**acidoCEST MRI Acquisition: Standard Operating Procedure**

Updated: 1/6/2023 by Renee Chin and Marty Pagel

This SOP describes our steps for performing the entire acidoCEST MRI procedure. For notes about the CEST MRI acquisition protocol, see:

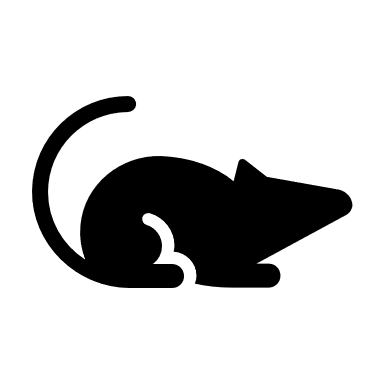
CEST\_Pagel4\_acquisition SOP for Bruker Paravision 5.0.1

or

CEST\_Pagel5\_acquisition SOP for Bruker Paravision 6.1

1. **Prepare iopamidol**
   1. Boil water and allow bottle of iopamidol to incubate in the water to dissolve the precipitate. If there is no precipitate, then you can use the
2. **Set up the MRI**
   1. Set up the air heater for the SA Instruments physiological monitoring system. In addition or as an alternative, turn on the water ciculater/heater for the water pad system. The air heater is recommended for best temperature stabilization at 36.0-38.0C
   2. Ensure that the MRI transceiver volume coil is centered. The 35 mm coil is recommended for best sensitivity for mice. The 72 mm coil can be used for phantoms.
   3. Prepare the infusion stand with the infusion pump. CHECK THE PUMP for proper settings. The settings on the pump are occasionally changed for studies with non-human primates.
3. **Set up the acquisition software**
4. Log on to the MRI workstation using the “pagel1” login.
5. Start ParaVision.
6. Set up examination card.
7. **Set up biosafety cabinet**
   1. Prepare a small catheter by joining a syringe to a 27G needle tip using 2-French tubing (25 µL long).
   2. Flush a large catheter with iopamidol, and attach a 1 mL syringe with iopamidol to one end.
   3. Prepare a 1 mL syringe with 1% heparin in sodium chloride solution.
   4. Flush small catheters with the 1% heparin/sodium chloride solution.
   5. Anesthetize a mouse using isoflurane, and inject the needle of the small catheter into the tail vein.

Needle head



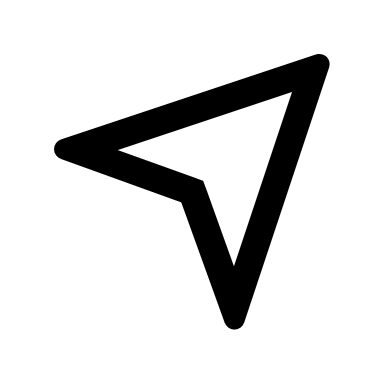
Iopamidol

Syringe

Large catheter

Small catheter

1% Heparin Syringe



1. **Scanning the mouse**
   1. Place the mouse in the MRI cradle, and ensure that the isoflurane gas anesthetic is on.
   2. Remove the syringe filled with 1% heparin from the catheter, add a few drops of 1% heparin into the needle head, then attach the large iopamidol catheter to the small tail vein catheter
   3. Align the tumor to the MRI lasers, and insert the mouse into the MRI magnet.
   4. Adjust the tune/match wobble by switching the cables and turning the capacitor sticks to align the dip with the center
   5. Run the following scans, while recording the respiratory rate and temperature every 5 mins:
      1. Localizer
      2. RARE with 24 slices. Slice thickness is 1 mm.
      3. RARE with 1 slice positioned on the tumor. Slice thickness is 1 mm.
      4. preCEST\_FISP\_Inj *(mouse must be between 36-38 °C)* using the same position for the 1 slice used for the RARE 1 slice in step iii. Slice thickness is 2 mm. This scan has 4 repetitions of the CEST spectrum.

After the preCEST\_FISP\_Inj scan, inject 200 µL of iopamidol into the tail vein catheter over 1 min, then start the automated injector to infuse iopamidol at 200 µL over 30 min. Then run the postCEST\_FISP\_Inj scan.

* + 1. postCEST\_FISP\_Inj *(mouse must be between 36-38 °C)*. This scan has 6 repetitions of the CEST spectrum.