GUIDE TO NIH SECTIONS III-D thru III-F

Section III-D - Requires Dartmouth IBC Approval

Section	Subsection	Research Application Description	Comments
III-D-1		Experiments using Risk Group (RG) 2, 3, or 4, or Restricted Agents as host-vector systems	USDA/APHIS permit may be required for work with certain plant or animal pathogens. See http://www.aphis.usda.gov/.
	III-D-1-a	rDNA into RG2 agents	Usually conducted at BSL-2/ABSL-2
	III-D-1-b	rDNA into RG3 agents	Usually conducted at BSL-3/ABSL-3 [1]
	III-D-1-c	rDNA into RG4 agents	Usually conducted at BSL-4/ABSL-4 [1]
	III-D-1-d	rDNA into restricted agents	Containment determined on a case-by-case basis following NIH/OBA review
III-D-2		Experiments in which DNA from Risk Group 2, 3, or 4, or Restricted Agents is cloned into nonpathogenic prokaryotic or lower eukaryotic host-vector systems	
	III-D-2-a	rDNA from RG2, RG3, or RG4 agents	BSL-2 containment for cloning from RG2 or RG3 pathogens; specific lowering to BSL-1 may be approved by the IBC BSL-2 for cloning from RG4 agents only after demonstration that a totally & irreversibly defective fragment of the agent's genome is present in a given recombinant; otherwise BSL-4 [1] required.
	III-D-2-b	rDNA from restricted agents	Containment determined on a case-by-case basis following NIH/OBA review
III-D-3		Experiments involving the use of infectious DNA or RNA viruses or defective DNA or RNA viruses in the presence of helper virus in tissue culture systems	
	III-D-3-a	Infectious/defective RG2 viruses with helper virus	Usually conducted at BSL-2
	III-D-3-b	Infectious/defective RG3 viruses with helper virus	Usually conducted at BSL-3 [1]
	III-D-3-c	Infectious/defective RG4 viruses with helper virus	Usually conducted at BSL-4 [1]
	III-D-3-d	Infectious/defective restricted poxviruses with helper virus	Containment determined on a case-by-case basis following NIH/OBA review
	III-D-3-e	Viruses not covered in III-D-3-a through III-D-3-d	Usually conducted at BSL-1
III-D-4		Experiments involving whole animals in which the genome has been altered by stable introduction into the germ-line (transgenic animals) and experiments involving viable rDNA-modified microorganisms tested on whole animals	
	III-D-4-a	rDNA from any source except for > 2/3 of eukaryotic viral genome	Usually conducted at BSL-1; viral vectors must not lead to transmissible infection
	III-D-4-b	rDNA involving whole animals and not covered by III-D-1 or III-D-4-a	Appropriate containment decided by the IBC
	III-D-4-c-(1)	Generating transgenic rodents that require BSL-1 containment	Covered under Section III-E-3
	III-D-4-c-(2)	Purchase or transfer of transgenic rodents	Exempt under Section III-F-6, Appendix C-VI
III-D-5		Experiments involving whole plants – genetically engineering plants by rDNA methods, using or propagating such plants, using plants with microorganisms or insects containing rDNA	
	III-D-5-a	Exotic plant pathogens with recognized potential for serious detrimental impact on ecosystems	Usually conducted at BSL-2+P/BSL-3P
	III-D-5-b	Readily transmissible exotic agents in which the complete and functional genome may be reconstituted *in planta*	Usually conducted at BSL-2+P/BSL-3P
	III-D-5-c	Readily transmissible exotic agents in the presence of their arthropod vector	Usually conducted at BSL-4P [1]
	III-D-5-d	Sequences encoding potent vertebrate toxins introduced into plants or associated organisms	Usually conducted at BSL-3P [1]
	III-D-5-e	Microbial pathogens of insects or small animals associated with plants	Usually conducted at BSL-2+P/BSL-3P [1]
III-D-6		Experiments involving > 10 liters of culture	Containment to be decided by IBC; see Appendix K for containment conditions
III-D-7		Experiments involving influenza viruses	Conducted at the containment level corresponding to the RG of the virus that is the source of the majority of segments
	III-D-7-a	Human H2N2 (1957-1968)	BSL-3+ for viruses containing H2 hemagglutinin (HA) segment [1] BSL-2 for H2 HA gene in cold-adapted, live attenuated vaccine strains and for H2N2 genes other than HA

	III-D-7-b	Highly pathogenic avian influenza H5N1	Usually conducted at BSL-3+ [1]
	III-D-7-c	1918 H1N1	Usually conducted at BSL-3+ [1]
	III-D-7-d	Antiviral susceptibility for genes from viruses in III-D-7-a through III-D-7-c	Higher containment may be required if any of the genes are resistant to both classes of current antiviral agents (adamantanes and neuraminidase inhibitors)

[1]BSL-3 or 4 agents cannot be used at Dartmouth College

Section III-E - Requires Dartmouth IBC Approval

Section	Subsection	Research Application Description	Comments
III-E		All components derived from non-pathogenic prokaryotes and non-pathogenic lower eukaryotes	BSL-1
III-E-1		Formation of rDNA molecules containing no more than 2/3 of the genome of any eukaryotic virus	BSL-1, provided that cells lack helper virus for the specific families of defective virus being used
III-E-2		rDNA-modified plants or rDNA-modified microorganisms associated with plants not covered in sections III-A, III-B, III-D or III-F	
	III-E-2-a	rDNA-modified plants that are not noxious weeds and rDNA-modified non-exotic microorganisms (e.g. Rhizobium and Agrobacterium spp.)	BSL-1P
	III-E-2-b-(1)	Noxious weeds or can interbreed with noxious weeds in the immediate area	BSL-1+P/BSL-2P
	III-E-2-b-(2)	Plants containing complete genome of non-exotic infectious agent	BSL-1+P/BSL-2P
	III-E-2-b-(3)	Plants associated with rDNA-modified non-exotic microorganisms that have potential for serious detrimental impact on ecosystems	BSL-1+P/BSL-2P
	III-E-2-b-(4)	Plants associated with rDNA-modified non-exotic microorganisms that have no potential for serious detrimental impact on ecosystems	BSL-1+P/BSL-2P
	III-E-2-b-(5)	rDNA-modified arthropods or small animals associated with plants or arthropods or small animals with rDNA-modified microorganisms associated with them if the microorganism has no potential for serious detrimental impact on ecosystems	BSL-1+P/BSL-2P
III-E-3		Creation of transgenic rodents	BSL-1; experiments requiring BSL-2 or higher covered under section III-D-4
	III-E-3-a	Breeding of BSL-1 transgenic rodents	Exempt under Section III-F-6, Appendix C-VII

Section III-F - Exempt from the NIH Guidelines, but still reviewed by the Dartmouth IBC

Section	Subsection	Research Application Description	Comments
III-F		Exempt experiments involve rDNA molecules that:	
III-F-1		Are not in organisms or viruses	
III-F-2		Consist entirely of DNA from single nonchromosomal or viral DNA source (one or more segments may be synthetic equivalent)	
III-F-3		Consist entirely of DNA from prokaryotic host when propagated only in that host (or closely related strain of the same species) or when transferred to another host by well-established physiological means	
III-F-4		Consist entirely of DNA from a eukaryotic host (excluding DNA from viruses) when propagated only in that host (or closely related strain of the same species)	
III-F-5		Consist entirely of DNA from different species that exchange DNA by known physiological processes (one or more segments may be synthetic equivalent)	See Appendix A for list of natural exchangers
III-F-6		Do not present significant risk to health or environment	Appendix C
	App C-1	rDNA containing < ½ of any eukaryotic viral genome in tissue culture	Exceptions: Experiments described in Sections III-A or III-B, those involving RG3, 4, or restricted agents, large-scale experiments, or cloning of toxin molecule genes coding for biosynthesis of molecules toxic for vertebrates
	App C-II	*E. coli* K-12 host-vector systems	Same exceptions as C-1
	App C-III	*Saccharomyces* host-vector systems	Same exceptions as C-1
	App C-IV	*Bacillus subtilis* or *Bacillus licheniformis* host-vector systems	Same exceptions as C-1

	App C-V	Extrachromosomal elements of listed gram positive organisms propagated and maintained in gram positive organisms	See App C-V for listSame exceptions as C-1
	App C-VI	Purchase or transfer of transgenic rodents	Only applies to rodents requiring BSL-1 containment
	App C-VII	Breeding of two different transgenic rodents or breeding of a transgenic rodent with a non-transgenic rodent	Requirements: 1) Both parental rodents require BSL-1 containment, 2) Neither parental rodent contains incorporation of > ½ of the genome of an exogenous eukaryotic virus or incorporation of a transgene under control of a gammaretroviral long terminal repeat (LTR) and, 3) Rodent resulting from the breeding not expected to contain > ½ of an exogenous viral genome