Footpad Injections Guidelines in Mice and Rats

Footpad injection: Combination of an intradermal and subcutaneous injection used primarily in models of immunization, inflammation, arthritis, pain and to administer certain types of neurotracer dyes. Footpad injections have the capacity to cause inflammation, tissue necrosis, discomfort, and pain.

The use of footpad injections is generally discouraged, since rodent forefeet are used for handling food and hind feet are considered major weight-bearing structures. Ventral footpad injections can result in inflammation and swelling at the injection site, resulting in unrelieved pain and distress or progressive debilitation. The magnitude of the inflammatory and pain response is known to be dependent on a number of factors, including dose and immunogenicity of the antigen and/or adjuvant. If the study requires administration of an adjuvant into the footpad, adjuvants known to produce less intense inflammatory responses and pain should be considered. In addition, the hock may be a viable alternate injection site, possibly preventing movement impediment. Injection into the hock (lateral tarsal region) just above the ankle drains to the same lymph nodes as the footpad yet is a non-weight bearing structure.

Consult with a veterinarian to determine an appropriate analgesic regimen to be implemented.

Approval for footpad injection:
1. Requires scientific justification
2. Allows injection into only one hind foot per animal
3. Is limited to a maximum injection volume of 0.05 ml in mice; 0.10 ml for rats
4. Ensure that animals are able to reach food and water
5. Requires animals to be housed on soft bedding
6. Requires daily monitoring for pain/distress or complications at injection site for four weeks or until all lesions have healed or there is no evidence of pain or discomfort
7. Supportive therapy may include topical cleansing, antibiotics, and use of an analgesic
8. Euthanasia should be considered for rodents exhibiting signs of severe pain or distress

Guidelines:
- In some instances it is appropriate to sedate or anesthetize the rodent
- Disinfect the injection site with an approved skin disinfectant
- Use a 25G needle or smaller
- Inject with the bevel facing the skin while going in with the needle
- Push the needle past the bevel into the skin before injecting
- Withdraw the needle slowly from the injection site while pressing down lightly on top of the injection site
- Keep firm pressure on the injection site for a few seconds once the needle is removed. No injected material should be leaking from the injection site

References:

2 NIH ARAC Guidelines, Guidelines for the Use of Adjuvants in Research

3 Institutional Animal Care and Use Committee, University of North Carolina at Chapel Hill, Identification of Pain and Distress in Laboratory Animals

4 Institutional Animal Care and Use Committee, University of North Carolina at Chapel Hill, Survival Surgery, Rodents

5 Laboratory Techniques in Biochemistry and Molecular Biology, A.M.Campbell, Elsevier Science Publishers, 1991

6 The Anatomy of the Laboratory Mouse, Jackson Laboratories

Disclaimer: if your experimental procedure requires a significant deviation to this Standard Operating Procedure (SOP), please amend your application(s) to include Addendum 8.0 Request for Exception to Policy and indicate the following: a description of the exception; the rationale (provide scientific justification and/or justification based on animal welfare); the potential adverse effects/clinical signs resulting from the exception; and specify which (and the total number of) animals in the approved protocol that will be affected. The IACUC will review your request at the next monthly meeting

Reviewed and Approved: January 13, 2012