

## **Surgery Model #: CAC-M**

### **Carotid Artery Catheterization (CAC) Care and Use Document for the Mouse**

*Anesthetic: Sodium Pentobarbital (IP): Mouse Dose 75 mg/kg*

*Analgesic: Buprenorphine (SQ): Mouse Dose 0.05 mg/kg*

#### **Basic Surgical Procedure Description:**

An anesthetized and surgically prepared animal is placed in dorsal recumbency under a dissecting microscope. A 1cm midline, cervical skin incision is made with its caudal terminus at the level of the clavicle. The omohyoideus muscle is divided and retracted in order to visualize the left carotid artery. The artery is mobilized caudal to the bifurcation of the internal and external carotid. A catheter is inserted into the vessel via a small incision in the artery using either a 30G needle or a pair of microscissors and secured in place. Once secured, the catheter is filled with 10 µl of saline followed by 10 µl of lock solution via a Hamilton syringe (1.25 to 1.5 turns). The syringe is replaced with a catheter pin. A 0.5cm midline skin incision is made between the scapulae. A trocar is used to draw the catheter through the subcutaneous tunnel created between the scapular and ventral cervical skin incisions. A stainless steel wound clip secures the catheter port and closes the scapular incision, while wound adhesive is used to close the ventral skin incision.

#### **Catheter:**

Catheter material consists of a single length of sterile polyurethane tubing funneled at the insertion tip. Catheter has a 9 mm intra-vascular tip and 15 mm access port. The access port is sealed with a sterile stainless steel pin. 25 gauge blunted needles are required to enter the port. Fill volume of the catheter is 10ul.

#### **Lock Solution:**

Heparinized Dextrose (500 IU/ml): 10.0 mL stock heparin (1000 IU/mL) + 10.0 mL Dextrose.

#### **Quality Control:**

Patency is verified by the ability to withdraw a blood sample within 24 hours of shipment and is guaranteed upon animal receipt. To maintain animals over longer periods of time, catheters need to be flushed twice per week (once every 3-4 days). Follow the sampling procedure outlined below, minus sample withdrawal to flush catheters. For best results, use the animals within one week of delivery.

#### **Sampling / Test Article Administration:**

CAC are reliable for obtaining blood samples and blood pressure readings. Sample size and frequency should be minimized to essential time points to maintain the health of the animal. Pilot studies are always encouraged to be sure our CAC preparation performs up to user expectations. For blood withdrawal, gather the following materials: Syringe assemblies (1cc syringe and microsyringe syringe attached to 25G blunted needle), sterile saline and sterile lock solution

1.) Place mouse in a restrainer

***Important: Always clamp the port with rubberized or smooth hemostats to prevent unintended blood flow and port damage when changing syringes and flushing the catheter***

2.) Clamp port and remove the pin from the catheter and set aside

3.) Insert an empty syringe assembly (SA) into the port and release hemostats

4.) ***Gently*** withdraw fill solution and blood to the point of seeing blood in the needle hub; clamp port

5.) Attach a second SA, release hemostats and withdraw sample (syringe may contain anticoagulant); clamp port

6.) Release hemostats and ***Slowly*** flush catheter with sterile saline (~10µl); clamp port

7.) Attach microsyringe and refill with 10µl lock solution – avoid overfilling the lock solution! Clamp port and replace pin.

If blood fails to flow in step 4, remove the empty SA and replace with a SA containing saline. Gently flush the catheter with 10µl of saline and repeat as outlined above.

#### **Housing:**

Individually house animals to prevent cage mates from chewing on one another's catheters.

**Notes: 1.** Using needles larger than 25G will stretch the port and make future sampling difficult. Additionally, employing needles with bevels or rough edges will damage the port – decreasing the longevity of the catheter.