

## ANIMAL BIOSAFETY REFERENCE GUIDE

EXPERIMENTAL ACTIVITY	MINIMAL ANIMAL BIOSAFETY LEVEL (applicable to housing, cage changes)	MINIMAL BIOSAFETY LEVEL (BSL) (applicable to administration, other procedures, necropsy)
<b>Creation of Transgenic or Knockout Animals</b>		
By commercial vendor or external institution	Not applicable	N/A
On campus	Contact the IBC Office	Contact the IBC Office
<b>Purchase or Transfer of Transgenic or Knockout Animals</b>		
Purchase or transfer of animals	ABSL-1 or higher (As determined by source)	N/A
<b>Breeding or Maintenance of Transgenic or Knockout Animals</b>		
Breeding animals from one strain (propagation/colony maintenance) or two strains (generating new strain)	ABSL-1 or higher (Depending on nature of the <b>genetic modification</b> <sup>1</sup> )	BSL-1 or higher
<b>Administration of Cells or Tissues to Animals (Transgenic or Otherwise)</b>		
Unmodified host species (i.e. endogenous) cells	ABSL-1	BSL-1
Host species cells transduced with <b>ecotropic</b> <sup>2</sup> <b>retroviral vectors</b>	ABSL-1	BSL-2
Host species cells transduced with <b>amphotropic</b> <sup>3</sup> or <b>pantropic</b> <sup>4</sup> <b>retroviral vectors</b>	ABSL-2 for 72 hours then ABSL-1	BSL-2
Host species cells transduced with <b>adenovirus vectors</b>	ABSL-2 for 72 hours then ABSL-1	BSL-2
Host species cells transduced with <b>adeno-associated virus vectors</b>		
contains less than 2/3 of a eukaryotic virial genome, <b>AND</b> does not express potentially toxic product (e.g., toxin, oncogene)	ABSL-1	BSL-1
contains more than 2/3 of a eukaryotic virial genome, <b>OR</b> expresses potentially toxic product	ABSL-2 for 72 hours then ABSL-1	BSL-2
<b>Unmodified (established)</b> human cell lines into <b>immunocompromised animals</b>	ABSL-1	BSL-2
<b>Modified</b> <sup>5</sup> human cell lines into <b>immunocompromised animals</b>	ABSL-2 for 72 hours then ABSL-1	BSL-2

<b>Patient derived</b> human cells or tissues (i.e. PDX models)	ABSL-2	BSL-2
<b>Administration of Recombinant Viruses to Animals (Transgenic or Otherwise)</b>		
Consult <a href="#">Viral Vector Biosafety Reference Guide</a>		
<b>Administration of Microorganisms to Animals (Transgenic or Otherwise)</b>		
Microorganisms assessed to be <b>Risk Group (RG) 1 organisms</b> (ex. <i>Bacillus subtilis</i> , <i>Bacillus licheniformis</i> , <i>E. coli</i> strains lacking O antigen, active virulence or colonization factors, or modified to possess genes encoding active virulence or colonization factors)	ABSL-1	BSL-1
Microorganisms assessed to be <b>Risk Group (RG) 2 (or higher) organisms</b>	ABSL-2 (or higher depending on RG)	BSL-2 (or higher depending on RG)
<b>Modified microorganisms</b> known or hypothesized to increase the microorganism's pathogenicity	ABSL-2 (or higher)	BSL-2 (or higher)
Microorganisms <b>modified with drug resistance phenotype</b> compromising the use in veterinary medicine	Set by NIH (case by case)	Set by NIH (case by case)

<sup>1</sup> Higher containment levels are typically required if the modification (a) results in a tumorigenic phenotype (overexpression of an oncogene or inactivation/deletion of a tumor suppressor); (b) results in expression of a toxin or other hazardous agent; (c) incorporates a transgene that is under the control of a gamma-retroviral long terminal repeat (LTR); (d) incorporates more than one-half of the genome of an exogenous eukaryotic virus from a single family of viruses; OR (e) results in progeny containing more than one-half of an exogenous viral genome from a single family of viruses.

<sup>2</sup> Viruses that are only infectious in the host species

<sup>3</sup> Viruses that can infect more than one species

<sup>4</sup> Viruses that can infect various tissues

<sup>5</sup> Modifications include stable or transient genetic modifications, labeling, membrane loading, etc.