Safe Work Practice

Animal Perfusions

1.0 Hazard Description

Conducting perfusions in projects with animals can have the potential to cause injury or illness in humans and animals or harm to the environment. Federal and provincial safety regulations required that Principal Investigators (PIs) conduct a hazard assessment for their project, which includes chemical hazards.

In general, perfusions involve additional hazards than typically animal work. The first is the use of formaldehyde, which is an irritant, sensitizer, and known carcinogen. Depending on the type of animal, the process can also introduce larger amounts of a chemical than would typically be used in an animal project. For these reasons, additional precautions must be taken.

If the PI identifies animal perfusions in their Animal Use Protocol (AUP), they must review this Safe Work Practice (SWP). PIs must incorporate the required controls identified in these documents into their hazard assessment and subsequent project-specific Standard Operating Procedures (SOPs) as detailed in the Animal Research, Teaching and Testing Projects SWP (EHS-SWP-101).

1.1 Hazard Assessment Considerations

1. When conducting a hazard assessment of perfusion activities, the PI must consider whether project plans or experimental activities will pose a risk to the employees, animals, or environment. Considerations include:
   - **Irritant** – Formaldehyde is a known irritant and can cause skin, eye, and respiratory irritation from both contact and inhalation.
   - **Sensitizer** – Formaldehyde is a known skin and respiratory sensitizer. This means that exposure through skin contact or inhalation could cause an immune reaction to the substance. Once an employee has become sensitized, any future exposure, even in small quantities, can trigger the immune reaction.
   - **Carcinogen** – Known carcinogens are hazardous regardless of the amount of exposure. It is important to keep exposure as low as reasonable achievable (ALARA) when handling carcinogens.
   - **Larger quantities** – When handling larger quantities of chemicals, it is important to take additional precautions to protect employees.
2.0 Minimum Hazard Controls

In addition to the Minimum Requirements listed in the Animal Research, Teaching and Testing Projects, and Animal Projects with Chemicals (EHS-SWP-140) SWPs, PIs working with pressurized gases must abide by the following:

2.1 Elimination/Substitution

1. Appropriate substitutions or eliminations of a chemical substance must be used wherever possible to reduce the risk of exposure to highly toxic chemicals.

2.2 Engineering Controls

1. Ventilation is a key control for work with animal perfusions. Where possible, work should be conducted inside a chemical fume hood. Where a fume hood is not practical, work must be conducted using other local exhaust ventilation, such as a downdraft examination table, or a portable or wall mounted capture ventilation unit that can be placed where needed.

2. Isolation is important to protect the eyes, skin, and to help reduce the potential for inhalation. The fume hood sash provides barrier protect to the face and torso. Additional barriers should be considered for larger applications outside of a fume hood.

2.3 Administrative Controls

1. Users must be made aware of the potential health impacts of work with formaldehyde. They must be trained in the appropriate controls to protect themselves and others from exposure.

2.4 Personal Protective Equipment (PPE)

1. Respirators, skin protection, and eye protection must be worn in addition to the engineering controls for animal perfusions. This PPE will act as a last line of defense to protect the employee should the engineering or administrative controls fail.

3.0 Emergency Preparedness/Response

1. Considerations should be taken to prevent exposure to other personnel who may be affected by a spill, leak, or other incident.

4.0 Applicable Legislation and Regulations

3. Occupational Health and Safety Regulations, Government of Alberta
5.0 Related Resources

2. Chemical Safety Program, Environment, Health & Safety, University of Alberta
3. Safe Work Practice: How to Use Animal Safe Work Practices (EHS-SWP-100), Environment, Health & Safety, University of Alberta
5. Safe Work Practice: Allergen Protection (EHS-SWP-110), Environment, Health & Safety, University of Alberta
6. Safe Work Practice: Needle Safety (EHS-SWP-120), Environment, Health & Safety, University of Alberta
7. Safe Work Practice: Animal Projects with Chemicals (EHS-SWP-140), Environment, Health & Safety, University of Alberta
8. Safe Work Practice: Animal Projects with Highly Toxic Substances (EHS-SWP-142), Environment, Health & Safety, University of Alberta

6.0 Document Management

Creation Date: 15 December, 2017
Version Date: 15 December, 2017
Author: Greg Hodgson
Review Schedule: The document shall be reviewed by the EHS Occupational Hygienist before 15 December, 2018.

Record of Amendments:

<table>
<thead>
<tr>
<th>Document Version</th>
<th>Amendment Date</th>
<th>Amended Section</th>
<th>Description</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>15-Dec-2017</td>
<td>N/A</td>
<td>Original document</td>
<td>GH</td>
</tr>
</tbody>
</table>