Laboratory Organization & Project Management

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Objectives

- **Research Perspectives**
- **Lab Set up & Organization**
  - Sample storage
- **Managing your Research Project(s)**
  - General Advice
  - Pre-proposal Considerations
    - Research Personnel
  - Study set-up
  - Study management & data collection
  - Post-study wrap-up
- **MSU & CVM resources**
Research Perspectives

- Human vs Animal subjects
- Investigator-initiated vs Sub-site or Contracted
- Single vs Multi site
- Clinical Trial vs Observational
- Client-owned subjects
- Pharmaceutical or Device
- Benchtop Research
- Pre-clinical animal models
- Community-based
- Federal regulated

Lab Set up & Organization

Keri Gardner
Keep in mind that “the size of the laboratory is never positively correlated with productivity. In almost all fields the most productive labs are the smallest”- Nicolas Carayol, Mirielle Matt; Research Policy 33, 2004, 1081-1102

Science is a way of thinking much more than it is a body of knowledge. Carl Sagan

CVM’s Mission: Learn, Discover, Heal, Protect

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Lab Set up & Organization

**Considerations-Pre Moving**

Check with Infrastructure Planning and Facilities (IPF)
- Faculty Readiness Project (FRP) is a new initiative to improve the transition of hiring new employees by ensuring they have everything they need to get started before they move into their new workspace.

**Hire early**
- Hiring part-time, full time, on-call, post doc, specialist (personnel)
- Prior laboratory setup experience
- Prior university (MSU) experience,
- Already has a P-card (purchasing card)
- Previous Environmental and Health Services (EHS) experience
- Supervisory experience for students
Setting up accounts (Dept fiscal officer)
- VTH (clinical studies), VDL (diagnostics), CAR (lab animal), Other

Moving logistics
- Clearing hallways, elevator size
- Equipment requirements (electrical supply, size, wall brackets, noise)
- Freezer warning system (centralized)

Ordering equipment
- > $10,000 competitive bids (sole/single source letter)
- P-card has restricted daily limit ($2500)
- Spartan Marketplace, Biochemistry Store, MSU Requisition...
- Chairs must be plastic, specific rollers
- Filters inside ventilation system

Get Information Technology (IT) on board
- Massive data sets
- Other types of data programs
- Special programs

Physical Setup

Work Stations
- Each station contains specific equipment to purpose
- Decrease cross-contamination
  - Tissue culture-water bath, low traffic
  - RNA station only for RNA
  - Radiation/Toxins
- Manuals stay with equipment or in 1 location

Chemical Storage (EHS required)
- Chemicals, Oxidases, Flammables, Corrosives
- Do not store liquids above solids
- Do not store chemicals in alphabetical order
- Keep a chemical inventory
- Post an abbreviation list (TRIS, PBS, ETOH...)-EHS requires
- Must have a flammable-safe freezer (methanol-protein/DNA/RNA)
Supply Ordering and Organization

- Company order list-contains passwords/acct numbers/products names/contact person
- Keep an order log
- Weekly or biweekly lab meetings-are important!
  - Keeps everyone on task (orders and equipment updates)
  - Brings up unknown questions (new suppliers, protocol changes)
  - Diversity promotes problem solving (different suppliers/newer protocols)
- DATE EVERYTHING! When it comes in date it and consider having a check-in list with location of placement so everyone knows it came in and where it’s located.
- Label drawers, shelves, cabinets
- Check accounts monthly (mistakes happen!)
- Drugs-depends on company and classification

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EHS-Environmental and Health Safety

- Call them early-make friends, tell them about your research, ask for suggestions and listen to EHS requirements
- Before experiments involving biological materials begin, the Principal Investigator must submit a Biological Materials Registration Form (example) to the Institutional Biosafety Committee
- Complete required courses for safety compliance-initial courses are often in person (yearly online refresher)
- Make sure you complete the New Laboratory Checklist (EHS website)
- Spill Kits-Biological and Chemical
- List of all hazardous/biological waste and disposal dates
- Notebooks/Binder/Online file of all laboratory training certificates and check periodically for compliance
- Phone list by lab phone-important numbers for easy access-EHS, CAR, IPF...(not all labs have cell phone service!)
Make sure **EVERY** person in the lab is up-to-date on training, even yourself!

**Example**
A person is going to be doing tissue culture using feline cells infected with Feline Leukemia virus for a summer research project.

Required EHS Training BEFORE starting the project:
- Site Specific Training-fire extinguisher, eye wash, hazardous waste...
- Chemical Hygiene, Laboratory Safety, and Hazardous Waste training
- Laboratory Security Awareness (lab is always locked)
- Autoclave Safety (sterilizing tools)
- Biosafety Principles (BSL-2 for virus)
- Compressed Gas Cylinder Safety (changing CO₂ tanks)
- Non-Medical Waste Management (TC Pasteur pipettes)
- Cryogen Safety (cells are stored in liquid nitrogen)

**Laboratory Duties Assigned to Individuals**
Otherwise it will NEVER get done!

**Checks** - prevents EHS non-compliance & sample loss
- Freezer, refrigerator temperatures **1x day**
  - IPF monitoring system
- Eyewash checks documented **1x week**, EHS requirement
- Expiration dates
  - Hazardous waste
  - Chemicals/Solutions
  - Sterile equipment

**Calibration** - ensures accuracy in all assays
- Scales **2x year** (internal/weights)
- PH meter-accurate buffer pH
- Desiccator-replace desiccant for chemical purity
- Pipettes **1x year** (send out/come to lab)-Worth It!
  - ~$35.00 single channel
  - ~$75.00 multichannel
- Anesthesia Machines **1x year** (internal/send-out)-animal safety
- Laminar Flow, Biosafety Cabinet, Fume Hoods (MSU) **1x year**
  - Requires equipment release form (de-contamination)
Hazardous & Biohazardous Waste-promotes safety
- Hazardous Waste-Must be picked up in 90 days
  - Regular Sharps (+ syringes)-RED
  - Chemical/Pharmaceutical sharps-BLACK
  - Blood Tubes-Empty Bottle
- Biohazardous waste not 90 days
  - How to autoclave-open, +water, disposal, tubs
- Glass-no longer janitorial

Drug Duties-ensures license and FDA compliance
- Check for Expiration, dispose properly (ASK!-pharmacy, EHS)
- Controlled Drugs-Clinical vs Research DEA
  - Lock-Box, locked cabinet
  - Yearly inventory 1x year-submitted to DEA
  - Drug log (check-in, daily use, authorized person)
  - Disposal only thru incineration 1-2 times a year or as specified by EHS

Incubator Health-enables cell health and repeatable assays
- Gas tank (O2, N2, CO2, NO)-brackets and backup tanks, regulators, leaks, transport
  - Filters placed in gas tank incubator lines-during tank change
  - Consider building ventilation (example vet G-big filter)-2x year
  - Gas log 1x week or more using a fyrite/other system to measure CO2 or O2
Cleaning
• Water bath-antimicrobial, water/bead change 1x month
• Incubators-cleaned as needed, decontaminated 1x year, water bath 1x month
• Fume hoods-declutter/decontaminate (10% bleach)
• Centrifuge-clean according to manual, rotor 1x year
• Biosafety cabinet-70% ETOH, 10% bleach, clean filter
• Freezers-clean or replace filters (-80)
• Ventilation Filters-replace (IPF) 2x year
• Many more!

DATE EVERYTHING!

Example: 1. Use centrifuge for blood, some leaks, bacteria grows, TC tubes spun, bacterial contamination, study loss. 2. Waterbath not cleaned, bacterial contamination, TC media warmed, bacteria transferred, cell death
Bench Research Tips

Document EVERYTHING! Everyone or every study has a notebook/binder. Each time a person runs a study experiment make a study sheet. Pen only! (mistakes=one line strikethrough, initials, date). Even if you don’t think it’s important….it is!

Have Standard Operating Protocols (SOPS) for every study. Keep all protocols, even simple ones, one notebook or shared file. Update as needed!

Expiration dates-working vs. stock (KNOW YOUR PRODUCT!!)

TIPS:
- File for primers
- File for antibodies
- File for Supplies
- File of SOPs
- File of TC cell lines
- Checklist protocol

Nothing worse then when a student whose been in your lab for 3 years leaves and no one knows what primers were used for the SNP that was discovered or how to perform the enzymatic assay that took 2 years to optimize.

Example Study Sheet

- Purpose
- Hypothesis
- Specific aims/protocol
- Results
- Conclusion
- Future, what to try next

Why? Study sheets are placed into notebooks as work is completed. This is done when the experiment is fresh, not later. They provide the reasoning behind study modifications and allows others to repeat the experiment at a later time.
Example Checklist

Protocol

DNA Extraction from Guthrie Cards
Michigan State University, 9-27-17
Kit & Protease Lot #: 
Supplies:
Qiagen QIAmp DNA Investigator Kit-#56504
Gloves:
Sterile 1.5ml microcentrifuge tubes
Sterile 2.0ml microcentrifuge tubes (Eppendorf #022363352
Microcentrifuge
Thermomixer
Vortex:

- Wash lab bench with 10% bleach (made fresh weekly). Turn on heat for thermomixer (56°C).
- Check AL and ATL Buffer for precipitation. If needed, dissolve buffers by heating to 70°C with gentle agitation.
- Using a sterile hole-punch, punch out 3 full 6mm punches from saturated blood circles on each Guthrie card to sterile foil. Place 1 punch per sterile 2.0 ml round-bottom tube for 3 tubes per card using sterile forceps. Wash and dry forceps with 10% bleach between samples. Use new punch for each sample.
- Make ATL/Protease K Master Mix. Add 300ul of master mix to each sample tube.

Example:
280ul ATL x 26 (9 of samples) = 7280 ul
20ul Protease K x 26 (9 of samples) = 520 ul

- Place sample tubes into a prewarmed thermomixer at 56°C and incubate samples with shaking at 900rpm for at least 3 hours, but incubation can be longer, up to overnight, with no detrimental effects.
- Set thermomixer temperature to 70°C.
- Briefly centrifuge (pulse) samples to remove drops from the inside of the lids.
- Add 300ul Buffer AL, close lid, and mix by pulse-vortexing for 10 sec.
- Incubate samples in thermomixer at 70°C with shaking at 900rpm for 10 min. Reset thermomixer to 56°C.
- Briefly centrifuge (pulse) samples to remove drops from the inside of the lids.
- Add 110ul ethanol (96–100%), close the lid, and mix thoroughly by pulse-vortexing for 15 sec.
- Briefly centrifuge (pulse) samples to remove drops from the inside of the lids.

Sample Storage
- Boxes-label on the side, not on the top
- Specimen labels-bags vs sample, lid vs container
- Freezers, refrigerators, cryogenic storage
- Cryolabels-tape falls off, types of vials (-80 vs liquid N²)
- Typed vs handwritten
- Racks, bins, baskets, boxes
- Shared drives-maps, locations, protocols
- Agree on labeling protocol-numbers, letters, dates, file naming, by study, by animal...

DATE EVERYTHING!
Managing your Research Project(s)
Michele C. Fritz

Example Freezer Map

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<tr>
<th>Shelf</th>
<th>Rack</th>
<th>Row</th>
<th>Box</th>
<th>A Number</th>
<th>Sample</th>
<th>Notes</th>
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Freezer Map

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Managing your Research Project(s)
Michele C. Fritz

My Organized Chaos

https://www.myorganizedchaos.net/wp-content/uploads/2015/01/MOC.jpg
General Advice

It takes time!

Pre-proposal Considerations

- Study design
  - Statistical analysis consult: biostats co-I vs CSTAT
  - Stakeholders

- Protocol “practicality” & Budget → plan for the unexpected
  - Seek HELP with your budget
  - VTH services
  - VDL services
  - Other service labs/core facilities
  - Specialized equipment & supplies
  - Software/Data collection systems
    - REDCap, OpenClinica, Research Informatics (RIX), Barcoding Technology
  - Research personnel: scope and availability → don’t underestimate time
Research Personnel - Dedicated team

- What is the Scope of work? Who best fits which role?
  - Hiring Options: full-time part-time, temporary, on-call, voluntary
    - Technician - Lab vs L VT: RATTS
    - Post-doc, Specialists
    - Students: DVM vs Technicians, undergraduate, graduate
      - CVM Summer Research Program
  - Attributes: detail-oriented, motivated to learn, team player, good communicator, flexible

- Things to consider → timetime, budget tradeoffs
  - Team diversity
  - Time commitments - “Hidden time”
  - Expertise creates Efficiency
  - Longevity creates Consistency across studies
  - Ask Administrator and HR for help hiring

ALL Labs/Studies need a Project Manager

Involve your staff EARLY

Study Set-up

- Non-industry = OSP (Office Sponsored Programs)/CGA (Contract & Grant Administration): https://www.cga.msu.edu/Default.aspx
- Industry = Business connect: http://www.businessconnect.msu.edu/

- Initial contract and budget executions
- Conflict of Interest
- Effort Reporting
- Contract or Budget Modifications
- Progress report approvals
- Subcontracts
Study Set-up

- Personnel Hiring & Training → help with study set-up
  - Risk assessments
  - Research compliance training - determined by protocols
  - Research methods, regulations, etc.

- Set up Subcontracts and Service accounts - internal & external
  - Multisite study contracts
  - Establish service fee agreements

- MSU Technologies: [http://www.technologies.msu.edu](http://www.technologies.msu.edu)
  - Material Transfer Agreements (MTA)
  - Data Use Agreements (DUA)

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Study Set-up

- IACUC = Institutional Animal Care & Use Committee
  - Monitors regulatory compliance for all vertebrate animal use activities
    - Identify training requirements - species specific, hazardous material, health questionnaire, etc.
  - Preps for other regulatory inspection, i.e. USDA
  - Reviews and approves Animal Use Form (AUF) protocols & personnel, and amendments → REQUIRED FOR:
    - Animal purchase/transfer
    - Animal use or sample collection

- CAR = Campus Animal Resources
  - Animal Procurement
  - Husbandry, Veterinary care, Training for animal handling/procedures

Animal Use Form
Animal Use Form for Clinical Research
- Client Consent Form template
- Personnel Page
- Surgical Procedures
- Breeding Colonies
- Wildlife Field Research
- Biological Material, Recombinant DNA, and Hazardous Materials
- Unrelieved Pain & Distress
- Physical Restraint
- Food/Fluid Restriction
- Antibody/Ascites Production
- Exceptions to the Guidelines

Collaborate on writing your AUF!
Study set-up

- Develop Protocols -
  - Create Standardized Operating Procedures (SOP) for **EVERYTHING!**
  - Ensure AUF/IRB protocol is current
    - Know what has been approved
    - Finalize randomization procedures
  - Create reporting & observational forms, study checklists, consent forms, tracking forms, adverse event forms, identification labels
    - Paper vs electronic? HIPAA compliant?
    - Reporting standards - CONSORT, SPIRIT, STROBE, etc.
  - Organize animal health records → separate from research results records, lab notebooks, & administrative records
  - Establish study contact information sheets

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BLOOD COLLECTION & PROCESSING SOP

**Purpose:** To collect paired (1:2) serial blood samples

1. Pressurize supplies, located in ANAS

2.1. Ensure catheter, cleaning, and set up supplies are stocked – toothbrush x2, green towel, sex supply checklist

2.2. Change capes and caprice

2.3. Label one 3ml EDTA tube for each blood collection time point

2.3.1. Write day/week/month (D/T/M – TIDPO)

2.3.2. Abbreviated Study ID (year-GOv)

2.3.3. Patient Name

2.4. Date

2.4.1. Label one 3ml Serum Separator tube for protein evaluation at T0 blood collection time point

2.4.2. Label one 3ml EDTA tube (for RNA analysis at T0 blood collection time point

2.4.3. Abbreviated Study ID (year-GOv)

2.4.4. Patient Name

2.4.5. Date

2.5. Label one 3ml EDTA tube for DNA analysis at T0 blood collection time point

2.5.1. Mark with TD vibration parameters

2.5.2. RNA

2.5.3. Patient Name

2.5.4. Date

2.6. Label three 3ml cryovial tubes each blood collection time point for plasma samples, plus two additional 3ml cryovials for plasma samples, plus two additional 3ml cryovials for serum samples

2.6.1. Abbreviated Study ID (year-GOv)

2.6.2. Patient Name

2.6.3. Date

2.6.4. Platelet rich plasma

2.6.5. Date

2.6.6. Sample Type (e. plasma or serum)

2.6.7. Read (blood, dripper, dripper, dripper, or urine)

2.6.8. Print Blood Sample Collection form

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Sample Collection

3.1. Place Iguana catheter in cephalic or saphenous vein

3.2. Collect Time 0 blood sample (1:2) from catheter using this protocol

3.2.1. Push catheter with 0.5% phenolized saline to ensure patency

3.2.2. Using 3ml syringe containing 0.5ml phenolized saline 0.5%, remove 2-3ml of blood from catheter set aside

3.2.3. Using non-phenolized syringe collect 1:1 time blood and aliquot into appropriate tubes

3.2.3.1. Transfer 1:1 time EDTA evacuated tube labeled T0 to T0 blood collection tube labeled T0

3.2.3.2. Transfer 1:1 time serum separator tube labeled for protein

3.2.3.3. Transfer 3ml to serum separator tube labeled for protein

3.2.3.4. Add tissue homogenized blood back into catheter

3.2.3.5. Save 3ml remaining may be used but replace needle before drawing up more additional blood

3.3.1. Push catheter with approximately 0.5, 0.2% phenolized saline

3.3.2. Push catheter guard over catheter if needed for evaluation

3.3.3. Record time of sample collection on Blood Sample Collection form

3.4. For remaining required time points, collect 1:1 time of blood and transfer to EDTA evacuated tube labeled appropriately for each time point

3.4.1. Use collection methods described in 3.2.2-3.2.7

3.4.2. Timepoints: T1, T2, T3, T4, T5, T6, T7, T8, T9, 120 min

3.5. Remove catheter after 120 min sample is collected

3.6. Need 2g after bld sample is collected (administer prophylactic)

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Sample Processing

3.6.1. Centrifuge EDTA tube as quickly after collection as possible for 10 minutes at 5000g setting S-10

3.6.2. Record start time of centrifugation on Blood Sample Collection form

3.6.3. Using syringe transfer plasma, transfer plasma into time, aliquot

3.7. Place (cystic with sample in cooler on ice

3.8.1. Record time placed on ice vs Blood Sample Collection form

3.8.2. Record time placed in -80°C freezer on Blood Sample Collection form

3.9.2. Record sample location and location of sample on freezer map and Blood Collection form

3.10. Transport sample to Tech A&M/ST Diagnostics Laboratory on dry ice via FedEx standard overnight shipping when requested

3.11. Add Address to label

3.11.1. Texas Veterinary Medicine study

3.11.2. Texas A&M University

3.11.3. Texas A&M Veterinary Medical College

3.11.4. College Station, TX, 77843-6545

3.11.5. Phone no. 9794108894

4.1. Record sample ship date in spreadsheet tab: GDV, X던, X던, X던, X던

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Study set-up

- Develop Protocols -
  - Create Standardized Operating Procedures (SOP) for **EVERYTHING!**
  - Ensure AUF/IRB protocol is current
    - Know what has been approved
    - Finalize randomization procedures
  - Create reporting & observational forms, study checklists, consent forms, tracking forms, adverse event forms, identification labels
    - Paper vs electronic? HIPAA compliant?
    - Reporting standards - CONSORT, SPIRIT, STROBE, etc.
  - Organize animal health records → separate from research results records, lab notebooks, & administrative records
  - Establish study contact information sheets
Effects of a hyaluronic acid-based topical medication on the healing of open wounds in dogs.

AUF #: 12/08-198-00

PI: Dr. Baylon Studley
Cell: 719-4107
Co-PI: Dr. Heather Hubley
Cell: 612-561-0915

RATTS Technician:
Michala Fritz, LVT BSc
RATTS office: 412-9500
Cell: 517-980-6100

Medical Records for this project are located in:
1. Vivarium
2. Vivarium - see binder on top of records cabinet.
3. RATTS Office – G107

Hyaluronic Acid-based

DAY 4: BANDAGE CHANGE, BIOPSY

Date: 

HYALURONIC ACID-BASED

Right lateral thorax

Left lateral thorax

SUBJECTIVE VISUAL EVALUATION

Score

Pain assessment

Pain score: None

STANDARD OF CARE

Right lateral thorax

Left lateral thorax

Bandage change

Subjective Wound Evaluation

Photo record

Pouch biopsy, from, location:

Notes:

Amnestic /Narcotic

Anesthesia: 5.50mg/kg IM, xg: _/xg:

Mepipac: 2.5mg/kg IM, xg: _/xg:

Hydromorphone: _/xg

O2 L/min

O2 flow:

Death Note:

Note:

JNWPIT Study Checklist

Study ID: ________________________

PRE-SURGERY

Schedule surgery appointment:

Medical record: Next client name, address, phone, patient name, DOB, breed, gender

Pre-medicate (if necessary)

Update Master log: JNWPIT patient medical record log 2012-22-20 also located in

JNWPIT_Clinic_Patients/Medical Record.

Create patient folder and labels.

Client study consent

Copy for RN medical record

Copy for record:

OR, gers: submit to DPC/RAC #891224

Copy for VN medical record

JNWPIT study report:

Study/History - ask about current medications, seizure history, adverse medication reactions

Study questions:

Surgery / VTH HOSPITALIZATION

VTH consent

Notify NCC and set up surgery - label cage

VTH label (patient name and medical record)

Anesthetist contact anesthesia

Copy for VTH medical record, original = study record

JNWPIT study report

Surgery report: students do surgery, Jr. Vet Tech to finalize, send to GN

Preparation: 1. 2400-patient side strips, JNWPIT study AUF 2012-030-00-2

Diagnosis:

Changes (over right-left laterally): performed in delivery suite or VTH center

Copy for medical record

Change gender status from intact to spayed

Client owner surgery: complete VTH communication form

Medical record label:

JNWPIT

DAY 5: RECHECK (inpatient)

Anesthetist contact anesthesia

Copy for study record, original = medical record

JNWPIT study report

Infection evaluation and Score form

Hematology testing and biopsy

Call owner after anesthesia recovery, complete VTH communication form

Schedule 20 and 10 day rechecks

Miscellaneous notes:

Budget: $ 45 46 64 $ 45 46 64

Comments:

Days active

Days subject at hospital

Days subject at GN

NCC

VTH

VTH

JNWPIT

Medical record label:

Medical record label:

12/8/2017
MISTT Steps 1 & 2: Screening

Patient Study ID: ____________

Step 1 Pre-Screening: Identify ALL potentially eligible patients which include:

a. Confirmed stroke diagnosis
b. Adult

Step 2 Screening:

a) Collect limited Demographic data for ALL adult stroke patients living <50mi from the hospital – data source = medical record

<table>
<thead>
<tr>
<th>Date of Admission:</th>
<th>Stroke type (clinical diagnosis):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ischemic stroke</td>
</tr>
<tr>
<td></td>
<td>Intracerebral hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Subarachnoid hemorrhage</td>
</tr>
</tbody>
</table>

Date of Birth: Male 
Sex at Birth: Female 
Race (choose 2 or more): White 
Black or African American 
Asian 
American Indian or Alaska Native 
Native Hawaiian or Other Pacific Islander 
Other - specify: 
Unknown 
Hispanic origin: Not Hispanic or Latino 
Yes, Hispanic or Latino 
Unknown 

b) Screen for Eligibility - data source = medical record or referring physician.

First confirmed hospital diagnosis of acute stroke Ischemic or hemorrhagic | No |
Lives <50mi from hospital? | Yes |
Distance between home & hospital (miles): | 10 |
Living at home pre-stroke | No |

Norwich Terrier Upper Airway Study

Record Status Dashboard (all records)

Displayed belo is a table linking the working hypothesis and the status for every data collection instrument level (ongoing, for every wave). You may click on any of the colored boxes to open a new tab window to your browser to view that record on the particular data collection instrument. Please note that if the fields are not linked to any data collection instrument, you will only be able to view records that belong to your group. You will also be able to view records that belong to your group.

Legend for status: Complete

Displayed record Range 1 of 1 through 100 of 200 records 20 records per page

Display menu: New record status only

Filter menu: All status
Study Set-up

- Order equipment, controlled drugs, supplies, animals
  - Keep copies of all purchases and services

- Discuss administrative procedures for services - research discount, utilization & availability of staff / equipment

- Established shared files
  - Avoid simultaneous use
  - Determine file naming rules to track document versions

Examples

- YR-MO-D
  - 2017-03-5
- File name_VX
  - AB Newsletter #3_V2
  - AB Newsletter #3_V2-mcf edits
Study Management & Data Collection

Administrative Management
- Understand reporting requirements - internal & external
  - Allow time for Co-I’s and multi-site staff to review progress reports, AUF/IRB revisions, peer-review submissions
- Cross-check service charges: VTH, VDL, CAR
  - Communicate research coverage and discounts with service staff
- Monthly Budget / Operating statement reconciliation - track & know your expected “lag time”
  - % FNA
  - Salaries & Benefits
  - Purchases / service charges
  - Subcontract payments

Team Management
- Set clear expectations
  - Provide adequate training for protocols and methods - general & project-specific
  - Perform quality checks & performance reviews
  - Communication
  - Authorship
- Conduct team meetings, sub meetings
  - Appropriate frequency
  - Keeps everyone on task & helps manage conflict
  - Be inclusive; allow creativity
- Encourage active learning
  - Apply knowledge, build new skills, be receptive to new ideas and techniques
Study Management & Data Collection

- Communicate & collaborate with those outside the study team
  - Introduce the study, provide study progress updates
  - Be inclusive - engage others to help actively problem solve
  - Educate about evidence based practice

- Keep animal health records updated: CAR, VTH, primary care
  - Post study contact information
  - Post standard-of-care deviations for staff
  - Document informed consent and research-related procedures in the medical record

Study Management & Data Collection

- Data Collection - **BE ORGANIZED and CONSISTENT!**
  - Document EVERYTHING!
  - Use your Tools
    - Detailed SOPs
    - Screening, Recruitment, Informed consent forms
    - Reporting forms, clinical observations, sample collection forms
    - Checklists - procedures and supplies
  - Take photos
  - Follow-up to ensure things are finalized
  - Strive for Gold Standard procedures

- Keep EVERYTHING!

- Timely data entry - make time for deskwork
Post-study wrap-up

- Finalize data
  - Pending results (labs, radiology reports, etc.) - services & co-I’s
  - Data cleaning; prep data sets for analysis
  - Statistical analysis and team interpretation

- Disseminate study results
  - Study team and other informal collaborators
  - Participants
  - Peer review and invited presentations, Manuscripts
  - Community-based venues - newsletters, press releases, etc.

- Submit Final Reports; fulfill contractual obligations
  - Funding Agency
  - Budget

Generate ideas for the next proposal!

Things to Remember

- EVERYTHING is more complicated and takes more TIME than anticipated

- Plan ahead; Anticipate the Unexpected

- Consistency and Organization are Key

- Communicate, Communicate, Communicate!
MSU & CVM Research Resources

- **MSU research:** [https://msu.edu/research/](https://msu.edu/research/)
- **Office of Regulatory Affairs:** [https://ora.msu.edu/units](https://ora.msu.edu/units)

- InVivo Facility: [http://invivo.msu.edu/](http://invivo.msu.edu/)
- **C-STAT = Center for Statistical Training and Consulting:** [https://cstat.msu.edu/](https://cstat.msu.edu/)
- **CTSI = Clinical and Translational Sciences Institute:** [https://ctsi.msu.edu/](https://ctsi.msu.edu/)
  - BRIC: [https://ctsi.msu.edu/bric-tools](https://ctsi.msu.edu/bric-tools)
- **MSU Extension:** [http://msue.anr.msu.edu/](http://msue.anr.msu.edu/)
- University Outreach and Engagement: [https://engage.msu.edu/](https://engage.msu.edu/)
- **Communication and Branding Strategy:** [https://cabs.msu.edu/](https://cabs.msu.edu/)
  - CVM Communications Team

- **RATTS**
- **CVM Summer Research Program**

https://msu.edu/research/
RATTS can Help!

“We are a hardworking, professional team of Veterinary technicians that provides quality research for our diverse clientele. As veterinary professionals, we live strong by the Veterinary Technician’s Oath. As a team, we work with integrity while pledging to remain ethical and advocate for both man and animal.”

- Five Licensed Veterinary Technicians- ALL with bachelor’s degree, 1 Masters degree, 1 working on Masters degree, 1 with Molecular biology training, 1 with AALAS certification
- Clinical research, student labs, weekend wet labs
- Sample collection and processing, study budgeting, ordering
- Benchwork-IHC, DNA, RNA, Enzyme Assay, ELISA, Western Blot-proteins, rtPCR, TC
- Animal Experience-porcine, rats, mice, canine, feline

Contact Information: Manager-Keri Gardner D203, RATTS office G107- phone 432-9906, CVM.RATTS@cvm.msu.edu

Thank You!
Questions?