Technical Description of the ALZET Brain Infusion Kit 3

I. Brain Infusion Cannula

Material (tube): stainless steel
Material (elbow stop, flange): polycarbonate

Dimensions (0.1 mm): Dimensions (outside diameter, base) 3.0 mm

L (length): 9.3 mm
B (length, overall): 10.0 mm
C (height, tube): 7.9 mm
D (diameter, tab): 0.31 mm
E (outside diameter, distal inlet): 0.71 mm
F (outside diameter, proximal inlet): 0.31 mm
G (diameter, base): 3.9 mm
H (outside diameter, tube): 0.31 mm
Volume inside tube: 0.23 μl

II. Height Adjustment Spacer

Material (space): polycarbonate
Dimensions (0.1 mm): L (space) 5.9 mm
J (thickness, spacer): 0.5 mm

III. Catheter Tubing

Material (tube): polyvinylchloride (medical grade)

Dimensions:
- Inner diameter: 0.14 mm (± 0.08)
- Outer diameter: 1.5 mm (± 0.08)
- Volume: 3.74 μl/cm

Note: Attachment of more than four spacers to each cannula may not be desirable as this will cause the top of the cannula to project greater than 5 mm above the skull. This may make it difficult to close the scalp after cannula placement.

Step 3. After attachment of the spacers, verify the length of the remaining cannula tube. Also verify that the tube is straight and that it is at right angles to the bottom of the elbow stop and spacers. Should the cannula become contaminated during this procedure, soak it in an aqueous solution of 70% ethanol for several minutes. Before implantation, allow the ethanol to evaporate from the surface of the cannula and from the interior of the cannula tube.

Step 4. A 0.41 cm length of catheter tubing is included in this kit. This tubing can be used to attach the cannula to the flow moderator of the ALZET pump. First, measure the distance between the location at which the cannula will be placed and the ALZET pump. Then cut a piece of catheter which connects the cannula to the pump should be 25% longer than the distance between the subcutaneous site of the pump and the location of the cannula, to allow free movement of the animal’s head and neck.

Step 5. Cut the catheter tubing to the length determined in Step 4. Attach one end of the tubing to the cannula’s proximal inlet and the other end to the ALZET pump flow moderator. Check the attachment by gently pulling on the tubing. Failure of this assembly to retract should be loose or easily dislodged. If you are concerned about the security of this assembly contact the cannula to the skull, and in this state with corticosteroids. The brain infusion assembly is now complete.
IV. Surgical Procedures for Placement of the Cannula and ALZET Osmotic Pump

Note: The stereotactic coordinates and dimensions listed in these instructions are based on DURECT’s experience with brain infusion in rats. They may not be appropriate in your particular application.

VI. Longer Infusion Periods Using a Single Brain Cannula with Multiple Pumps

Optimal brain infusion results are obtained when a single osmotic pump is used for the full duration of infusion. For delivery periods longer than the full duration of infusion, the pump should be replaced by a new, fully-loaded and primed pump.

Step 1. Anesthetize the animal. Make a small skin incision in the midline of the neck and allow taking care not to disturb the integrity of the brain infusion assembly.

Step 2. Clamp the catheter using a non-traumatic hemostat. Cut the cannula 5-10 mm inferior to the apex pump and remove the pump from the incision.

Step 3. Attach a fresh, fully-loaded pump with flow moderator in place to the newly cut off end of the catheter tubing and remove the clamp.

VIII. Resources

Stereotactic Atlases

Stereotactic data for placement of cannulae and catheters is available in:


Stereotaxic Apparatus and Cannula Holder

Heavy duty electrode holders fit the removable cannula frame and facilitate stereotaxic placement. These are available from:

- Stoelting Co. (Cannula holder part No. 51638)
- 620 Westlane Ward
- Wood Dale, IL 60191
- Tel.: (850) 880-9707
- Fax: (850) 880-9708
- email: physiology@stoeltingco.com

- David Kopf Instruments (Cannula holder part No. 11776-PA or 11776-PP)
- 7246 Ellis St
- Tujunga, CA 91042
- Tel.: (818) 357-3974
- Fax: (818) 357-3975
- email: Kopf@kopf.com

- www.kopf.com

Pin Vice and Drill Bit

Holes in the skull can be drilled with a steel drill (number 56, part number 31618-56) and a small pin vice (part PV-5). These are available from:

- Small Parts, Inc.
- 13890 NW 58th Court
- PO Box 4560
- Miami Lakes, FL 33014-0650
- Tel.: (305) 557-3527
- Fax: (305) 557-3528
- email: parts@smallparts.com

Stainless Steel Machine Screws

Stainless steel machine screws (sizes #8-80, 1/8” in length with a fillister head, part number MX-0080-02-F) are available from Small Parts, Inc. (see above).

Cyanocrylate Adhesive

DURECT sells Locite 454 (item #0008670), a cyanacrylate adhesive gel, for affixing the cannula to the skull.

Dental Cement

Dental cement (part number HSD-56) and a small pin vice (part number PV-5). These are available from:

- DURECT Technical Support
- 12230 South Main Street
- Sunnyvale, CA 94087
- Tel.: (408) 367-4036 (Outside the U.S.)
- www.alzet.com (web site)

IX. Warranty

For a period of 12 months from date of shipment, DURECT warrants that the ALZET Brain Infusion Kit 3 (“Product”) is free from defects in materials and workmanship. This warranty does not include any specifications in this Instructions and Specifications Sheet. The warranty and all responsibilities of DURECT shall be the replacement, at no cost to the customer, of this unit. Products of which have been shown to DURECT’s reasonable satisfaction to have been defective.

DURECT Corporation

www.alzet.com (web site)