

Research Animal Standard Operating Procedures (SOP) must meet the following criteria:

1. Describe procedures or activities involving research animal(s) common to more than one research project.
2. Support the handling and or performance or undertaking of a procedure(s), involving an animal, in the same way on each occasion it is performed.
3. Describe a procedure or activity involving a research animal(s) undertaken by more than one person; and
4. Describe a procedure or activity involving a research animal(s) that will be undertaken in more than one location.

Name of Procedure	Subcutaneous injection in small rodents and rabbits	
Species	Rat, mouse, guinea pig, rabbit	
ACEC	Reference	SOP#80- Jan 22 - Injection, subcutaneous-rodents and rabbits
	Author	Jenny Smart
	Version	1.1
	Date approved	28 January 2022
	Date for review	27 January 2025
	Procedure classification 1. Observation involving minor interference 2. Animal unconscious without recovery 3. Minor conscious intervention 4. Minor surgery with recovery 5. Major surgery with recovery 6. Minor physiological challenge 7. Major physiological challenge	3
Ethical considerations	1. Respect for animals must underpin all decisions and actions involving the care and use of animals for scientific purposes. 2. The procedure must be performed according to current best practice to support the wellbeing of the animal. 3. Persons performing this procedure must be competent in the procedure or be under the direct supervision of someone who is competent.	

Details

1. Purpose

To describe the procedure for safely performing a subcutaneous injection in rats, mice, guinea pigs and rabbits with a minimum of stress to the injected animal.

2. Description of procedure

EQUIPMENT

1. Sterile syringe of sufficient size to contain the volume of injectate
2. Sterile hypodermic needle. The needle should be of the smallest gauge possible through which the injectate can pass. Viscous solutions will require a larger gauge needle. In general use a 23 G needle for rabbits, 25G needle for rats and guinea pigs and a 29G needle for mice.
3. Cotton gauze swabs
4. Sharps container
5. Injection solution

NOTE:

1. Injections should be carried out in a quiet area away from other animals.
2. Animals should be acclimatised to handling before attempting injections. Use the acclimatisation period between delivery of the animal to the research holding facility and the first injection to condition the animal to the catching and restraint techniques used for the injection.
3. The maximum volume to be injected via the subcutaneous route should be no more than:

Species	Mouse	Rat	Guinea Pig	Rabbit
Maximum Volume for adult animal	0.5 ml/ site	2mls/site	5mls/ site	10 mls/ site

PROCEDURE

1. Attach the needle to the syringe, carefully uncap the needle and insert it through the rubber diaphragm of the bottle of injectate..
2. Invert the bottle of injectate and draw up the calculated volume of injectate into the syringe.
3. Put the needle and syringe to one side. DO NOT recap needle (to avoid needle stick injuries). Avoid contaminating the sterile needle by resting the needle hub or top of syringe against the needle cap so that the needle is elevated.
4. Catch and restrain animal to be injected as follows:
 - a. **Mice**- grasp the base of the tail and restrain by “scruffing” (holding the skin over the shoulders between the thumb and forefinger). Place the animal on the

- benchtop while still grasping the scruff.
- b. **Rats**- grasp the rat gently around the upper body. If a single operator is performing the injection, either place the rat into a 'Rat Bag' for restraint, or place the rat on the benchtop and gently grasp and elevate the skin over the neck and back ('scruff').
 - c. **Guinea Pigs**- grasp the guinea pig gently around the upper body, left out of the cage while supporting the hindquarters and place on the benchtop. Gently grasp and elevate the skin over the neck and back ('scruff').
 - d. **Rabbits**- grasp the rabbit around the upper body, or if it is struggling, by the skin of the neck and upper back ('scruff'). While lifting the rabbit support the hindlimbs by wrapping the other arm around the hindquarters. Place the rabbit on the benchtop. Gently grasp and elevate the skin over the neck and back ('scruff').
5. For a subcutaneous injection the needle is inserted under the "scruffed" and elevated skin.
 6. Insert the needle through the skin so that the tip lays under the skin in the subcutaneous tissue.
 7. Draw back on the hub of the needle to ensure that the needle has not penetrated a blood vessel. If blood is seen in the syringe, withdraw the needle, prepare a new injection and start again.
 8. If the needle is correctly sited, inject and remove the needle quickly and smoothly.
 9. Place needle and syringe into sharps container. Do not re-use needles or syringes.
 10. Release the animal back into its cage and observe for any signs of abnormal behaviour.

References

1. Basic Bi methodology for laboratory mice

http://www.theodora.com/rodent_laboratory/injections.html

2. NC3Rs – procedure with care

<https://researchanimaltraining.com/articles/subcutaneous-injection-in-the-rat/>

<https://researchanimaltraining.com/articles/subcutaneous-injection-in-the-mouse/>

ACEC Chair

