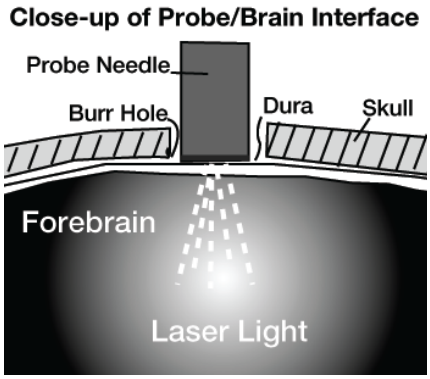
BLF22 Surgical Protocol

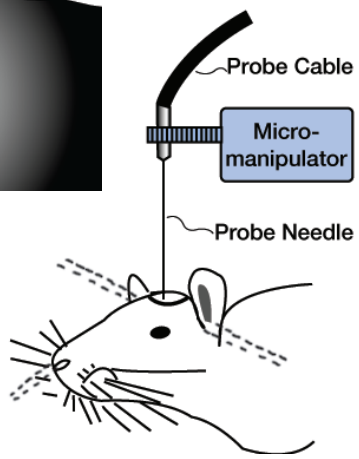
Local Cerebral Perfusion Measurements in the Rat

APPLICATION BASICS

Site:	Cerebral Cortex
Species:	Rat (Sprague-Dawley)
Body Weight:	370-390 grams
Duration:	Acute
Probe Type:	N 18 gauge needle



Type N Probe clamped into position for rat forebrain perfusion measurements such that there is no visible dent in the dura.



Application

To study the effects of transient forebrain ischemia and to study the effects of various drugs on forebrain perfusion.

Surgical Approach

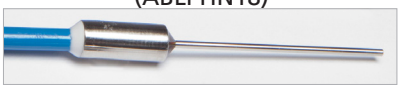
1. Induce anesthesia in the rat using 2.5% isoflurane in 40% 0_2, 60% N_2. Maintain anesthesia by slowly administering pentobarbital (40mg/kg i.v.) over ten minutes followed by pentobarbital (10 mg/kg i.v.) every 30 minutes. Stabilize the position of the animal in a stereotaxic device. Prevent hypothermia with a heating pad or water bottles.
2. Prepare the site for perfusion monitoring at a point 8 mm lateral and 2 mm anterior to the bregma (where coronal and sagittal sinuses join).
3. Make incisions in the scalp exposing enough of the skull to bore a 2.5 mm hole. Use a slow 2.5 mm trephine with a gentle saline drip (0.9%, 25°C) over the drill to prevent thermal injury. Stop drilling when a very thin bone layer remains in order to avoid physical damage to the cortex.
4. Carefully remove the remaining bone with forceps taking care not to disrupt the dura.
5. Using a micromanipulator, clamp the probe in position over the burr hole so as to minimize movement artifact. Avoid area directly over large blood vessels. The probe must be mounted so that it touches the dura, without applying pressure, as this would occlude the vessels and reduce perfusion in the area of interest. This is accomplished by seeing that neither the dura nor cortex are visibly indented by the probe. If there is any question of too much pressure, observe the perfusion readout on the laser Doppler monitor; then withdraw the probe slightly and observe the perfusion readout again. A sustained increase indicates the previous pressure was too great.

PERFUSION RANGES OBSERVED

Normal Perfusion: 20 TPU (tissue perfusion units)

Common carotid artery occlusion plus hypotension: 2 TPU

Type N (18 gauge needle) (ABLPHN18)



Diameter: 1.2 mm

ACKNOWLEDGEMENT

Protocol and data courtesy of Robert N. Willette, PhD, SmithKline Beecham Pharmaceuticals, Division of Pharmacology, King of Prussia, PA

REFERENCE

Willette RN, Sauermelch C, Ezekiel M, Feuerstein G, Ohlstein EH, "Effect of Endothelin on Cortical Microvascular Perfusion in Rats," Stroke 1990; 21(3) 451-458.

transonic
THE MEASURE OF BETTER RESULTS.