

 THE UNIVERSITY OF QUEENSLAND AUSTRALIA CREATE CHANGE	UQ Animal Ethics Committee - Standard Operating Procedure LAB_031 Fluorescent/bioluminescence imaging of live rodents Institutional author: Centre for Advanced Imaging AEC Reviewed & Approved: September 2025 SOP Expiry: September 2028	Version #3.2 Page 1 of 3
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LAB_031 Fluorescent/bioluminescence imaging of live rodents (Expiry: Sept 2028)

I. OBJECTIVE

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

NB: The use of (*) indicates this statement is dependent on the facility procedures.

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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 and be deemed competent in the procedure.
- 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. If the method of anaesthesia is Isoflurane the current SOP for this procedure must be included in the ethics approval along with any variations required**.

III. SAFETY AND COMPLIANCE

- The person undertaking this task must ensure all relevant approvals are in place, training has been undertaken, and risk assessments have been performed. If unsure, consult your supervisor.
- Facility protocols should be followed.
- Possible risks include mouse/rat bite injury, needle stick injury, spills, exposure to infectious agents, repetitive task musculoskeletal injury and psychosocial harm.

IV. TRAINING CONSIDERATIONS

- All unsupervised animal procedures must be performed by appropriately trained personnel who have been deemed competent in the procedure.

Conditions:

- Investigators named in an animal ethics application, relative to this SOP, must be competent to implement the SOP
- Any variation to this SOP must be described in the relevant animal ethics application
- If this SOP has not been reviewed and approved by a UQ AEC within the last three years it is no longer valid and cannot be used in animal ethics applications until reapproved (see “AEC Reviewed/Approved” date in this document’s header).

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V. EQUIPMENT

- PPE should include disposable gloves, safety glasses, face mask, long sleeved lab gown, closed in shoes.
- Vaporous isoflurane anaesthetic apparatus** (see comments on anaesthesia above), including:
 - Precision isoflurane vaporiser
 - Oxygen
 - Induction chamber
 - Nose cone
 - Rodent anaesthetic circuit (one-way)
 - Isoflurane scavenger system
 - Anaesthesia monitoring equipment if repeat imaging is required
- 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®)

VI. 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 and commence monitoring as per LAB_060 Rodent Anaesthesia - Isoflurane
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.

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7. Ensure the animal's anaesthesia depth is checked and appropriate before placing it into the imaging instrument. Due to the short imaging acquisition time (typically 1 to 3 minutes), respiratory sensors are not used, instead animals must be monitored for signs of appropriate anaesthesia depth before and after scanning.
8. Commence imaging and 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. In some cases, repeat imaging may be required to capture time-course data. For intervals shorter than 20 minutes, the animal can remain under anaesthesia as long as monitoring (monitoring equipment should be used) shows they are stable in-between image acquisitions. For longer intervals, it is normally recommended that animals are allowed to recover and are then re-anaesthetised prior to the next imaging session. Consult with facility staff for further advice if repeat imaging is required and ensure that all procedures are clearly described in the ethics application and approved by the ethics committee**.
11. Clean imager, workplaces and any other equipment with surface disinfectant.

The development of this Standard Operating Procedure is duly attributed to Ms Mary-Anne Migotto, whose contribution warrants formal acknowledgment. Ms Migotto is the Coordinator, Optical Imaging Facility Australian Institute for Bioengineering and Nanotechnology 2025.

Version #	Reviewing AEC	AEC Review Date	Outcome
2.0	Molecular Biosciences AEC, Laboratory Biomedicine AEC, Anatomical Biosciences AEC, Health Sciences AEC	March 2022	Approved
2.0	Molecular Biosciences AEC, Laboratory Biomedicine AEC, Anatomical Biosciences AEC, Health Sciences AEC	March 2025	Approved (1 year extension)
3.2	Molecular Biosciences AEC, Laboratory Biomedicine AEC, Anatomical Biosciences AEC, Health Sciences AEC	September 2025	Approved

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