Vectors/Biosafety Levels currently approved by the IBC

Agent	In vitro	In vivo (mice, rats)				Notes
		Administration/ sample collection		Housing/ Husbandry		
		ABSL2	ABSL1	ABSL2	ABSL1	
Adeno-associated virus (AAV) vectors	BSL1		X		X	- 'Most adults (85-90% in the USA) are seropositive…not an etiological agent for disease.' (Tenenbaum, L. et al.) - BSL2 if adenoviruses used in production - BSL2 if express oncogenes or silence tumor suppressors
Adenovirus vectors	BSL2	X		X (mucosal routes)	X (non-mucosal routes)	- Generally E1-deleted (E1a and partial E1b) or E1-E3-deleted - Replication-competent virus is commonly present - For human serotypes, mice are not permissive for infection
Baculovirus vectors	BSL1					- Not a human pathogen - No VV form required
Feline immuno-deficiency virus (FIV) vectors	BSL2	X			X	- See Lentivirus vectors - VSV-G pseudotyped allows entry into non-feline cells
Herpes simplex virus (HSV) vectors	BSL2	X		X		Vectors developed with helper viruses can be cytopathic on transduced cells (Wang et al.)
Lentivirus vectors	BSL2	X		X (mucosal routes)	X (non-mucosal routes)	- BSL2+ if express oncogenes or silence tumor suppressors - Lentiviruses insert themselves into the host's genome, risk of insertional mutagenesis - Newer 'self-inactivating vectors …no serious adverse events since first use in (human) clinical trials in 2006'. (ref: Cavazzana M et al.) (SIN = truncated 3'LTR)

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		Administration/ sample collection		Housing/ Husbandry		
		ABSL2	ABSL1	ABSL2	ABSL1	
Rabies virus vectors	BSL2	X		X		- G-deleted and/or pseudotyped with an avian virus envelope - Rabies vaccine offered
Retrovirus vectors	BSL2 (amphotropic or VSV-G pseudotyped) BSL1 (ecotropic)					- MMLV- or MSCV-based - BSL2+ if pseudotyped and express oncogenes or silence tumor suppressors - Retroviruses insert themselves into the host's genome, risk of insertional mutagenesis - Insertional mutagenesis due to retroviral vectors has occurred in human gene therapy (Kaiser J.)
Sindbis virus vectors	BSL2	X		X		- Infect a wide range of cells and species - Ability to cause cell death and tropism for tumor cells attractive for cancer therapy (Quetglas et al.)
Vaccinia virus vectors	BSL2	X		X		- Generally replication-competent - Vaccinia vaccine offered
Vesicular Stomatitis Virus	BSL2					- G-deleted
Transduced human cells/cell lines*	BSL2	X		X		
Transduced mouse cells/cell lines*	BSL1		X		X	

* Cells transduced with viral vectors must be handled at the vector's BSL until the vector and its genetic material has been fully integrated into the cell's DNA by one of the following methods:

1) the cells have been washed with growth media to remove extraneous viral vector or

2) the viral vector has been inactivated by treating the transduced cells with trypsin (>0.1%) or human serum.

After the vector has been integrated and free virus removed, the BSL may be lowered to that of the cell pre-transduction.