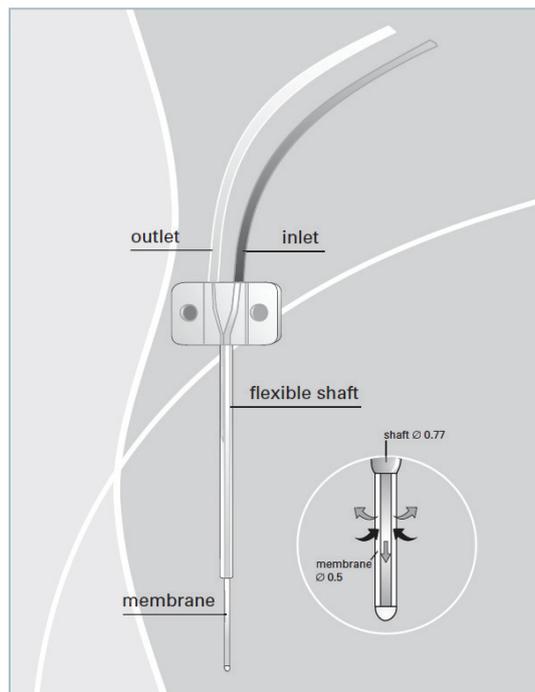


## CMA 20 Elite Microdialysis Probe User's Manual



### TECHNICAL INFORMATION

#### Membrane

Material	Polyarylethersulfone (PAES)
Molecular Cut-Off	20,000 Daltons
Outer Diameter	0.5 mm
Length	4, 10 and 30 mm

#### Probe Shaft

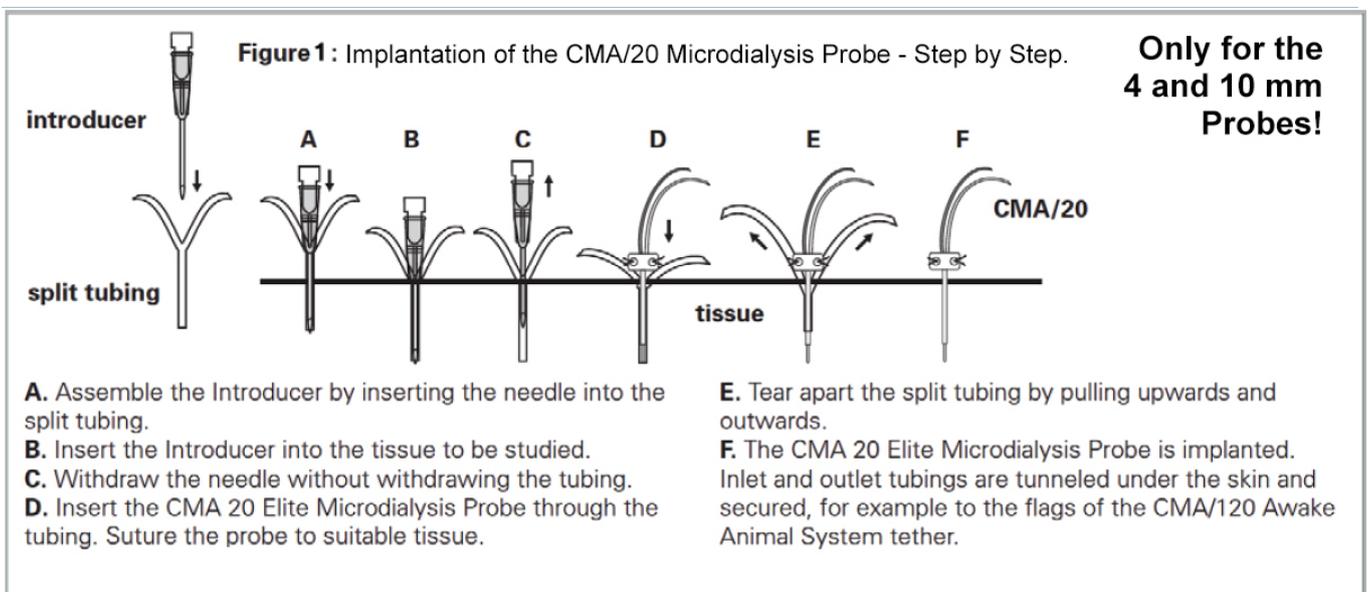
Material	Polyurethane
Diameter	0.77 mm
Shaft Length	14 or 20 mm
Probe Length (Shaft + Membrane)	24 mm (20 mm Shaft + 4 mm Memb.) 24 mm (14 mm Shaft + 10 mm Memb.) 44 mm (14 mm Shaft + 30 mm Memb.)

#### Internal Volume

Inlet Volume	1.4 $\mu$ L (4 mm Memb.) 1.4 $\mu$ L (10 mm Memb.) 2.4 $\mu$ L (30 mm Memb.)
Outlet Volume	2.9 $\mu$ L (4 mm Memb.) 2.4 $\mu$ L (10 mm Memb.) 3.4 $\mu$ L (30 mm Memb.)
200 mm Inlet Tubing (blue)	3.5 $\mu$ L (ID 0.15 mm)
200 mm Outlet Tubing (transparent)	3.5 $\mu$ L (ID 0.15 mm)

## Instructions for CMA 20 Elite Microdialysis Probe for Subcutaneous and Peripheral Tissue Implantation

1.	Connect the syringe to the inlet tube by using a tubing connector. <b>To facilitate the handling of Tubing Adaptors, they should be pre-soaked in ethanol for a minimum of 10 minutes.</b> Perfuse the probe with 10-12 $\mu\text{l}/\text{min}$ in order to remove air. It is important that the probe is primed with perfusion fluid before insertion in the tissue.
2.	Anesthetize the rat. Be sure to keep the animal's body temperature normal during the surgical procedure and the waking period, which can be achieved by using a homeothermic blanket..
3.	Place the anesthetized animal on its ventral surface (see fig 2A).
4.	Make a small midline incision in the skin to expose the lobular adipose tissue between the scapulae (see fig 2A).
5.	If securing with sutures, suture two threads in the muscle, approximately where the wings of the probe will be placed. If securing with cyanoacrylate glue, see step 8.
6.	Hold the tissue with forceps while inserting the Introducer with split tubing into the adipose tissue (see fig 1B and 2A).
7.	Carefully remove the needle without removing the split tubing. It may be necessary to hold the tubing with forceps (see fig 1C).
8.	Insert the probe through the tubing (see fig 1D).
9.	Carefully pull upwards and outwards on the split ends of the tubing to tear it apart and remove the tubing (see fig 1F).



## Instructions for CMA 20 Elite Microdialysis Probe for Intravenous Implantation

1. Place the anesthetized animal on its back with the tail towards you (see fig 2B).
2. Make a small incision in the skin over the pectoral muscle on one side of the midline (see fig 2B). The large jugular vein is easily seen in young rats, but in older animals it may be concealed by fat. If so, make a blunt dissection to clear the fat and connective tissue.  
**NOTE:** Do not attempt to isolate or handle the vein as it will constrict.
3. If securing with sutures, suture two threads in the muscle, approximately where the wings of the probe will be placed. Take care not to suture too deep into the pectoral muscle.  
If securing with cyanoacrylate glue, see step 8.
4. Lift the pectoral muscle with toothed forceps and insert the Introducer with the split tubing through the pectoral muscle into the vein (see fig 1B and 2B). The Introducer should be inserted through the pectoral muscle at an angle of about 10 degrees.
5. Carefully remove the needle without removing the split tubing. It may be necessary to hold the tubing with forceps (see fig 1C). Blood should seep back through the tubing, which indicates that the tubing is in the correct position.
6. Insert the probe through the tubing (see fig 1D). Perform this operation quickly to avoid too much blood loss.  
**NOTE:** The pectoral muscle will seal the vein around the probe. The jugular vein does not need to be ligated in order to secure the probe.
7. Secure the probe with sutures on both sides of the wing (see fig 1E).  
If securing with cyanoacrylate glue, place glue on the underside of the probe wing and secure to the tissue.
8. Carefully pull upwards and outwards on the split ends of the tubing to tear it apart and remove the tubing (see fig 1F).  
**NOTE:** Do not tear against the tissue.
9. To protect the probe tubing from damage by the animal, tunnel the inlet and the outlet tubing under the animal's skin to a point at the skull, nape of the neck or midline of the back. To do so, first make an incision through the skin at the desired exit point. Then insert a cannula of appropriate length and diameter (or hemostatic forceps) through the incision. Push the cannula under the skin to the CMA 20 Elite implant site. Insert the ends of the probe inlet and outlet tubing and gently push them through the cannula (see fig 3).  
Removing the cannula from the direction it was inserted will exteriorize the probe tubing at the desired site. Secure the exteriorized probe tubing and close both incisions. It is advisable to use some type of secured cover or harness to prevent the animal from damaging the exteriorized tubing.
10. Connect the blue inlet tubing to the CMA 402 or CMA 4004 Microdialysis Pumps (via the swivel). Start the pump on 8-10  $\mu\text{L}/\text{min}$ . Observe the transparent outlet tubing to make sure that liquid is flowing. Proceed flushing for approximately 3-5 minutes to remove air bubbles.
11. Before connecting the outlet tubing, reduce the flow rate to operational flow rates, usually 1-5  $\mu\text{L}/\text{min}$ .
12. For further set up instructions, see CMA 120 System for Freely Moving Animals, User's Manual.
13. After the experiment, cut the sutures and remove the probe.  
**NOTE:** Once wetted it is recommended that the probe membrane should remain wet.

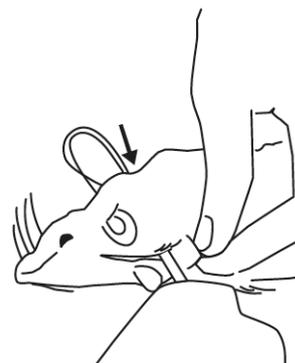
Figure 2: A. Implantation in adipose tissue.



B. Implantation in the jugular vein.



Figure 3 Tunnel the tubing of the CMA 20 Elite Microdialysis Probe under the skin to the skull and secure.



ORDER INFORMATION	Ref No.
CMA 20 Elite Microdialysis Probe, 4 mm, 3/pkg*	CMA 8010435
CMA 20 Elite Microdialysis Probe, 10 mm, 3/pkg*	CMA 8010436
CMA 20 Elite Microdialysis Probe, 30 mm, 3/pkg**	CMA 8011430
Tubing Adapter, 10/pkg	CMA 3409500
FEP Tubing 1 m, 1/pkg	CMA 3409501
FEP Tubing 1 m, 10/pkg	CMA 8409501
CMA 20 Split Tubing, 10/pkg	CMA 8309019
Perfusion Fluid T1	CMA P000034
Perfusion Fluid CNS Dextran	CMA 8050151
Microsyringe 1 mL	CMA 8309020
Microsyringe 2.5 mL	CMA 8309021

\*Provided with a Split Tubing with introducer

\*\*Provided with a Split Tubing, but without introducer

## WARRANTY

The probes manufactured by CMA Microdialysis are warranted to be free from defects in material and workmanship for a period of two years from the manufacturing date if stored in the original package. Claims should be forwarded without delay to CMA Microdialysis or to your local distributor.

*The CMA 20 Elite Microdialysis Probe is not intended for use in humans. It is only suitable for laboratory research in animals. CMA Microdialysis only guarantees single usage of CMA 20 Microdialysis Probes.*



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