BLF22 Surgical Protocol

Intestinal Serosa Blood Perfusion Measurement in Dogs

**APPLICATION BASICS**

- **Site:** Intestinal serosa & mucosa
- **Species:** Dog, mongrel
- **Weight:** 11 - 19 kg
- **Duration:** Acute

**PROBE TYPE:** S straight with Balance Arm, Probe Holder

**Application**

Basic research in laser Doppler. Applied laser Doppler research on the effects of various substances on intestinal serosal perfusion.

**Surgical Approach**

Withhold food from the dog for 24 hours before surgery. Induce anesthesia with sodium pentobarbital (25 mg/kg, IV). Maintain anesthesia during surgery and throughout the experiment with additional sodium pentobarbital (IV). Perform a tracheotomy and insert an endotracheal tube. Provide intratracheal insufflation with a respirator. Perform a median laparotomy. Catheterize the femoral artery to supply blood for a reservoir.

(Continued on back.)

**Type S (ABLPHS)**

- Titanium tip
- Diameter: 6 mm
- Length: 6 mm

**Flow Ranges Observed**

- Serosal Tissue Perfusion: 0 - 70 TPU
- Anterior Mesenteric Artery: 0 - 45 ml/min

**ACKNOWLEDGEMENT**

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**REFERENCES**


**Fig. 1:** Simultaneous perfusion measurement of serosal surface of the prepared intestinal and transit-time ultrasound volume flow measurements of the branch of the anterior mesenteric artery and anterior mesenteric vein.
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Select an intestinal loop for isolation which is supplied by a single main branch of the anterior mesenteric artery. Ligate and catheterize this arterial branch and perfuse with blood from the reservoir at rates controlled by means of a roller pump.

Ligate the intestinal loop and resect at both ends. To exclude collateral blood flow, isolate from all adjacent mesentery and peripheral vasculature but leave intact the anterior mesenteric vein draining the loop.

LASER-DOPPLER PROBE PLACEMENT
Place the Laser Doppler Probe on the serosal surface of the prepared intestinal loop using a balance mechanism (see LD-106-tn) applying a pressure of about 0.1 g/mm².

TRANSIT-TIME UTRASOUND FLOWPROBE PLACEMENT
Apply transit-time ultrasound Flowprobes to the branch of the anterior mesenteric artery supplying the bowel loop and the vein draining it.

SIMULTANEOUS MEASUREMENTS: LASER DOPPLER PERFUSION & TRANSIT-TIME UTRASOUND FLOW
Set the pump output at a low flow rate. Allow the system to equilibrate and then record the volume flow from the transit-time ultrasound Flowmeter and the perfusion reading from the Tissue Perfusion Monitor. Increase the pump output and again record volume flow to the loop and microvascular perfusion. Repeat to cover the range of flows of interest.