

NORTH AMERICAN RESEARCH MODELS SURGICAL SERVICES

SPECIES (preferred weight)	PROCEDURE ORDER CODE	COMMON APPLICATIONS	DESCRIPTION/ COMMENTS
RAT (225-250g)	ABDOMINAL AORTA CATHETERIZATION AORTICATH	Blood pressure monitoring	A catheter is inserted into the abdominal aorta .
RAT (min. of 125g)	ABDOMINAL BANDING ABDBAND	Hypertension model	Constriction of renal artery using suture.
RAT (75-300g) MOUSE (18-30g)	ADRENAL DEMEDULLATION ADREXDEMED	Studies of sympathetic or parasympathetic nervous system, epinephrine, or norepinephrine	The cortex of each adrenal gland is cut and the medulla removed.
RAT (75-300g) MOUSE (18-30g)	ADRENALECTOMY ADREX	Studies of steroidal hormone metabolism and obesity	Bilateral removal of the adrenal glands on each side. Retired rats not recommended. Normal saline (0.9%) supplementation of water required post-surgically.
RAT (min of 225-250g)	ALZHEIMER'S MODEL ALZHEIMER	Physiologically induced Alzheimer model used to screen compounds and evaluate therapies	Lesion on brain resembling Alzheimer's disease is produced by injecting 192-Saporin into the left lateral ventricle.
RAT (min of 225-250g)	BILATERAL BRAIN CANNULATION BIL-BRAIN	Routine dosing into two areas of the brain simultaneously	Coordinates for insertion of brain cannulae need to be specified by customer at time of order.
RAT (175-300g) MOUSE (> 25g)	BILE DUCT CATHETERIZATION BILECANN	Routine sampling of bile for pharmacokinetic studies	Continuous loop system: one end of catheter placed in the bile duct , the other in duodenum.
RAT (50-350g) MOUSE (18-35g)	BILE DUCT LIGATION BILEDUCLIG	Studies of hepatic fibrosis, cholestasis, and drug metabolism with compromised liver function	The bile duct is ligated.
RAT (125-325g) MOUSE (25-35g) G. PIG (125-600g)	CAROTID ARTERY CATHETERIZATION-COMMON CARART	Blood pressure monitoring, blood sampling, available in extended length catheters for automated samplers	A catheter is inserted into the common carotid artery .
RAT (20-350g) MOUSE (12-35g)	CASTRATION CASTRATE	Behavior studies, prostatic hyperplasia, and cancer	Removal of the testes .
RAT (200-300g)	COLON CATHETERIZATION COLON	Dosing compounds into colon	Catheter is inserted into the colon . For infusion only.
RAT/MOUSE (>3 wks of age)	CUSTOMER-SUPPLIED DEVICE IMPLANT IMPLANT	Individual animal identification	Subcutaneous implant of small device with limited manipulation required. Device supplied by customer in manufacturer packaging.
RAT/MOUSE (>3 wks of age)	CUSTOMER SUPPLIED DEVICE IMPLANT IMPLANT2	Vascular access port for long term access to vessel	Device implant requiring surgical manipulation. (i.e, vascular access port implant). Requires an additional code to indicate vessel of entry. Device supplied by customer in manufacturer packaging.

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RAT (200-300g)	DUODENAL CATHETERIZATION DUODCANN	Dosing compounds into duodenum	Catheter is inserted into the duodenum . For infusion only.
RAT (100-350g)	FEMORAL ARTERY CATHETERIZATION FEMART	Blood pressure monitoring, blood sampling, available in extended length catheters for automated samplers	A catheter is inserted into the femoral artery .
RAT (125-350g)	FEMORAL VEIN CATHETERIZATION FEMVEIN	Dosing compounds or blood sampling, available in extended length catheters for automated samplers	A catheter is inserted into the femoral vein .
MOUSE (25-32g)	GANGLIONECTOMY (SUPERIOR CERVICAL) GANGLION	Study effects of parasympathetic denervation on the function of other organ systems	Both Superior Cervical Ganglion are removed.
RAT (> 325g)	HEPATIC ARTERY CATHETERIZATION HEPARTCANN	Direct infusion into the liver	A catheter is inserted into the hepatic artery .
RAT (100-300g) MOUSE (20-30g)	HEPATECTOMY* HEPATEX	Liver function studies	70% of the liver is surgically removed.
RAT (50-300g) MOUSE (12-30g)	HYPOPHYSECTOMY HYPOX	Endocrinology studies	Removal of the pituitary gland using parapharyngeal methods (through the neck). 5% glucose or sucrose supplementation in water required post-surgically. Animals require warm environments. HYPOX1 for rat <75g or >200g.
RAT (50-300g)	HYSTERECTOMY* HYSTERX	Hormonal and reproductive physiology studies	Removal of the entire uterus , leaving the ovaries intact.
RAT/MOUSE/ G. PIG (>3 wks of age)	IDENTIFICATION CHIP (AVID) IMPLANT AVIDTRANS	Individual animal identification	Avid chip implanted subcutaneously. Usually done in animal room, not surgery suite, unless combined with another procedure.
RAT/MOUSE/ G. PIG (>3 wks of age)	IDENTIFICATION CHIP (BIOMEDICAL) IMPLANT BIOMEDTRNS	Individual animal identification	Biomedical chip implanted subcutaneously. Usually done in animal room, not surgery suite, unless combined with another procedure.
RAT (225-300g)	INTRACISTERNAL CANNULATION INTRCIST	Cerebrospinal fluid sampling	A cannula is implanted in the cisterna magna , between the caudal part of the cerebellum and the medulla oblongata.
RAT (200-300g) MOUSE (25-30g) G. PIG (250-300g)	INTRALATERAL VENTRICULAR CANNULATION IVC	Routine infusion of compounds into the brain	A cannula is implanted in the lateral ventricle of the brain , using standard coordinates.
RAT/ (200-300g)	INTRALATERAL VENTRICULAR CANNULATION FOR OSMOTIC PUMP IVCTUBING	Continuous infusion into the brain	A cannula is implanted in the lateral ventricle of the brain . Tubing connecting to the cannula is subcutaneously tunneled towards the scapula region to connect to an osmotic pump for continuous delivery of compound to the brain.

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RAT (225-300g)	INTRATHECAL CATHETERIZATION THECALCAN	Direct infusion into subdural space of the spine	A catheter is inserted into the subdural space of the spine . The catheter is exteriorized from the scapular region. For infusion only.
RAT (200-300g)	JEJUNUM CATHETERIZATION JEJUNUM	Infusion only for dosing compounds into jejunum	A catheter is inserted into the jejunum . For infusion only.
RAT (125-325g) MOUSE (22-30g) G. PIG (225-500g)	JUGULAR VEIN CATHETERIZATION JUGVEIN	Blood sampling or compound dosing, also available in extended length catheters for automated samplers	A catheter is inserted into the jugular vein .
RAT (200-325g)	JUGULAR VEIN CATHETERIZATION (DOUBLE) JUGJUGVEIN	Blood sampling from the right jugular vein. Compound dosing through the left jugular vein	Both jugular veins are catheterized.
RAT (125-325g)	JUGULAR VEIN CATHETERIZATION W/ HEAD MOUNT JUGHEAD	Blood sampling or compounds dosing	A jugular vein catheter is externalized on the head and secured with head mount.
RAT (275-350g)	MESENTERIC LYMPH DUCT CATHETERIZATION MESENTRIC	Immunological studies, lymph fluid sampling/collection	A catheter is implanted in the mesenteric lymph duct . For optimum patency, it is best to use these animals the day after surgery.
RAT (200-300g)	MICODIALYSIS GUIDE IMPLANTATION UNI-BMICRO	Brain microdialysis	A microdialysis guide cannula is placed in a target area of the brain .
RAT (200-300g)	MIDDLE CEREBRAL ARTERY OCCLUSION MCA OCCL	Ischemic stroke model	The middle cerebral artery, (which provides blood supply to the brain) is occluded to create an ischemic stroke model.
RAT (175-200g)	MYOCARDIAL INFARCTION MYOINFARC	Study of heart disease	The left anterior descending coronary artery is permanently ligated. MYOINFARC1 for animals >200g.
RAT (100-300g) MOUSE (20-30g)	NEPHRECTOMY NEPHREX	Studies of hypertension or renal impairment	The left kidney is removed.
RAT (150-275g) MOUSE (25-35g)	NEPHRECTOMY (5/6) 56NEPHREX	Hypertension, renal failure, and drug metabolism with compromised renal function	Removes one kidney and 2/3 of the other kidney. One week between surgical procedures. Requires receipt of IACUC approval from customer facility. A renal artery ablation model is available upon request.
RAT (200-275g)	OLFACTORY BULBECTOMY OLFACTOREX	Behavioral studies involving an impaired sense of smell, depression studies	Removal of the olfactory bulb .
RAT (50-300g) MOUSE (12-30g) G. PIG (200-600g)	OVARIECTOMY OVARIEX	Osteoporosis, bone metabolism, and calcium absorption	Removal of both ovaries .
RAT (50-300g) MOUSE (12-30g)	OVARIECTOMY AND HYSTERECTOMY OVAR-HYST	Osteoporosis, bone metabolism, and calcium absorption	Removal of both ovaries and uterus .

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RAT (225-275g)	PANCREATECTOMY (PARTIAL) PANCRISX	Malabsorption model	Removes approximately 90% of the pancreas .
RAT (175-350g)	PARATHYROIDECTOMY PARATHYROX	Study of calcium and phosphorus deficiencies and metabolism	Removes parathyroid glands only, leaving the thyroid glands intact. 1% calcium lactate water supplementation required post-surgically.
RAT (225-300g)	PARKINSON'S MODEL PARKINSON	Parkinson's drug screening	6-Hydroxydopamine solution is injected into the substantia nigra of the brain . Apomorphine challenge is done 7+ days post-surgery. Only animals that spin are shipped.
RAT (min. of 125g)	PINEALECTOMY PINEAL	Circadian rhythms, melatonin function, and metabolism	Removal of the pineal gland .
RAT (250-280g)	PORTAL CAVAL SHUNT (ECK-FISTULA) PORTCAVSHT	Hepatic metabolism of compounds	Re-direct portal flow to the vena cava .
RAT (225-300g) MOUSE (> 25g)	PORTAL VEIN CATHETERIZATION PORTVEIN	Intestinal drug absorption, portal vein sampling, or infusion	A catheter is inserted into the portal vein .
RAT/MOUSE (varies)	SHAM SURGICAL PROCEDURES SH + PROCEDURE CODE	Used for scientific controls to measure impact of surgical procedure itself	Typically done for soft-tissue procedures, but available for most surgical procedures upon request.
RAT (175-275g) MOUSE (25-30g)	SIALECTOMY SIALEX	Gastroenterology studies	Removal of the parotid, sub-maxillary, and lingual salivary glands .
RAT (175-275g)	SPLANCHNIC DENERVATION SPLANIC	Research on adrenal function	Severs the splanchnic nerve .
RAT (70-350g) MOUSE (20-30g)	SPLENECTOMY SPLEENX	Studies of immunology and hematopoietic diseases	Removal of the spleen .
RAT (200-300g)	STOMACH CATHETERIZATION STOMCANN	Routine compounds infusion	Catheter is inserted into the stomach . For infusion only.
RAT (300-400g)	SUPRARENAL ARTERY CATHETERIZATION RENALART	Infusion model for renal metabolism and excretion	Catheter is inserted into the suprarenal artery . The tip of the catheter is located at the junction of the renal and suprarenal arteries.
RAT/MOUSE G.PIG/HAMSTER	SURGICAL SUPPORT SURGSUPPT	On-site surgical support for procedures	Full day service only. Typically Thursdays and/or Fridays. Requires prior IACUC approval of procedures to be performed.
RAT/MOUSE G.PIG/HAMSTER	SURGICAL TRAINING SURGTRAIN	On-site surgical training for procedures	Full day service only. Typically Thursdays and/or Fridays. Requires prior IACUC approval of procedures to be performed.

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RAT (125-300g)	SUSPENSORY LIGAMENT REMOVAL SUSPENLIGX	Evaluation of drugs affecting penile function	The suspensory ligament on either side of the penile body is sectioned.
RAT (200-375g) MOUSE (>25g)	TELEMETRY IMPLANT BLOOD PRESSURE TELEMBP	Blood pressure monitoring	Minimum 7 day post-op holding time to ensure catheter adequately secured in place through healing process. Customer supplies telemetry device in manufacturer packaging.
RAT (175-325g) MOUSE (>25g)	TELEMETRY IMPLANT ELECTROCARDIOGRAPH (ECG) TELEMECG	Used in cardiovascular studies for recording changes in electrical potential that occur as the heart beats	Customer supplies telemetry device in manufacturer packaging.
RAT (175-325g) MOUSE (>25g)	TELEMETRY IMPLANT BP + ECG TELEMPBECG	Blood pressure, heart rate, and ECG monitoring	Minimum 7 day post-op holding time to ensure catheter adequately secured in place through healing process. Customer supplies telemetry device in manufacturer packaging.
RAT (175-325g) MOUSE (>25g)	TELEMETRY IMPLANT ELECTROMYOGRAPH EMG	Used for monitoring animal activity or studying neuromuscular disorders. Records electrical activity associated with skeletal muscle functioning.	Customer supplies telemetry device in manufacturer packaging.
RAT (175-325g) MOUSE (>25g)	TELEMETRY IMPLANT ELECTROENCEPHALOGRAPH EEG	Used for neurological studies to record brain wave activity	Customer supplies telemetry device in manufacturer packaging.
RAT (225-325g) MOUSE (>25g)	TELEMETRY IMPLANT EEG + EMG EEG/EMG	Used to measure brain wave activity along with general animal activity	Customer supplies telemetry device in manufacturer packaging.
RAT (90-150g)	THORACIC BANDING TABAND	Studies of left ventricular hypertrophy	Stenosis is created by ligation in the ascending aorta .
RAT (50-175g) MOUSE (18-25g)	THYMECTOMY THYMEX	Immunology studies and transplant research	Removal of both lobes of the thymus gland .
RAT (175-350g)	THYROIDECTOMY THYROX	Thyroid function studies	Removes the thyroid gland , replaces the parathyroid gland .
RAT (175-350g) MOUSE (18-30g)	THYROID-PARATHYROIDECTOMY THYRO+PARA	Calcium metabolism and thyroid function studies	Removal of both thyroid and parathyroid glands . 1% calcium lactate water supplementation required post-surgically.
RAT (125-350g)	TUBAL LIGATION (BILATERAL) BITUBALLIG	Studies of ovarian function	Both uterine horns are ligated just below the fallopian tubes.
RAT (200-300g) MOUSE (25-30g)	UNILATERAL BRAIN CANNULATION UNI-BRAIN	Routine infusion to a target brain area	A cannula is implanted in the target brain area on one side of the brain.

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RAT (50-300g) MOUSE (12-30g)	VAGOTOMY (BILATERAL SUBDIAPHRAGMATIC) VAGOX	Differentiate peripheral and central mediated effects on autonomic nervous system of drugs or other therapies	Severs the vagus nerve at sub-diaphragmatic level.
RAT/MOUSE (min. of 150g)	VASCULAR PUMP IMPLANT VASC-PUMP	Osmotic infusion dosing studies	Osmotic pump implanted. Also need to specify relevant vascular catheterization procedure.
RAT/MOUSE (can vary)	VASECTOMY VASEX	Bred to produce pseudopregnant females.	Removes a section of each vas deferens .
RAT (200-300g) MOUSE (25-30g)	3RD VENTRICLE CANNULATION 3RDVENTCAN	Routine infusion to ventricular system	A cannula is implanted in the third ventricle, using standard coordinates.

* Protocol not currently active.