Don’t Get Lost in Translation

Department of Comparative Medicine
Division of Laboratory Animal Resources
Clinical Services

843-876-5205
vet-services@musc.edu
Services

• Project development
• Implementation options for every step
  • Animal use protocol submission
  • Creating the animal model of interest
  • Compound administration
  • Tissue or fluid collection
• Data collection and basic statistics
Project Development

• Consultation -> Understand the science first!
  • Goals and hypotheses

• Consultation -> What’s at stake?
  • Start up funding
  • Students with deadlines
Project Development

• Consultation

• Animal model selection involves more than choosing an animal...
  • Housing conditions
  • Diet
    • Purified or natural ingredient
    • Open formula (fixed) or Closed formula (fixed or variable)
  • Health status (not just SPF!)
    • Helicobacter, commensal bacteria, norovirus....
  • Age
  • Conditioned or trained
  • Sex (Male versus Female?)
    • Intact and account for the cycle
    • Ovariectomized with hormone replacement
  • Source
    • Do all animals need to be from the same originating vendor, building, room location?
Project Development

• Consultation

• Animal model selection

• Animal protocol submission and approval
  • “stubborn on vision...flexible on details.” –Jeff Bezos
  • Research requires flexibility
  • A poorly written animal protocol will remove flexibility

• Pilot study if needed or requested

• Preliminary data for grants
Project Implementation

• Implementation options at every step in the process
Project Implementation

• Implementation options at every step in the process
• Compound dosing
  • Intravenous
  • Intraperitoneal
  • Intranasal
  • Subcutaneous
  • Gavage
Project Implementation

- Implementation options at every step in the process
- Compound dosing
- Surgical models
  - Large animal species -> SRL facilities
  - Rodent surgical models
    - Cecal Ligation and Puncture
    -ectomies
    - Spleen
    - Adrenal glands
    - Cecum
    - Reproductive tissue
    - Kidney
    - Thyroid
    - Etc...
    - Device implantation
    - Vascular cannulation
    - Organ cannulation
    - Intestinal tract
    - Urinary
    - Site injections
    - Kidney capsule
    - Bile duct
Project Implementation

• Implementation options at every step in the process
• Compound dosing
• Surgical models
• Data collection
  • Single or serial physiological measurements
  • Single or serial tissue or body fluid collection
Clinical Care

• Individually tailored endpoint criteria
  • *Stubborn on vision... flexible on details*...

• Unexpected adverse events
  • Identified early with direct veterinary involvement
  • Are they related to research or coincidence?
    • Diagnostic lab services on site
  • Treatment provided by experienced veterinary technicians
    • Only treatments that will not interfere with research
  • Timely changes to methods and protocol if needed
    • Solvent
    • Dose
    • Volume
  • Consolidation of health, treatment and research records to identify possible outliers in data
Breeding Services

• Breeding colony management
  • Detailed records
  • Genetic analysis
  • Systematic methods to prevent genetic drift

• Cross foster
  • Eliminate certain pathogens
  • In-house breeding of genetically modified strains that can’t (or won’t) rear pups

“When are you setting up the breeding?”
Division of Laboratory Animal Resources

- Diverse experiences and expertise in one central facility
  - Surgical
  - Phenotyping
  - Behavioral
  - Toxicology
  - Anesthesia
  - Nociception/Pain
  - Diagnostic
- Close proximity and access to other MUSC services creates a streamlined research process
Expertise

- Collaborative faculty
  - Surgery
  - Clinical care
  - Pathology
Facilities

- Operating Rooms for Translational Models
  - Rabbits
  - Feline
  - Canine
  - Porcine
- Separate surgeon & patient preparation areas
- Surgical tables, C-arm table
- Surgical lights, suction, cautery
- Basic general surgery & cardiothoracic instrument packs
- Anesthetic machines & monitoring equipment
Project Planning

- Goals / Hypothesis
- Timeline
- Species selection
- Staffing
- Budget
- Contract
Basic Surgical Package

- Anesthetic induction
- Pre-operative preparation
- Anesthetic monitoring
- O.R. circulating technician
- Post-operative care x 7 days
- General surgical instruments
- Veterinary care
Specialized Requests

• Surgical assistance
• Surgical approaches / closures
• Serial imaging post-op
• Technical assistance with data collection
Specialized Requests

- Specialized surgical instruments & implants supplied by PI
- 24-hour nursing care
- Specialized animal training
Pathology
Diagnostic, Translational/Research and Clinical
MUSC-VA Veterinary Diagnostic Laboratory

792-0593/ 876-5232
Diagnostic

• Do you have sick animals?
• Is your research not going as planned?
• Are animals dying unexpectedly?
Translational pathology

• Tumors

• Device studies

• Preliminary toxicology screens
Device studies
Preliminary toxicology screens

• Analysis of serum abnormalities
• Gross examination of tissues
• Histological examination of specific tissues
Research
Expertise in Animal Pathology

• Do you have a need for phenotyping?
  • Transgenic animals

• Immunohistochemistry

• Histological analysis
Histological analysis
Immunohistochemical analysis
Quantitative not Qualitative Data
Clinical Pathology
Clinical

• Hematology (30ul)
• Blood Chemistry (100ul)
• Hematology
• Small sample volume so you can do serial sampling (30ul)
• Complete blood count
  • Erythrocytes
    • Nucleated red cells, rubricytes
  • Leukocytes
    • Neutrophils, eosinophils, mast cells, monocytes, lymphocytes
Clinical chemistry

- Cholesterol
- Glucose
- Iron
- Alanine aminotransferase
- Alkaline phosphatase
- Aspartate aminotransferase
- Creatine kinase
- Gamma glutamyl transferase
- Albumin

- Total bilirubin
- Blood Urea Nitrogen
- Calcium
- Creatinine
- Inorganic phosphate
- Total protein
- Chloride
- Potassium
- Sodium

We can do individualized panels composed of one or all parameters
Systems you can measure with these parameters

- Liver
- Kidney
- Musculoskeletal system
- Others
Contact Us:

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  • Clinical Services: 843-876-5205
  • Surgical Services: 843-876-5239
  • Pathology Services: 843-876-5202

• Email
  • General Inquiries: vet-services@musc.edu
  • Training Services: DLAR-training@musc.edu
Summary:

- Project planning
  - Choosing appropriate model
- Clinical care
- Surgical procedures
  - Model creation
  - Device studies
- Pathology
  - Diagnostic
  - Tissue reaction
  - Tumor growth
  - Toxicology (preliminary)
We can be your partners in translational research.