STANDARD OPERATING PROCEDURE #703

USE OF VIRAL VECTORS IN NEUROSCIENCE - RODENTS

1. PURPOSE

This Standard Operating Procedure (SOP) describes the guidelines for the use of Adeno-Associated viral vectors, Lentiviral vectors, G-deleted Rabies viruses, and Herpesviral vectors delivered directly to the central nervous system (CNS) via intracranial injection in rodents.

2. CONSIDERATIONS

Viral vectors are used to transfect organisms and cell lines with new genes.

Adeno-associated viral vectors:

- Classified as Risk Group 1 agents by the Public Health Agency of Canada (PHAC).
- Not pathogenic to humans; they cannot replicate without a helper virus (adenovirus or herpesvirus).
- They are defective and cannot replicate and be shed, even in presence of a helper virus.

Lentiviral vectors:

- Classified as human and animal Risk Group 2 (RG2) biological agent by the Public Health Agency of Canada (PHAC).
- Lentiviral vectors are replication defective.
- Risk of exposure is associated to self-injection and droplets in contact with mucosa. Potential consequence is oncogenesis.
- Animals do not support replication of human lentiviruses.

G-deleted rabies viruses:

- Classified as human and animal Risk Group 2 (RG2) biological agent by the Public Health Agency of Canada (PHAC).
- Are not pathogenic to humans.
- The rabies virus has been modified to render it less hazardous and cannot infect mammalian cells.

Herpesviral vectors:

- Classified as human and animal Risk Group 2 (RG2) biological agent by the Public Health Agency of Canada (PHAC).
- Herpes Simplex Virus Type 1 (HSV-1) based vectors are most commonly used.
- Herpesviral vectors are replication defective.

The use of viral vectors must be described in an approved Animal Use Protocol (AUP).

The risk assessment of the gene insert, i.e., does the viral vector encode for an oncogenic or toxic protein, is done on a case-by-case basis and is part of the Environmental Health and Safety “Application to Use Biohazardous Materials”, in an Appendix which evaluates the risks of viral vectors, prior to issuing a biohazard certificate.