Approved by ACRIC on 28/9/2018

Policy on disposal of waste containing biological agents and/or genetically modified organisms

Introduction

The University generates a significant and diverse volume of waste containing genetically modified organisms (GMOs) and / or biological agents, much arising from the University's teaching and research programmes. To ensure the safety of University staff, students, and others who could be exposed to this waste, this Policy details the handling requirements which staff shall implement for waste containing biological agents and / or GMOs. This Policy details minimum requirements – departments, schools, and centres may choose to implement more stringent waste treatments. This Policy should be read by all employees who may be exposed to biological agents, as well as appropriate Heads of Functional Area, Heads of School, Heads of Department, Directors of Research Institutes, Centres and Units (RICUs), and relevant project leads.

Legislative framework

Statutory Instrument 73/2001 (GMO (Contained Use) Regulations, 2001) requires that users of GMOs shall "*take account, in particular, of issues related to the disposal of waste and effluent*" when performing risk assessments. SI 572/2013 (Biological Agents Regulations, 2013) stipulates that employers whose staff may be exposed to biological agents shall provide "*means for the safe collection, storage and disposal of waste by employees*".

Requirement for a risk assessment

The Biological Agents Regulations, 2013 and the GMO (Contained Use) Regulations, 2001 both **require an assessment of risk to be performed before any work** involving potential exposure to biological agents and / or GMOs. Such an assessment is an important first step before work commences and the completion of an assessment forms part of this Policy. The assessment should consider the hazards of the materials involved and identify the appropriate risk grouping, as well as any other information necessary to determine how any resultant waste should be processed according to the terms of this Policy; this is particularly important where the materials' risk group is not immediately apparent, as may be the case with environmental or other samples.

Definitions

"*Biological agent*" means micro-organisms, including those which have been genetically modified, cell cultures and human endoparasites, which may be able to provoke any infection, allergy or toxicity.

"*Genetically modified organism (GMO)*" means an organism in which the genetic material has been altered in a way that does not occur naturally by mating or natural recombination, or by a combination of both.

"*Genetically modified micro-organism (GMM)*" means a micro-organism in which the genetic material has been altered in a way that does not occur naturally by mating or natural recombination, or by a combination of both.

"*Cell culture*" means the in-vitro growth of cells derived from multicellular organisms.

"*Risk group 1 waste*" means waste containing group 1 biological agents (as defined in the Biological Agents Regulations, 2013) and / or arising from GMO activities for which level one containment ("*Class 1 activities*", as defined in the GMO (Contained Use) Regulations, 2001) is appropriate. Such waste is regarded as low risk and is unlikely to cause human disease to employees.

"*Risk group 2 waste*" means waste containing group 2 biological agents (as defined in the Biological Agents Regulations, 2013) and / or arising from GMO activities for which level two containment ("*Class 2 activities*", as defined in the GMO (Contained Use) Regulations, 2001) is appropriate. Such waste may cause human disease and should be regarded as posing a hazard to employees.

"*Risk group 3 waste*" means waste containing group 3 biological agents (as defined in the Biological Agents Regulations, 2013) and / or arising from GMO activities for which level three containment (as defined in the GMO (Contained Use) Regulations, 2001) is appropriate. Such waste may cause severe human disease and should be regarded as posing a serious hazard to employees.

Risk group 1 waste

All waste arising from the intentional culture or manipulation of Group 1 biological agents (e.g. broth cultures, agar plate cultures, tissue culture flasks etc.), or any waste containing GMMs arising from Class 1 activities shall be inactivated by validated means before disposal or sent to an appropriately registered and regulated offsite decontamination facility. Other wastes which may contain non – genetically modified Group 1 biological agents (e.g. soil samples) may be disposed of in the University's general waste stream without inactivation – note that such wastes may be subject to separate requirements under other legislation (e.g. environmental), and shall be disposed of with due regard to such measures if appropriate.

Risk group 2 waste (including routine diagnostic work with specimens that contain or may contain blood-borne viruses)

All materials containing Risk Group 2 biological agents, whether genetically modified or not, shall be inactivated by validated means before disposal or sent to an appropriately registered and regulated offsite decontamination facility. Inactivation of effluent from hand washing sinks or drains and showers and similar effluents will not normally be required unless such has been identified as necessary by the assessment of risk performed prior to work commencing.

Risk group 3 waste

All Group 3 waste shall be inactivated by validated means within the facility itself, before disposal. Inactivation of effluent from hand washing sinks or drains and showers and similar effluents is not required unless such has been identified as necessary by the assessment of risk performed prior to work commencing.

Additional considerations for specific waste types

GM plant waste

All GM plant material, as well as all pots, trays, compost, equipment and tools contaminated with such material, shall be decontaminated by appropriate autoclave protocol prior to cleaning or disposal, unless the prior agreement of the Environmental Protection Agency (EPA) for other arrangements has been obtained. Run-off water or effluent shall be treated by chemical inactivation.

Cell culture waste

Human and animal cell cultures should be treated as per their corresponding risk group. Note that cell cultures of primate origin should normally be regarded as risk group 2 unless evidence exists that they are free of adventitious agents.

Body fluid and faecal waste

Waste containing primate faeces or body fluids (including, but not limited to, blood, urine, saliva, etc.) should be treated as risk group 2 waste. Note that, depending on the location of work involving these materials, they may be subject to an equivalent Health Service Executive policy on waste disposal.

Animal waste tissues

Animal tissues and carcasses identified as Risk Group 1 by the assessment of risk performed prior to work commencing shall be subjected to an inactivation protocol onsite before disposal, or sent to an appropriately registered and regulated offsite decontamination facility.

Animal tissues carcasses identified as Risk Group 2 by the assessment of risk performed prior to work commencing shall be subjected to an inactivation protocol onsite before disposal.

Human tissues

Due to the ethical issues involved, all disposal of human tissues (other than cell cultures, body fluids, and faeces, as above) must be approved of in advance by the appropriate head of functional area. All such tissues must be incinerated, cremated, or buried appropriately, and shall only be disposed of following consultation with the Department of Anatomy and Neuroscience, who can advise on the processes involved.

Sharps

Where the use of sharps has been identified as necessary by the assessment of risk performed prior to work commencing, all such waste will be disposed of in accordance with the relevant departmental safety statement.

Identification of research micro-organisms

Mislabelling, misidentification, and contamination of microbiological cultures (in particular cell cultures) is a worldwide problem. Prior to the commencement of work, especially in cases where cultures have not been obtained from a source which can certify their identity (e.g. commercial culture supply agencies such as the American Type Culture Collection), employees should satisfy themselves as to the identity of micro-organisms with which they intend to work, and that they are of the expected risk grouping. This step also has significant benefits for research integrity.

Inactivation requirements

Autoclave protocols shall be sufficient to ensure complete inactivation of all waste within. Chemicals used for inactivation shall be prepared and used according to the manufacturer's instructions. All methods shall be validated under normal working conditions at least annually and copies of the validation protocol and results shall be retained locally. Furthermore, control measures (including, but not limited to, spore strips) shall be applied at least monthly to ensure inactivation methods remain adequate and effective; corresponding records shall be retained locally. Records of all GM inactivation events (e.g. autoclave printouts, logbooks) shall also be maintained for inspection by the EPA.

Disposal of inactivated waste

While inactivated waste has been made safe, the appearance of laboratory waste, etc., can sometimes cause concern to third parties. In all cases where waste has been inactivated according to this Policy, and is to be subsequently disposed of in the University's general waste stream, it shall be packaged in such a manner as not to be visible external to the container, i.e. autoclaved waste bags must be placed in strong, opaque, bags before being placed in waste collection skips.

Relevant links

UCC Biosafety website

Biological Agents Regulations, 2013

GMO (Contained Use) Regulations, 2001

Code of Practice for the Biological Agents Regulations 2013

HSA Guidelines to the Biological Agents Regulations 2013

Biological risk assessment form

Email the University's Biological Safety Advisor