NU–IACUC Procedure

Northeastern University Institutional Animal Care and Use Committee

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| Trans-Cardial Perfusion Surgical Section |

*Re-Approved Date: 04/12/2022*

**Please fill in information on anesthetics in Section 4, then paste this section into the Surgery Section in the animal protocol/amendment form.**

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| 1. **Name of surgery: Trans-Cardial Perfusion for Rodents**
 | Confirm if [ ]  survival or [x]  terminal  |
| 1. **Species**
 |  |
| 1. **Check the relevant boxes for this surgery:**
 |
| The following are all required for survival surgery. Provide scientific justification to omit or change. Terminal surgeries only require continuous monitoring under anesthesia (the last box).[x]  Disinfection of the surgical area/table. [ ]  Surgeon is properly prepared for each surgery. At a minimum, sterile gloves, mask, and gown. Disposable or  clean lab coats may only be used for non-USDA species.[ ]  Surgical instruments are sterilized prior to use and in between animals.[ ]  Animal is appropriately prepped for surgery by the following steps:1. Provision of eye lubricant2. Removal of the fur/hair3. Disinfectant/ethanol wipe of the skin (3x for each scrub).[x]  Supplemental heat is provided while the animal is under anesthesia. [x]  All animals are monitored continuously while under anesthesia. |
| 1. **Anesthetic details:** Click link forcommonly used anesthetics:[Anesthesia/Analgesia Formulary](https://research.northeastern.edu/animalcare/anesthesia-and-analgesia-guidelines-final-2021/)

*You may copy and paste the appropriate regimen based on surgery type. Additional rows can be added as necessary.*   |
| Anesthetic/Sedation Name | Dose | Route | Re-Dose/Maintenance |
|  |  |  |  |
|  |  |  |  |
| **Methods used to monitor anesthetic depth** (check all that apply): | [ ]  Tail/Toe Pinch |
| [ ]  Respiratory rate/effort. |
| [ ]  Other: |
| Methods used for intraoperative monitoring (USDA species only) |  |
| [x]  All animals are monitored continuously while under anesthesia.[x] Thermoregulation is provided while the animal is under anesthesia.  |
| 1. **How are the surgical instruments sterilized for each animal (for survival surgery)?**
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| 1. **Describe the surgery in detail including skin incisions, manipulations, closures, and suture information.**

*Do not repeat details confirmed in Part 2 and 3 above.*[ ]  Confirm initial dose of analgesia will be given prior to making the incision OR provide justification below. [ ]  Confirm sutures/wound clips will be removed 7-14 days post-operatively OR provide justification below*.* |
| Trans-Cardial Perfusion for Rodents1. All staff will wear a labcoat, mask, gloves, and safety glasses/goggles.
2. All work with hazardous fixative agents, i.e. formalin, will be inside of a fume or in a properly vented work area.
3. Anesthetize animal with appropriate dose of approved anesthetic (see NU-IACUC Policy *Recommended Doses of Anesthetics and Analgesics of Laboratory Animals*). If needed, give booster at appropriate dose.
4. Once animal is FULLY anesthetized (animal does not respond to toe/tail pinch or palpebral reflex), prepare animal on tray.
5. A midline insicion will be made in the skin of the abdominal region to expose the underlying facia. If the animal responds to the cutting, administer more anesthetic.
6. Then the peritoneal cavity will be surgically exposed by clamping the sternum with a hemostat and cutting through the body wall of the animal with a scalpel. Be careful not to puncture liver lobes.
7. The diaphram will be carefully pierced along it's edges using scissors, followed by cutting up through the top of the rib cage to open the thoracic cavity.
8. Any extraneous membranes holding the heart to the ribcage will be freed by dissection and the thoracic cavity will be fully opened by resting the clamp attached to the sternum back away from the thoracic cavity.
9. The left ventricle of the heart will be identified by gently twisting heart forward.
10. Grasp the exposed ventricle with forceps and inject 0.8cc heparin (1,000 units/ml saline) into left ventricle.
11. Insert perfusion needle into the same place that the heparin injection was made and clamp the needle in place (Note - make sure that the needle does not pierce any of the walls of the heart). Push in needle just so that it enters the ventricle area. Be careful not to insert it too far into the heart.
12. With scalpel or small scissors, cut right atrium. Dark blood should flow from the atrium.
13. Flush circulatory system with 50-100 ml 1x PBS.
14. Afterwards, stop flow, and perfuse system with appropriate fixative solution.
15. Once perfused, the animal’s extremities should be rigid (this can be determined by squeezing the neck and both sets of paws).
16. Properly dispose of all fixative agents.
17. Place animal carcass in small plastic bag and place animal freezer for disposal.

\*\* Additional anesthetic will be administered if any complications arise. |
| 1. **Analgesic regimen:** Click link forcommonly used analgesics: [Anesthesia/Analgesia Formulary](https://research.northeastern.edu/app/uploads/sites/5/2020/02/Anesthesia-and-Analgesia-Guidelines-Final-2019.doc)

*Multiple analgesics may be added to provide flexibility. When multiple analgesics are selected, indicate and/or below. Additional rows may be added if necessary* |
| Analgesic Name | Dose | Route | Duration of Treatment |
|  |  |  |  | [ ]  and [ ]  or [ ]  +/- |
|  |  |  |  | [ ]  and [ ]  or [ ]  +/- |
|  |  |  |  | [ ]  and [ ]  or [ ]  +/- |
| 1. [ ]  Confirm that a DLAM Surgical Card will be placed on the animal’s cage and that it is completely filled out.
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