved
 4. whether there is evidence of infection by an organism in use.
 5. risk to others in the work environment.

Confirmed cases of Occupational Disease are reportable to the Health and Safety Executive under the Reporting of Injuries Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR).

Appendix 4 – Allergy to Animals Guidance Note

Laboratory Animal Allergy (LAA) is a relatively common condition which develops in between 15-35% of people who work with animals.

Allergy may also develop in persons not directly working with animals but who are regularly exposed to them e.g. by working in areas like laboratories which are used for experiments involving animals.

LAA is a hypersensitivity or allergic response which may develop as a result of repeated exposure to substances called allergens. The common allergens are proteins from body tissue, excretions and secretions of most mammals, insects and birds' urine, hair/fur, dander/animal dandruff, saliva and serum, bird droppings may all contain allergenic proteins.

The symptoms of LAA are similar to those of hay fever. They include:

- Rhinitis (sneezing/running nose)
- Skin rashes
- Conjunctivitis
- Weals on skin around bites and scratches
- Asthma

The most common symptoms are running eyes and nose. Symptoms usually develop within 6 months of first starting work with animals and in most cases within a 2 year period.

It is not possible to predict who will develop symptoms of LAA and any person working with animals who thinks they may be experiencing symptoms should contact their school or unit safety advisor, manager or supervisor who will be able to refer the individual to the Occupational Health Service for further investigations. In order to protect their health all staff and students should:

- Always change clothes or put on appropriate over clothes on entry into animal units and remove all protective clothing on leaving.
- Make proper use of any control measures provided, e.g. ventilation, safety cabinets, etc as well as any personal protective equipment as specified in the local rules and standard operating procedures. Any defects in equipment should be reported immediately to the supervisor.
- Adopt high standards of personal hygiene and make proper use of washing facilities provided.
- Do not eat, drink, chew or write reports (brief notes excepted) in animal units where allergen contamination may exist.
- Attend any health surveillance sessions as required by the University.

- Report any symptoms as soon as possible to their safety advisor, manager or supervisor.

Control Measures

Under the Control of Substances Hazardous to Health (COSHH) Regulations the University must prevent or, if this is not reasonably practicable, adequately control the exposure to animal allergens. This control is achieved by a variety of measures including implementation of local rules, standard operating procedures, and safe systems of work, ventilation and personal protective equipment.

Access to Animal Care Facilities

Access to the animal care facilities is restricted to essential personnel only. Access by staff employed within the facilities is dependent on the individual undergoing health surveillance and working in accordance with established local rules and working procedures.

Ventilation

Ventilation systems in animal facilities are designed to contain and remove aeroallergens; however they can only reduce and not eliminate the contact. The ventilation is designed to pass clean air over the worker towards the animal cages and thus the contaminated air is drawn from the animal cage into the extract ducts. Any disturbance of the air e.g. movements of caging, equipment and personnel within the room will disturb this air flow and thus may reduce the effectiveness of the ventilation and therefore the level of protection.

Ventilation provides no protection against direct skin contact with allergenic material from handling animals. Effective control depends upon the use of protective clothing and work practices that are designed to reduce exposure times and amounts. The ventilation systems are maintained and tested under the COSHH Regulations annually by Estate Operations.

Personal Protective Equipment (PPE)

All persons (students, cleaners, maintenance workers, technical staff, academic staff and visitors) entering a University Animal Facility must wear the protective clothing as specified for that facility. The requirements will vary between facilities and will be identified in local rules and protocols. The minimum requirement will be a change of laboratory coat but in some circumstances a complete change of clothing will be required. This protective clothing **must not** be worn outside the facility **or in any rest/communal/tea room** and should be disposed of as directed. Where respiratory protection is specified in the local rules/standard operating procedures it **must** be worn in accordance with the training received. When carrying out any procedure likely to release allergen respiratory protection must be worn according to risk assessments.

All personal belongings or outdoor clothing will only be permitted in designated areas of the animal facilities. No laboratory coats or other protective clothing worn in other areas of the University will be permitted within the animal containment facilities. This is to prevent passive exposure of other members of staff to animal allergens.

All personnel entering animal containment facilities will be expected to have read and to comply with the local rules and standard operating procedures for that facility.

Transport of Animals

It is the aim of the University to reduce the passive exposure to animal allergens by reducing the amount of animal movements through buildings to laboratories by providing more experimental animal space within the animal facilities. Whenever small animals are moved out of animal units they must be transported in filtered boxes or cages.

Working Practices.

The Manager of the Animal Care facility is responsible for carrying out risk assessments and for implementing the local rules and standard operating procedures. These should include a reference to: eating, chewing, drinking etc., cleaning, animal handling and transport, cage cleaning, use of PPE including respiratory protection, management of PPE, skincare and how to report symptoms.

Health Surveillance.

A health surveillance programme including respiratory questionnaires and lung function testing (spirometry) as required is carried out by the Occupational Health Service. All staff exposed to animal allergens will be assessed as part of this programme having been referred by their DSA/Manager.

Responsibilities

Head of School or other Unit

It is the responsibility of the Head of School or their delegate to ensure that all activities within Animal Care Facilities have been risk assessed. Records of risk assessment should be kept and updated at least every 5 years or after any significant change in the working environment or practices.

Training, information and instruction regarding LAA, control measures, PPE, and working practices must be provided for every employee. This should be done on recruitment and re-iterated regularly in response to changes in work environment or activity, professional guidance and best practice.

Records of training in the use of and the issue of PPE should be kept.

Employees

All personnel entering animal facilities are required to attend health surveillance arranged by the Occupational Health Service.

Employees have a duty under health and safety legislation to co-operate with local arrangements for health and safety and to abide by local standard operating procedures and protocols.

Appendix 5 – Hepatitis B Virus Vaccination Policy

Hepatitis B vaccination is required for all staff working with body fluids and tissues which contain or may contain Hepatitis B virus. The immunisation programme is managed through the Occupational Health Service.

Regardless of immunisation status, anyone working with material that may contain blood borne viruses must also be made aware of the “Needlestick Hotline” for reporting any potential exposure to such viruses as a result of their work. This will enable any post-exposure treatment to be considered and administered. All risk assessments for such work and local rules documents must reference this information and it must also be brought to the attention of workers during induction and other training.

Further information is available from the Occupational Health Service website

<http://www.bris.ac.uk/safety/health/>

Appendix 6 - Disinfectants

Appendix withdrawn

Information on disinfectants is now contained in a guidance document “Waste Decontamination and Disposal” available from the Health and Safety Office website

<http://www.bris.ac.uk/safety/biological/guidance/biowaste-gn/>

Note that since 1st September 2006 certain disinfectants, that contain active substances, which are not supported as part of the Biocidal Products Directive review programme, cannot be placed on the EU market or subsequently stored for any purpose (except for export and disposal). The Directive is implemented in the UK as the Biocidal Products Regulations 2001 (BPR). Advice may be sought from the University BSO and more information is available in the above guidance document.