

Adeno-Associated Virus Guidelines for FIU Laboratories

General Description

Adeno-associated viruses (AAV) belong to the family Parvoviridae. They are non-enveloped, single-stranded DNA viruses that can only replicate in the presence of a helper virus, adenovirus (Ad), herpes virus, or vaccinia. Wild-type AAV may integrate into the host-cell genome (preferentially into human chromosome 19) and remain latent until a helper virus supplies the necessary genes for replication. AAV-vector characteristics include:

- A limited cloning capacity (~4.5kb).
- Ability to be produced in high titers.
- Ability to infect a broad range of cells.
- Long-term (stable) expression from randomly integrated sequences or episomal sequences.
- Replication in the presence of wild-type AAV and of a helper virus.

Potential Health Hazards

- AAV is not associated with any human disease; however, there is evidence of AAV infection in the human embryo and an association of AAV with male infertility.
- A significant correlation was found between the presence of AAV DNA in amnion fluids and premature amniorrhexis (rupture of the amnion) and premature labor.
- Contrary to wild-type AAV which readily integrate into the AAVS1 site on human chromosome 19, recombinant AAV which lack the Rep protein maintained extrachromosomally. As such, recombinant AAV have a very low likelihood of non-homologous integration.

Laboratory Hazards

- Inhalation of aerosolized droplets, mucous membrane contact, parenteral injection, or ingestion.
- No specific treatment for infection with AAV.
- Hand washing after removal of gloves and before leaving the work area, no mouth pipetting, no food or drink in refrigerators where material is stored, no eating/drinking in work area etc.

Biosafety Containment

- Construction of AAV with helper virus should be performed at BSL2 within BSC.
- Once constructed, AAV may be manipulated at BSL1.
- PPE required for manipulation at BSL1 or BSL2: eye protection, lab coat, disposable gloves.

- Animal procedures may be conducted using ABSL1 practices and containment.
- Animal housing must be maintained at ABSL-1.
- ABSL-2 containment is required if helper virus is present.
- When performing work with animals, IACUC guidelines for PPE should be followed.

Disinfection

Susceptible to:

- 0.5% Sodium hypochlorite, 2% Glutaraldehyde and 5% Phenol.
- Autoclave for 30 minutes at 121°C under 15 lbs. per square inch of steam pressure.
- **Freshly prepared** 10% household bleach recommended.
- Alcohol is **NOT** an effective disinfectant against AAV.

Debris generated as part of the cleaning and disinfection process will be transferred to a biohazard collection container lined with a red biohazard bag. When full, this containers will be submitted to EH&S for off-site disposal by the FIU biological waste vendor.

Special Precautions for Pregnant Laboratory Workers

Please remember that particular reproductive risks and hazards may exist within certain FIU laboratory facilities and that you are a critical component in safeguarding your reproductive health--this applies to both men and women. In addition, laboratory workers who are pregnant or attempting to become pregnant need to take extra precautions to promote the best possible outcome of the pregnancy. The following guidelines are highly recommended:

- Consult with your personal physician about your work conditions.
- Clear communication and cooperation among the laboratory worker, PI or Laboratory Manager.
- Strictly adhere to the safety guidelines in the FIU Chemical Hygiene Plan.

Spill and Accident Response Procedure

- Place absorbent towel over spill and apply freshly prepared 10% bleach solution over entire area, allowing contact time of 30 minutes.
- Place all clean-up materials into biohazard bag. Contact EHS.

Personal Exposure to Biohazards

- In case of skin exposure, wash skin with soap and water.
- In case of eye exposure, rinse with water at emergency eyewash station for 10 minutes.

- In case of sharps stick, encourage bleeding then wash with soap and water.
- Report exposure immediately by calling the FIU Biosafety Officer at 305-348-0489.

Trainings

All laboratories are required to complete the core training modules. Visit <https://ehs.fiu.edu/training> to identify the required proper training for lab personnel.