

T400-Series Surgical Protocol

Mouse Superior Mesenteric Artery: Acute Blood Flow Measurement

APPLICATION BASICS

Site:	Mesenteric artery
Species:	Mouse
Body Weight:	20 - 50 grams
Duration:	Acute
Vessel Diameter:	0.60 mm
Length:	10 mm

PROBE

Size:	0.7 mm
Reflector:	JN
Connector:	CRA10: 10-pin
Cable Length:	60 cm
Catalog #:	MA-0.7PSB
FLOWMETER	TS420 Perivascular Module

Flow Ranges Observed

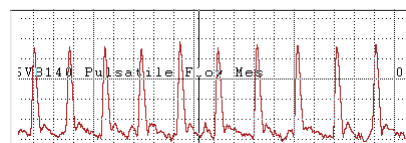
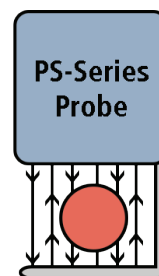


Fig. 1: Superior mesenteric arterial flow in the mouse.

Reported Flows: 0.9-3.0 ml/min in sham operated C57BL6/N male mice, body weight 25-33 g



(side view)

Fig. 2: Nanoprobe PS-Series: The full ultrasonic window has the same flow sensitivity, so that the vessel can be positioned anywhere within the Probe lumen.



Surgical Protocol

- Administer anesthesia, clip from xiphoid process to lower abdomen.
- Make a midline incision into abdomen (either one incision or first through skin then muscle).
- Reflect small and large intestines laterally to the right.
 - Major landmarks at this point include:
 - Vena cava and abdominal aorta on midline
 - Left kidney in more ventral position
 - Right kidney located more rostrally is usually obscured by intestine
 - Liver midline and superior usually partially obscures the celiac ganglia
 - The coeliac ganglia is the large white body located in midline and slightly on the right in the area between the two kidneys. Its posterior border is perpendicular to the axis of the aorta. The ganglia contains a number of lymphatic vessels which are usually easy to visualize.
 - The superior mesenteric artery is located within the ganglia or at its posterior border, running almost perpendicular to the aorta. Occasionally (especially in rats), it is located superiorly (under) the posterior border of the ganglia.
- Carefully dissect the artery from the ganglia and lymphatic vessels. You should be able to clear at least a 10 mm section of the artery from the portion within the ganglia before encountering branches. Also, you can clear additional space back to the aorta. Occasionally there is a small branch near where the artery exits from the aorta.

(Continued on next side.)

Mouse Superior Mesenteric Artery: Acute Blood Flow Measurement Cont.

Surgical Protocol cont.

- Place the vessel gently within the Probe lumen and attach the handle of the Flowprobe to a micromanipulator to stabilize the Probe on the vessel. Fill the space between the vessel and Probe with SurgiLube gel to aid in transmission of the ultrasound signal. Check that the "Signal Quality" indicator on the Flowmeter shows 4 – 5 lit bars; 3 or less bars may indicate an air bubble.
- Measure flow.

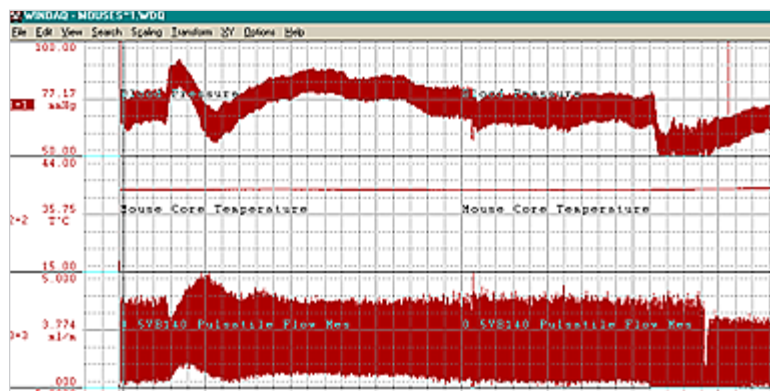


Fig. 3: Mouse Arterial Pressure (top) and Mesenteric Blood Flow measured with a 0.5PSB Nanoprobe showing dose response data.

Blood Flow Mapping in the Mouse with Transonic® Precision Nanoprobes

Ascending Aorta	1.5PSL
Lower Thoracic Aorta	1PR
Pulmonary Artery	1PR
Carotid Artery	0.5PS, 0.5VB
Femoral Artery	0.5PS
Mesenteric Artery	0.7PS
Renal Artery	0.5PS
Portal Vein	1PR

REFERENCE

Albuszies G, et al, " Effect of increased cardiac output on hepatic and intestinal microcirculatory blood flow, oxygenation, and metabolism in hyperdynamic murine septic shock," Crit Care Med. 33(10): 2332-2338, 2005.



Transonic Systems Inc. is a global manufacturer of innovative biomedical measurement equipment. Founded in 1983, Transonic sells "gold standard" transit-time ultrasound flowmeters and monitors for surgical, hemodialysis, pediatric critical care, perfusion, interventional radiology and research applications. In addition, Transonic provides pressure and pressure volume systems, laser Doppler flowmeters and telemetry systems.

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