

SOP No: AHP 50

SUBJECT: Intravenous Glucose Tolerance Test (IVGTT) in mice

REASON FOR USE: The intravenous glucose tolerance test (IVGTT) is used to evaluate islet function in vivo and to measure the early insulin response following an intravenous glucose load.

POLICY: Only experienced operators are to perform this procedure.

PRECAUTIONS:

EQUIPMENT: 1 X Timer
1 X Heat Mat
1 X 50% Glucose
Anaesthetic of choice

Per Mouse:

2 X 0.5ml Insulin Syringe:

- 1 x 0.5ml Insulin Syringe for delivery of anaesthetic
- 1 x 0.5 ml insulin syringe, bevel removed for delivery of glucose

**1 x Catheter Silastic tube size ID. 0.012in X 0.025in OD.
15cm long**

4 x 1 ml Insulin Syringe:

- 1 x 1 ml Insulin Syringe, bevel removed (blood syringe)
- 1 x 1 ml Insulin syringe filled with hep/saline, bevel removed and catheter attached (catheter syringe)
- 1 x 1 ml Insulin Syringe filled with hep/saline, bevel removed (spare hep/saline syringe)
- 1 x 1 ml Insulin Syringe filled with anaesthetic, bevel removed (anaesthetic top up syringe)

1 X Micro smooth clips 29mm (1 1/8") Place onto

catheter to stop blood from draining out.

1 X 0.5ml Conical (micro) tube to collect hep/saline from catheter before each blood sample

PROCEDURE:

For an IVGTT blood sample time points are: 0, 2, 5, 10, 15 and 30 minute. For all time points, start taking the blood sample 30 sec before the actual time point.

- 1. Place mouse on heat mat and place a clip onto catheter and start the timer to allow mouse to rest for 20 minutes**
- 2. To take 0 minute (basal) blood sample, remove clip from catheter, drain out hep/saline from catheter into the conical tube, place catheter into the eppendorf tube and allow ~200µL of blood to flow from the carotid artery.**
- 3. Blood sample is immediately centrifuged at 13,000 rpm and the plasma is removed and store at ~20°C.**
- 4. Red blood cells are resuspended in hep/saline to the volume of 200µL and infused back into the mouse via the carotid catheter to avoid anaemic shock.**
- 5. Glucose bolus (1g/kg) is delivered to the mouse via the catheter, start the timer, flush the catheter with hep/saline and replace clip on catheter.**
- 6. To take the 2 minute blood sample repeat steps 2 & 3. Red blood cells are resuspended in hep/saline to the volume of 200µL. Instead of giving the blood back to the mouse, wait until the 5 minute sample is taken and then give the 2 minute sample back to the mouse. For all other time points the blood can be given back after the sample was taken.**
- 7. Continue repeating step 2-4 for the remaining time points.**
- 8. At the conclusion of the procedure the mouse is euthanized by an overdose of sodium pentobarbital according to [SOP AHT 39 Euthanasia of Rodents \(Lethobarb\)](#)**

RECOMMENDATIONS:

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REVISED:

REFERENCES

- 1. Andrikopoulos S, Blair A, Deluca N, Fam BC, and Proietto J (2008). Evaluating the glucose tolerance test in mice. *Am J Physiol Endocrinol Metab.* 295 (3): E531 - E729**