**Containment Level Flowchart**

# Applying for a Registration Document from the Institutional Biosafety Committee (IBC) to use Recombinant DNA and / or Infectious Agents

The key element of information that an investigator must determine and provide to the IBC in the application process is the level of containment required for the proposed activity.

If you are going to use recombinant DNA (rDNA), finding the appropriate section of the NIH Guidelines can be a challenge. We hope the following information will help you.

# Flow chart to determine Risk Level and Section of NIH Guidelines

The NIH Guidelines are online at the following link:

<https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf>.

To determine which section of the Guidelines apply, you should ask the four following questions:

* Is rDNA to be put in an organism?
* What is the nature of the gene(s) to be cloned?
* What is the nature of the host and vector to be used?
* Does the experiment involve cultures of more than 10 liters?

# Do you intend to put recombinant DNA into another organism - bacteria or other cells (i.e., clone it)?

YES

Please see question two.

NO—I am only using PCR or an oligonucleotide synthesizer to make DNA, therefore the experiment is exempt. Section III-F-1

\*\*NOTE: Even “exempt experiments” should be performed under BL-1

containment conditions.

# What is the nature of the DNA to be cloned?

It produces a TOXIN molecule that is lethal for vertebrates at an LD50 of less than 100 ng/kg body weight. This is a Section III-B experiment, which requires direct NIH/ORDA approval.

It is from RISK GROUP 2, 3, 4, or a restricted agent. This experiment will fall under Section III-D-2, or Section III-F. Please continue to question three.

NONE OF THE ABOVE - continue for additional information

# What is (are) the host(s)/vector(s)?

IF ALL HOSTS TO BE USED ARE:

* + Non-pathogenic laboratory strains of E. coli K-12 OR
  + Laboratory strains of Saccharomyces cerevisiae OR
  + Cultured cell lines (not expressing viral genes)

The experiment may be exempt (Section III-F-6), IF it does NOT involve cloning genes from Risk Group 2, 3, 4, OR restricted agents, OR viral genes.

It may also be exempt if all components of the rDNA molecule come from the same species (Section III-F-3 or –4), or from species that naturally exchange DNA (Section III-F-5).

# 3.1. What is (are) the host(s)/vector(s)?

IF A HOST OR VECTOR is in Risk Group 2, 3, 4, or a Restricted Agent Section III-D-1 applies.

IF AN INFECTIOUS VIRUS is being used as a vector OR a DEFECTIVE VIRUS is being used in the presence of a helper virus or helper cells (e.g., 293 cells)

Section III-D-3 applies.

# 3.2. What is (are) the host(s)/vector(s)?

IF ANIMALS are to be used — either transgenic animals OR animals as hosts to test viable rDNA-modified microorganisms. Section III-D-4 applies.

\*\*NOTE: The box on the IBC form indicating use of animals must be checked

and an IACUC form must be completed if vertebrate animals are to be used.

* Section III-D-4-a: introduction of DNA other than two-thirds of eukaryotic viral genome into a non-human animal;
* Section III-D-4-b: includes introduction of larger viral segments; does not include Risk Group 2, 3, 4 or restricted agents;
* Section III-D-4-c: exceptions for transgenic rodents (see Section III-E-3).

# 3.3. What is (are) the host(s)/vector(s)?

IF PLANTS are to be used — transgenic plants OR plants to be used to test rDNA-modified microorganisms or insects:

Section III-D-5 applies: if experiments will employ exotic infectious agents that may have serious detrimental impact on managed or natural ecosystems

Section III-E-2-a applies: for r-DNA modified plants that are not noxious weeds or for experiments with plants and rDNA-modified non-exotic microorganisms

Section III-E-2-b applies: for

1. rDNA-modified noxious weeds;
2. plants modified by entire genomes of non-exotic infectious agents;
3. plants associated with rDNA- modified nonexotic microorganisms with a potential for detrimental effects;
4. plants associated with rDNA modified exotic microorganisms;
5. experiments with rDNA- modified arthropods or small animals or modified microorganisms associated with arthropods or small animals

# Does the experiment involve cultures of more than 10 liters?

YES, Section III-D-6 applies.

Remember that the complete NIH Guidelines are online at the following link: [https://osp.od.nih.gov/wp-content/uploads/NIH\_Guidelines.pdf](https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf.)

If you have difficulty determining the Section of the Guidelines that apply to your proposed rDNA activity, contact the University Research Compliance Office or a member of the IBC for assistance.