

# BLF22 Surgical Protocol

## Acute Renal Medulla Perfusion in the Rat

### APPLICATION BASICS

Site: Kidney, Outer Medulla  
 Species: Rat  
 Weight: 330 - 500 gram  
 Duration: Acute  
**PROBE TYPE:** NS 24 gauge needle  
 (0.15 mm fiber spacing)

**TYPE NS** (24 gauge needle)  
 (ABLPHNS24)



Diameter: 0.58 mm  
 Length: 40 mm

### Application

Studies on the effect of various drugs on regional renal blood flow. In this experiment L-N<sup>G</sup>-mon-methyl-arginine (LNMMA, an inhibitor of nitric oxide formation) was infused (40 mg/kg) over 3 - 4 minutes, intravenously. The reported systemic vasoconstrictor effect was reflected in a blood pressure increase from 110 to 122 mmHg. The Laser-Doppler trace (Fig. 1) shows a 20% decrease from baseline flow, to around 7.0 TPU. The recording was made using the Laser Doppler's time constant switch set a 3 seconds (averaging). Interestingly, the cyclic oscillations become more prominent after LNMMA infusion.

### Surgical Protocol

Anesthetize the rat with Inactin (100 mg/kg). Place in dorsal recumbency and make a ventral midline abdominal skin incision. Extend the abdominal incision through the linea alba into the abdominal cavity. Deflect the intestines to the right to expose the left kidney. Mechanically fix the kidney as for a micropuncture experiment. The kidney is decapsulated to reduce tissue compression during penetration. Using a micromanipulator, insert the Laser-Doppler Probe perpendicularly into the kidney to a depth of 4 mm (i.e., the outer medulla). Maintain the kidney temperature at 37°C with a heat lamp and warm saline/mineral oil drip. Catheterize the femoral artery and vein with PE-50 catheters for infusion of normal saline with bovine serum albumin (4.5g/dl) at a rate of 0.08 ml/min and for monitoring of blood pressure with a pressure transducer.

### Perfusion Ranges Observed

Initial flow readings were on the order of 8.5 - 9.5 tissue perfusion units (TPU). The flow is stable, except for cyclic oscillations at 1 - 2 minute intervals.

### REFERENCE

Brezis M, Heman SN, Dinour D, Epstein FH, Rosen S, "Role of Nitric Oxide in Renal Medullary Oxygenation," J Clin Investig 1991; 88: 390-395.

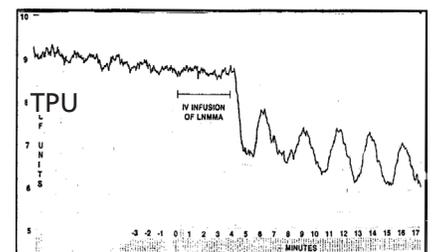
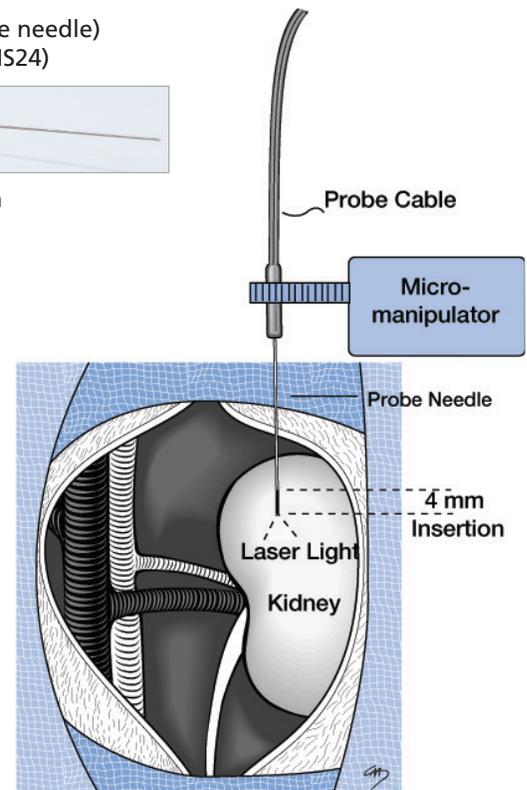


Figure 1 Rat Renal Medulla BF by LD with LNMMA Infusion

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 Mayer Brezis, MD Associate  
 Professor of Internal Medicine &  
 Nephrology, Hadassah-Hebrew  
 University, Medical Centers-  
 Jerusalem, Israel.

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