

Title: Genetically Modified Micro-organism research	
Effective Date: 1-6-22	Review Date: 1-6-25
Author: Richard Cowie, NHSG Biological Safety Officer	QA Approval: Richard Cowie, QA Manager
Approver: Prof Maggie Cruickshank, R&D Director	Approver: Prof Siladitya Bhattacharya, Head of School

Document History


Version	Description of update	Date Effective
1	New SOP	1-6-19
2	Scheduled review with no updates	1-6-22

1. Scope

1.1 This SOP applies to any clinical research study performed on the Foresterhill campus which may be sponsored, co-sponsored, or hosted, by **NHS Grampian** and which falls within the remit of the Genetically Modified Organisms (contained use) 2014 Regulations.

1.2 The purpose of this SOP is to define the requirements of clinical research involving Genetically Modified Micro-organisms (GMM), which fall within the remit of the Genetically Modified Organisms (contained use) 2014 Regulations.

1.3 NHS Grampian holds authority from the UK Competent Authority (Health and Safety Executive (HSE)) to undertake Class 1 research involving Genetically Modified Micro-organisms. The HSE reference number for NHS Grampian is GM 1043, which applies to the Foresterhill campus.

1.4  A separate HSE reference applies to University of Aberdeen facilities located on the Foresterhill campus (GM 490). For University of Aberdeen research projects involving GMM, reference should be made to the University of Aberdeen Biological Safety Officer and the appropriate University of Aberdeen procedure.

1.5 Some research projects may involve plasmids (ie naked nucleic acid) which do not constitute GMM, however it is considered best practice to follow the procedure detailed in this SOP ie Risk Assessment, involving the Biological Safety Officer and seeking the opinion of the local GM Safety Committee.

2. Responsibilities


Biological Safety Officer	Supervision, co-ordination and safety of GM contained use. Advise management and liaise with Competent Authority (HSE).
Chief Investigator (or PI)	Complete a Risk Assessment for consideration by the local GM Safety Committee.
GM Safety Committee	Review the Risk Assessment, advise and provide local approval regarding its adequacy for local GMM use.


Uncontrolled when printed. Please ensure that you are working on the most up to date version of this SOP.


Key to symbols  = Important point to note  = Warning


Principal Investigator Ensure all contained use activity comply with the regulations, study protocol and local procedures.

3. Procedure

3.1  The majority of GMMs used in human studies shall fall into the lowest level of activity classification, ie Class 1. No GM contained use involving Class 2, 3 or 4 (possible risk to human health and/or the environment) is permitted under the current NHS Grampian Premises Notification.


3.2  The Biological Safety Officer shall be notified immediately when there is the potential that any clinical research study may involve Genetically Modified Micro-organisms.


3.3  No procedures involving Genetically Modified Organisms or Genetically Modified Micro-organisms shall be performed until the appropriate approval has been received.

3.4  The CI/PI shall ensure that any staff involved in contained use involving GMM have received suitable and sufficient information, instruction and training in the study protocol and procedures involved. This shall be documented in individual Training Record (see SOP-QA-2 – Training record) and the Site delegation log (TMP-QA-13) as appropriate.

Risk Assessment

3.5 A Risk Assessment may have been prepared by those who generated and tested the GMM, eg the Biotechnology Company or Sponsor of the study. This may be used by the CI/PI as the basis for a local Risk Assessment; which may be submitted by the Biological Safety Officer to the local GM Safety Committee for approval.

3.6  The CI/PI shall complete a Risk Assessment using a standard template (available from the Biological Safety Officer) which shall be submitted, by the Biological Safety Officer, to the local GM Safety Committee for approval.

3.7  The CI, or person delegated to undertake contained use involving GMM, must ensure that the risks to human health and the environment arising from the contained use are reduced to the lowest level that is reasonably practicable.

3.8 Measures taken to comply must include the general principles of good microbiological practice and good occupational safety and hygiene. See SOP-QA-38 – Equipment, and Genetically Modified Organisms (contained use) 2014 Schedule 7, Regulation 18 and Schedule 8 Part 1 and Part 2.

3.9 The local Risk Assessment requires the following information:


- Research study title
- Research study leader (normally the CI/PI and Biological Safety Officer)
- Location of proposed GMM research activity
- Relevant experience of CI/PI regarding genetic modification
- An overview of the proposed research study including the following:
 - (a) Scientific goals
 - (b) Details of recipient micro-organism (including strain number)
 - (c) Details of vectors
 - (d) Details of genes being modified
 - (e) Estimation of culture volumes which shall be used.

Uncontrolled when printed. Please ensure that you are working on the most up to date version of this SOP.


Key to symbols  = Important point to note  = Warning

- How might the GMM be a hazard to human health? Consider the following:
 - (a) Hazards and effects of any stable disabling mutations
 - (b) Hazards arising directly from inserted gene
 - (c) Hazard arising from alternation of existing pathogenic traits
 - (d) Likelihood and effects of natural gene transfer to other organisms
 - (e) Detail how has a conclusion of no/low severity has been reached
- Containment level
- Detail of how the GMM may be a hazard to the environment
- Additional containment measures required to protect the environment
- GM activity class (only class 1 is permitted)


Advice and assistance regarding the Risk Assessment may be obtained from the Biological Safety Officer or local GM Safety Committee.


3.10  Once submitted to the local GM Safety Committee the Risk Assessment shall be reviewed at their next scheduled meeting. The review shall result in one of the following:

- Approval of the activity and work may commence.
- Rejection of the activity and work may not commence.
- A request for clarification or further information.


3.11  If a request for clarification or further information is received from the Chair of the local GM Safety Committee, this shall be communicated to the CI/PI by the Biological Safety Officer.


3.12  Resubmitted Risk Assessments shall follow the same process detailed in 3.10 and 3.11.

3.13  Once approved by the local GM Safety Committee work on the clinical research study may only commence once all other research approvals are in place eg REC, R&D and MHRA, as appropriate (see SOP-QA-4 – Applying for sponsorship).


3.14  Once approved by the local GM Safety Committee work shall require re-approval every three years, or earlier if there are any changes to information contained in the original Risk Assessment. An updated Risk Assessment shall be resubmitted to the local GM Safety Committee.

Conduct of contained use

3.15  The CI/PI shall ensure that the requirements detailed in 3.8 are applied at all times to contained work involving GMM.

3.16  All GMM contained use waste generated shall be identified as such, segregated and either disposed of by High Temperature Incineration as GMM waste, by the appropriate NHS Grampian waste contractor, or inactivated on site. Inactivation may be achieved by autoclaving at 134C/10-15 minutes, as segregated GMM waste, before following the normal NHS Grampian clinical waste route for autoclaved waste. Advice on GMM waste disposal can be provided by the Biological Safety Officer and/or NHS Grampian Waste Manager.

Deliberate release

3.17  If a clinical research study involves the deliberate release of GMM into the environment compliance with the Genetically Modified Organisms (Deliberate Release) (Scotland) Regulations

Uncontrolled when printed. Please ensure that you are working on the most up to date version of this SOP.

Key to symbols  = Important point to note  = Warning

2002 may apply. **Note:** Shedding of GMM after vaccination may be considered a deliberate release activity. Advice may be sought from the Biological Safety Officer and local GM Safety Committee.

4. Abbreviations and definitions

CI	Chief Investigator
GMM	Genetically Modified Micro-organism
GMO	Genetically Modified Organism
HSE	Health and Safety Executive (UK Competent Authority)
Microorganisms	Bacteria, fungi, viruses, cell cultures and tissue cultures**
MHRA	Medicines and Healthcare products Regulatory Agency
Organism	All organisms, including multi-cellular organisms*
PI	Principal Investigator
R&D	Research & Development (Management permission)
REC	Research Ethics Committee

*The regulations do not cover humans, human embryos and human admixed embryos.

**Naked nucleic acid, oligonucleotides, synthetic DNA, plasmids or liposomes are not considered to be micro-organisms. However full-length copies of the genomes of viruses (whether recombinant or synthetically made) that have the potential to be infectious in their own right, are considered to be microorganisms (even when not encapsulated or enveloped). The potential to be infectious includes situations where infectivity is dependent on the presence of an exogenous source of polymerase.

5. Related documentation and references

SOP-QA-2	Training record
SOP-QA-4	Applying for sponsorship
SOP-QA-38	Equipment
TMP-QA-13	Site delegation log
-	Genetically Modified Organism (contained use) Regulations 2014
-	HSE Scientific Advisory Committee on Genetic Modification (SACGM) Compendium of guidance (Part 6: Guidance on the use of genetically modified micro-organisms in a clinical setting)
-	Genetically Modified Organisms (Deliberate Release) (Scotland) Regulations 2002
HSE website	www.hse.gov.uk/biosafety/gmo

Uncontrolled when printed. Please ensure that you are working on the most up to date version of this SOP.

Key to symbols  = Important point to note  = Warning