

Intracerebral Guide Cannulae For MBR Brain Probes

NOT APPROVED FOR USE IN HUMANS! THESE PRODUCTS ARE DESIGNED SOLELY FOR USE IN EXPERIMENTAL ANIMALS.
Revised 02-06

Introduction

MBR style microdialysis probes and guide cannulae are intended for use in **M**ice or wherever **M**ultiple and/or **M**iniature implants of **B**rain microdialysis probes are desired.

The role of an intracerebral guide is to pre-target an implant site and support a microdialysis probe during in vivo sampling experiments in the brain. A guide is commonly used for studies in awake, freely moving animals. Although the microdialysis probe could also be cemented directly to the skull, the use of a guide cannula allows time for the animal to recover from surgical trauma before the experiment and may permit re-use of a probe.

Features

Permits insertion and removal of a single MBR brain microdialysis probe.

During stereotaxic surgery, guide patency is maintained by a stainless steel stylet. The stylet remains in the guide until a MBR probe, which uses the same head design, replaces it.

Stylets and probes are held into the guide by a light elastomeric friction fit which both holds them in the guide and provides the easy to insert, low insertion force fit necessitated by the fragile skull of a mouse.

The guide will necessarily raise the probe higher on the head. This feature, together with lengthened inlet/outlet tubing, better protects the probe from the animal.

Usage

When the intracerebral guide is implanted, it is placed just above the tissue that will eventually be sampled by microdialysis. Therefore, when a MBR Microdialysis Probe is later placed inside a guide, only the dialysis membrane extends beyond the end of the guide cannula. After the animal recovers from the guide implant surgery (3-5 days), the edema will subside and ruptured blood vessels will have been sealed. Glial cell formation will be restricted to the tissue disrupted by insertion of the guide and not the actual microdialysis target site. The damage caused by insertion of the probe will now be restricted to

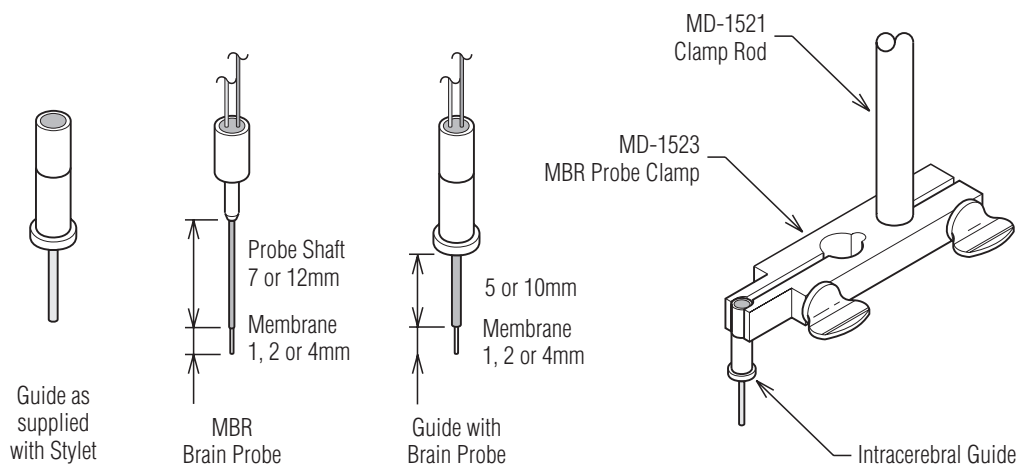
a very small path the length and diameter of the dialysis membrane. This is considerably less trauma for the brain than

the damage caused by opening the skull, puncturing the dura, and then inserting the longer probe just prior to sampling. After a sampling experiment, the probe can be removed and the guide can be re-sealed with its stylet. The probe often can be re-used at a later time.

Procedure

Implantation of intracerebral guides requires two special accessories: the MD-1523 MBR Probe and Guide Clamp and the MD-1521 Clamp Rod. The rod will fit on most stereotaxic devices, including Kopf, and the ASI models offered by BASi. For other models, please check to make sure the instrument will accommodate the clamp rod, which has a diameter of 7.9 mm (5/16"). Ordering information for the additional accessories mentioned in this procedure are listed on the back page.

1. Insert the narrow end of the clamp rod into the rear-most hole of the probe clamp. Tighten the rear screw to secure the clamp.
2. Mount the clamp and rod on the stereotaxic frame.
3. Slip the guide cannula into the U-shaped cavity at the end of the clamp. Clamp the guide by its upper (stylet) portion. The parting line between the stylet and the lower portion of the guide should be immediately below the area clamped. This will minimize the possibility that the stylet might accidentally be cemented into the guide. Tighten the front clamp screw to secure the guide in place. While doing so, confirm that the guide is being held perpendicular to the clamp.
4. Anesthetize and prepare the animal for surgery and position the animal on the stereotaxic frame.
5. Expose the skull. Using the coordinate system defined by your stereotaxic atlas, position the guide above the desired implant site. Lower the guide until it just contacts the skull. Mark the planned entry point on the skull and then raise the guide to make room for the drill.
6. Drill (MF-5362) small holes for bone screws. For rats, insert at least two screws (MF-5182 or MD-1310) on adjacent bone plates. For mice, insert at least one screw (MD-1310) on an adjacent bone plate.



7. Use a MBR Probe & Guide Drill (MD-1360) to drill a hole through the skull at the location marked for the guide cannula.
8. Carefully pierce the dura by pricking it with a sharp syringe needle, being careful not to jab it into the brain tissue below.
9. As determined by your stereotaxic atlas, lower the guide so the cannula tip sits immediately above the dialysis target.
10. In a plastic microfuge vial, mix a small amount of the two-part acrylic cement (MD-1300). While still fluid, draw the cement into a disposable syringe or transfer pipette. Begin to dispense cement around the bone anchor screw(s) and around the lip at the base of the guide cannula. While the cement begins to thicken inside the dispenser, dispense it to form a mound from around the screw(s) extending up to thoroughly surround and envelop the lip on the base of the guide cannula. Be careful not to cement up to the line where the stylet meets the guide cannula.
11. Allow cement to harden (curing time ~ 10 to 20 min) and repeat step 10 if additional cement is needed to secure the guide.
12. During surgical recovery following guide implantation, the animal should be individually housed in containment without wire grids or descending protrusions upon which the animal might strike or catch the guide.
13. When you are ready to conduct the microdialysis experiment, place a lightweight animal collar (MF-5371 for rats, MD-1365 for mice) around the animal's neck. Snug the collar sufficiently so the animal cannot escape the collar. An Awake Animal System's tether wire then hooks to the collar during awake animal studies to relay the animal's locomotion to a liquid swivel or to the RaturTM optical sensors. This prevents the probe inlet and outlet tubing from twisting.

To insert a microdialysis probe, first remove the stylet. A gentle upward motion coupled with a slight twisting motion facilitates insertion and removal of MBR probes and stylets. Insert the prepared MBR probe by gently pushing it (with a slight twisting motion) into the guide's lumen until it bottoms out. Once the probe has been inserted into the guide cannula, in contrast to the instructions in BASi Awake Animal Containment System manuals, the inlet and outlet FEP tubing should be taped **only** to the upper flag on the tether line. Taping the tubing to the flag nearest the animal is NOT recommended for MBR Probes as this may stress the guide cannula/probe connection.

Ordering Information

MBR probes are available with 1 and 2, and 2 and 4 mm membrane lengths, with cannulae lengths that match our MBR 5 or 10 mm guide cannulae, respectively. Since both membrane and cannula lengths may differ, in addition to each probe's unique part number, the membrane and cannulae lengths are included in the item's description. For example, a MBR-2-5

probe would have a 2 mm membrane and a cannula matching a 5 mm (MBR-5) guide, while a MBR-4-10 probe would have a 4 mm membrane and a cannula matching a 10 mm (MBR-10) guide. Two millimeters of a probe's cannula is positioned in the body of the guide cannula, thus the actual cannula length of the probe is 2 mm longer than the 5 or 10 mm of the guide's cannula.

MD-2255	MBR-5 5 mm Intracerebral Guide Cannula and Stylet.
MD-2256	MBR-10 10 mm Intracerebral Guide Cannula and Stylet.
MD-2211	MBR-1-5 Brain Probe, 1 mm membrane. Matches MBR-5 guide.
MD-2212	MBR-2-5 Brain Probe, 2 mm membrane. Matches MBR-5 guide.
MD-2232	MBR-2-10 Brain Probe, 1 mm membrane. Matches MBR-10 guide.
MD-2234	MBR-4-10 Brain Probe, 4 mm membrane. Matches MBR-10 guide.
MD-1523	Clamp for MBR Brain probes
MD-1521	Clamp Rod MD-1524 MBR Calibration Station (includes two MD-1523 MBR clamps)
MD-1300	Dental Acrylic Cement
MF-5182	Bone Screw Anchors (machine screw thread, not recommended for mice), 100/pkg.
MD-1310	Bone Screw Anchors (self-tapping thread, good for rats or mice), 50/pkg.
MF-5362	Drill Bits for Screw Anchors, 5/pkg.
MD-1360	Drill Bits for MBR Style Probes and Guides, 5/pkg.
MF-5371	Rat Animal Collars, 100/pkg.
MD-1365	Mouse Animal Collars, 100/pkg.
MD-1401	Ratur TM Interactive Awake Animal Containment System

Pricing and information on BASi microdialysis and liquid chromatography products may be reached from the BASi home page: www.bioanalytical.com.

Warranty

Intracerebral guides are warranted to be free from manufacturing defects and viable for a single use. BASi is liable only to the extent of replacement of defective items for claims registered within 90 days of the shipping date. BASi will not be liable for any personal injury, property damage, or consequential damages of any kind whatsoever arising from the use of the guide. This warranty does not cover damage to membranes or cannulae through improper preparation, inappropriate connections or faulty handling by the user. The foregoing warranty is in lieu of all other warranties expressed or implied but not limited to the implied warranties of merchantability and fitness for a particular purpose.

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