Ordering Information

MF-7050	DL-2 Dialysis Probe, 2 cm membrane for loop or linear insertion.
MF-7052	DL-3 Dialysis Probe, 3 cm membrane for Loop or linear insertion.
MF-7051	DL-5 Dialysis Probe, 2 cm membrane for loop or linear insertion.
MR-1313	Introducer Needle
MD-1510	Tubing Connectors, 20/pkg.
MF-5164	FEP (teflon) flexible connecting tubing, 1 meter
MF-5366	PEEK connecting tubing (more rigid and less oxygen permeable), 1 meter
MD-1505	Dual Channel Teflon-Lined Liquid Swivel
MF-5179	Dual Channel Quartz-Lined Liquid Swivel
MD-1001	BAS Baby Bee Syringe Pump
MD-1002	3-syringe bracket for Baby Bee pump
MD-1000	Worker Bee Controller
MD-1020	Bee Hive Controller
MD-1051	Queen Bee Intelligent Controller
MD-0100	1000 µL Bee Stinger Gastight Syringe
MD-1401	BAS Raturn Awake Animal Containment System
MD-1575	BAS BeeKeeper Awake Animal Containment System
MD-1200	Honeycomb Refrigerated Fraction Collector

DL MICRODIALYSIS PROBES

USER'S GUIDE

5/3/96 Update A-1880

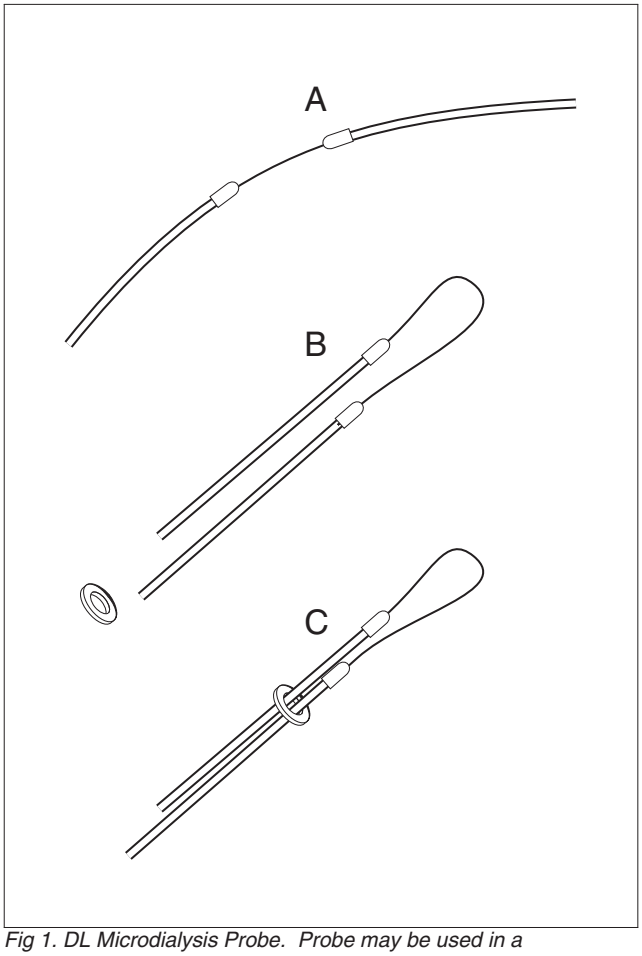

Fig 1. DL Microdialysis Probe. Probe may be used in a linear approach (A), or folded in half to form a dialysis loop (B). A small slice of plastic tubing can be used to secure the loop (C). The glue joints should be staggered instead of adjacent to minimize the thickness of the looped probe.

Product Description

DL probes have been designed for both *in vivo* studies (subcutaneous tissue, peritoneal cavity) in experimental animals and *in vitro* studies in aqueous solutions (tissue homogenates, cell suspensions, plasma, biological fluids). Although the DL probe design is thicker than other BAS linear probes, it is also a stronger probe with more reinforcement at the joint. The DL is a good choice for many *in vitro* applications, teaching, and first-time users.

BIOANALYTICAL SYSTEMS, INC
2701 KENT AVENUE
WEST LAFAYETTE
INDIANA 47906
765.463.4527
FAX 765.497.1102

Probe Usage

Standard DL microdialysis probes are available with either a 2 , 3 or 5 cm dialysis membrane. The membrane is located in the mid-section of the probe between two glue joints which fasten the membrane to the connecting tubing. The probe can be used in a linear fashion (Fig. 1, A), remaining straight as it is placed in tissue. A BAS introducer needle, or equivalent, is required to insert the probe into tissue.

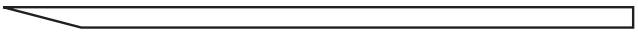

Fig. 2. Introducer Needle (not actual size). The DL probe is placed inside the needle in the linear fashion. The needle is pushed through the subcutaneous layer until it exits at the desired location. One end of the probe tubing is held while the needle is pulled out, leaving the membrane within the subcutaneous layer. Sutures anchor the probe in position. The needle can also be used to direct probe tubing under the skin to an exit at the back of the neck.

To form a loop dialysis probe (Fig. 1,B,C), gently bend the probe in half. Align the joints so that they are staggered instead of adjacent to each other (Fig. 1, B). Either tie a suture thread around the connecting tubing, or slide a piece of tubing over the probe inlet and outlet tubes. The final position of either fastener should be below the glue joints and resting on the connecting tubing, but not the membrane.

Relative Recovery

Since the recovery of analyte in a microdialysis study increases with membrane length, it may be advantageous to use longer membranes. DL micro-dialysis probes can provide close to 100% relative recovery when used at the appropriate flow rate.

Collect a series of samples at various flow rates to determine the optimal recovery for your experiment. Compare the concentration of the dialysate with the concentration of the analyte in the sampled solution to obtain a % relative recovery. Remember to discard the dialysate in the probe that is leftover from the previous test. Calculate the volume in the outlet portion of the probe and the time required to replace that volume at the flow rate being used. Change to a fresh sample solution, start the new flow rate. Time the interval needed to collect the outlet volume, then switch the outlet tubing to a new vial.

Swept Volumes

Probe Component	**Length**	**Swept Volume**
Probe Inlet Tubing	16 mm*	1.2 µL per 100 mm
DL-2 Membrane	20 mm	0.6 µL
DL-5 Membrane	50 mm	1.5 µL
Probe Outlet Tubing	16 mm*	1.2 µL per 100 mm
Optional Accessories:		
PEEK Tubing (MF-5366)	1 meter	1.2 µL per 100 mm
FEP Tubing (MF-5164)	1 meter	1.2 µL per 100 mm
Teflon Swivel Center Channel		1.5 µL
Teflon Swivel Side Channel		4.5 µL

* subject to change: user should verify final length

Probe Preparation

Pores within the probe fiber are coated with a protective layer of glycerin. Until this material is removed, it may interfere with assay results or affect recovery. For *in vitro* studies, the probe can be placed in water or an aqueous salt solution such as Ringer's solution or Artificial CSF. Flushing with the same solution, delivered by a syringe pump at a rate of 2 µL/min for 30 minutes, will remove ~ 90% of the glycerol in the probe membrane. It may require several hours of flushing to remove 100% of the glycerol.

For *in vivo* studies, the probe is usually implanted without prior flushing. In subcutaneous tissue, glycerol will be metabolized by the surrounding tissue and normal glycerol uptake. This process will occur during a period of ~ 5 days in the rat. This is the normal recovery period after implant surgery. Alternately, the probe may also be flushed using the same procedure described for the *in vitro* application. The membrane will become softer and more delicate once wetted. Use special care when inserting a wetted probe into tissue.

Probe Sterilization

DL probes are not supplied sterile. However, they can be sterilized using ethylene oxide (ETO). Probes should be transferred to a gas permeable package which includes an indicator line that changes after ETO sterilization. This sterilization method involves exposure to a heated gas for a prolonged period. This treatment will decrease the life of the probes by changing the membrane. We recommend that you only sterilize probes that you plan to use within the following two weeks. Longeviity of probes after sterilization will vary according to temperature and exposure time to ETO. To maintain sterility, the flushing procedure described previously would then be conducted using sterile fluids and components.

Probe Storage

DL probes are guaranteed for a single use only. During *in vitro* studies, it may be possible to reuse the probe if care is taken to maintain the integrity of the membrane.

Once a probe has been wetted, keep it wet at all times. Rehydrating a dry membrane will not regenerate the pores.

DL probes can be stored in sealed vials or test tubes. Longer tubes are preferred to avoid excessive bending at the junction between the membrane and hub.

If studies are conducted in blood, plasma or serum, the membrane may be coated by lipids and proteins which can change recovery characteristics. Before reusing probes exposed to these samples, verify the recovery of the desired analyte to determine if the probe is still viable.