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Blood collection in mice: Retro-orbital sinus sampling

SCOPE

Retro-orbital sinus sampling is a controversial method of blood collection and must only be used where the quality of the blood sample [non-haemolysed, non-contaminated] requires this method and the use of this procedure is justified to the AEC

AUTHORISATION TO UNDERTAKE PROCEDURE

Animal technicians and investigators authorised by AEC or assessed as competent by BRC training assessor.

SPECIAL REQUIREMENTS/SAFETY

- Correct restraint of the mouse
- Disposal of haematocrit tubes into approved container
- Wear protective personal equipment

MATERIALS/EQUIPMENT

- Haematocrit tube (suitable for sample collection)
- Collection tubes (e.g. Eppendorf, FACS, pink cap)
- Gauze swab or tissue

PROCEDURE

- Prepare change station and labelled collection tubes
- Restrain mouse by scruffing and facing towards operator. The capillary tube is directed horizontally with a twist on insertion into the outside corner of the eye, where the upper and lower eyelids meet.
- Rotate during the passage of the tube, and when blood enters the tube withdraw slightly and allow it to fill. Cover the end of the pipette with finger before removing it. Bleeding stops immediately when the tube is withdrawn.
- Aseptic technique is important to minimise the risk of any post procedural infection.
- Hold sterile gauze or tissue to the eyeball and exert gentle pressure on the eyeball and return mouse to box.
- When the mouse is released it will be immediately mobile and alert.
- Observe for 5 minutes before returning the box to the rack.

Blood volumes and collection frequency

The acceptable volume is based on the circulating blood volume.
In mice this is 0.05 -0.07ml/g, approximately 10% can be removed safely every 2-4 weeks.

Weight of mouse	Total blood volume	Max volume permitted
20g	1.10- 1.40 ml	0.11- 0.14 ml
25g	1.37 -1.75 ml	0.14 -0.18 ml
30g	1.50- 2.10 ml	0.15- 0.21 ml

MONITORING REQUIREMENTS

- When the mouse is released it will be immediately mobile and alert.
- Observe for 5 minutes before returning the box to the rack.

EXPECTED RISKS

- This procedure is quick and safe when conducted by a skilled operator
- Post sampling some changes occur in the tissues at the back of the eye – occasionally the optic nerve is damaged which causes blindness.

REFERENCES

Australian code for the care and use of animals for scientific purposes (8th Edition 2013)

Guidelines for survival bleeding of mice and rats NIH Intermural Program Methods of blood collection in the mouse Lab Animal Nov 2000, Vol. 29, No 10

Quality of plasma sampled by different methods for multiple blood sampling in mice, SD Christiansen, LF Mickkelson, JJ Fels, TB Bodvarsdottir and AK Hansen. Laboratory Animals 2009 43:65-71

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