

BLF22 Surgical Protocol

Acute Renal Cortex & Medulla Perfusion in Rats

APPLICATION BASICS

Site:	Left Kidney: Cortex & Medulla
Species:	Rat (Sprague Dawley)
Body Weight:	320-400 grams
Duration:	Acute
PROBE TYPE:	N and NS
Renal Cortex:	N: 18 gauge needle
Renal Medulla:	NS: 24 gauge needle (0.15 mm fiber spacing)

Application

This study demonstrates the importance of studying renal microcirculation in the functional recovery of the kidney from post ischemic acute renal failure.

Surgical Approach

Rats were anesthetized with sodium pentobarbital administered intraperitoneally (50mg/kg). The kidneys were accessed through an abdominal midline incision and renal ischemia was produced by occlusion with smooth vascular clamps of both right and left renal arteries for 60 minutes.

Twenty-four hours later, the rats were again anesthetized with intraperitoneal sodium pentobarbital. The left kidney was exposed through a midline incision, decapsulated and immobilized. The exposed kidney was maintained at 37°C by bathing it in mineral oil warmed by a heating lamp. Regional blood flow was measured by a Tissue Perfusion Monitor.

Two Laser Doppler Probes were mounted on micromanipulators. Cortical flow was measured by resting the Probe on the kidney surface, and medullary flow was measured by inserting the Probe 3.0 to 4.5 mm into the renal parenchyma with placement guided by a separate needle puncture.

After one hour equilibration, animals were infused with zaprinast (0.03 or 0.30 mg/kg/min). Blood flow was measured every 30 minutes during four hours of drug infusion. Animals receiving zaprinast experienced a significant increase in their renal function. Following sacrifice, the left kidney was dissected and visually inspected to verify Probe placement in the medullary tissue.

Type N (18 gauge needle) (ABLPHN18)



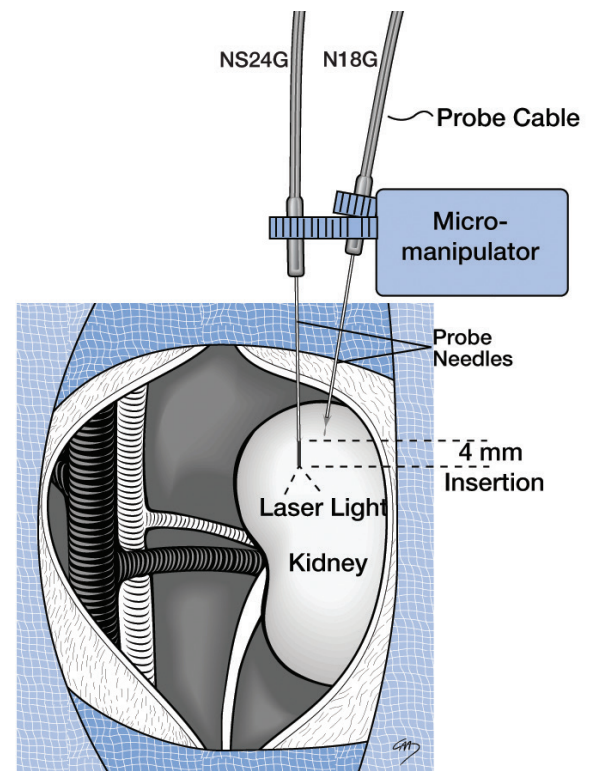
Diameter: 1.2 mm

Type NS (24 gauge needle) (ABLPHNS24)



Diameter: 0.58 mm

Length: 40 mm



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Perfusion Ranges Observed

KIDNEY	PRE-ISCHEMIA (LD UNITS)	24-HOUR POST-ISCHEMIC INSULT (LD UNITS)
CORTEX	39.0	5.6
MEDULLA	35.4	11.8

Both high dose and low dose zaprinast increased cortical blood flow in the post-ischemic kidney by approximately 17% compared to control. At four hours of drug infusion, low dose and high dose zaprinast increased medullary blood flow by 60% and 40%, respectively, compared to control.

ACKNOWLEDGEMENT

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REFERENCES

Guan Z, Miller SB, Greenwald JE, "Zaprinast Accelerates Recovery from Established Acute Renal Failure in the Rat," Kid Int 1995; 47: 1569-75.



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