Ordering Information

MD-2252	Infusion Probe, 2 mm,
MD-2253	Infusion Probe, 1 mm,
MD-2262	IBR-2 Probe: Infusion Cannula, 2-mm dialysis membrane,
MD-2264	IBR-4 Probe: Infusion Cannula, 4-mm dialysis membrane,
CUSTOM	Any other cannula length
MF-5164	FEP Teflon Tubing, 0.65 mm OD x 0.12 mm ID, 1 meter (clear)
MD-1510	Flanged Tubing Connectors, 20/pkg.
MD-2250	Intracerebral Guide Cannula and Stylet, 6/pkg.
MD-2251	Locking-Ring Intracerebral Guide Cannula and Stylet, 6/pkg.
MD-1520	Clamp for BR, IBR, and IN Brain Probes and Guide Cannulae
MD-1521	Clamp Rod (holds MD-1520 and mounts on stereotaxic frame)
MD-1522	Calibration Station (includes platic vials and two MD-1520 clamps)
MF-5500	MF-1 Centrifugal Microfilters, 12/pkg.

Surgical Accessories

MF-5181	Acrylic Cement
MF-5182	Screw Anchors, 100/pkg.
MF-5362	Drill Bits for Screw Anchors, 5/pkg.
MF-5176	Trephine Bone Drills, 3/pkg.

Limited Warranty

BAS brain infusion probes are warranted to be free from manufacturing defects and viable for a single use. Reuse of probes after insertion into tissue or repeated handling is not guranteed since this is wholly dependent on the skill of the individual user. BAS is liable only to the extent of replacement of defective items for claims registered within 90 days of the shipping date. BAS will not be liable for any personal injury, property damage, or consequential damages of any kind arising from the use of BAS probes. 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 including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

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IBR AND IN BRAIN INFUSION PROBES

USER'S GUIDE

7/15/97 A-1896

NOT APPROVED FOR USE IN HUMANS! THESE PRODUCTS ARE DESIGNED SOLELY FOR USE IN EXPERIMENTAL ANIMALS.

Introduction

This user's guide describes the design of BAS IN infusion cannulae and the infusion cannulae of BAS IBR microdialysis probes. If you are using IBR probes, you should also read the accompanying ***BR Brain Probes User's Guide***. IN infusion probe users need only consult the IN probe section of this user's guide.

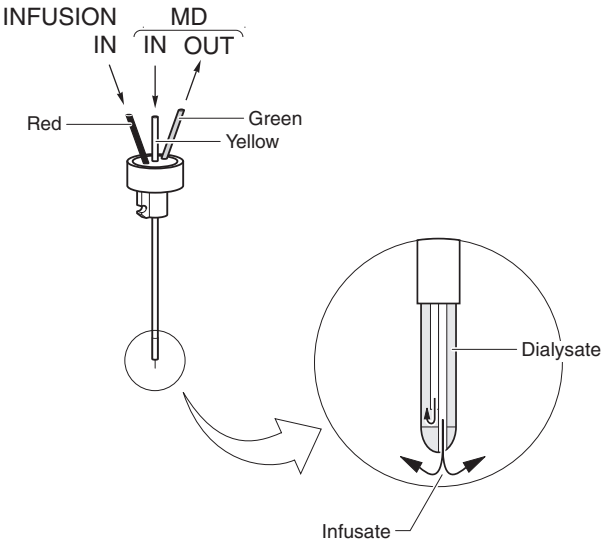
IBR Combination Microdialysis Probes and Infusion Cannulae

IBR probes are conventional microdialysis probes which have an infusion cannula passing through the lumen of the probe. The infusion cannula ends at the distal end of the probe. Thus, infusates exit the cannula and are exposed to the tissue at the distal end of the probe membrane (Figure 1). Unlike retrodialysis, this facilitates probe-localized administration of known quantities of an infused treatment.

IBR probes have three cannulae on the top of the probe. The yellow and green cannulae are the inlet and outlet cannulae, respectively, for the microdialysis probe. The red cannula is the inlet for infusion. Consult the Infusion Guidelines section in this guide.

Aside from the infusion cannula feature, IBR probes are identical to BAS BR brain microdialysis probes. Consult the ***BR Brain Probes User's Guide*** for information on the preparation and use of these probes for microdialysis. Like BR probes, IBR probes may be used with standard BAS guide cannulae, FEP tubing, and tubing connectors.

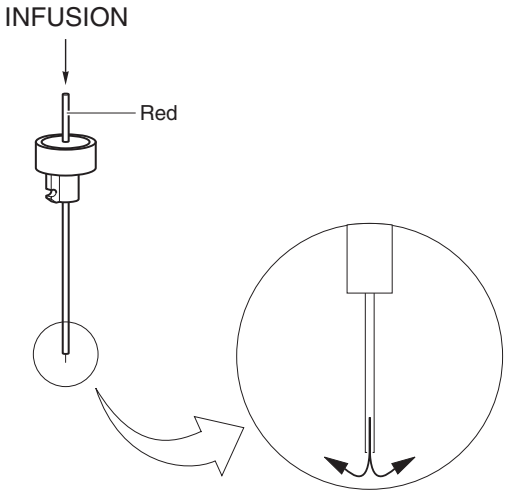
Figure 1. IBR Combination Probe



IN Infusion Cannulae

BAS IN infusion cannulae are simply cannulae which may be used to infuse compounds into brain or other appropriate tissue. The infusion cannula projects either one or two mm (MD-2253 and MD-2252, respectively) past the distal end of the larger supporting cannula at the end of the probe. Infusates exit the cannula and are exposed to the tissue at the distal end of the infusion cannula (Figure 2). IN probes have one red cannula on the top of the probe for infusion. IN probes may be used with standard BAS guide cannulae, FEP tubing, and tubing connectors.

Figure 2. IN Infusion Probe



Infusion Guidelines

This section applies to both IBR and IN infusion probes. The term *infusion probe* refers to the infusion function of either product.

The dead volume of IN and IBR infusion probes is approximately 0.3 µL. Working with such low dead volumes, especially when you may want to infuse as little as several microliters, requires some special consideration when making connections to the infusion probe.

BAS infusion probes should be plumbed using standard FEP Teflon® tubing (MF-5164) and flanged tubing connectors (MD-1510). Tubing connectors make connections by "sleeving" the tubing and/or cannulae to be connected, thus enabling you to make zero dead volume connections (see Figure 3). Soak the tubing connectors in 70% ethanol for 5-10 minutes before use, causing them to expand slightly so that tubing can easily be inserted into the connector's lumen.

The dead volume of an empty tubing connector is approximately 2.5 µL. The relative largeness of the tubing connector dead volume dictates that you **must empty the tubing connector lumen of ethanol before connecting the infusion probe.** Otherwise, the ethanol inside the connector will fill the infusion cannula and possibly expose your target tissue to toxic levels of ethanol.

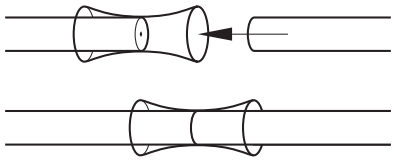
Making connections. We recommend that you follow the steps below when plumbing infusion probes. The smaller the volume of your planned infusion, the more critical these steps are.

1. Using a tubing connector, connect the appropriate length of tubing to your syringe. To improve precision, use a gastight syringe only slightly larger than needed for your infusion.

2. With your syringe, prepare the tubing for the subsequent infusion by filling the FEP tubing with the compound to be infused. This will allow you to have the plumbing primed and purged of air.

3. Remove a tubing connector from the ethanol and insert a small diameter rod or needle inside the connector to force any ethanol out of the connector's lumen. (You may also want to quickly rinse the connector in water or isotonic medium.) Now slip the connector halfway over the FEP tubing coming from your syringe.

Figure 3. Flanged tubing connectors join FEP tubing to inlet and outlet cannulae. Tubing should touch the cannula being joined, leaving no dead space in between.



4. Slip the other end of the tubing connector over the infusion probe's inlet cannula. **Make zero dead volume joints** between the FEP and the inlet cannula. If you are infusing small quantities of liquid and you do not make zero dead volume joints, your treatment could be wasted filling the void volume between the FEP and the infusion probe instead of getting to your animal.

After you have connected your infusion probe in this manner, your system will be primed and ready to infuse the treatment at your later command. When you infuse your treatment, be sure to account for the 0.3 µL volume of the infusion cannula by infusing that much more drug than you actually want to apply.

Infusion solution. At approximately 40 µM, the bore of the infusion cannula (and inlet microdialysis cannula of the IBR probe) is very small. Filter your infusion solution through a 0.2 µM filter before use (even if you are using reverse osmosis or distilled water!). Otherwise, the solution may contain particulates which may clog the probe's cannulae (BAS MF-1 Centrifugal Microfilters are well suited to filtering small volumes). The cannulae of new BAS probes are factory tested and guaranteed to be patent. However, it is the user's responsibility to **use particulate-free, filtered infusion solutions** to insure they do not clog during use.