



May 17,
2019

Working

UC Davis - Femoral Vein Cannulation [↗](#)

Jennifer Rutkowsky¹

¹University of California, Davis

dx.doi.org/10.17504/protocols.io.zavf2e6

Mouse Metabolic Phenotyping Centers
Tech. support email: info@mmpc.org

Lili Liang

ABSTRACT

Summary

In multiple studies, access to the circulatory system in laboratory studies is necessary and femoral vein is one of the more common. Implanted femoral catheters permit a researcher to effectively administer substances and perform repeated blood sampling from an anesthetized mouse (for instance administration of gadolinium for MRI BBB permeability studies).

EXTERNAL LINK

<https://mmpc.org/shared/document.aspx?id=280&docType=Protocol>

MATERIALS

NAME	CATALOG #	VENDOR
Electric shaver		
Alcohol wipes		
Sterile Saline (0.9% NaCl)		
Sterile Field Drape		
Heating Pad	TP22B	Gaymar
sterile cotton swabs	806-WC	Puritan
Heparin diluted 1:1000 in saline		
Surgical scissors		
Mouse Surgery Instruments	276-0034-001	Data Scientific International
Hemostat		
Vannas spring micro-scissors	15610-08	Fine Science Tools
Vessel cannulation forceps	00608-11	Fine Science Tools
Blunt dissecting	14018-14	Fine Science Tools
P-10 tubing		
0.5cc insuline syringe	0.5cc insuline syringe	Monoject
Ketamine		
Xylazine		

SAFETY WARNINGS

WARNING

All blood components and biological materials should be handled as potentially hazardous. Follow universal precautions established by CDC when handling and disposing of infectious agents.

1 Surgical Preparation

1. Administer a cocktail of Ketamine/Xylazine anesthesia i.p. at 90/10 mg/kg (initial dose) so animal is under deep anesthetic plane. Ketamine/Xylazine will be administered throughout the duration of the procedure at 22.5/2.5 mg/kg for subsequent doses every 30-45min after 1 hour from the initial dose.
2. Remove the body hair from all intended incision sites by shaving.
3. Surgically scrub the incision sites.
4. Once the animal is prepped for surgery and a sterile field has been established, the surgery is ready to begin.

2 Femoral Vein Injection (*Tissue hydration should be maintained throughout the procedure by irrigations with saline (0.9% sodium chloride) to the tissues as needed.*)

1. Position the animal in supine position on the surgery table with the head away from the surgeon. Provide supplemental warmth during the surgery using heatpad.
2. Loosely tape the animal's hindlimbs and tail to the table.
3. Establish a sterile surgical field on the left side of the animal (your right side) and apply sterile draping material. However, because this is a terminal procedure, a sterile field is not necessary.
4. Using small surgical scissors make a 0.5 cm incision parallel to where would the femoral vein would be running in the groin area between the abdomen and thigh.
5. Using the scissors, gently open the incision further by blunt dissection to reveal the vasculature.
6. Using hooks or retractors, keep the incision open.
7. Locate the femoral vein, which should be in the center of the incision. The vein should run parallel to the thigh, and there should be a branch coming off it perpendicularly, making a T-shape. Carefully isolate the vein using the fine tip forceps through blunt dissection.
8. Once the vein has been isolated, use curved forceps to hook the vein and lift it at a 45 degree angle from the left side. Tie off the vein on the right side with surgical thread. Tie off the branching part of the vein that makes up the bottom of the T-shape using surgical thread.
9. Using a clip, momentarily clip off the left side of the vein. There now should be a build up of blood in the vein that bubbles up.
10. Prime the P-10 tubing with the 1:1000 heparin saline solution at the tip and the rest with saline with the tubing attached to a 0.5ml insulin syringe. Using the spring scissors, cut a small incision into the vein and insert the P-10 tubing as your cannula.
11. Remove the clip and insert the cannula further into the vein.
12. Push the heparin solution in, wait 2-3 seconds and pull back on the syringe. Blood should come up the tubing. There should be no bleeding.
13. The animal is now ready for the MRI protocol.



This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited