

**Risk Assessment for Genetic Modification Project to be considered by the Biological
Safety Committee of Geneservice Ltd, Cambridge.**

- | | |
|---|--|
| 1. Name of applicant: | Geneservice Ltd |
| Unit: | Services: DNA sequencing team. |
| Group Leader responsible (if not applicant): | Dr Chengeng Ang |
| <hr/> | |
| 2. Title of project: | DNA Sequencing of cloned DNA from various origins (templates) |
| <hr/> | |
| 3. Overview, including details of insert(s): | Culture of bacterial cells and subsequent DNA extraction of cloned DNA templates for the sole purpose of DNA sequencing. The constructions of all cloned DNA templates will be made in the customer's own laboratories. |
| <hr/> | |
| 4. Host/vector system(s): | Customers sending biological materials to the sequencing team will be required to declare the host name and promoters present in any host/vector systems and also that all work is agreed containment level 1. Geneservice Ltd will accept no material unless such a declaration is received. No materials to be processed outside containment level 1. |
| <hr/> | |
| 5. Hazard identification in respect of human health and environmental safety. (Consider host, vector, insert and final GMM.) | All hosts are likely to be laboratory <i>E.coli</i> K12 derivatives which are recognised as non-colonising and disabled and may be considered to be equivalent ACDP hazard group 1. They are not considered pathogenic to humans or animals. They are expected to have limited survivability in the environment and often have auxotrophic requirements that are unlikely to be satisfied outside of laboratory culture. |
| Estimation of the severity or consequences of the harmful effect were it to occur. | The cloned templates may be present in a wide variety of vectors with various promoter systems eg T3/T7, CMV, lacZ, T7/SP6, which could potentially be used to express a cDNA. Of these, only the CMV is a eukaryotic promoter. The clones will not be used for expression in a mammalian system and so they pose no additional hazard, as they are not recognised by their current <i>E.coli</i> host. |
| <hr/> | |
| Despite the inherently random nature of the material received, none of the processes being carried out under this proposal will alter the pathogenicity of the host, therefore no additional hazards are predicted. | |
| <hr/> | |
| 6. Provisional Class/containment level (in particular taking account of the biological agents hazard group and other classification scheme for pathogens). | All host cells are envisaged to be disabled <i>E.coli</i> K12 strains and the vectors disabled. The inserts will not increase the pathogenicity of the host and therefore Class1 is appropriate. In addition, all customers sending materials to the DNA sequencing team will be required to declare that the material is appropriate for handling under containment level 1. |
| This step will often involve considering the containment level necessary to control the risk of the host and making a judgement about whether the modification will result in a GMM which is more hazardous, | |

less hazardous or about the same.
 Sometimes it might help to compare the GMM with the relative hazard presented by other organisms.

7. Environment and activity considerations.

This includes an estimation of the likelihood that hazards will be realised. Given that the provisional Class (and hence containment level) has already been decided it helps to bear this in mind when deciding how likely a harmful event is.

Use these considerations of likelihood to revise the provisional containment so that all risks are controlled to low or effectively zero.

Double check that all hazards are properly controlled by the proposed containment.

It is envisaged that the vectors involved in this service will be non-mobilisable and the associated hosts disabled. Therefore it is considered that the likelihood of environmental hazards are negligible, making the estimation of risk effectively zero. All work can be effectively and safely performed under containment level 1 facilities.

8. Assign final activity Class.

This is done by comparing the containment and control measures identified as necessary to control the risk with the table of containment in the Regulations.

Containment Level 1, with no additional precautions required.

Final Class/containment level:

1

9. ALL persons involved in GM work (give experience or name of trainer if not already experienced):

All new staff members are fully trained according to Geneservice H&S regulations by Helen Longland. The Biological Safety aspects of the H&S regulations are enforced under the guidance of the Biological Safety Officer: A.J.Walker.

Leaves, Nicholas.

Ang, C-E.

Mayes, S.

Osbourne, M.

Jones, C.

Bevan, S.

Brooking, J.

Beighton, G.

10. Notes (including any abbreviations used):

None

If work involves transgenic animals and is not exempt, give Licence number:

This return was prepared by A.J.Walker BSO, in consultation with Dr ChengEng Ang, Services Manager.

11. Signed:

Date:

Andrew Walker, BSO, Geneservice Ltd

12. Signed:

Date:

Nicholas Leaves, Chief Operations Director, Geneservice Ltd

13. Comments of Biological Safety Committee:

This service aims to sequence already cloned DNA templates, which are sent in by customers. The cloned DNA is effectively random, as far as the service is concerned, but will already have been cloned into the appropriate host/vector system. Once received, the service grows up small volumes of the cells, to obtain a sufficient quantity to extract the DNA and then sequence it. The host/vector systems are all standard and since the inserts are highly unlikely to enhance the pathogenicity, the work is correctly assessed as

Class 1.

One additional factor is that some DNAs could be potentially hazardous and it is recommended that all naked DNA should be handled appropriately to cover this hazard, ie DNA should be handled as set out in

the ACGM Compendium of Guidance, Part 3A, Annex I, paras. 8-10; ie gloves should be worn, sharps avoided and all wastes be rendered harmless before disposal.

Clearance has been given by the GMSC that work can be started, pending receipt from the HSE.

14. Signed:

Date: