



INTERNATIONAL ISLAMIC
UNIVERSITY MALAYSIA

DOCUMENT

STANDARD OPERATING
PROCEDURE

DOCUMENT NO.	REVISION NO.	01
IIUM-KOS-SOP-42	REVISION DATE	12/12/2022
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LIVING MODIFIED ORGANISM (LMO) DISPOSAL		

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REVISION HISTORY

Revision Number	Revision Date	Description of Amendment / Change

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1. OBJECTIVE

The Standard Operating Procedure (SOP) for disposing Living Modified Organism (LMO) is to reduce risks and further complications to human, animal and the environment in the future.

The LMO used in the research poses a risk to human beings and the environment. Therefore, it requires the implementation of Biosafety laboratory settings and guidelines for its disposal.


2. SCOPE

This SOP covers all procedures, specifically on the disposal of solid and liquid waste contaminated with LMO and disposal of LMO generated from the laboratories under Kulliyyah of Science.

3. DEFINITION

1. IIUM - International Islamic University Malaysia
2. KOS - Kulliyyah of Science
3. IBBC - Institutional Biosafety and Biosecurity Committee
4. SOP - Safe/Standard Operating Procedure
5. SO - Science Officer
6. LMO - Living Modified Organism
7. BSL or BL - Biosafety Level
8. PIC - Person in Charge
9. PPE - Personal Protective Equipment
10. EQSWR - Environmental Quality (Scheduled Wastes)

Regulation 2005

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4. PREREQUISITES

- 4.1 All laboratory users who handle the LMO disposal are required to understand and adhere to the procedures outlined. They are also required to wear suitable personal protective equipment (PPE) such as covered shoes, a lab coat, rubber gloves, masks (when required) and goggles (when required).


Cross-reference with IIUM-KOS-SOP-40: Personal Protective Equipment Management

5. RESPONSIBILITIES

- 5.1 All laboratory users shall be responsible to comply with the safe operating procedure.

6. PROCEDURES

- 6.1 LMO wastes shall be identified and notified to Lab PIC. LMO wastes shall be collected in a suitable container (leak-proof, compatible). The container shall be labeled according to the EQSWR 2005 (third schedule) and segregated from other wastes.
- 6.2 Prior to disposal, the LMO waste shall be inactivated before leaving the facility. The preferred method is autoclaving, and is detailed as follows:
- Biohazard waste: 121°C for at least 30 minutes per bag
 - Liquids (contain LMO): 121°C for 25 minutes per gallon
 - Glassware (contain LMO): 121°C for a minimum of 25 minutes
- 6.3 Chemical disinfection (e.g., treatment with household bleach or 70% ethanol) may also be carried out as deemed appropriate or necessary in some cases.
- 6.4 Disposal of LMO :
- a) Storage for all non-inactivated waste is restricted within the generating laboratory.
 - b) LMO waste shall be held in a closed/covered biowaste container and should not be stored longer than 24 hours before inactivation.
 - c) Filled or partially filled LMO waste containers or bags (inactivated) should not be held for more than 14 days, transferred to Centralized Storage Facility, and stored in the cold room separated from others.

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- d) Stock solutions of suitable disinfectants should be maintained in each laboratory for disinfection.
- e) The LMO waste containers or bags should be packed (double beg), clearly labelled “LMO WASTES”, including DATE, POINT OF GENERATION, PIC & phone no. and shall be stored following Environmental Quality (Scheduled Wastes) Regulation 2005 (EQSWR 2005).
- f) LMO shall be disposed of at prescribed premises only, and disposal inventory shall be maintained up to date and accurate.

6.5 Disposal of solid or liquid waste contaminated with LMO:

- a) Solid or liquid waste contaminated with LMO shall be inactivated or decontaminated before disposal.
- b) The wastes should be packed in heavy metal autoclavable plastic bags (Blue/Yellow) with the biohazard symbol.
- c) The preferred method is by autoclaving the waste at 121°C, 15 psi pressure, for a minimum of 30 minutes. The time required for autoclaving depends on the amount of waste (autoclave load), the presence of water, and the type of container used.


or

- d) Chemical disinfection using (5-10%) hypochlorite and (Chlorine) may also be used to inactivate or decontaminate the waste.
- e) Prior to disposal, the waste shall be packed in the biohazard yellow bag, properly labelled “LMO WASTES”, including DATE, POINT OF GENERATION, PIC & phone no., and thrown in the yellow bin as stipulated in EQSWR 2005.
- f) The lab personnel shall keep the waste inventory up to date and accurate as per the 5th schedule.

6.6 Disposal of handling materials:

- a) Gloves/paper/tissues/disposable plastics contaminated with LMO shall be removed before touching other surfaces (e.g., doorknobs, keyboards, handphones).
- b) Place the waste handling materials in a solid yellow plastic bag (Biohazard bag).
- c) Dispose of all the waste from the clean-up of instruments in a biohazard beg, and it must be handled as biohazard waste as described in the EQSWR 2005.
- d) The wastes shall be labelled as “LMO WASTES”, including DATE, POINT OF GENERATION, PIC & phone no.

Cross-reference with IIUM-KOS-SOP-18: Schedule Waste Management

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7. REFERENCE

- 7.1 Biosafety, D. O. (2010). *Biosafety Guidelines Contained Use Activity of Living Modified Organism*. Putrajaya, Malaysia: The Ministry of Natural Resources and Environment Malaysia.
- 7.2 IIUM-KOS-SOP-17: Biological Management
- 7.3 IIUM-KOS-SOP-18: Scheduled Waste Management
- 7.4 IIUM-KOS-SOP-40: Personal Protective Equipment Management

8. APPENDIX

N/A.