

Saphenous Vein Blood Collection from the Mouse

- Supplies:
- 50 ml Falcon tube with air holes (to restrain mouse)
 - electric shaver (Oster Finisher Trimmer 76 with 913-56 blade, J Tarnow Company, Toronto, Canada) or a small, sharp scalpel blade
 - gauze
 - 70% ethanol
 - heat lamp
 - vaseline
 - 25 Gauge needles
 - capillary tube (ammonium heparinized for blood biochemistry analysis and EDTA coated for hematology, Drummond Microcaps, Drummond Scientific Company, Broomall, PA)
 - 0.5 ml microtubes
 - crushed ice

General Information:

Saphenous vein blood collection is the preferred method of mouse blood collection in the mouse physiology screening laboratory. It is the method that most consistently yields the required volumes of blood needed for the screens we run (see Blood Biochemistry and Hematology Protocols). With practice and confidence, an individual can use this method to collect blood from their own mice in a short period of time. We have adapted for our needs the method developed by Annelise Hem and Per Solberg from the Laboratory Animal Centre of the Norwegian Institute of Public Health, Adrian Smith from the Norwegian Veterinary College and Richard T. Fosse from the University of Bergen. There is a description of their method with informative photos on the website for the Vivarium Fellesforskningssenteret Medical Research Centre at the University of Bergen. The website address is:

http://www.uib.no/vivariet/mou_blood/Blood_coll_mice_.html

Saphenous vein blood collection is available in the mouse physiology screening laboratory on a fee-for-service basis. However, individuals are encouraged to use the method described below to do their own mouse blood collections and to simply provide the blood samples for any desired screening.

Procedure:

The conscious mouse is restrained in an uncapped 50 ml Falcon tube that has had air holes drilled into the closed end. The mouse's nose is at the closed end of the tube with the back legs, rear and tail of the animal exposed at the open end of the tube. The left hind leg is extended and fixed by firmly holding the fold of skin between the tail and thigh. If collecting blood from the right leg, the fold of skin between the abdomen and cranial thigh surface is used to fix the leg. In both cases, the skin is held with the same hand that is holding the restraining tube. The hair is then removed from the outer surface of the fixed leg.

In our laboratory we use an electric shaver to remove the hair. Alternatively, a small, sharp scalpel blade can be used. Removal of the hair from the target area of the leg aids in visualization of the saphenous vein. The vein should now be visible on the surface of the thigh. Pinching the skin between the tail and thigh of the mouse restricts blood flow from the lower limb causing the saphenous vein to protrude.

The shaved skin is wiped clean with 70% ethanol and a piece of gauze then dried with a dry piece of gauze. It is our experience that circulation is increased and blood collection is improved if the hind-end of the mouse is warmed for 5-10 seconds under a heat lamp. In addition, we have also found that wiping a small amount of vaseline onto the shaved skin seems to reduce clotting and helps prevent the blood from collecting in the remaining hair on the leg.

A 25 gauge needle is held almost parallel to the saphenous vein and the vessel is punctured. It is not necessary to lance the vein. A drop of blood should appear on the surface of the leg. A steady flow of blood is required to prevent the formation of clots mid-collection. The appropriate capillary tube (see Blood Biochemistry and Hematology Protocols) is held on a 45° angle with one end of the tube at the edge of the drop of blood collecting on the leg surface. The blood travels up the capillary tube by capillary action. Approximately 150 µl of blood can be collected from a 15 gram mouse using this method. A second puncture of the same vessel or use of the saphenous vein in the other leg may be necessary to collect the desired volume of blood. A second capillary tube may be necessary to avoid clotting in the sample.

When the desired volume of blood has been collected, the blood is dispensed into a 0.5 ml microtube. The tube is capped and the contents of the tube are mixed by flicking the side of the tube. The tube of blood is stored under the appropriate conditions (stored on crushed ice for biochemistry analysis or at room temperature for hematology).

At this point, the mouse is still restrained in the restraining tube. In order to reduce the flow of blood to the puncture site, the mouse's foot is flexed. Slight pressure is then applied to the puncture site with a gauze compress until the bleeding stops. A small scab soon forms. The mouse is then returned to its cage.

Acknowledgements:

The CMHD requests that the users of our screening service acknowledge the technical assistance of our facility in any presentations or publications that report results generated by our services. A suitable acknowledgement for publications is as follows: "The authors would like to acknowledge the Samuel Lunenfeld Research Institute's CMHD Mouse Physiology Facility for their technical screening services (www.cmhd.ca)."

Additionally, please send reprints or information on such publications or presentations when they are submitted or available. Such acknowledgements will help promote the use of our service and assist us in obtaining continued financial support to help defray service fees.