

 <p>THE UNIVERSITY OF QUEENSLAND AUSTRALIA CREATE CHANGE</p>	<p>UQ Animal Ethics Committee - Standard Operating Procedure LAB_010 Euthanasia – Foetal and Neonatal Mice and Rats Institutional author: UQ Biological Resources AEC Reviewed & Approved: 18/03/2021</p>	Version #2
		Page 1 of 2

LAB_010 Euthanasia - Foetal and Neonatal Mice and Rats

I. OBJECTIVE

To promote the safe and humane euthanasia of foetal and neonatal mice and rats, and describe acceptable procedures to effect this via hypothermia, as per Clause 3.3.45 of the Australian Code for the care and use of animals for scientific purposes.

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

NB: The use of () indicates this statement is dependent on AEC Approvals**

II. COMMENTS / RECOMMENDATIONS

- Whenever performing terminal procedures consideration must be taken as to the potential for stressful auditory, visual or olfactory stimuli that may be perceived by other animals. Efforts must be made to isolate these potential stressors:
 - Euthanasia of laboratory rodents should only occur in “terminal procedure rooms”(*),
 - Biosafety cabinets or fume hoods should be used for the procedure wherever possible,
 - Ensure the area is cleaned prior to use, and between animals,
 - Different species (i.e. rats and mice) should not be euthanised in the same area at the same time.
- Methods of euthanasia considered acceptable in foetuses that are NOT removed from the uterus:
 - Mammalian foetuses are unconscious in utero (hypoxia does not evoke a conscious response). Therefore, after a pregnant rodent has been humanely killed it is unnecessary to remove the foetuses to effect humane euthanasia (of the foetuses).
- Methods of euthanasia considered acceptable in foetuses (E10-E21) that are removed from the uterus:
 - Hypothermia, described within this procedure,
 - Decapitation, see [LAB_009 Euthanasia - Decapitation in Mice and Rats](#),
 - Cervical dislocation, see [LAB_007 Euthanasia - Cervical Dislocation in Mice and Rats](#),
 - Lethal injection, see [LAB_011 Euthanasia - Lethal Injection in Mice and Rats](#)
- Methods of euthanasia considered acceptable in neonates (P0 - P10):
 - Hypothermia, described within this procedure,
 - Decapitation, see [LAB_009 Euthanasia - Decapitation in Mice and Rats](#),
 - Cervical dislocation, see [LAB_007 Euthanasia - Cervical Dislocation in Mice and Rats](#),
 - Lethal injection, see [LAB_011 Euthanasia - Lethal Injection in Mice and Rats](#),
 - Carbon dioxide, see [LAB_008 Euthanasia - Carbon Dioxide Asphyxiation in Mice and Rats](#)

III. EQUIPMENT

- PPE (*)
Although PPE is facility dependent, minimum expectations include: disposable gloves, clean log-sleeved laboratory gown, hair bonnet, eye protection, face mask, closed in shoes.
- Source hypothermia ($\leq 0^{\circ}\text{C}$)
This may be a conducting cold plate or ice slurry ($\leq 0^{\circ}\text{C}$), commercial freezer (-10°C), liquid CO_2 (-56.6°C), dry ice (-78.5°C), or liquid nitrogen (-210°C).
- Cadaver bag, appropriately labelled (*)

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).

 <p>THE UNIVERSITY OF QUEENSLAND AUSTRALIA CREATE CHANGE</p>	<p>UQ Animal Ethics Committee - Standard Operating Procedure LAB_010 Euthanasia – Foetal and Neonatal Mice and Rats Institutional author: UQ Biological Resources AEC Reviewed & Approved: 18/03/2021</p>	Version #2
		Page 2 of 2

IV. PROCEDURE

1. Place the foetus directly onto a cold source.

Following their removal from the uterus, foetuses must be placed into the cold source as soon as possible.

- For rapid methods of hypothermia (e.g. liquid CO₂), rodent foetuses experience rapid unconsciousness and death. Insulation of the skin from direct contact with the cold source is unnecessary.
- For gradual methods (e.g. ice slurry and commercial freezer), the skin should be insulated (e.g. via a piece of paper towel) to prevent any potentially painful burning of the skin. Additionally, due to the gradual nature of the hypothermia, pups will become sedate prior to death: 30 minutes should be permitted before the animal is considered deceased.

V. BIBLIOGRAPHY

AVMA. (2020). AVMA guidelines for the euthanasia of animals: 2020 Edition. American Veterinary Medical Association (AVMA) Retrieved from <https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf>

NHMRC. (2008). Guidelines to Promote the Wellbeing of Animals Used for Scientific Purposes: The Assessment and Alleviation of Pain and Distress in Research Animals. National Health and Medical Research Council (NHMRC).

NHMRC. (2013). Australian code for the care and use of animals for scientific purposes, 8th edition. National Health and Medical Research Council (NHMRC).

Shomer, N. H., Allen-Worthington, K. H., Hickman, D. L., Jonnalagadda, M., Newsome, J. T., Slate, A. R., . . . Wilkinson, M. (2020). Review of Rodent Euthanasia Methods. *Journal of the American Association for Laboratory Animal Science* : JAALAS, 59(3), 242-253. doi:10.30802/aalas-jaalas-19-000084

Uni. Cal. (2019). Euthanasia of Research Animals. University of California (Uni. Cal.) Retrieved from <https://research.uci.edu/compliance/animalcare-use/research-policies-and-guidance/euthanasia.html>

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).