

Brain Cannulation: Handling Instructions

Description of the Cannulae

Standard Brain Cannulae for Unibrain Cannulation, IVC, and 3rd Ventricle Surgery:

Guide cannula: A threaded cylindrical plastic pedestal molded around a piece of stainless steel or Teflon® tubing. It is implanted into the target following specific stereotaxic coordinates. The standard outer diameter measurements for the Charles River stock guide cannulae are 22-gauge for rats/guinea pigs and 26-gauge for mice.

Dummy cannula: A plastic threaded cap with a metal wire stylet. The wire stylet is inserted into the guide cannula and the cap is screwed into place to seal the guide cannula. It is installed to seal the top of the guide cannula and prevent contaminant entry into the guide.

Internal cannula (also called an injector): A smaller diameter stainless steel or Teflon® tube with plastic stop lock. This is fed down into the guide cannula and snaps into place when the item locks onto the top of the guide cannula. This enables the internal cannula to penetrate to a consistent depth and allows for fluids to be dosed to the target. The standard outer diameter measurement for the Charles River stock internal/injector cannulas are 28-gauge for rats/guinea pigs, 33-gauge for mice, and are cut to extend 0.1 mm below the guide cannula. *The internal cannulae are supplied with each order.*

Cannula Manipulation

When manipulating the cannula, all procedures must be performed using aseptic technique.



guide cannula



dummy cannula



internal cannula

Materials

1. Sterile syringe(s): appropriately sized
2. Sterile blunted 23-gauge needles (optional, depending upon syringe)

3. Sterile internal/injector cannulae (sterilize before use)
4. Sterile PE 50 or 3 French polyurethane tubing
5. Syringe pump (optional)
6. Manual repeating dispenser (Hamilton PB-600, optional)
7. Sterile 70% alcohol wipe/gauze

Construction of the Dosing Set-up

The standard dosing set-up is composed of an internal/injector cannula connected to a syringe by PE 50 or 3 French polyurethane catheter tubing. Whether using a syringe with a fixed or detachable needle, it must be a 23-gauge needle to securely attach to the catheter tubing. The catheter tubing would only need to be of sufficient length to facilitate dosing based upon the individual's need. For more accurate dosing, a syringe pump or manual dispenser, such as the Hamilton PB-600, may be used.

Lateral Ventricle Dosing Procedures (IVC/ICV)

1. This process is best performed with two people; one person gently restraining the animal while another performs the procedure. Avoid applying excessive force to the cannula headpiece, as this may result in damage to the cannula and injury to the animal.
2. Load the compound into the dosing set-up. Calibrate the syringe pump for the specific dosing requirement. A manual dispenser must use a specific micro-syringe depending upon the dose required. For rats, bolus injection should be limited to a volume of less than 10 μL and should be administered over a period of 15 to 30 seconds; for mice, 5 μL for 15 minutes. Continuous infusion should be delivered at a rate no greater than 1 μL per minute.
3. Carefully clean the cannula, plastic cap of the dummy cannula, and surrounding dental cement cap with sterile 70% alcohol wipe/gauze. Unscrew the plastic cap and remove the dummy cannula. The metal stylet should be maintained on a sterile surface. Be careful not to touch the stylet, as this may contaminate the guide cannula after reinsertion.

technical sheet

4. Carefully insert the internal/injector cannula all the way down into the guide cannula until it snaps onto the guide cannula indicating it is locked into place.
5. Dose the animal accordingly.
6. Carefully remove the internal/injector cannula after dosing and replace the dummy cannula into the guide cannula. Be careful not to touch the stylet, as this may contaminate the guide cannula after insertion.

Animal Maintenance

1. Animals must be housed individually to prevent them from damaging each other's cannula.
2. Animals must be housed in cages with enough clearance to prevent the cannula from making contact with the cage lid/food hopper. Cannulae that make repeated contact with a low clearance cage lid/food hopper may become caught or damaged and result in injury to the animal.