OCCUPATIONAL AND ENVIRONMENTAL HEALTH AND SAFETY
THE UNIVERSITY OF UTAH

FACT Sheet

Recombinant Herpes Viral Vectors

The following provides information on the use and containment of recombinant herpes viral vectors. Investigators should use these guidelines as part of their risk assessment when planning experiments with these vectors and preparing applications to the Institutional Biosafety Committee (IBC). Note the listed containment levels are the minimum that should be employed with these vectors: some experiments, such as the expression of toxins or oncogenes, may require higher levels of containment. The appropriateness of the containment should be considered as part of the investigator's risk assessment and will be reviewed by the IBC.

NIH Risk Group	RG2 Herpesviruses are enveloped, icosahedral, double-stranded linear DNA viruses.
Biocontainment Level	BSL-2
Infectious to Humans/Animals	Yes
Route of Transmission	HSV-1 is typically transmitted by saliva or by the infection on hands of healthcare personnel. HSV-2 is typically transmitted through sexual contact. HSV can be transmitted by direct contact with epithelial or mucosal surfaces.
Laboratory Hazards	In the laboratory, HSV can be transmitted by ingestion, parenteral injection, droplet exposure of the mucous membranes (eyes, nose or mouth), and inhalation of aerosolized materials.
Disease	Depends on type: • Oral Herpes • Genital Warts • Herpes esophagitis • Herpes encephalitis or meningitis
Treatment/Prophylaxis	Antivirals may reduce shedding
Pathogenesis	After infection, the viruses are transported along sensory nerves to the nerve cell bodies, where they reside lifelong. Causes of recurrence may include: decreased immune function, stress, and sunlight exposure. The first episode is often more severe and may be associated with fever, muscle pains, swollen lymph nodes and headaches. Over time, episodes of active disease decrease in frequency and severity

Replication Competent	All versions of HSV vectors are prone to recombination. Additionally, approximately 50% - 90% of adults possess antibodies to HSV type 1; 20% - 30% of adults possess antibodies to HSV type 2. This is a concern since reactivation from latency is not well understood. Infection by HSV vectors into latently infected cells could potentially reactivate the wild-type virus, or spontaneous reactivation of a latent infection could produce an environment where replication defective vectors could replicate.
RCV Testing	Viral preparations used for *in vitro* studies should be tested every 6 months for replication competent viruses by plaque assay. These assays should be tested at a sensitivity limit of 1 infectious unit per mL.
Disinfection	Effective disinfectants require a minimum of 20 minutes contact time. Use one of the following: • RECOMMENDED: Sodium hypochlorite (0.5%: use 1:10 dilution of fresh bleach) • 5% Phenol • 70% Ethanol or Isopropanol
Animals	ABSL-2: Animals will be maintained at ABSL-2 for the duration of the study. Animals must be injected in a Biological Safety Cabinet. All bedding, waste and animals infected with HSV shall be treated as biohazardous. After all animals are removed from their primary enclosure immediately autoclave or treat with chemical disinfectant. After disinfection, dump the cage contents and begin cleaning the cage for re-use. All waste must be decontaminated by autoclaving or chemical disinfection prior to disposal. Animal carcasses must be placed in autoclave bags and be designated for infectious waste disposal. All necropsies must be performed in a designated room using animal BSL-2 practices and procedures. Animal cages must be labeled with a biohazard sign.

Sources:
http://web.stanford.edu/dept/EHS/prod/researchlab/bio/docs/Working_with_Viral_Vectors.pdf
http://www.dartmouth.edu/~ehs/biological/biosafety_docs/110_1_ibc_viral_vector_policy.pdf