 <p>THE UNIVERSITY OF QUEENSLAND AUSTRALIA CREATE CHANGE</p>	<p>UQ Animal Ethics Committee - Standard Operating Procedure</p> <p><b>LAB_097 Subcutaneous Implant Surgery</b></p> <p>Institutional author: <b>UQ Biological Resources</b></p> <p>AEC Reviewed &amp; Approved: 16/02/2022</p>	<p>Version #2</p>
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## LAB\_097 Subcutaneous Implant Surgery

### I. OBJECTIVE

To surgically implant material/device in rodents subcutaneously to meet the objectives of a specific study. This may include osmotic or mini pumps where continual controlled dosing of a drug is required

### II. COMMENTS / RECOMMENDATIONS


- Users must keep monitoring records, which includes surgical records and anaesthesia records (example templates can be obtained by contacting the UQBR Veterinarians or Animal Ethics Unit Veterinary Officer).
- Any associated experimental compounds or medications (including your anaesthetic protocol) must be detailed within the Animal Ethics Committee (AEC) application.
- PPE is facility dependent, however, this should at least include disposable gloves, long sleeved lab gown, face mask, safety glasses, hair bonnet, closed in shoes.
- Wherever possible, active heating (e.g. a heat mat) must be used at all times.
- Clean surgical technique must be practiced, as per [LAB\\_002 Clean Technique for Laboratory Animal Surgery](#)
- Wherever practicable, aseptic surgical technique must be practiced, as per [LAB\\_001 Aseptic Technique for Laboratory Animal Surgery](#)
- In the event of equipment failure, or anaesthetic recovery mid-surgery, “alleviating unanticipated pain and distress must take precedence over an individual animal reaching the planned endpoint of the project, or the continuation or completion of the project. If necessary, animals must be humanely killed without delay” (Clause 2.4.18, Australian code for the care and use of animals for scientific purposes 8<sup>th</sup> Edn., 2013)

### III. EQUIPMENT

- Disinfectants: surface disinfectant (e.g. 70% ethanol) and skin disinfectants (e.g. chlorhexidine based). Refer to [LAB\\_001 Aseptic Technique for Laboratory Animal Surgery](#) and [LAB\\_002 Clean Technique for Laboratory Animal Surgery](#) for options.
- Clean recovery boxes – standard housing boxes including feed, water, appropriate nesting materials (to aid thermal support) and environmental enrichment.
- Active heating equipment (e.g. fit for purpose heat mats, Aria Ventilated Cabinets®)
- Anaesthetic agents – as per AEC approved protocol
- Analgesic agents – as per AEC approved protocol
- Implant device containing experimental compounds for release – as per AEC approved protocol
- Ophthalmic lubricant (non-medicated, viscous and pH neutral: e.g. Refresh “Lacri-lube”®, Visco-tears® gel)
- Electric clippers or depilatory cream (e.g. Nair hair removal cream®)
- Sterile surgical instruments
  - Including: scalpel, fine surgical scissors,
- Sterile surgical consumable
  - Including: gauze, cotton tips, absorbable monofilament suture (size: 4-0, 5-0 or 6-0), warmed normal (0.9%) saline (sterile), 7mm or 9mm wound clips and wound clip applicator or surgical glue.

#### Conditions:

- Investigators named in an animal ethics application, relative to this SOP, must be competent to implement the SOP
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- 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 reappraised (see “AEC Reviewed/Approved” date in this document’s header).

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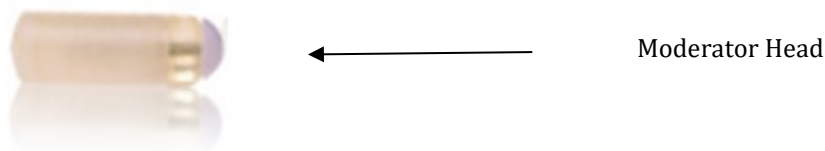
#### IV. PROCEDURE

1. Prepare yourself and the work station as per [LAB\\_001 Aseptic Technique for Laboratory Animal Surgery](#) / [LAB\\_002 Clean Technique for Laboratory Animal Surgery](#)
2. Prepare clean, warm recovery boxes (e.g. resting on a heat mat).
3. Anaesthetise the animal, as per AEC approved protocol.
4. Apply ophthalmic lubricant to both eyes, using a sterile cotton tip.
5. Prepare the animal for surgery in dorsal or lateral recumbence including removal of fur, as per [LAB\\_001 Aseptic Technique for Laboratory Animal Surgery](#) / [LAB\\_002 Clean Technique for Laboratory Animal Surgery](#)
6. Check for the absence of a withdrawal reflex. If a withdrawal reflex is present, the animal is not sufficiently anaesthetised and anaesthetic depth needs to be increased prior to proceeding.

*If movement of skeletal muscle, or withdrawal reflexes are present at any point throughout the procedure, activity must stop and only resume once sufficient anaesthetic depth regained. If you are having difficulty maintaining appropriate anaesthetic depth consult a UQBR veterinarian (once the animal has recovered, and before proceeding to anaesthetise any more animals).*

7. Using fine surgical scissors or scalpel blade make a skin incision at the appropriate location, generally this is longitudinally/vertical and between the shoulder blades. The incision should be no larger than required.
8. Use blunt dissection in the caudal direction make a subcutaneous pocket of sufficient size to comfortably hold the implant.
9. Flush the sub cutaneous pocket with warmed saline if required for the specific implant.
10. Insert the implant and ensure there is minimal tension over the surgical site, either over the implant or at the incision. Also ensure the implant does not sit directly under the incision site.

*Note if inserting a mini pumps the moderator head should be inserted away from the incision.*




*Figure 1. 100uL capacity Alzet Mini Pump. This company produces 3 pump sizes: 100uL (appropriate SC for mice and rats >10g), 200uL (appropriate SC for mice and rats >20g), and 2mL (appropriate SC for rats only >150g), limitations exist relative to IP placement of minipumps, always check manufacturers details (Alzet, 2019).*

11. Close the incision using either suture material, or wound clips or surgical glue as per approved AEC protocol. The surgical site is then gently cleaned with gauze or a cotton tip moistened with skin disinfectant to remove any blood contamination.
12. Place the animal into a recovery box, maintained on a heat mat until recovered from anaesthesia. If available, recovery boxes may then be placed into a climate controlled, Ventilated Cabinets® for ~12 hours recovery.
13. Clean and disinfect all equipment between each animal.

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14. Continuously monitor all rodents during surgery and throughout the recovery phase until fully ambulatory. Post operatively mice must be housed separately and should be reassessed within 6 hours post recovery, then at least daily for the following 2 days. Ongoing monitoring is as described by the approved AEC activity.
15. Remove skin sutures or surgical clips between 10-14 days post-operatively.

### Post Procedure Monitoring

If discomfort is observed refer to the UQBR SOP 22 Veterinary Care Protocol and consult with a UQBR Veterinarian.

### UQBR Training Consideration

For UQBR training purposes animals may remain for a number of days to monitor. Adverse effects may take time to develop and can assist with the assessment of competency.

## V. BIBLIOGRAPHY

Alzet Osmotic Pumps 2019, viewed 18 January 2019, <http://www.alzet.com/company/>.

Silverman, J. (2008). Hypothermia as anesthesia. *Lab Animal*, 37(3), 105-105. doi:10.1038/labani0308-105a

Version #	Reviewing AEC (note: all other relevant AECs ratify the approval)	AEC Review Date	Approved Until
2	LBM	16/02/2022	16/02/2025

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