How to prepare animal for intravenous injection

This Document

This document describes how to prepare a rat/mouse for injection of contrast agent through tail-vein.

Table of Contents

What you will need

1ml syringes for saline
1 ml or 5ml syringes for contrast
Yellow needles
Yellow cannula
20ml NaCl bottle
Heparin
Contrast agent (e.g., Dotarem)
Heating pad, scale, animal anaesthesia

Preparation

Make sure you have all the equipment you will need before you start the procedure.

Take out some of the Heparin from the bottle with a needle. Add 4 drops into the 20mL bottle of NaCl and mix.

Prepare two 1m1 syringes with the salt solution and add a yellow needle to one of them, which you will use to fill the cannula (if not enough blood) and suck out bubbles.

Put the heating pad on max as you will need to dilate the veins of the tail.

Sleep down the animal in the anaesthesia chamber using 5% Isoflurane.

When the animal is asleep, turn the Isoflurane down to 2,5% and place the animal on the heating pad so that it breaths through the mask. Remember to constantly monitor that the animal does not overheat on the heating blanket.

You might have to weight the animal to compute the volume of the solution you want to inject.

Warm up the tail of the animal: hold your hands over it until it is warm. Alternatively, you can put the tail in warm water or use a paper towel soaked in warm water to rub the tail gently.


You will now see the two veins clearly on each side of the tail.

Protocol

Always start to inject from the tip of the tail and work yourself up if you need to do several injections! If you start in the middle of the tail and inject a second time further down, the vein will collapse.

Lift the tail and bend it over your finger. Make sure the eye of the needle is facing upward and inject it parallel to the tail.
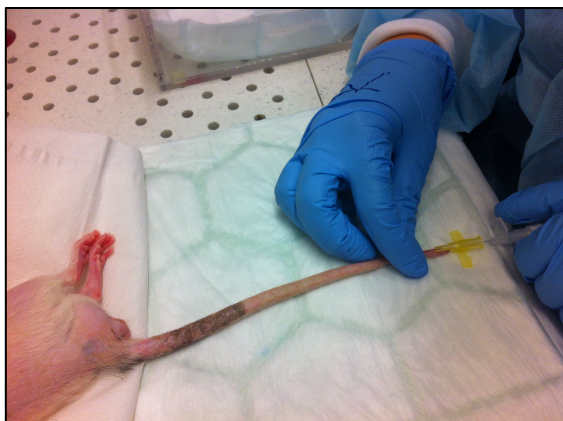
When you're inside the vein you will feel the needle sliding in easily.

Push the needle far inside and then a little bit out again. The plastic tube of the cannula will stay inside, while you pull the needle out.

If you've hit the vein, blood will follow and fill to the end. Put the tail down for the blood to flow freely.
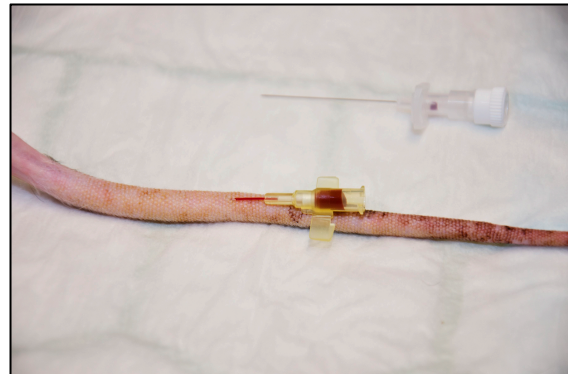
If the blood is not flowing out, stroke the tale gently downward or use the NaCl syringe with the needle to fill the last part.

Now, put one of the syringes with NaCl on to the cannula and inject a small amount of saline. It should be easy to inject, without resistance. If you feel resistance, try to pull the cannula tube a little bit out and inject again.

You should always inject a little bit of NaCl with Heparin before you inject your solution.

When you have controlled that the cannula is in the right place, you need to secure the cannula to the tail.

Take a piece of tape under the tail and make sure to cover tail, cannula tube and the broader part of the cannula with the tape.

When the cannula is secured you can change to the syringe with the solution you want to inject.

Changing syringes will lead to bubbles in the cannula. You therefore have to suck out all the bubbles with the syringe with yellow needle and fill the cannula with NaCl again.

After injecting your solution you should flush the cannula with 0,1ml NaCl to get the rest of the solution inside the vein.
If you're taking the animal to scanning after injection, leave the cannula inside the tail and put on the stopper at the end to stop the bleeding.
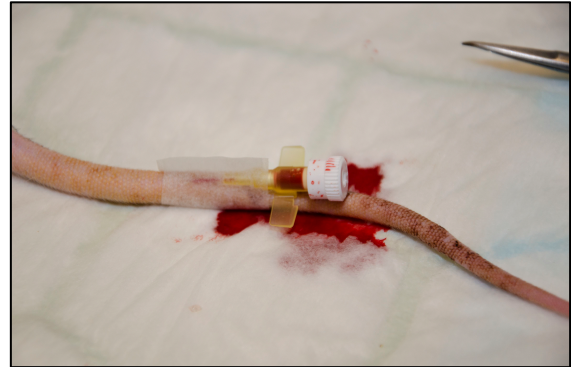
Have 2 syringes with NaCl ready at the scanner to check whether the vein is still open after transferring the animal by injecting a small amount of saline before positioning the animal into the magnet bore.

You are now ready to inject the contrast agent, either manually, or using the injection pump (see manual on "How to use the injection pump").

When removing the cannula from the tail - pull of the entire cannula with the tape. Stop the bleeding by holding a paper towel over the tail and pushing gently.