LAB_031 Fluorescent/bioluminescence imaging of live rodents (Expiry: March 2026)

I. OBJECTIVE

To effect safe and humane fluorescence / bioluminescence imaging in live rodents.

II. COMMENTS / RECOMMENDATIONS

- At the Centre for Advanced Imaging (CAI) this procedure must be performed by a CAI approved experienced operator or the operator must have completed an induction and training by Facility Manager or approved operator.
- PPE should include disposable gloves, safety glasses, face mask, long sleeved lab gown, closed in shoes.
- Almost all imaging facilities are “shared spaces” with unknown commensal microbial status. Once transported to a shared space it is often not possible, for biosecurity reasons, to return rodents to their original animal facility. Arrangements for transportation and ongoing care of experimental animals must be made with relevant animal facility managers when planning projects that aim to use a shared imaging facility.
- “Low fluorescence” diets, or withholding food for a period prior to imaging may improve image quality NOTE: these actions require specific Animal Ethics Committee (AEC) approval.
- Using nude mice or removing hair may improve image quality, however, the increased impacts on thermoregulation while under general anaesthesia must be considered.
- If the intended method of anaesthesia for use is not isoflurane this must be specified in the AEC application.

III. EQUIPMENT

- Vaporous isoflurane anaesthetic apparatus, including:
  - Precision isoflurane vaporiser
  - Induction chamber
  - Nose cone
  - Rodent anaesthetic circuit (one-way)
  - Isoflurane scavenger system
- Fluorescence/Bioluminescence imaging unit
- Surface disinfectant (70% ethanol is appropriate)
- Heating Pad
- Species specific cage or transport box

- Electric clippers (appropriate for rodents)
- Depilatory cream (e.g. Nad's Hair Removal Cream®)

IV. PROCEDURE

1. Ensure all workspaces and equipment are clean using surface disinfectant.
2. Fill the anaesthetic induction chamber with 3-5% isoflurane and oxygen gas mixture (~1L/min is appropriate, given a 2-5L induction chamber).
3. Place the rodent into the anaesthetic induction chamber.
   Note: depending on the system, more than one animal may be imaged simultaneously.
4. Once adequately anaesthetised, move the animal onto a heated workstation, maintaining anaesthesia (~2% isoflurane, ~400mL/min gas flow rate) via use of a nose cone.
5. Remove hair as required using electric clippers +/- depilatory cream.
   Note: hair should be removed only from the required area. Removing excessive amounts of fur will impact the animal's ability thermoregulate effectively.
6. Move the rodent onto the heated imaging stage, maintaining anaesthesia (~2% isoflurane, ~400mL/min gas flow rate) via use of a nose cone.
7. Start imaging and monitor the animals through the images on the screen.
8. Once images are acquired (max. duration 10 minutes), remove animals directly to a heated cage with access to feed and water and monitor continuously until completely conscious and able to walk normally.
9. Ensure isoflurane vaporiser and oxygen gas supply are turned off.
10. Clean imager, workplaces and any other equipment with surface disinfectant.