Guidelines for Principal Investigators Working with Recombinant or Synthetic Nucleic Acids

According the NIH Guidelines, recombinant or synthetic DNA molecules are defined as either: (i) molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or (ii) molecules that result from the replication of those described in (i). It is the responsibility of each investigator to make sure that his/her laboratory is in compliance with the NIH guidelines. Work with nucleic acids that fall under these guidelines must be reviewed by the Institutional BioSafety Committee (IBC), as described below. Work with recombinant nucleic acids that do not meet these criteria, such as the use of plasmids to express genes in mammalian cells, may be exempt from IBC review. If your experiments require registration with the IBC, check the Guidelines for the appropriate biosafety level and relevant section. For additional information, copies of the Guidelines or registration forms, or if you are unsure into which category your experiments fall, please contact the University of Utah Biosafety Officer (BSO), Dr. Neil Bowles, or Associate BSO, Derek Hedquist, at (801) 581-6950 or biosafety@ehs.utah.edu.

Experiments which must be registered and approved by the IBC prior to initiation

- Deliberate transfer of a drug trait to a microorganism not known to acquire it naturally (if it could compromise the use of the drug to control disease agents in humans, animal or agriculture).
- Human gene transfer experiments.
- Cloning of DNA encoding molecules lethal to vertebrates at an LD 50 of <100ug/kg body weight.
- Cloning using human or animal pathogens as host-vector systems.
- Cloning of DNA from all Risk Group 3, 4 or restricted human or animal pathogens (including HIV and related viruses, and human tumor viruses).
- Experiments using more than 2/3 of the genome of infectious animal or plant viruses or defective viruses grown in the presence of helper virus.
- Recombinant DNA experiments involving whole animals or plants.
- Large scale DNA project (>= 10 liters of culture combined).

Experiments that require IBC registration simultaneous with initiation

- Experiments using as vectors <= 2/3 of the genome of a eukaryotic virus, free of helper virus
- Low risk plant rDNA experiments
- BL1 transgenic or knockout rodent experiments. (Note: the purchase of transgenic rodents for BL1 experiments is exempt from registration).

Exempt experiments that require registration but not IBC review

- rDNA containing less than 1/2 of an eukaryotic viral genome propagated in cell culture. The following categories are not exempt from the *NIH Guidelines*: (i) experiments described in Section III-B which require NIH/OBA and Institutional Biosafety Committee approval before initiation, (ii) experiments involving DNA from Risk Groups 3, 4, or restricted organisms (see Appendix B, *Classification of Human Etiologic Agents on the Basis of Hazard*, and Sections V-G and V-L, *Footnotes and References of Sections I through IV*) or cells known to be infected with these agents, (iii) experiments involving the deliberate introduction of genes coding for the biosynthesis of molecules that are toxic for vertebrates (see Appendix F, *Containment Conditions for Cloning of Genes Coding for the Biosynthesis of Molecules Toxic for Vertebrates*), and (iv) whole plants regenerated from plant cells and tissue cultures are covered by the exemption provided they remain axenic cultures even though they differentiate into embryonic tissue and regenerate into plantlets.
- rDNA work involving E.coli K12, S. cerevisiae, and B. subtilis host-vector systems. The following categories are not exempt from the *NIH Guidelines*: (i) experiments described in Section III-B which require NIH/OBA and Institutional Biosafety Committee approval before initiation, (ii) experiments involving DNA from Risk Groups 3, 4, or restricted organisms (see Appendix B, *Classification of Human Etiologic Agents on the Basis of Hazard*, and Sections V-G and V-L,

Footnotes and References of Sections I through IV) or cells known to be infected with these agents may be conducted under containment conditions specified in Section III-D-2 with prior Institutional Biosafety Committee review and approval, (iii) large-scale experiments (e.g., more than 10 liters of culture), and (iv) experiments involving the deliberate cloning of genes coding for the biosynthesis of molecules toxic for vertebrates (see Appendix F, *Containment Conditions for Cloning of Genes Coding for the Biosynthesis of Molecules Toxic for Vertebrates*).

- Those synthetic nucleic acids that: (1) can neither replicate nor generate nucleic acids that can replicate in any living cell (e.g., oligonucleotides or other synthetic nucleic acids that do not contain an origin of replication or contain elements known to interact with either DNA or RNA polymerase), and (2) are not designed to integrate into DNA, and (3) do not produce a toxin that is lethal for vertebrates at an LD50 of less than 100 nanograms per kilogram body weight. If a synthetic nucleic acid is deliberately transferred into one or more human research participants and meets the criteria of Section III-C of the **NIH Guidelines** (http://osp.od.nih.gov/sites/default/files/NIH_Guidelines.html), it is not exempt under this Section.
- Other types of experiment that fall under Section-III-F of the **NIH Guidelines** (http://osp.od.nih.gov/sites/default/files/NIH_Guidelines.html
- See the *FAQs* (http://osp.od.nih.gov/sites/default/files/Experiments_that_are_Exempt_from_the_NIH_Guidelines.pdf) on the NIH OBA website for more details