

# BRIEF COMMUNICATION

## Cannula System for Local Stimulation of the Rat Brain

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LAVENHAR, S. R. AND A. L. PALANKER. *Cannula system for local stimulation of the rat brain.* PHARMAC. BIOCHEM. BEHAV. 4(3) 351-352, 1976. - The cannula design permits microinjection and push-pull perfusion, plus the use of a pressure probe for intraventricular placements.

Cannula    Chemical Stimulation    Microinjection    Push-Pull Perfusion    Pressure Probe

DIRECT chemical stimulation of the brain is a widely used method for studying the biochemical events underlying behavior. Booth [1], Chisholm and Singer [2], Hoebel [4], and Myers [5] have described various systems for microinjection or perfusion of isolated regions of the rat brain. The particular problem under investigation will dictate the procedure used to introduce a substance into the brain. The present paper describes the construction of a cannula base with caps for microinjection and push-pull perfusion, plus a pressure probe for intraventricular placement, used in our laboratory.

The cannula body is made from 0.250 in. dia. Delrin (DuPont Corp.), a biologically inert plastic which because of its low coefficient of friction, is extremely easy to machine. An 8 mm length of Delrin is first centered in a lathe, drilled with a No. 43 drill to a depth of 6 mm, the remainder being drilled with a No. 74 drill. The No. 43 hole is then threaded with a 4-40 tap. The Delrin is then machined to a 0.1875 in. dia. An appropriate length of 22 ga thin wall stainless tubing is then secured to the base with epoxy cement (Araldite).

The stylet, infusion and perfusion caps, and the pressure probe (Fig. 1) are made from 1/8 in. 4-40 stainless steel socket head cap screws. An appropriate sized hole is drilled through the center of each screw and stainless steel tubing or wire is cemented with epoxy into the hole.

An infusion cap is made by cementing a piece of 26 ga tubing inside the drilled out screw. The infusion needle is cut to extend 1.0 mm beyond the tip of the guide cannula and 5 mm above the screw so polyethylene tubing can be connected to the needle.

A push-pull perfusion cap [5] is made by cementing a 23 ga thin wall pull tube and a 30 ga push tube (reinforced by cementing a piece of 23 ga thin wall tubing over it) inside the drilled out screw. The 23 ga pull tube extends 0.5 mm beyond the bottom of the screw, while the 30 ga push tube extends 0.5 mm beyond the tip of the guide cannula. Both tubes are cut off 5 mm above the screw and are

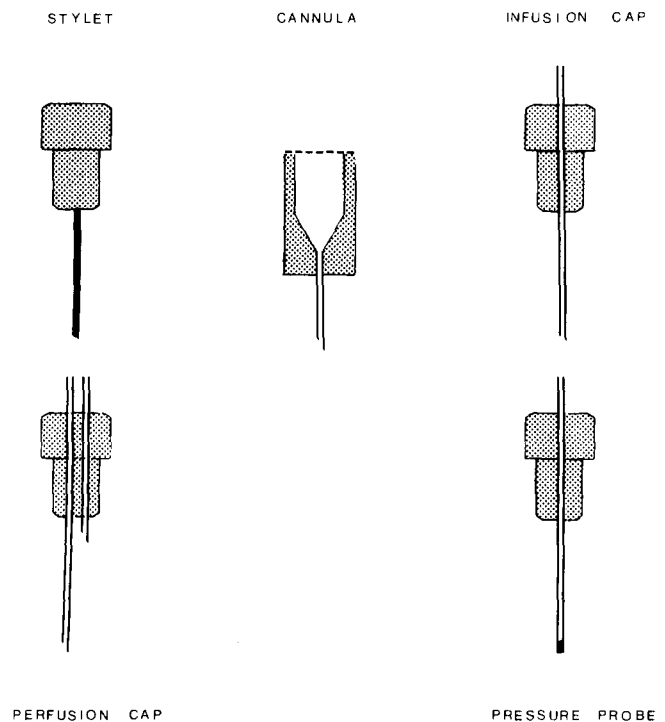


FIGURE 1

separated by gentle bending so polyethylene tubing can be attached to both needles.

A pressure probe, which allows verification of intraventricular placement during stereotaxic surgery, is made from 26 ga tubing. The tubing end is closed off and cut so that it protrudes 1.0 mm beyond the guide cannula and 5 mm above the screw so polyethylene tubing can be

connected to the probe. A fine slit is cut into the side of the tube just above the closed off end. The procedure used for intraventricular placement has been described elsewhere [3].

Implantation of these cannula is done with a Kopf Cannula Insertion Kit modified with a Jacobs Chuck. Because of its small size as many as 4 implants in the rat brain are possible.

#### REFERENCES

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