

Health and Safety Office, NUI Galway

GUIDANCE NOTE

Laboratory Biosafety Levels 1 and 2

GENERAL CODE OF PRACTICE

This general code of practice (COP) lists the essential laboratory practices and procedures that are central to good (safe) microbiological technique when handling biological agents (BAs). It is based on the guidelines of the World Health Organisation and is given as minimum requirements for laboratories where BAs in Risk Groups/Classes 1 and 2 are used. This COP will be useful when preparing risk assessments of BAs. Some of the precautions may appear unnecessary for biological agents in Risk Group 1, but they are desirable not least for training purposes to promote good microbiological technique; this aspect is of particular relevance to NUI Galway as a teaching and research institution.

1. Access

- a) Only authorised persons should be allowed in the laboratory working areas.
- b) Laboratory doors should be kept closed during working hours and should be locked when the laboratory is not occupied.
- c) Lone working and out-of-hours working must be risk assessed and authorised.
- d) Children should not be authorised to enter the laboratory.
- e) Access to animal houses should be especially authorised.
- f) Vermin/pests and other animals, including pets, must be kept away from the laboratory.
- g) Where biological agents are handled, the hazard warning symbol and sign (Figure 1) must be displayed at the entrances to rooms.



BIOHAZARD

ADMITTANCE TO AUTHORISED PERSONNEL ONLY

Biosafety Level: _____

Principal Investigator: _____

In case of emergency call: _____

Daytime phone: _____ Other phone: _____

**Authorisation for entrance must be obtained from
the Principal Investigator named above.**

Figure 1. Biohazard symbol and sign for entrances to laboratories where BAs are present.

2. Personal Protective Equipment (PPE)

- a) Laboratory coats must be worn at all times for work in the laboratory.
- b) Appropriate gloves must be worn for all procedures that involve direct or accidental contact with potentially infectious materials, including animals. After use, gloves must be removed and hands must then be washed.
- c) Protective gloves must only be worn when handling infectious material. To avoid contamination gloves must not be worn if touching telephones, door handles, PCs, calculators etc.
- d) Safety glasses, visors and other protective devices must be worn as necessary to protect from splashes, impacting objects and ultraviolet radiation.
- e) PPE must not be worn outside the laboratory areas, such as toilets, libraries, offices.
- f) To avoid contamination, laboratory protective clothing must be stored separately from personal clothing.

3. Procedures

- a) Pipetting by mouth is prohibited. Nothing must be placed in the mouth. Labels must not be licked.
- b) All technical procedures should be performed in a way that minimises the formation of aerosols or droplets.

- c) The use of hypodermic needles and syringes should be limited. They must not be used for any purpose other than injection or aspiration of fluids from laboratory animals.
- d) All spills of, accidents with, and uncontrolled exposures to BAs must be reported and recorded as per university procedure.
- e) A written procedure for the clean-up of spills must be in place and followed.
- f) Contaminated or possibly contaminated waste liquids and solids must be inactivated and/or safely contained, and must not pose a hazard to persons exposed to or handling the material while in the waste management process.
- g) Packaging and transportation of BAs outside the University must follow national/international regulations.
- h) Open-toed footwear must not be worn in the laboratory.
- i) Eating, drinking, applying cosmetics and handling contact lenses is prohibited in the laboratory.
- j) Storing food and drink is prohibited in the laboratory.
- k) Personnel must wash their hands after handling infectious materials or animals, and before they leave the laboratory working area.
- l) Suitable arrangements must be made for the safe handling and transport of a BA within the workplace.

4. Laboratory Working Areas

- a) The laboratory should be kept clean, tidy, and free of materials that are not pertinent to the work.
- b) Work surfaces and sinks should be resistant to acids, alkalis, solvents, and excessive temperatures, and be impervious to water.
- c) Work surfaces must be decontaminated after any spill of potentially hazardous material, and at the end of the working day.
- d) Laboratories should be subject to vermin/pest control where necessary.
- e) Written documents that are expected to be removed from the laboratory need to be protected from contamination while in the laboratory.
- f) There must be clearly defined storage areas for BAs in the laboratory.
- g) An observation window (or alternative) into the laboratory should be present. This is specifically recommended in Class 2 containment laboratories.

h) Material infected with a Class 2 BA must be handled in a safety cabinet or other suitable containment facility.

5. Biosafety Management

a) It is the responsibility of the principal investigator to ensure the development and execution of a written biosafety management plan and an operations manual. Such documents may include risk assessments, safety training records, standard operating procedures, licences, and emergency plans.

b) The principal investigator must notify the Health and Safety Authority in relation to all Class 2 BAs, including genetically modified (micro)organisms (GMM/GMO).

c) In relation to the contained use of GMM/GMOs the principal investigator must apply to the Environmental Protection Agency for a licence.

d) The principal investigator must ensure that procedures are specified for taking, handling and processing samples of human or animal origin.

e) The principal investigator must make effective vaccines or prophylaxis available, when necessary, to those who are not already immune to the BA to which they are exposed.

f) Laboratory personnel, university maintenance, house-keeping staff, and other authorised persons must be trained in, advised of, or consulted by laboratory management of, any special hazards involving BAs.

g) Laboratory personnel, university maintenance, house-keeping staff and other authorised persons must comply with safety procedures that are in place to minimise the risk of exposure to BAs.

h) Appropriate medical evaluation, treatment and surveillance should be provided for staff at risk, as necessary, and adequate medical records should be maintained.

i) The biohazard symbol in figure 2 must be displayed where BAs are present outside a laboratory where the sign in figure 1 is necessary:



Figure 2. Biohazard symbol for display where BAs are present

END
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This Guidance Note is consistent with the following legislation:

- Safety, Health and Welfare at Work Act, 2005
- Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994
- Safety, Health and Welfare at Work (Biological Agents) (Amendment) Regulations, 1998
- Genetically Modified Organisms (Contained Use) Regulations, 2001