Fall 2021 Semiannual Program Review
November 2, 2021

Voting Member Attendees:
Richard Bianco, Lynn Impelluso, Sally Noll, Ilana Cohen, Henry Wong, Jen Hubbard, Jessica Sieber, [redacted], Keith Barker, Marilyn Bennett, Beverly Norris, Carolyn Fairbanks, Geoffrey Ghose, [redacted], Laura Stone

Alternate Member Attendees and Guests:
Frances Lawrenz, Nathan Koewler, Whitney McGee, Jessica Felgenhauer, Kat Coda, Julia Smachlo, Jennifer Borgert, Megan McCoy, Nima Estharabadi, Cynthia Lee, Margaret Luesse, Georgiy Aslanidi, Craig Flory, Wensheng Lin, [redacted], Julia Davydova, [redacted], Jodi Ogilvie, Brenda Kick, [redacted], [redacted]

1. **Agenda:**
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    - IACUC Office Administrative Summary and Approval Times (pg. 4-5)
    - Program Discussion Summary (from FCR Meetings) (pg. 6-16)
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        - Group 4: Jennifer
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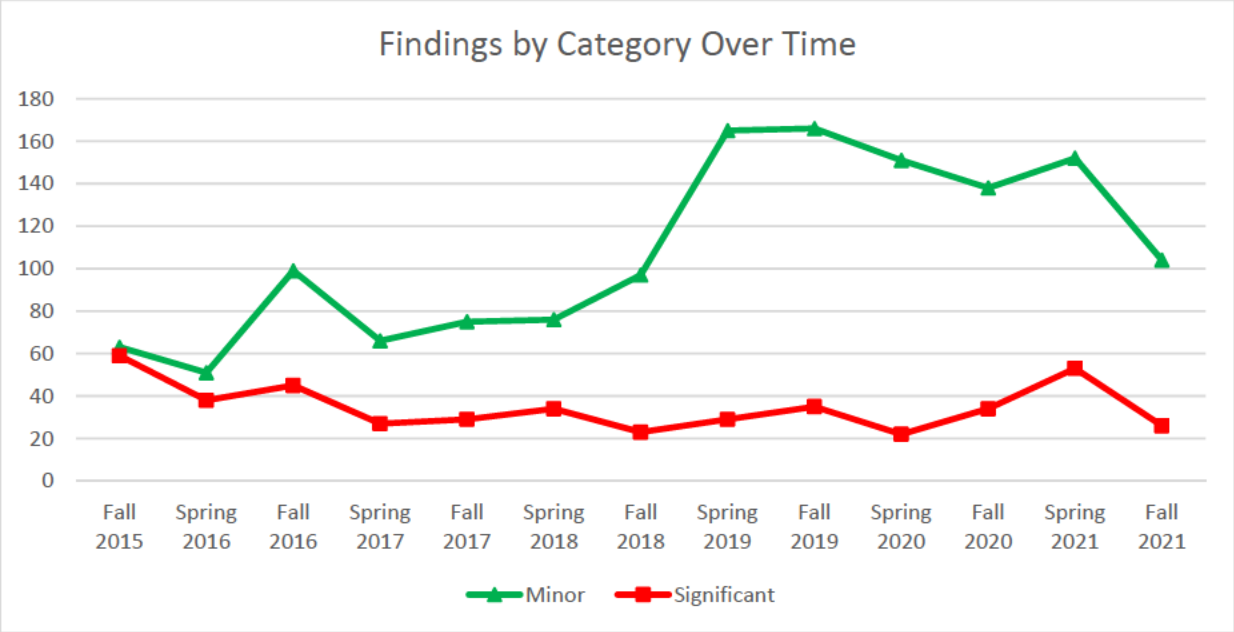
2. Fall 2021 Inspection Summary

During the Fall 2021 six-month cycle, there were 219 inspections with 130 findings (104 Minor Findings, 26 Significant Findings). Twenty-one of the Significant Findings were welfare related. At this time, all significant and minor findings have been corrected and the reports closed.

Over the last six months, we had the following:

- 7 reports sent to OLAW
- 2 reports to USDA
- 190 areas that had no findings
- 1 repeat finding (repeat significant)
- 4 notes to file
- 21 veterinary recommendations

	Fall 2021 April 2021—September 2021	**Spring 2021 October 2020—March 2021**
Significant	26	53
Minor	104	152
Total	130	205



NOTE:

- *Additional data and graphs located in appendices*

3. Investigator Managed Housing Area (IMHA) Summary

Fall 2021

# of PIs that have approved areas: 113

# of IMHA areas: 52

Spring 2021

# of PIs that have approved areas: 120

# of IMHA areas: 61

Fall 2020

# of PIs that have approved areas: 126

# of IMHA areas: 67

Spring 2020

# of PIs that have approved areas: 128

# of IMHA areas: 68

Fall 2019

# of PIs that have approved areas: 120

# of IMHA areas: 65

Spring 2019

# of PIs that have approved areas: 115

# of IMHA areas: 68

Fall 2018

# of PIs that have approved areas: 118

# of IMHA areas: 71

Spring 2018

# of PIs that have approved areas: 117

# of IMHA areas: 62

4. Administrative Statistics for Fall Program Review 2021

- Total FCR submissions April 1, 2021—September 30, 2021: 121
- Total DMR submissions April 1, 2021—September 30, 2021: 407
- Review Outcomes:

FCR
Number of new protocols: 93
Number of new protocols that received stipulations: 63
Number of new protocols that were approved as submitted: 28
Number of new protocols that were deferred: 2

Number of amendments:28
Number of amendments that received stipulations: 17
Number of amendments that were approved as submitted: 9
Number of amendments that were deferred: 2

DMR
Number of new protocols: 136
Number of new protocols that received stipulations: 83
Number of new protocols that were approved as submitted: 50
Number of new protocols that were sent to FCR: 2
Number of new protocols still pending review: 1

Number of amendments: 271
Number of amendments that received stipulations: 98
Number of amendments that were approved as submitted: 172
Number of amendments that were sent to FCR: 0
Number of amendments still pending review: 1

Vet Panel
Total Number of New protocols and Amendments on Vet Panel: 242

- Median Approval Times for submission from April 1, 2021—September 30, 2021

FCR
New Protocols:
Days on Vet Panel: 16
Days from receipt of submission (i.e., from vet panel) to meeting: 18
Days from meeting date to initial letter sent: 1
Days from stips sent to responses received: 2*
Days from submission to FCR to approval: 26
Total days from initial submission to approval: 42

Amendments:
Days on Vet Panel: 13
Days from receipt of submission (i.e., from vet panel) to meeting: 15
Days from meeting date to initial letter sent: 1
Days from stips sent to responses received: 4.5*
Days from submission to FCR to approval: 22
Total days from initial submission to approval: 35

DMR:
New Protocols:
Days on Vet Panel: 16
Days from receipt of submission (i.e., from vet panel) to agenda assignment: 7
Days from agenda assignment to all reviews received: 8.5
Days from reviews received to first letter sent: 1
Days from stips sent to responses received: 4*
Days from submission to DMR to approval: 20.5
Total days from initial submission to approval: 28

Amendments:
Days on Vet Panel: 8
Days from receipt of submission (i.e., from vet panel) to agenda assignment: 5
Days from agenda assignment to all reviews received: 8
Days from reviews received to first letter sent: 1
Days from stips sent to responses received: 2*
Days from submission to DMR to approval: 16
Total days from initial submission to approval: 18

*There may be additional rounds of stipulations whose timing is not captured here

Vet Panel:
Days protocol spends in control of Office: 3
Days protocol spends in control of Reviewer: 9
Days protocol spends in control of Investigator: 4
Total days from submission to approval to move on to DMR or FCR: 16

Compared to the last semi-annual period, there has been an increase in the number of submissions and a decrease in total time to approval across all protocol types.

Note that although all protocols undergo a veterinary review, in some cases this is concurrent rather than a pre-review on the Vet Panel. Compared to the last semi-annual period there has been a decrease in the number of items that undergo a pre-review on the Vet Panel.

5. Compilation of IACUC Discussion Notes April 2021—September 2021

- **INSTITUTIONAL PRACTICES, POLICIES, AND RESPONSIBILITIES**

APR The committee was updated on changes made to the Policy and Guidelines for Transportation of Animals. The policy now clearly indicates that RAR must be contacted for transportation between disconnected buildings. The committee requested the following additions to the Guidelines and will be updated when they have been made:

a. Vehicles must be approved in advance of use.

b. Transportation at agricultural sites is governed by their respective unit SOPs and does not require RAR to transport between buildings.

c. If inappropriate animal transportation is observed, it should be reported to the IACUC, as well as any applicable vendors.

APR The committee was updated on the adoption of a research dog. Pre-adoption procedures have been completed and the dog is recovering well and ready to go home with the new owner. The IACUC office will follow up with the adoptor in one month and update the committee.

APR The committee was updated on the progress of implementing IACUC mandated RAR training for new animal users and was reminded that protocol approval is not being delayed for the new training. An experienced research group will be contacted to request their assistance with hands-on training for agricultural cows.

APR The committee was updated on the upcoming AAALAC site visit, which will be scheduled sometime in summer 2021. RAR will conduct mock visits, including in IMHA areas, and RAR and IACUC will develop materials to assist labs in preparing for the site visit.

APR Semi-annual Program Review is scheduled for 4/20/21 during the normal FCR meeting time. Discussion items will include the OLAW checklist, summary of previous discussion items, inspection data, administrative data, and preparation for AAALAC. All members are encouraged to attend.

APR The committee was updated on a revised supervision plan for a lab. The plan was approved, with the inclusion of supervised anesthetic events as previously communicated to the PI.

APR The committee was updated on an NHP that is no longer a candidate for long-term studies. The labs involved would like to plan an acute-use study for the animal and several scenarios for this were discussed. The committee was supportive of the proposal to transfer the animal between the protocols on which the final procedures are approved and endorsed the suggestion for the labs to create an “end of study” protocol for future use.

MAY The committee reviewed the updated Policy and Guidelines on Anesthesia Monitoring in Research Animals and approved the updated documents.

MAY The committee reviewed the updated Policy and Guidelines on the Transportation of Research Animals and approved the updated documents.

MAY The committee voted to approve the final version of the Spring 2021 Program Review packet and send it on to the Institutional Official.

MAY The committee was updated on the recent adoption of a dog that had been on study. The dog is doing well in his new home.

MAY The committee discussed the recently implemented IACUC mandated RAR training. The Aseptic Technique and Suture course required for new surgeons has limited availability due to both staffing and COVID-related constraints. To facilitate timely training of surgeons, the committee approved the following three options as alternatives to the course:

1.Labs may train surgeons but they cannot perform surgery independently until their proficiency has been certified by an RAR or IACUC designee.

2.A lab member can be certified as a trainer by an RAR or IACUC designee and can then train others in the lab.

3.Waiver of the course for experienced surgeons.

Training will be revisited at the next semiannual Program Review.

MAY The committee discussed sourcing of NHPs. The matter was tabled and will be discussed again at a future meeting with input from a PI who uses NHPs.

JUN The committee discussed the length of time to allow for review of protocols. Committee members were reminded to contact the chair if they are not able to complete their reviews in a timely manner, to allow for reassignment to another reviewer. If an investigator has not responded to comments or taken other action on a pending protocol for at least four months, the office will contact them to give a one week deadline. If no response or action is taken, the protocol will be returned to the PI and would start a new review cycle if resubmitted.

JUN The committee continued the discussion from a previous meeting on sourcing of NHPs. RAR will continue to enforce their policies, and the IACUC will develop a broader policy to be considered at a future meeting.

JUN The committee welcomed new Interim Vice President for Research Dr. J. Michael Oakes

JUN The committee discussed an update from a PI that was permitted to use an Instant Pot for surgical tool sterilization on a trial basis. No infections or other issues have been seen. Autoclave tape has been used as a sterilization indicator, and the committee requests that biological indicators be added going forward. Another request has been received from Duluth, and the committee will require more information before any additional exceptions will be made for other PIs.

JUN The committee discussed the nationwide shortage of pentobarbital and agreed that due to this shortage, pentobarbital-containing solutions may be used for euthanasia for up to three

months past the manufacturer's expiration date. These solutions must be inspected for any visible signs of contamination or degradation, and a secondary method or confirmation of death must be performed to verify effective euthanasia. This provision will be reassessed in three months based on the conditions at that time.

JUN The committee discussed participation of committee members on inspections. The committee decided the current exemption for not having a second member present for non-USDA housing area inspections will be extended until August 2nd to match University guidelines. IACUC staff will update the assignment of committee members to inspections.

JUN The committee discussed a request by a lab on the Duluth campus to use an Instant Pot for surgical instrument sterilization due to decommissioning of the autoclave they currently have access to. The committee requested more information regarding access to another autoclave before making a decision on the request**.**

JUN The committee was updated on communication with a PI using cephalopods in research. There is no update from the PI at this time.

JUN The committee was updated on the ongoing discussion of NHP sourcing and potential positive TB test. Additional TB testing has been done, and the lab will continue to monitor the animal while it remains in extended quarantine.

JUL The committee discussed the shelf life of drugs in multi-dose vials after initial preparation. A draft policy update will be presented at a future meeting for further discussion.

JUL The committee discussed the recent AAALAC site visit, on which there were 7 suggestions for improvement and no mandatory findings.

JUL The committee was updated on tuberculosis testing results. Serial tests have not increased, so the animal has been released from quarantine. The lab will continue regular testing and will alert RAR to any health concerns.

AUG The committee was updated on a lab's use of an instant pot for tool sterilization. The committee informed the lab that it may continue to use an Instant Pot with the biological indicators for the next six months and to provide updates regarding sterilization cycles/results from the Instant Pot. Use of the Instant Pot is not considered a long-term, permanent solution.

AUG The committee was updated on a fire that occurred in a building where animals are used. No animals were impacted due to the fire.

AUG The committee discussed a request by an investigator to continue using an Instant Pot for instrument sterilization long term. The Chair will discuss other options with the PI, as the committee does not consider this a permanent solution.

AUG The committee discussed an investigator's responses to questions raised about a recent amendment on a protocol for which no more animals are available to order. The PI will be asked to clarify whether more animals will be requested and reminded that if there are no plans for more animals the amendment is not needed.

AUG The committee was presented with a request for an exception to the Guide to allow use of the manufacturer's expiration (9 months) vs the current 6 month expiration date for animal feed. The committee unanimously voted to allow the exception.

AUG The committee was updated on the RAR staffing shortage. The situation is considered critical and animal welfare may be impacted soon.

a. It was noted that messaging to investigators on this matter came from the IACUC email. It was discussed that further messages on this matter should come from OVPR or RAR emails, unless it has been discussed by the IACUC committee in advance.

SEP The committee was informed of the upcoming Semi-Annual Program review, scheduled for 10/19/21, and encouraged to attend and participate.

SEP The committee discussed a proposal to allow Veterinary Medical Center anesthesiology residents and faculty to participate in anesthesia of research animals. VMC staff would be added to the RAR Roster protocol to track occupational health and training requirements and sign a confidentiality agreement, and investigator permission would be obtained in advance. The committee voted to accept this proposal.

SEP The committee discussed the IACUC office's request for permission to take advantage of OLAW guidance providing the flexibility to conduct inspections of non-USDA areas with only one member. The standard would remain to use two members when possible. The committee voted to approve this proposal.

SEP The committee discussed whether IACUC approval is needed for a project that does not involve university-owned animals, university personnel, or university facilities. After consultation with the Office of General Counsel and verification that the grant does not require an IACUC protocol, the committee voted not to require a protocol for this project. The submitted protocol will be withdrawn.

SEP The committee discussed classification and reporting of wild animals as USDA-covered species. Currently wildlife undergoing invasive procedures are being included in our USDA report, but there is a lack of clarity on which procedures should be considered invasive. A subcommittee will be formed to develop clear definitions and policy around which procedures would be considered invasive and therefore non-exempt from USDA categorization.

SEP The committee was updated on the availability of pentobarbital-containing euthanasia solutions. The previous shortage appears to have resolved, therefore the exemption to use pentobarbital-containing euthanasia solutions for up to 3 months past the manufacturer's expiration date will be allowed to expire on 9/15/21. In date solutions must be used after that time.

SEP During review of a protocol, it was decided that a subcommittee will be formed to allow for further discussion of and development of updated policies and guidelines related to the use of SR-buprenorphine institution-wide.

SEP The committee was updated on the rescheduling of the fall Semi-Annual Program Review; the new date is 11/2/21.

SEP The committee was notified of a continuing education opportunity, the Animal Research Oversight Course through PRIM&R. There was interest in the course and the IACUC office will arrange an institutional subscription.

SEP The committee was updated on the veterinary pre-review process.

- **SELF-REPORTS and OUTSIDE REPORTS**

APR The committee reviewed a self-report in which surgical procedures were conducted on a protocol for which they were not yet approved. Moving forward, the animals have been transferred to an appropriate protocol on which the procedures and follow-up care are approved, and these procedures will not be done on the original protocol until they are approved. The committee considers the matter closed.

APR The committee reviewed a self-report in which animals received a special diet not approved on the protocol, and food levels were found to be low by RAR and the lab did not immediately replenish the supply. Moving forward, the lab has submitted an amendment to add the diet and reminded lab staff of the need to complete weekend tasks. The committee will send the PI a letter reinforcing the importance of prompt attention to issues identified by RAR.

APR The committee reviewed a self-report in which two dogs experienced burns caused by a grounding unit for an electrocautery device used during surgery. Moving forward, the lab will use gel on the grounding device and include this on their pre-surgery checklist. The committee considers the matter closed.

APR The committee was updated on efforts to identify a suitable method for monitoring heart rate in cats while in a high field MRI environment. The Mouse Ox device worked initially but the lab reported fluctuations later in the scan. The committee requires that the lab use the Mouse Ox device for their future procedures, to collect as much heart rate data as possible. Additionally, the committee was updated on a new staff member in this lab and will allow her to supervise cat anesthetic procedures in place of RAR/IACUC supervision, once she is added to the protocol.

APR The committee was updated on a self-report from RAR in which an equipment failure caused animals to be without access to water and animals were subsequently found dead. The committee reviewed an additional self-report in which three cages of mice were found without food and one animal died and others required medical attention. RAR will remind animal care staff to check food levels every day during health checks and to verify water sources are in working order when placing cages on the rack. The committee requests that RAR evaluate the effect of the change in daily check procedures and report whether there have been additional issues with food or water access since the change was made.

MAY The committee was updated on a recent unannounced visit to the [redacted]. Cows appeared healthy and the facilities were in good condition. The staff member that the site visitors met with was knowledgeable and engaged. It was recommended that the previously required monthly meetings between NCROC and an RAR vet become optional. The committee endorsed this plan.

MAY The committee reviewed a self-report in which a rat pup was inadvertently left in a temporary cage overnight. The animal was found by RAR and no adverse health effects were noted. Moving forward, the lab has implemented additional checks to ensure that all animals are accounted for. The committee considers the matter closed.

MAY The committee reviewed a self-report in which blood pressure was not monitored during a non-human primate surgery due to an equipment failure. The animal, which had other underlying conditions, did not fully recover from surgery, and was euthanized. A necropsy is in process. Moving forward, the lab has ordered additional backup blood pressure monitoring equipment and will contact RAR to borrow their equipment if needed. The committee considers the matter closed.

MAY The committee was updated on recent self-reports from RAR regarding animals found without access to water or food. Daily animal checks are done as carefully as possible while minimizing disruption and staff have discretion to pull out any cages for more detailed checks. No other similar incidents have been reported since the adoption of the current process for daily checks, and RAR staff regularly identify animals with low food or water and intervene. The committee thanks RAR for their detailed response and considers the matter closed.

MAY The committee reviewed a self-report involving issues with surgical and aseptic technique. The lab has met with their area veterinarian to discuss best practices and the lab member performing surgery will take the RAR aseptic technique and suture class prior to performing additional surgeries. The committee considers the matter closed.

MAY The committee reviewed a self-report in which animals were weaned improperly and a staff member was brought into the animal facility before completing all training requirements. Moving forward, the lab has reviewed access requirements and proper weaning practices. The committee considers the matter closed.

MAY The committee reviewed a report of an adverse event involving an animal that developed tail lesions following surgery. The tail was amputated and has healed well. Moving forward, the lab will continue to pay special attention to blood pressure and heating during surgeries. The committee endorsed the plan and has no further concerns at this time.

MAY The committee reviewed two self reports involving individual animal rooms missed during RAR daily health checks. Both rooms were checked the following day and no health or husbandry concerns were noted. Supervisors have worked with staff to ensure that all rooms are checked daily going forward. The committee considers the matter closed.

JUN The committee reviewed an adverse event report involving an animal that died following anesthetic induction for a surgical procedure. No specific cause of death could be identified. The lab will continue to follow best practices for anesthesia and monitoring. The committee endorsed the plan and has no further concerns at this time.

JUN The committee reviewed a self-report in which unapproved imaging procedures had been conducted over a period of time. An amendment has been submitted and approved to add the procedure to the protocol. The committee requested additional information on the publication status of data obtained from the unapproved imaging and will be updated at a future meeting.

JUN The committee reviewed a self-report in which tail lesions that did not require amputation or analgesics were found on animals that had undergone surgery. The lab will begin using heat

support throughout the surgery as required, in addition to the current heat support during recovery. The committee considers the matter closed.

JUN The committee discussed an update on a self-report involving unapproved imaging. The PI reports that the results from this have not been published or planned for publication. The committee considers the matter closed.

JUN The committee reviewed a self-report in which food restriction was conducted for 12 hours without being approved on the protocol. The lab will not conduct this procedure again until an amendment regarding this procedure has been approved. The committee will consider the matter closed once the amendment has been received.

JUN The committee reviewed a self-report in which animals were left unattended for 30 minutes during recovery from anesthesia. Moving forward, staff will be present in the room during the entire recovery period. The committee considers the matter closed.

JUL The committee discussed a preliminary self-report regarding improper genotyping of mice. The committee agreed to table the matter until a formal self-report has been submitted by the lab.

JUL The committee discussed a self-report regarding a cage of mice that was dropped during cage change out, resulting in the death of one pup and an injury to another. Animal care staff have been reminded that step stools or ladders are available to help reach the high shelves if needed. The committee considers the matter closed.

JUL The committee was updated on reoccurring health issues associated with anesthetic events in a lab using cats. The lab will continue to work closely with RAR on their anesthesia protocol and how to remedy these health issues, and the committee will continue to be updated.

JUL The committee was updated on a lab that had a prior adverse event during an anesthetic procedure. Changes to drugs and supportive care were made for the most recent procedure and the animal did well. RAR vets will continue to work with the group to optimize their procedures.

JUL The committee reviewed a self report in which a lab administered an antibiotic at the wrong concentration. The lab proposed updating their IACUC protocol to state that the drug would be acquired from RAR at a ready to use concentration, and updating their surgery form to include the concentration. The committee informed the lab that they cannot rely on RAR to perform dilution for them, and instead need to train lab staff to check the concentration and dilute as needed. The committee will continue to be updated on this matter.

JUL The committee reviewed a self report in which burr hole procedures were performed at a time interval closer than approved in the protocol. The lab has updated their SOPs and retrained staff to ensure that the approved timing is adhered to. The committee considers the matter closed.

JUL The committee reviewed a self report in which breeding and DSS colitis procedures were carried out on the same animals without approval to combine these procedures. The lab has submitted an amendment to request permission to perform the procedures in the same animals and will not do so unless approved. The committee considers the matter closed.

AUG The committee reviewed a self report in which blood was found in cages after genotyping, in addition to neonates weaned at times that were not approved in their protocols. The lab proposed other genotyping techniques that were not outlined in the protocols. The committee informed the lab that they must submit an amendment to carry out alternative genotyping methods. The committee also requested further details about training and oversight for genotyping and weaning procedures.

AUG The committee reviewed a self report in which multiple animals were found dead in their cages with no previous clinical signs. The lab confirmed they will communicate with veterinarians in a more timely matter in instances where unexpected illness or death is observed in animals. The committee considers the matter closed.

AUG The committee reviewed a self report in which animals were housed in the lab. The lab confirmed they will no longer keep animals in the lab for over 24 hours. The committee considers the matter closed.

AUG The committee discussed an adverse event in which use of an 18-gauge needle to gavage caused death in a subset of animals. The lab switched to a 22-gauge needle and had a veterinarian observe the procedure to ensure animal welfare. The committee considers the matter closed.

AUG The committee discussed an adverse event in which the incorrect dose of a paralytic lead to euthanasia of an animal on study. IACUC leadership and RAR veterinarians are meeting to further discuss this incident, historical and recent lab events, and to consider possible next steps for this lab.

AUG The committee reviewed a self report in which a room in [redacted] was missed during RAR daily health checks. No animal welfare issues were noted. Animal care supervisors will have a second supervisor review all posted room schedules to ensure no room is missed. The committee considers the matter closed.

AUG The committee discussed an adverse event where an animal was found alive after assumed euthanasia. The animal was humanely euthanized upon discovery. The personnel responsible for the incident could not be identified. Animal care supervisors confirmed they will retrain staff in the building on appropriate euthanasia techniques and verification of death. The committee is waiting for further details from other labs that were potentially involved.

AUG The committee voted unanimously (12-0) to suspend all animal work by a lab that has had ongoing and serious issues with animal welfare, effective immediately. The suspension will remain in place until the lab develops a strong corrective plan that is approved by the committee.

AUG The committee discussed an adverse event report in which surgical complications led to the death of one animal and early euthanasia of another. The committee was satisfied with the lab's actions and considers the matter closed.

AUG The committee was updated on a recent critical citation from the USDA related to delayed reporting of animal mortality in Duluth. RAR will work with Duluth as well as [redacted]

and [redacted] to outline additional veterinary SOPs, which will include communication guidelines, and ensure they are followed.

SEP The committee discussed a preliminary reinstatement plan submitted by an investigator whose animal use privileges are currently suspended. The committee was satisfied with the responses and the lab's history specifically related to their use of rodents, and voted unanimously to reinstate the investigator's rodent protocol. The committee felt that the responses related to the use of cats were not yet sufficient. A meeting will be scheduled with the investigator to discuss the lab's history, the model, and the corrective action plans; all committee members are invited to attend.

SEP The committee discussed a self-report in which toe clipping of neonatal mice whose toes were still webbed resulted in the removal of more than the allowed single digit per foot. The lab was reminded of the IACUC's policy on toe clipping, and going forward, will not attempt to clip toes if they are still webbed. An amendment will be submitted if the lab decides on an alternative method. The committee endorsed the corrective action plan and considers the matter closed.

SEP The committee continued an ongoing discussion regarding a PI whose use of cats has been suspended, including the most recent corrective action plan submitted by the PI. The committee understands the PI’s rationale for the use of the species but has continued concerns about the age of the animals used and the role this may play in complications that have occurred. Additional information will be requested from the PI regarding consultations that the lab has had or plans to have with experts in the field, the proposed age and size of animals to be used, and protocol updates that will be needed. The committee will also request consultation from experts in veterinary anesthesiology. The suspension of the PI’s use of cats remains in place until further notice.

SEP The committee reviewed additional responses submitted in response to a self-report involving improper tail snipping of mice. The PI submitted an updated SOP for genotyping and a plan for ensuring lab staff are trained. The committee has no further concerns and considers the matter closed.

- **SUBCOMMITEE UPDATES**

There were no subcommittee updates during this semi-annual period.

6. Formation of New Subcommittees

The committee discussed the need for volunteers for two new subcommittees, which will be charged with creating or updating the following IACUC Policies and Guidelines.

- Multi-dose vials, diluting and compounding:
    - A Policy and Guidelines are needed for the handling and use of multi-use vials and diluted or compounded drugs and solutions. The current Guidelines for the Use of Non-pharmaceutical Grade Compounds in Research Animals covers some of these considerations but is specific to non-pharmaceutical grade compounds.

- Cleaning and sanitization:
    - The current SOP does not conform to the Policy and Guidelines format and only addresses the frequency of cleaning for behavioral equipment. It does not address other types of equipment or surfaces with which animals may come in contact.

7. Sub-groups for Evaluation of the OLAW Checklist:

Prior to the meeting IACUC members met in small groups (see below) to discuss assigned sections of the OLAW checklist. Groups summarized their assessment with the rest of the committee during a group discussion at the meeting. Discussion items for each section are listed below followed by the completed OLAW Checklist.

Group 1:
Institutional Policies and Responsibilities, Sections 1-4 ("Animal Care and Use Program", "Disaster Planning and Emergency Preparedness", "IACUC", and "IACUC Protocol Review - Special Considerations") (on pages 1-2)

Megan McCoy, Sam Baidoo, Jennifer Hubbard, Keith Barker, Georgiy Aslanidi, Jessica Sieber, [redacted] Michelle Reichert, Ian Aldrich

Megan McCoy summarized Group 1's evaluation and identified the following topic for discussion withthe rest of the committee:

Acceptable with room for improvement:

- "Law enforcement and emergency personnel are provided a copy and integration with overall planis in place" under Disaster Planning and Emergency Preparedness. Although main campus law enforcement has been contacted and provided a copy of the disaster plan, the committee Chair will follow up to ensure that all satellite campuses have been integrated into disaster planning.

Group 2:
Institutional Policies and Responsibilities Sections 5-8 ("IACUC Membership and Functions", "IACUC Training", " IACUC Records and Reporting Requirements", and "Veterinary Care") (on pages 2-3)

Nima Estharabadi, Paul Lindstrom, Carolyn Fairbanks, Geoff Ghose, Dick Bianco, Sammy Boyle, Nathan Koewler, Christin Wright, [redacted], Julia Davydova

Jennifer Borgert assisted Nima Estharabadi in presenting Group 2's evaluation and identified the following topics for discussion with the rest of the committee:

Minor Deficiency:

- "Training on how to inspect facilities and labs where animal use or housing occurs" under IACUC Training. Members feel that more training is needed prior to beginning to conduct inspections. IACUC office staff will develop and implement additional training both for new members and as continuing education for existing members.

Acceptable with room for improvement:

- "Methods for reporting and investigating animal welfare concerns are in place" under IACUC Membership and Functions. Although signage with directions for reporting concerns is in place in

animal housing and is being added to animal use areas, the committee feels that it could be more eye catching to ensure that it is being seen. The committee will work on higher visibility signs.

- "Ongoing training/education" under IACUC Training. The committee discussed adding more continuing education for members to full committee meetings. IACUC staff will work on this.
- "Records of IACUC reviews are maintained for 3 years after the completion of the study" under IACUC Records and Reporting Requirements. Records are being retained for longer than required, and the committee discussed consulting with both University legal counsel and peer institutions to determine a records retention policy.

Group 3:
Institutional Policies and Responsibilities Sections 9-12 (, "Personnel Qualifications and Training","Occupational Health and Safety of Personnel", "Personnel Security", and "Investigating & Reporting Animal Welfare Concerns") (on pages 3-5)

Ilana Cohen, Walt Tolllison, George Wilcox, Sally Noll, [redacted], Henry Wong, Cynthia Lee, Jessica Felgenhauer

Ilana Cohen summarized Group 3's evaluation and identified the following topics for discussion with the rest of the committee:

Acceptable with room for improvement:

- "Program covers all personnel who work in laboratory animal facilities" under Occupational Health and Safety of Personnel. The occupational health program covers all personnel who work with animals, but there is potential for indirect exposure of non-animal-using staff in shared laboratory spaces where animals may be present. Required annual lab safety training for all lab workers does have a section related to animals, but the committee will continue to explore mechanisms to convey occupational health information to additional personnel.

Not Applicable:

- "If serum samples are collected, the purpose is consistent with federal and state laws" under Occupational Health and Safety of Personnel. Serum samples are not collected.

Group 4:
Veterinary Care sections 1-3 ("Clinical Care and Management", "Animal Procurement andTransportation/Preventive Medicine", and "Surgery") (on pages 6-7)

Jennifer Borgert, Dezhi Liao, Kat Coda, Tim Goldsmith, [redacted], Lynn Impelluso, Whitney McGee, Laura Stone, Anna Stodolka

Jennifer Borgert summarized Group 4's evaluation and identified the following topics for discussion with the rest of the committee:

Acceptable with room for improvement:

- "Breeding colonies are based on need and managed to minimize numbers" under Animal Procurement and Transportation/Preventative Medicine. It was felt that some labs may not be minimizing breeding numbers. The committee will explore resources for training lab staff in best practices for colony management.

- "Procedures in place for stabilization/acclimation" under Animal Procurement and Transportation/Preventative Medicine. Not all species have a specific required acclimation period. The policy for acclimation will be updated to ensure that all species are addressed.
- "Researchers have appropriate training to ensure good technique" under Surgery. It was discussed that training required for new surgeons is helping with this, but does not capture previously approved surgeons, not all of whom may have good technique. RAR training staff are gathering data on additional training needs and will present to the committee at a later date.

Not Applicable:

- "Random source dogs and cats are inspected for identification" under Animal Procurement and Transportation/Preventative Medicine. Random source dogs and cats are not used.

Group 5:
Veterinary Care sections 4-6, ("Pain, Distress, Anesthesia and Analgesia", "Euthanasia", and"Drug Storage and Control") (on page 7)

Frances Lawrenz, Craig Flory, Liz Pluhar, Marilyn Bennett, Margaret Luesse, Wensheng Lin, Ferenc Toth, Giuseppe Dell'Anna, Julia Smachlo

Frances Lawrenz summarized Group 5's evaluation. There were no items identified for discussion.

I. Semiannual Program Review Checklist [i]

Institutional Policies and Responsibilities Date: 11/2/2021

1. Animal Care and Use Program	A*	M	S	C	NA
• Responsibility for animal well-being is assumed by all members of the program (*Guide*, p 1) [must]	✓				
• IO has authority to allocate needed resources (*Guide*, p 13)	✓				
• Resources necessary to manage program of veterinary care are provided (*Guide*, p 14) [must]	✓				
• Sufficient resources are available to manage the program, including training of personnel in accord with regulations and the *Guide* (*Guide*, pp 11, 15)	✓				
• Program needs are regularly communicated to IO by AV and/or IACUC (*Guide*, p 13)	✓				
• Responsibilities for daily animal care and facility management are assigned to specific individual(s) when a full-time veterinarian is not available on site (*Guide*, p 14) [must]	✓				
• Inter-institutional collaborations are described in formal written agreements (*Guide*, p 15)	✓				
• Written agreements address responsibilities, animal ownership, and IACUC oversight (*Guide*, p 15)	✓				

2. Disaster Planning and Emergency Preparedness	A*	M	S	C	NA
• Disaster plans for each facility to include satellite locations are in place (*Guide*, p 35, p 75) [must]	✓				
• Plans include provisions for euthanasia (*Guide*, p 35) [must]	✓				
• Plans include triage plans to meet institutional and investigators' needs (*Guide*, p 35)	✓				
• Plans define actions to prevent animal injury or death due to HVAC or other failures (*Guide*, p 35)	✓				
• Plans describe preservation of critical or irreplaceable animals (*Guide*, p 35)	✓				
• Plans include essential personnel and their training (*Guide*, p 35)	✓				
• Animal facility plans are approved by the institution and incorporated into overall response plan (*Guide*, p 35)	✓				
• Law enforcement and emergency personnel are provided a copy and integration with overall plan is in place (*Guide*, p 35)	✓				

3. IACUC	A*	M	S	C	NA
• Meets as necessary to fulfill responsibilities (*Guide*, p 25) [must]	✓				
• IACUC Members named in protocols or with conflicts recuse themselves from protocol decisions (*Guide*, p 26) [must]	✓				
• Continuing IACUC oversight after initial protocol approval is in place (*Guide*, p 33)	✓				
• IACUC evaluates the effectiveness of training programs (*Guide*, p 15)	✓				

4. IACUC Protocol Review - Special Considerations	A*	M	S	C	NA
• Humane endpoints are established for studies that involve tumor models, infectious diseases, vaccine challenge, pain modeling, trauma, production of monoclonal antibodies, assessment of toxicologic effects, organ or system failure, and models of cardiovascular shock (*Guide*, p 27)	✓				
• For pilot studies, a system to communicate with the IACUC is in place (*Guide*, p 28)	✓				
• For genetically modified animals, enhanced monitoring and reporting is in place (*Guide*, p 28)	✓				
• Restraint devices are justified in the animal use protocols (*Guide*, p 29) [must]	✓				
• Alternatives to physical restraint are considered (*Guide*, p 29)	✓				
• Period of restraint is the minimum to meet scientific objectives (*Guide*, p 29)	✓				
• Training of animals to adapt to restraint is provided (*Guide*, p 29)	✓				
• Animals that fail to adapt are removed from study (*Guide*, p 29)	✓				
• Appropriate observation intervals of restrained animals are provided (*Guide*, p 29)	✓				
• Veterinary care is provided if lesions or illness result from restraint (*Guide*, p 30) [must]	✓				

• Explanations of purpose and duration of restraint are provided to study personnel (*Guide*, p 30)	✓				
• Multiple surgical procedures on a single animal are justified and outcomes evaluated (*Guide*, p 30)	✓				
• Major versus minor surgical procedures are evaluated on a case-by-case basis (*Guide*, p 30)	✓				
• Multiple survival procedure justifications in non-regulated species conform to regulated species standards (*Guide*, p 30)	✓				
• Animals on food/fluid restriction are monitored to ensure nutritional needs are met (*Guide*, p 31)	✓				
• Body weights for food/fluid restricted animals are recorded at least weekly (*Guide*, p 31)	✓				
• Daily written records are maintained for food/fluid restricted animals (*Guide*, p 31)	✓				
• Pharmaceutical grade chemicals are used , when available, for animal-related procedures (*Guide*, p 31)	✓				
• Non-pharmaceutical grade chemicals are described, justified, and approved by IACUC (*Guide*, p 31)	✓				
• Investigators conducting field studies know zoonotic diseases, safety issues, laws and regulations applicable in study area (*Guide*, p 32)	✓				
• Disposition plans are considered for species removed from the wild (*Guide*, p 32)	✓				
• Toe-clipping only used when no alternative, performed aseptically and with pain relief (*Guide*, p 75)	✓				

5. IACUC Membership and Functions	**A***	**M**	**S**	**C**	**NA**
• IACUC is comprised of at least 5 members, appointed by CEO (PHS Policy, IV.A.3.)	✓				
• Members include a veterinarian, a scientist, a nonscientist, and a nonaffiliated non-lab animal user (*Guide*, p 24)[ii]	✓				
• IACUC authority and resources for oversight and evaluation of institution's program are provided (*Guide*, p 14)	✓				
• IACUC conducts semiannual evaluations of institutional animal care and use program (PHS Policy, IV.B.)	✓				
• Conducts semiannual inspections of institutional animal facilities (PHS Policy, IV.B.)	✓				
• IACUC organizationally reports to the Institutional Official (PHS Policy, IV.A.1.b.)	✓				
• Methods for reporting and investigating animal welfare concerns are in place (*Guide*, p 23) [must]	✓				
• Reviews and investigates concerns about animal care and use at institution[iii] (PHS Policy, IV.B.)	✓				
• Procedures are in place for review, approval, and suspension of animal activities[iv] (PHS Policy, IV.B.)	✓				
• Procedures are in place for review and approval of significant changes to approved activities (PHS Policy, IV.B.)	✓				
• Policies are in place for special procedures (e.g., genetically modified animals, restraint, multiple survival surgery, food and fluid regulation, field investigations, agricultural animals) (*Guide*, p 27-32)	✓				
• Requests for exemptions from major survival surgical procedure restrictions are made to USDA/APHIS[v] (*Guide*, p 30) [must]	✓				

6. IACUC Training	**A***	**M**	**S**	**C**	**NA**
• All IACUC members should receive:					
○ Formal orientation to institution's program (*Guide*, p 17)	✓				
○ Training on legislation, regulations, guidelines, and policies (*Guide*, p 17)	✓				
○ Training on how to inspect facilities and labs where animal use or housing occurs (*Guide*, p 17)		✓			
○ Training on how to review protocols as well as evaluate the program (*Guide*, p 17)	✓				
○ Ongoing training/education (*Guide*, p 17)	✓				

7. IACUC Records and Reporting Requirements[vi]	**A***	**M**	**S**	**C**	**NA**
• Semiannual report to the IO (PHS Policy, IV.B.)					
○ Submitted to IO every 6 months	✓				
○ Compiles program review and facility inspection(s) results (includes all program	✓				

and facility deficiencies)	✓					
○ Includes minority IACUC views	✓					
○ Describes IACUC-approved departures from the *Guide* or PHS Policy and the reasons for each departure[vii]	✓					
○ Distinguishes significant from minor deficiencies	✓					
○ Includes a plan and schedule for correction for each deficiency identified[viii]	✓					
• Reports to OLAW (PHS Policy, IV.F.)						
○ Annual report to OLAW documents program changes, dates of the semiannual program reviews and facility inspections and includes any minority views	✓					
○ Promptly advises OLAW of serious/ongoing *Guide* deviations or PHS Policy noncompliance (NOT-OD-05-034)	✓					
○ Institute must promptly advise OLAW of any suspension of an animal activity by the IACUC (NOT-OD-05-034)	✓					
• Reports to U.S. Department of Agriculture (USDA) or Federal funding agency[ix]						
○ Annual report to USDA contains required information including all exceptions/exemptions	✓					
○ Reporting mechanism to USDA is in place for IACUC-approved exceptions to the regulations and standards	✓					
○ Reports are filed within 15 days for failures to adhere to timetable for correction of significant deficiencies	✓					
○ Promptly reports suspensions of activities by the IACUC to USDA and any Federal funding agency	✓					
• Records (PHS Policy, IV.E.)						
○ IACUC meeting minutes and semiannual reports to the IO are maintained for 3 years	✓					
○ Records of IACUC reviews of animal activities include all required information[x]	✓					
○ Records of IACUC reviews are maintained for 3 years after the completion of the study	✓					

8. Veterinary Care (See also next section - Veterinary Care)	**A***	**M**	**S**	**C**	**NA**
• An arrangement for veterinarian(s) with training or experience in lab animal medicine is in place including backup veterinary care[xi]	✓				
• Veterinary access to all animals is provided (*Guide*, p 14) [must]	✓				
• Direct or delegated authority is given to the veterinarian to oversee all aspects of animal care and use (*Guide*, p 14) [must]	✓				
• Veterinarian provides consultation when pain and distress exceeds anticipated level in protocol (*Guide*, p 5) [must]	✓				
• Veterinarian provides consultation when interventional control is not possible (*Guide*, p 5) [must]	✓				
• If part time /consulting veterinarian, visits meet programmatic needs (*Guide*, p 14)	✓				
• Regular communication occurs between veterinarian and IACUC (*Guide*, p 14)	✓				
• Veterinarian(s) have experience and training in species used (*Guide*, p 15) [must]	✓				
• Veterinarian(s) have experience in facility administration/management (*Guide*, p 15)	✓				

9. Personnel Qualifications and Training	**A***	**M**	**S**	**C**	**NA**
• All personnel are adequately educated, trained, and/or qualified in basic principles of laboratory animal science. Personnel included: [must]					
○ Veterinary/other professional staff (*Guide*, p 15-16)	✓				
○ IACUC members (*Guide*, p 17)	✓				
○ Animal care personnel (*Guide*, p 16)	✓				
○ Research investigators, instructors, technicians, trainees, and students (*Guide*, pp 16-17)	✓				
• Continuing education for program and research staff provided to ensure high quality care and reinforce training (*Guide*, pp 16-17)	✓				
• Training is available prior to starting animal activity (*Guide*, p 17)	✓				
• Training is documented (*Guide*, p 15)	✓				
• Training program content includes: (*Guide*, p 17)					
○ Methods for reporting concerns (*Guide*, p 17)	✓				
○ Humane practices of animal care (e.g., housing, husbandry, handling) [xii]	✓				
○ Humane practices of animal use (e.g., research procedures, use of anesthesia,	✓				

pre- and post-operative care, aseptic surgical techniques and euthanasia (*Guide*, p 17)[xiii]	✓				
○ Research/testing methods that minimize numbers necessary to obtain valid results (PHS Policy, IV.A.1.g.)	✓				
○ Research/testing methods that minimize animal pain or distress (PHS Policy, IV.A.1.g.)	✓				
○ Use of hazardous agents, including access to OSHA chemical hazard notices where applicable (*Guide*, p 20)	✓				
○ Animal care and use legislation (*Guide*, p 17)	✓				
○ IACUC function (*Guide*, p 17)	✓				
○ Ethics of animal use and Three R's (*Guide*, p 17)	✓				

10. Occupational Health and Safety of Personnel	**A***	**M**	**S**	**C**	**NA**
• Program is in place and is consistent with federal, state, and local regulations (*Guide*, p 17) [must]	✓				
• Program covers *all* personnel who work in laboratory animal facilities (*Guide*, p 18)	✓				
• Changing, washing, and showering facilities are available as appropriate (*Guide*, p 19)	✓				
• Hazardous facilities are separated from other areas and identified as limited access (*Guide*, p 19)	✓				
• Personnel training is provided based on risk (e.g., zoonoses, hazards, personal hygiene, special precautions, animal allergies) (*Guide*, p 20)	✓				
• Personal hygiene procedures are in place (e.g., work clothing, eating/drinking/smoking policies) (*Guide*, p 20)	✓				
• Procedures for use, storage, and disposal of hazardous biologic, chemical, and physical agents are in place (*Guide*, p 21)	✓				
• Personal Protective Equipment for the work area is appropriate and available (*Guide*, p 21)	✓				
• Program for medical evaluation and preventive medicine for personnel includes:					
○ Pre-employment evaluation including health history (*Guide*, p 22)	✓				
○ Immunizations as appropriate (e.g., rabies, tetanus) and tests as appropriate (*Guide*, p 22)	✓				
○ Zoonosis surveillance as appropriate (e.g., Q-fever, tularemia, Hantavirus, plague) (*Guide*, p 23)	✓				
○ Procedures for reporting and treating injuries, including accidents, bites, allergies, etc. (*Guide*, p 23)	✓				
○ Promotes early diagnosis of allergies including preexisting conditions (*Guide*, p 22)	✓				
○ Considers confidentiality and other legal factors as required by federal, state and local regulations (*Guide*, p 22) [must]	✓				
○ If serum samples are collected, the purpose is consistent with federal and state laws (*Guide*, p 22) [must]					✓
• Waste anesthetic gases are scavenged (*Guide*, p 21)	✓				
• Hearing protection is provided in high noise areas (*Guide*, p 22)	✓				
• Respiratory protection is available when performing airborne particulate work (*Guide*, p 22)	✓				
• Special precautions for personnel who work with nonhuman primates, their tissues or body fluids include:					
○ Tuberculosis screening provided for all exposed personnel (*Guide*, p 23)	✓				
○ Training and implementation of procedures for bites, scratches, or injuries associated with macaques (*Guide*, p 23)	✓				
○ PPE is provided including gloves, arm protection, face masks, face shields, or goggles (*Guide*, p 21)	✓				
○ Injuries associated with macaques are carefully evaluated and treatment implemented (*Guide*, p 23)	✓				
• Occupational safety and health of field studies is reviewed by OSH committee or office (*Guide*, p 32)	✓				

11. Personnel Security	**A***	**M**	**S**	**C**	**NA**
• Preventive measures in place include pre-employment screening, and physical and IT security (*Guide*, p 23)	✓				

12. Investigating & Reporting Animal Welfare Concerns	A*	M	S	C	NA
• Methods for investigating and reporting animal welfare concerns are established (*Guide*, p 23) [must]	✓				
• Reported concerns and corrective actions are documented (*Guide*, p 24)	✓				
• Mechanisms for reporting concerns are posted in facility and at applicable website with instructions (*Guide*, p 24)	✓				
○ Includes multiple contacts (*Guide*, p 24)	✓				
○ Includes anonymity, whistle blower policy, nondiscrimination and reprisal protection (*Guide*, p 24)	✓				

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable

NOTES:

Veterinary Care

Date:

1. Clinical Care and Management	A*	M	S	C	NA
• Veterinary program offers high quality of care and ethical standards (*Guide*, p 105) [must]	✓				
• Veterinarian provides guidance to all personnel to ensure appropriate husbandry, handling, treatment, anesthesia, analgesia, and euthanasia (*Guide*, p 106)	✓				
• Veterinarian provides oversight to surgery and perioperative care (*Guide*, p 106)	✓				
• Veterinary care program is appropriate for program requirements (*Guide*, pp 113-114)	✓				
• Veterinarian(s) is familiar with species and use of animals and has access to medical and experimental treatment records (*Guide*, p 114)	✓				
• Procedures to triage and prioritize incident reports are in place (*Guide*, p 114)	✓				
• Procedures are in place to address:					
○ Problems with experiments to determine course of treatment in consultation with investigator(*Guide*, p 114)	✓				
○ Recurrent or significant health problems with the IACUC and documentation of treatments and outcomes (*Guide*, p 114)	✓				
○ Veterinary review and oversight of medical and animal use records (*Guide*, p 115)	✓				
• Procedures established for timely reporting of animal injury, illness, or disease (*Guide*, p 114) [must]	✓				
• Procedures established for veterinary assessment, treatment, or euthanasia (*Guide*, p 114) [must]	✓				
• Veterinarian is authorized to treat, relieve pain, and/or euthanize (*Guide*, p 114) [must]	✓				

2. Animal Procurement and Transportation/Preventive Medicine	A*	M	S	C	NA
• Procedures for lawful animal procurement are in place (*Guide*, p 106) [must]	✓				
• Sufficient facilities and expertise are confirmed prior to procurement (*Guide*, p 106)	✓				
• Procurement is linked to IACUC review and approval (*Guide*, p 106)	✓				
• Random source dogs and cats are inspected for identification (*Guide*, p 106)					✓
• Population status of wildlife species is considered prior to procurement (*Guide*, p 106)	✓				
• Appropriate records are maintained on animal acquisition (*Guide*, p 106)	✓				
• Animal vendors are evaluated to meet program needs and quality (*Guide*, p 106)	✓				
• Breeding colonies are based on need and managed to minimize numbers (*Guide*, p 107)	✓				
• Procedures for compliance with animal transportation regulations, including international requirements, are in place (*Guide*, p 107) [must]	✓				
• Transportation is planned to ensure safety, security and minimize risk (*Guide*, p 107)	✓				
• Movement of animals is planned to minimize transit time and deliveries are planned to ensure receiving personnel are available (*Guide*, pp 107- 108)	✓				
• Appropriate loading and unloading facilities are available (*Guide*, p 109)	✓				
• Environment at receiving site is appropriate (*Guide*, p 109)	✓				
• Policies in place on separation by species, source, and health status (*Guide*, pp 109, 111-112)	✓				
• Procedures in place for quarantine to include zoonoses prevention (*Guide*, p 110)	✓				
• Quarantined animals from different shipments are handled separately or physically separated (*Guide*, p 110)	✓				
• Procedures in place for stabilization/acclimation (*Guide*, pp 110-111)	✓				
• Policies in place for isolation of sick animals (*Guide*, p 112)	✓				
• Program is in place for surveillance, diagnosis, treatment and control of disease to include daily observation (*Guide*, p 112)	✓				
• Diagnostic resources are available for preventive health program (*Guide*, p 112)	✓				

3. Surgery	A*	M	S	C	NA
• Surgical outcomes are assessed and corrective changes instituted (*Guide*, p 115)	✓				
• Researchers have appropriate training to ensure good technique (*Guide*, p 115) [must]	✓				

• Pre-surgical plans are developed and include veterinary input (e.g., location, supplies, anesthetic and analgesic use, peri-operative care, recordkeeping) (*Guide*, p 116)	✓				
• Aseptic surgery is conducted in dedicated facilities or spaces, unless exception justified and IACUC approved (*Guide*, p 116)	✓				
• Surgical procedures including laparoscopic procedures are categorized as major or minor (*Guide*, pp 117-118)	✓				
• For nonsurvival surgery, the site is clipped, gloves are worn and instruments and area are clean (*Guide*, p 118)	✓				
• Aseptic technique is followed for survival surgical procedures (*Guide*, pp 118-119)	✓				
• Effective procedures for sterilizing instruments and monitoring expiration dates on sterile packs are in place (*Guide*, p 119)	✓				
• Procedures for monitoring surgical anesthesia and analgesia are in place (*Guide*, p 119)	✓				
• For aquatic species, skin surfaces are kept moist during surgical procedures (*Guide*, p 119)	✓				
• Post-operative monitoring and care are provided by trained personnel and documented (e.g., thermoregulation, physiologic function, analgesia, infection, removal of skin closures) (*Guide*, pp 119-120)	✓				

4. Pain, Distress, Anesthesia and Analgesia	**A***	**M**	**S**	**C**	**NA**
• Guidelines for assessment and categorization of pain, distress and animal wellbeing are provided during training (*Guide*, p 121)	✓				
• Selection of analgesics and anesthetics is based on professional veterinary judgment (*Guide*, p 121)	✓				
• Painful procedures are monitored to ensure appropriate analgesic management (*Guide*, p 122)	✓				
• Nonpharmacologic control of pain is considered as an element of postprocedural care (*Guide*, p 122)	✓				
• Procedures are in place to assure antinoception before surgery begins (*Guide*, p 122) [must]	✓				
• Guidelines for selection and use of analgesics and anesthetics are in place and regularly reviewed and updated (*Guide*, p 122)	✓				
• Special precautions for the use of paralytics are in place to ensure anesthesia[xiv] (*Guide*, p 123)	✓				

5. Euthanasia	**A***	**M**	**S**	**C**	**NA**
• Methods are consistent with AVMA Guidelines on Euthanasia unless approved by the IACUC (*Guide*, p 123)	✓				
• Standardized methods are developed and approved by the veterinarian and IACUC that avoid distress and consider animal age and species (*Guide*, pp 123-124)	✓				
• Training is provided on appropriate methods for each species and considers psychological stress to personnel (*Guide*, p 124)	✓				
• Procedures and training are in place to ensure death is confirmed (*Guide*, p 124) [must]	✓				

6. Drug Storage and Control	**A***	**M**	**S**	**C**	**NA**
• Program complies with federal regulations for human and veterinary drugs(*Guide*, p 115) [must]	✓				
• Drug records and storage procedures are reviewed during facility inspections (*Guide*, p 115)	✓				
• Procedures are in place to ensure analgesics and anesthetics are used within expiration date (*Guide*, p 122) [must]	✓				
• Anesthetics and analgesics are acquired, stored, and their use and disposal are recorded legally and safely (*Guide*, p 122)	✓				

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable

NOTES:

Fall 2021 IACUC Inspection Report Summary

Inspection Type	Number	Percentage
# of PAM Inspections	68	31%
# Second Surgery Inspections	52	24%
#PAM/Semi-Annual	31	14%
#Second Surgery/Semi-annual	5	2%
#Initial Surgery Inspections	0	0%
#Initial Surgery/Semi-annual	0	0%
# of Semi-Annual Inspections	54	25%
# of Ag Inspections	9	4%
Total # of Inspections	**219**	**100%**
Total # of Findings	**130**	

Inspection Finding Summary	Number	Percentage
Finding Category		
IACUC (% of total findings)	109	84%
IBC (% of total findings)	0	0%
DEHS-CS (% of total findings)	0	0%
DEHS (% of total findings)	0	0%
OHS (% of total findings)	20	15%
Ag (% of total findings)	2	2%
Type of Inspection		
PAM (% of total findings)	42	32%
Second Surgery Inspection (% of total findings)	38	29%
PAM/Semi-annual (% of total findings)	8	6%
Initial Surgery Inspection (% of total findings)	0	0%
Initial Surgery/Semi-annual (% of total findings)	0	0%
Semi-annual (% of total findings)	7	5%
Second Surgery/Semi-annual (% of total findings)	7	5%
Ag (% of total findings)	5	4%
Self Report (% total findings)	23	18%
Committee Request (% of total findings)	0	0%
Unannounced visit (% of total findings)	0	0%
Outside reports of non-compliance (% of total findings)	0	0%

Buildings/Areas Inspected
[redacted]

*AAALAC accredited units

Type of Finding		
Minor (% of total findings)--Standard	97	75%
Minor (% of total findings)--Other	7	5%
Significant (% of total findings)--Standard	10	8%
Significant (% of total findings)--Other	16	12%

Repeat Findings		
	Fall 2021	**Spring 2021**
Minor ------> Minor:	0	0
Significant -----> Significant:	1	1
Total # of repeat findings	**1**	**1**

Fall 2021 IACUC Inspection Report Summary

SIGNIFICANT Fall 2021		
Findings	**Number**	**Percentage**
pups removed from mother for weight weighing and temporarily put in another cage; one of the pups was missed when they were put back with the mother and was found on dirty cage side for 18 hours; put placed back with mother and doing well	1	4%
analgesics not given for terminal procedures as outlined in protocol	1	4%
dehiscence repaired without consulting vet; analgesics not given after dehiscence repair since lab communicated with RAR via email instead of vet pager; animals not shaved prior to dehiscence repair	1	4%
Untrained lab staff used cages for weaned pups that did not contain food and pups went without food overnight and were too small to reach water	1	4%
No PI in place for active husbandry SOP	1	4%
heat pad used during recovery but not during surgery, likely resulting in necrotic tail tip	1	4%
Animals being food restricted, but food restriction not approved on protocol	1	4%
Expired anesthetic in use*	1	4%
use of anapproved anesthetic	1	4%
animals left unattended during anesthetic recovery	1	4%
Cage of mice from top of rack was dropped during cage change-out	1	4%
lab failed to read Baytril concentration and accidently overdosed animals*	1	4%
tail snips conducted on mice older than the approved 35 days of age*	1	4%
mice replaced in cage before bleeding controlled*	1	4%

SIGNIFICANT Spring 2021		
Findings	**Number**	**Percentage**
Euthanasia methods not followed	0	0%
Analgesics not given after surgical or anesthetic procedures as outlined in protocol*	1	2%
Analgesics not given (time/duration) as outlined in protocol*	4	8%
Paralytic used during surgical procedure but paralytic not approved in protocol	1	2%
COVID research project done on tissue from rats that were performed under a protocol that does not have this research in protocol*	1	2%
three cages of mice found without food; one mouse found dead and three others needed medical attention	1	2%
miscalculation of drug dosages resulted in death of sixteen animals	1	2%
Animals returned to [redacted] under anesthesia without staff present unitl fully recovered	1	2%
tail snips taken on animals older than 21 days without anesthetic as required**	2	4%
Anesthesia used but procedure not approved as anesthetic event*	5	9%
Lidocaine/bupivacaine not given prior to or after surgery	0	0%
Personnel working with animals but not listed as staff on study***	6	11%
Expired anesthetic/ analgesic/euthanasia solution in use	4	8%
Housing of animals without approval	1	2%

SR-Buprenorphine given only 1 hour prior to surgery instead of 2 as outlined in the protocol*	1	4%
Animals induced with colitis prior to breeding - procedure not outlined in protocol	1	4%
Animals housed in laboratory over 24 hours without approval	3	12%
Burr hole procedures performed 4 days apart instead of 7 as outlined in protocol*	1	4%
paralytic administered at too high of rate (7,500 mcg/kg/hr vs 20-200 mcg/kg/hr)	1	4%
Lidocaine not administered in all DBS electrode implantation surgeries as described in protocol	1	4%
Analgesic not given as approved in protocol	1	4%
sensor on hypoxia chamber failed resulting in death of animals	1	4%
Performing unapproved anesthetic procedure	2	8%
Total Significant Findings	**26**	100%

unapproved surgical proedures on mice**	2	4%
improper euthananasia of mice***	3	6%
animal care staff found some young chicks had fallen under the tender food deck into the partially water filled waste reservoir. Twelve chicks were found dead	1	2%
one cage of mice on special diets found by RAR to hae no food; one female mouse found thin; do not know how long they have been without food*	1	2%
animals not properly transferred to correct protocol prior to initiating procedures	2	4%
mice from different cages combined into same cage and severe wounds resulted*	2	4%
No protocol in place for animal work	2	4%
mice shipped without food and some deaths occurred upon arrival to facility*	1	2%
tail snips conducted for genotyping but procedure not approved in protocol*	1	2%
row of mice did not have water for four days and two mice died	1	2%
suspected burns from electro-cautery unit; minimal surface area in contact with paddle and gel not used	1	2%
one NHP on fluid restriction not weighed weekly as outlined in protocol due to request to house other animals in their room and scrambline to accommodate request	1	2%
mouse found in between a stack of stainless steel wire bar lids that had been run through washer	1	2%
RAR found two carcasses in cages from an IMHA after they were being dissembled after autoclaving*	1	2%
cage divider not pulled after moving NHP to new bank; two animals locked into one cage side together overnight so animals did not have the required amount of cage space*	1	2%

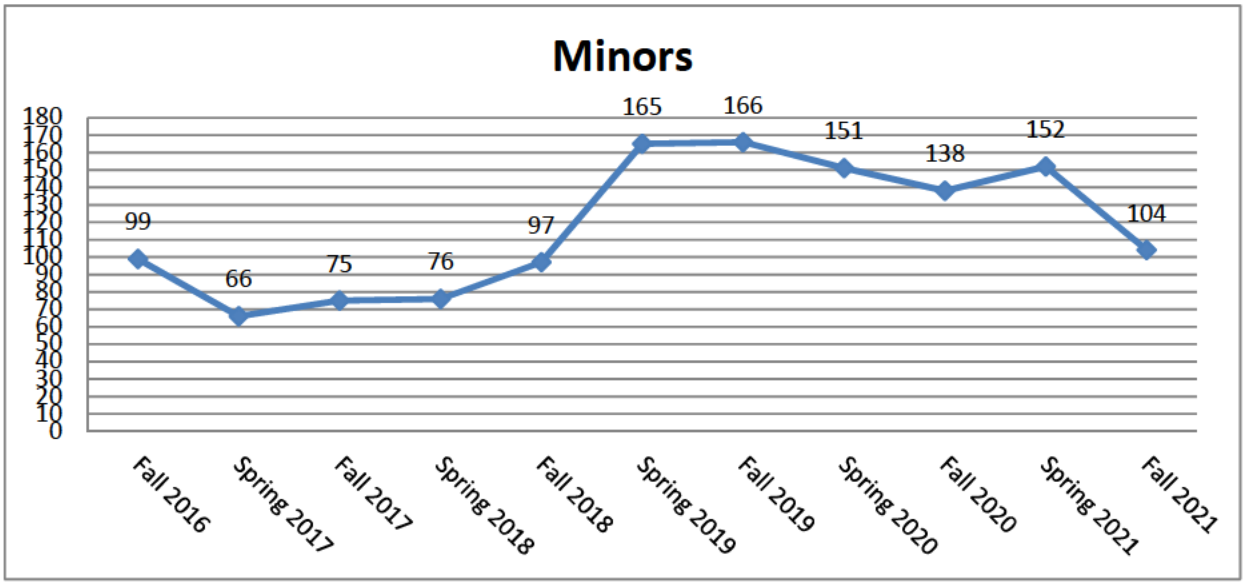
lixits fell off the cage rack and into animal cae leaving the animals without access to water for an unknown amount of time; animals suspected to have died from dehydration	1	2%
animals weaned too early and were too small to care for themselves; animals euthanized	1	2%
mouse found very thin; weight records show loss of 50% body weight; RAR requested euthanasia	1	2%
Injured pups were weaed prematurely and marked for euthanasia	1	2%
Total Significant Findings	**53**	100%

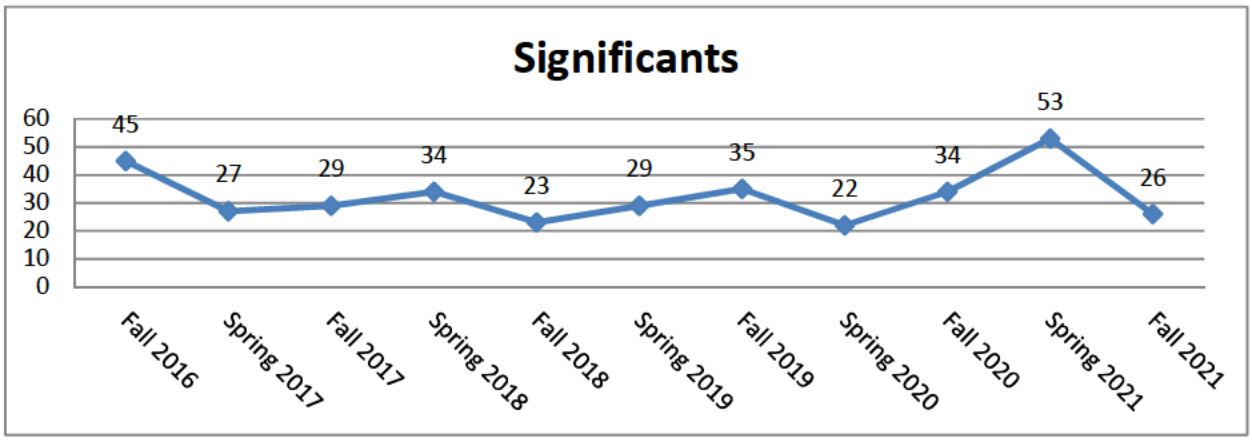
MINOR Fall 2021		
Findings	**Number**	**Percentage**
ROHP	20	19%
IPNF--Expired items	5	5%
IPNF-Surgical Records	10	10%
PNF-Standard	22	21%
IPNF--Standard	26	25%
IPNF-Anesthetic Records	6	6%
Ag	2	2%
IPNF-Personnel Training Records	1	1%
OHS	0	0%
IPNF-Aseptic Technique	6	6%
DEHS	0	0%
DEHS-CS	0	0%
Facility Issues	0	0%
Husbandry	6	6%
Total Minor Findings	**104**	**100%**

MINOR Spring 2021		
Findings	**Number**	**Percentage**
ROHP	36	24%
IPNF--Expired items	12	8%
IPNF-Surgical Records	4	3%
PNF-Standard	34	22%
IPNF--Standard	32	21%
IPNF-Anesthetic Records	3	2%
Ag	5	3%
IPNF-Personnel Training Records	8	5%
OHS	0	0%
IPNF-Aseptic Technique	8	5%
DEHS	1	1%
DEHS-CS	2	1%
Facility Issues	5	3%
Husbandry	2	1%
Total Minor Findings	**152**	**100%**

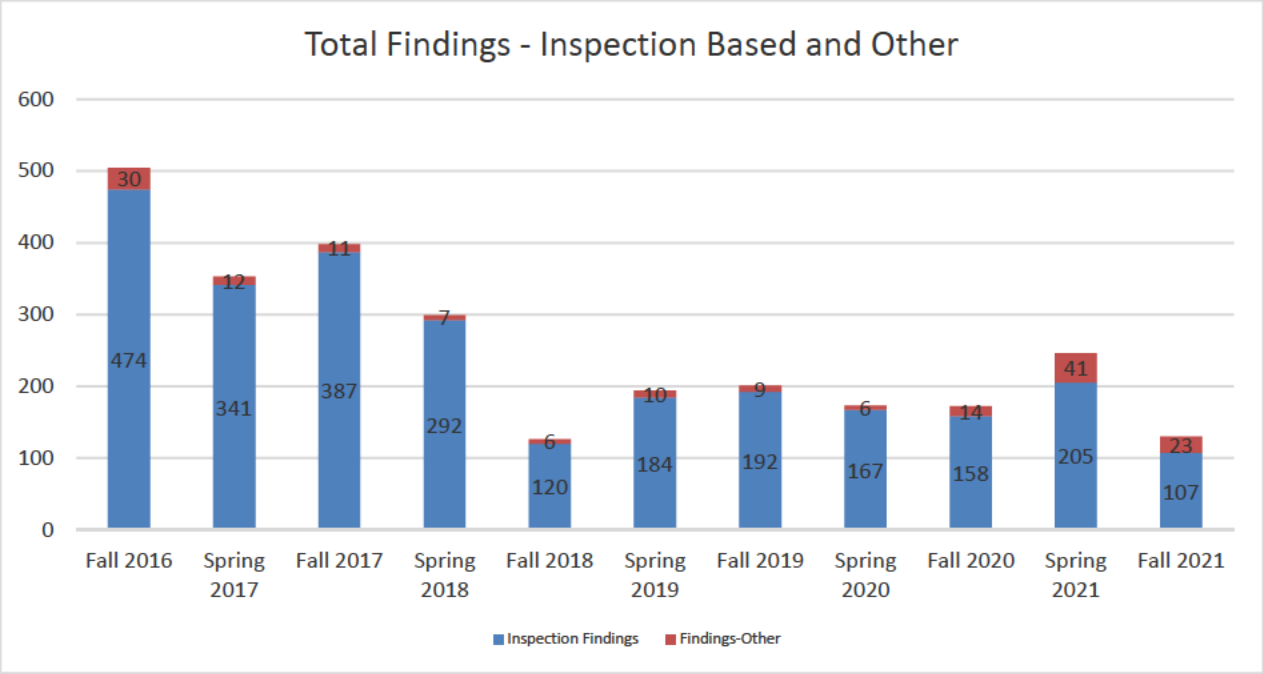
IPNF: IACUC Policy Not followed PNF: Protocol Not Followed

	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
Minors	99	66	75	76	97	165	166	151	138	152	104
Significants	45	27	29	34	23	29	35	22	34	53	26

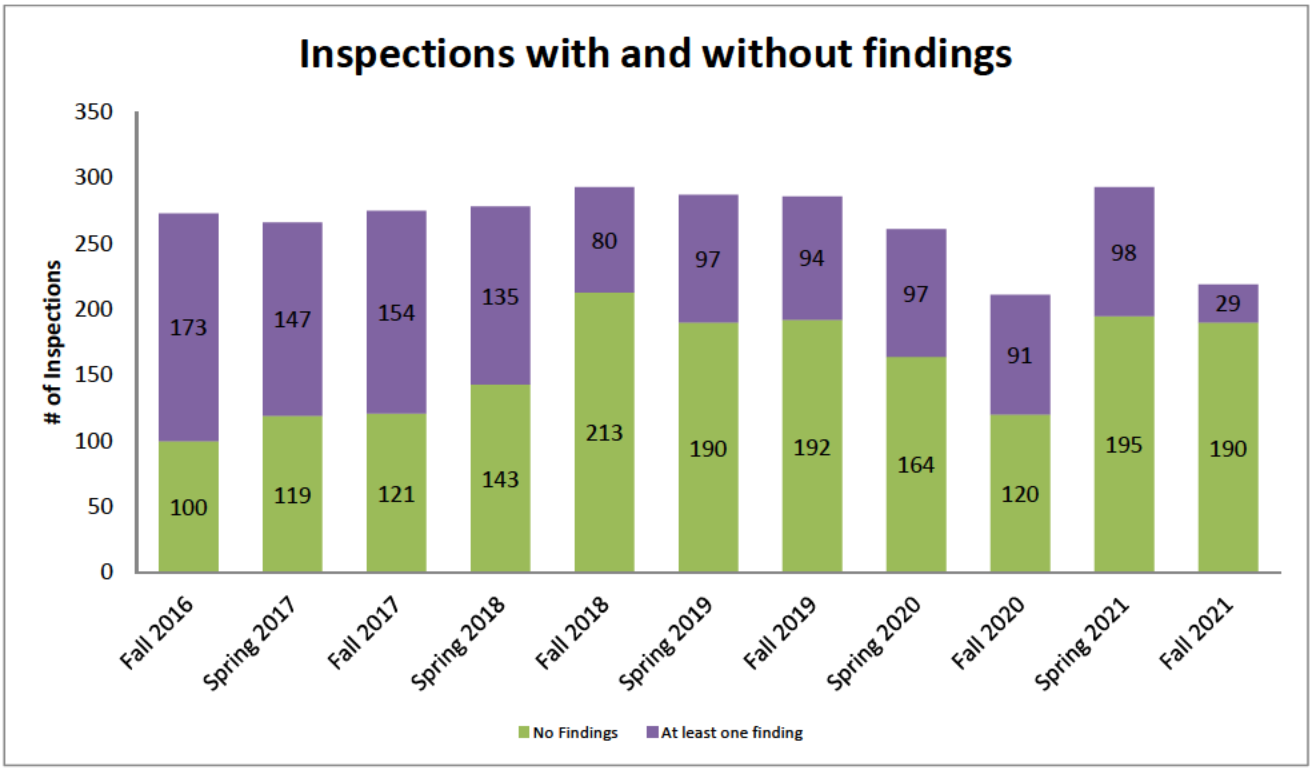




	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
Inspection Findings	474	341	387	292	120	184	192	167	158	205	107
Findings-Other	30	12	11	7	6	10	9	6	14	41	23

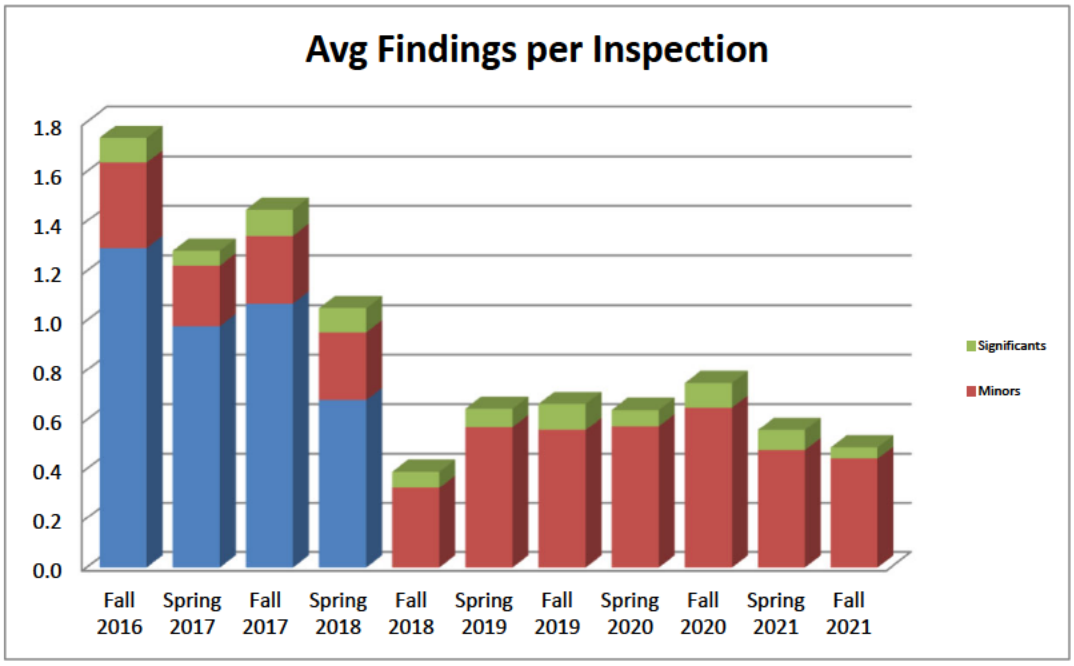


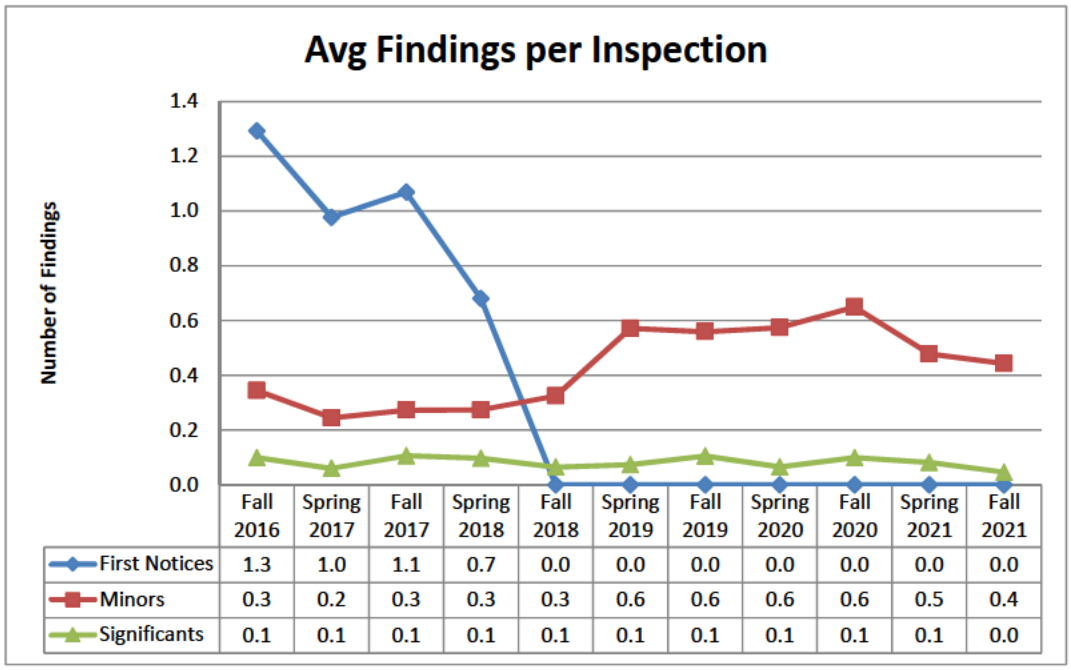
	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
Total Findings-Standard	474	341	387	292	114	184	201	167	158	164	107
Total Inspections	273	266	275	278	293	287	286	261	211	293	219
No Findings	100	119	121	143	213	190	192	164	120	195	190
At least one finding	173	147	154	135	80	97	94	97	91	98	29



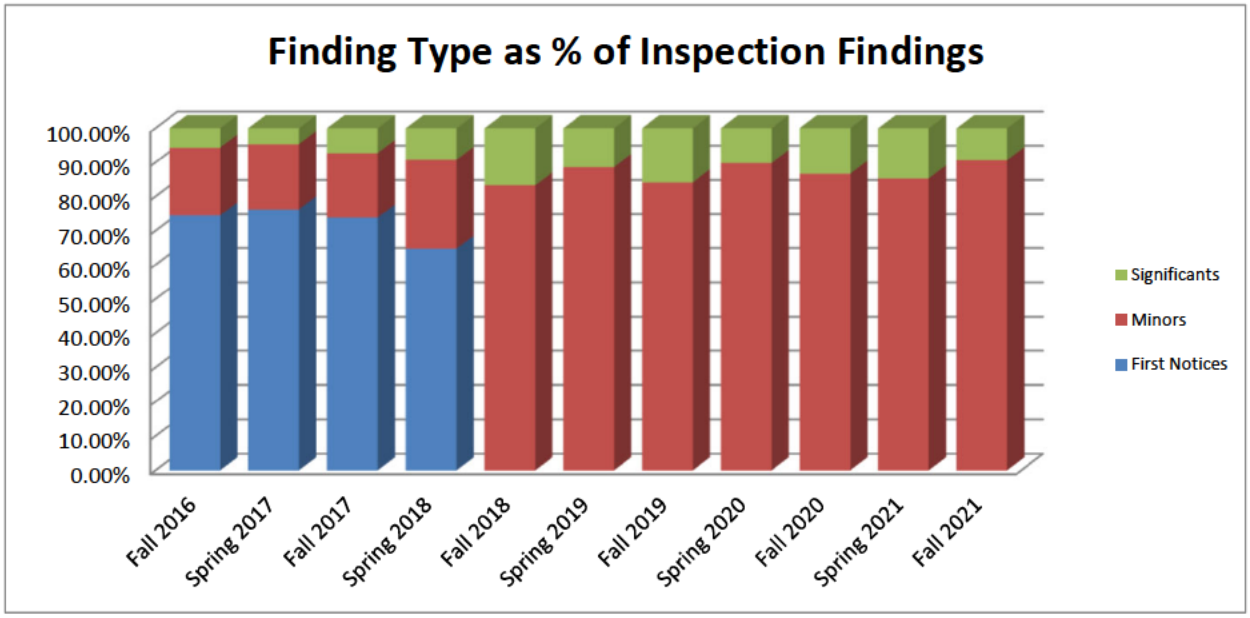
	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
Total Inspections	273	266	275	278	293	287	286	261	211	293	219
First Notices	353	260	294	189	0	0	0	0	0	0	0
Minors	94	65	75	76	95	164	160	150	137	140	97
Significants	27	16	29	27	19	21	30	17	21	24	10

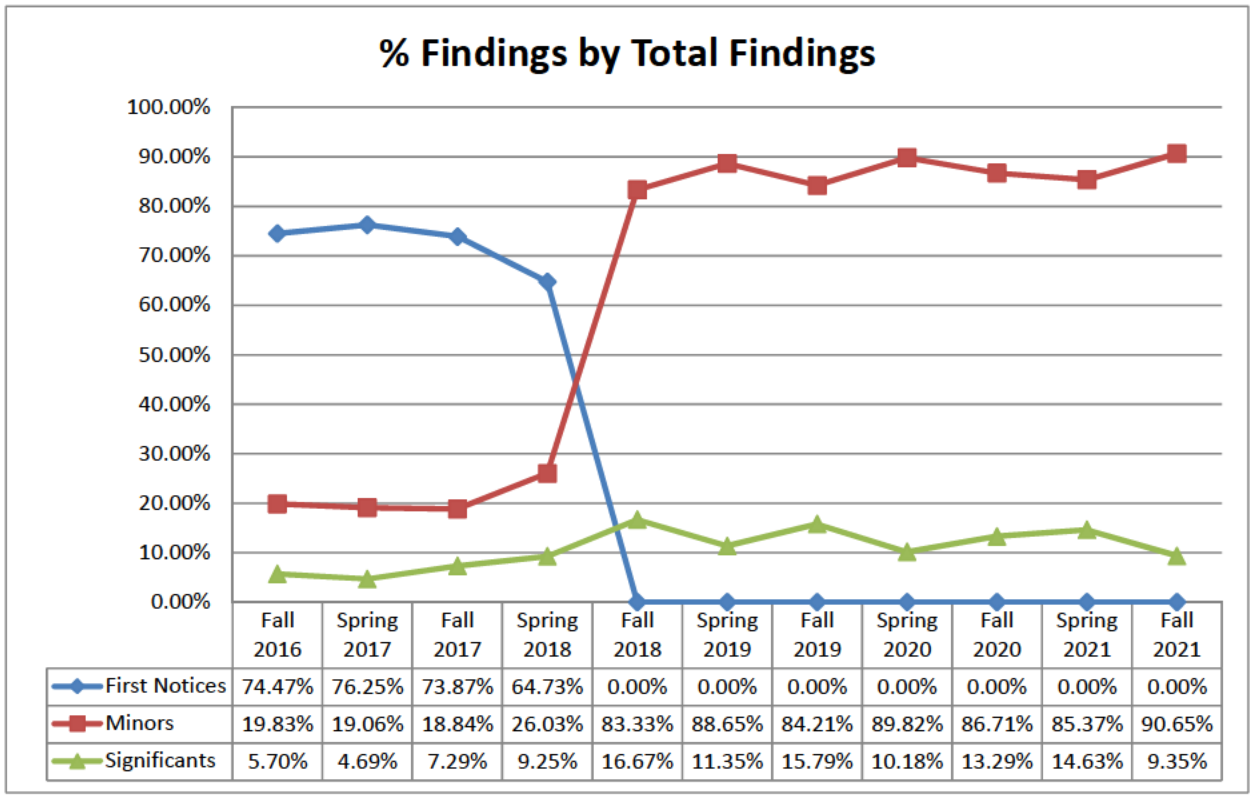
	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
First Notices	1.3	1.0	1.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minors	0.3	0.2	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.5	0.4
Significants	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0





	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
First Notices	74.47%	76.25%	73.87%	64.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Minors	19.83%	19.06%	18.84%	26.03%	83.33%	88.65%	84.21%	89.82%	86.71%	85.37%	90.65%
Significants	5.70%	4.69%	7.29%	9.25%	16.67%	11.35%	15.79%	10.18%	13.29%	14.63%	9.35%





	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021
First Notices	74.47%	76.25%	73.87%	64.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Minors	19.83%	19.06%	18.84%	26.03%	83.33%	88.65%	84.21%	89.82%	86.71%	85.37%	90.65%
Significants	5.70%	4.69%	7.29%	9.25%	16.67%	11.35%	15.79%	10.18%	13.29%	14.63%	9.35%

Fall 2021 Significant Findings Report

Type of Inspection	Building	Room #	Responsible Party	Date of Inspection	Deficiency Type-DEHS, OHS, etc.	Deficiency * = reported to OLAW ** = repeat finding	Corrective Action	Completion Date	Inspectors
Self Report	[redacted]			4/5/2021	IACUC	pups removed from mother for weight weighing and temporarily put in another cage; one of the pups was missed when they were put back with the mother and was found on dirty cage side for 18 hours; put placed back with mother and doing well	will remove all enrichment from temporary cage to prevent visual occulsion of the pups, counting all pups after returning the litter to the home cage and doing a complete sweep of the temporary cage prior to placing in the dirty cage area	4/9/2021	Self Report
Second Surgery				4/28/21 and 4/30/21	IACUC	analgesics not given for terminal procedures as outlined in protocol	will follow protocol until amendment submitted and approved, detailed correctional plan also submitted	5/7/2021	Jennifer Borgert
Self Report				4/28/21 and 5/1/21	IACUC	dehiscence repaired without consulting vet; analgesics not given after dehiscence repair since lab communicated with RAR via email instead of vet pager; animals not shaved prior to dehiscence repair	In future, emergency vet will be paged prior to performing any procedure off protocol; all future vet communications regarding analgesia will be done via emergency pager; all animals will be shaved prior to surgery; surgeon will take RAR suture class, RAR vet will observe future surgery, protocol will be updated regarding wound healing issues	5/3/2021	Self Report
Self Report				4/21/2021	IACUC	Lab staff brought an untrained member of lab into [redacted] (had not yet received [redacted] tour); untrained lab member weaned into new cages pups that were too small to be weaned; lab staff used cages for the wean that did not contain food and pups went without food overnight and were too small to reach water	Lab will pay stricter attention to rules regarding who is allowed in [redacted]; lab will monitor and manage activites of new staff until it is verified that new staff know proper procedures; RAR staff will consulted in future regarding weaning of pups that are small; cages will be double-checked to make sure they have food; senior lab members will train/monitor junior members	4/29/2021	Self Report

Fall 2021 Significant Findings Report									
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Deficiency Type-DEHS, OHS, etc.**	**Deficiency * = reported to OLAW ** = repeat finding**	**Corrective Action**	**Completion Date**	**Inspectors**
Self Report	[redacted]			4/22/2021	IACUC	imaging procedures performed but not approved in protocol	lab immediately stopped performing procedures and amendment submitted adding procedures to protocol; lab asked to double check protocol prior to performing any animal procedures	5/7/2021	Self Report
Ag				5/17/2021	IACUC	No PI in place for active husbandry SOP	There is now a new PI	8/16/2021	Jennifer Borgert
Self Report				4/30/21 and 5/6/21	IACUC	heat pad used during recovery but not during surgery, likely resulting in necrotic tail tip	PI will use heat support during entire procedure	5/24/2021	Self Report
Self Report				5/25/2021	IACUC	Animals being food restricted, but food restriction not approved on protocol*	Food restriction will be delayed until a protocol amendment has been approved regarding this procedure.	6/9/2021	Self Report
PAM				6/10/2021	IACUC	expired isoflurane in use*	expired isoflurane disposed, new isoflurane purchased	6/15/2021	Paul Lindstrom
PAM/Semi-annual				6/16/2021	IACUC	unapproved anesthesia used for telemetric temperature implant	amendment will be submitted to add anesthesia to procedure; procedure will not be performed until amendment approved	6/21/2021	Megan McCoy
Self Report				6/9/2021	IACUC	animals left unattended for period of 30 minutes during anesthetic recovery**	A [redacted] staff member will be present in the room during the entire recovery period to monitor the mice, unless they are alone and need to use the restroom when they will only leave the mice if they are stable and for a maximum of 15 minutes.	6/17/2021	Self Report
Self Report				6/1/2021	IACUC	Cage of mice from top of rack was dropped during cage change-out; 1 pup died and 1 suffered a tail injury	staff reminded that there are ladders and stepstools available for mice on top of rack	6/9/2021	Self Report

Fall 2021 Significant Findings Report									
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Deficiency Type-DEHS, OHS, etc.**	**Deficiency * = reported to OLAW ** = repeat finding**	**Corrective Action**	**Completion Date**	**Inspectors**
Self Report	[redacted]			6/29/2021	IACUC	Baytril obtained from RAR was not diluted as it has been when previously received. Lab member did not read concentration on label and administered undiluted Baytril to mice resulting in toxicity. Mice euthanized.*	Lab will read label prior to using	11/12/2021	Self Report
Self Report				6/30/2021	IACUC	tail snips conducted on mice older than the approved 35 days of age*	Tail snips will be performed from 21 to 35 days of age with careful consideration of new litter DOBs for future planning. Snipping prior to weaning could be considered to ensure adherence to protocol guidelines.	8/2/2021	Self Report
Self Report				6/30/2021	IACUC	mice replaced in cage before bleeding controlled	Direct pressure until hemostasis as well as use of silver nitrate to facilitate hemostasis immediately following rodent tail biopsy. Ten minutes following rodent tail biopsy, rodents will be re-checked to ensure hemostasis.	8/2/2021	Self Report
Second Surgery				7/27/2021	IACUC	SR-Buprenorphine given only 1 hour prior to surgery instead of 2 as outlined in the protocol*	SR Buprenorphine will be administered 2 hours prior to the start of surgery	7/28/2021	Ilana Cohen
Self Report				7/7/2021	IACUC	Animals induced with colitis prior to breeding - procedure not outlined in protocol	mice euthanized and amenendment submitted to protocol outlinging procedure	7/22/2021	Self Report
Second Surgery				7/30/2021	IACUC	Animals housed in laboratory over 24 hours without IMHA approval	animals will be housed [redacted]	8/2/2021	Nima Estharabadi
Self Report				7/23/2021	IACUC	Burr hole procedures performed 4 days apart instead of 7 as outlined in protocol*	Staff will undergo retrraining, timing ill be highlighed in protocol and and SOP; protocol will be amended to include information on why/when burr holes will be needed	7/23/2021	Self Report
Self Report				7/29/2021	IACUC	Animals housed in laboratory over 24 hours without approval	PI has documented in writing that animals will no longer be kept in the lab over 24 hours	8/3/2021	Self Report

Fall 2021 Significant Findings Report									
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Deficiency Type-DEHS, OHS, etc.**	**Deficiency * = reported to OLAW ** = repeat finding**	**Corrective Action**	**Completion Date**	**Inspectors**
Self Report	[redacted]			8/5/2021	IACUC	paralytic administered at too high of rate (7,500 mcg/kg/hr vs 20-200 mcg/kg/hr)*	PI protocol suspended; PI responded; rodent procedures reinstated and cat protocol remains suspended	9/8/2021	Self Report
Second Surgery				8/25/2021	IACUC	Lidocaine not administered in all DBS electrode implantation surgeries as described in protocol	lidocaine will be administered per protocol	8/27/2021	Paul Lindstrom
PAM				9/3/2021	IACUC	Analgesic not given as approved in protocol	post-op analgesics will be administered per approved protocol	9/6/2021	Ilana Cohen
PAM				9/3/2021	IACUC	Animals housed in laboratory over 24 hours without IMHA approval	animals will not be housed in the lab more than 24 hours	9/6/2021	Ilana Cohen
PAM				9/15/2021	IACUC	Performing unapproved anesthetic procedure	amendment submitted for anesthetic procedure	9/16/2021	Megan McCoy
Self Report				9/11/2021	IACUC	sensor on hypoxia chamber failed resulting in death of animals	Ensure backup alarm, clean all jacks, complete test run, eventually replace	9/22/2021	Self Report

Fall 2021 Minor Findings Report

Type of Inspection	Building	Room #	Responsible Party	Date of Inspection	Deficiency Type-DEHS, OHS, etc.	Minor Deficiency * = Repeat Finding	Corrective Action	Completion Date	Inspectors	Category
Second Surgery/Semi-annual	[redacted]			4/1/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	4/5/2021	Kristin Pilon and Walt Tollison	ROHP
Second Surgery/Semi-annual				4/1/2021	IACUC	person performing surgery not listed as a surgeon	surgeon added to protocol	4/5/2021	Kristin Pilon and Walt Tollison	PNF
Self Report				4/6/2021	IACUC	could not take blood pressure during procedure due to equipment failure	have ordered a large supply of new blood pressure cuffs to prevent this recording omission. Additionally, we will immediately contact RAR to supply us with their backup equipment should a similar event occure; a manual blood pressure cuff has also been ordered as a backup	4/8/2021	Self Report	PNF
Second Surgery				4/14/2021	IACUC	person performing surgery not listed as a surgeon	amendment to add surgeon submitted	4/21/2021	Ilana Cohen	PNF
Second Surgery				4/14/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	4/21/2021	Ilana Cohen	ROHP
Second Surgery				4/22/2021	IACUC	Expired betadine scrub	expired betadine replaced	4/27/2021	Ilana Cohen	IPNF - Expired Items
Second Surgery				4/22/2021	IACUC	sterile saline in use that is beyond 30 days from opening	sterile saline will be disposed 30 days after opening	4/27/2021	Ilana Cohen	IPNF - Expired Items
Semi-annual				4/23/2021	IACUC	two sentinel cages in [redacted] clouded and need replacing	cages replaced	5/11/2021	Ilana Cohen	Husbandry
Second Surgery				4/30/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	5/17/2021	Jennifer Borgert	ROHP
Second Surgery				4/30/2021	IACUC	person performing surgery not listed as a surgeon	person added as surgeon	5/7/2021	Jennifer Borgert	PNF
PAM				4/30/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	5/4/2021	Jennifer Borgert	ROHP
Second Surgery				4/28/21 and 4/29/21	IACUC	person performing surgery not listed as a surgeon	person added as surgeon	5/5/2021	Jennifer Borgert	PNF
Self Report				4/28/2021	IACUC	daily health checks missed by RAR technician for this room	RAR suprvisor worked with RAR technician to ensure they understand and are following SOP	5/7/2021	Self Report	Husbandry

Fall 2021 Minor Findings Report										
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Deficiency Type-DEHS, OHS, etc.**	**Minor Deficiency * = Repeat Finding**	**Corrective Action**	**Completion Date**	**Inspectors**	**Category**
PAM	[redacted]			5/3/2021	IACUC	Survival procedure performed as terminal and analgesic not given as outlined; need to update protocol stating analgesic will not be given for terminal version of procedure	amendment submitted	5/21/2021	Jennifer Borgert	PNF
Self Report				5/9/2021	IACUC	Daily health check not performed by RAR staff for this room	formal coaching will be provided by supervisor	5/10/2021	Self Report	Husbandry
Second Surgery				5/25/2021	IACUC	anesthetic records not kept for imaging procedures	anesthetic records will be kept	6/9/2021	Ilana Cohen	IPNF - anesthetic records
Second Surgery				5/26/2021	IACUC	Expired opthalmic ointment in use	disposed of at inspection	5/26/2021	Megan McCoy	IPNF - Expired Items
PAM				5/24/2021	IACUC	Need to add hypothermia anesthesia option for embryos >E15	amendment submitted to add hypothermia anesEthesia for >E15	6/18/2021	Jennifer Borgert	PNF
Semi-annual				5/21/2021	IACUC	Need additional justification research timeline for singly-housed dog	amendment with additional justification submitted	6/16/2021	Megan McCoy and Keith Barker	PNF
Second Surgery				6/3/2021	IACUC	sterile saline is expired	new saline has been ordered	6/7/2021	Ilana Cohen	IPNF-Expired Items
Second Surgery				6/3/821	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	6/10/2021	Jennifer Borgert	ROHP
Second Surgery				6/8/2021	6/14/2021	analgesics not given for stereotaxic surgery performed as non-survival	amendment submitted to omit pre-surgery analgesic for non-survival surgery	6/25/2021	Ilana Cohen	PNF
PAM/Semi-annual				6/16/2021	6/17/2021	expired ophthalmic ointment in use	new eye ointment will be obtained prior to next procedure	6/21/2021	Megan McCoy	IPNF-Expired Items
PAM/Semi-annual				6/16/2021	6/17/2021	animals singly housed but exception not approved in protocol	amendment submitted requesting social housing exemption	7/1/2021	Megan McCoy	IPNF
PAM/Semi-annual				6/16/2021	6/17/2021	ROHP requirements not met by all staff listed on protocols	staff will either complete requirements prior to returning to work on animals or will be removed from protocol	6/21/2021	Megan McCoy	ROHP

Fall 2021 Minor Findings Report

Type of Inspection	Building	Room #	Responsible Party	Date of Inspection	Deficiency Type-DEHS, OHS, etc.	Minor Deficiency * = Repeat Finding	Corrective Action	Completion Date	Inspectors	Category
Second Surgery	[redacted]			6/24/2021	6/25/2021	Uses more than 6 animals per surgical pack	will use instruments for up to 6 animals for each sterilized pack	6/28/2021	Ilana Cohen	IPNF-Aseptic Technique
PAM				6/29/2021	7/1/2021	animals kept longer than approved endpoint	protocol will be amended prior to keeping animals longer than 7 days post surgery	7/14/2021	Paul Lindstrom	PNF
PAM				6/29/2021	7/1/2021	needs to add alternate euthanasia method to protocol	currently approved euthanasia method will be followed	7/14/2021	Paul Lindstrom	PNF
PAM				6/29/2021	7/1/2021	cover of induction chamber is cracked and putty is not sanitizable	induction chamber will be replaced	7/14/2021	Paul Lindstrom	IPNF
PAM				6/29/2021	7/1/2021	ROHP requirements not met by all staff listed on protocols	Status changed to "inactive" ROHP requirements now met	7/19/2021	Paul Lindstrom	ROHP
PAM				6/30/2021	7/1/2021	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	7/7/2021	Paul Lindstrom	ROHP
Ag				6/30/2021	7/1/2021	several bottles of expired vaccine in refridgerator of [redacted]	expired vaccines disposed	7/6/2021	Paul Lindstrom	Ag
Second Surgery				6/30/2021	7/6/2021	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	7/19/2021	Jennifer Borgert	ROHP
Second Surgery/Semi-annual				6/25/2021	7/7/2021	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	7/19/2021	Jennifer Borgert and [redacted]	ROHP
Second Surgery/Semi-annual				6/25/2021	7/7/2021	vaporizers in need of calibration	vaporizers have been calibrated	7/19/2021	Jennifer Borgert and [redacted]	IPNF
PAM				7/7/2021	7/7/2021	Doxcycline administered by IP, but only approved for administration in chow	7/21/2021	amendment will be submitted once current amendment is approved	Paul Lindstrom	PNF
Second Surgery				7/12/2021	7/16/2021	person performing surgery not listed as a surgeon	7/30/2021	person added to protocol as surgeon	Ilana Cohen	PNF
Second Surgery				7/12/2021	7/16/2021	vaporizers due for calibration	7/30/2021	vaporizers calibrated	Ilana Cohen	IPNF
Second Surgery				7/27/2021	7/27/2021	ROHP requirements not met by all staff listed on protocols	8/10/2021	ROHP requirements met	Ilana Cohen	ROHP
Second Surgery				7/27/2021	7/27/2021	ROHP requirements not met by all staff listed on protocols	7/30/2021	ROHP requirements met	Ilana Cohen	ROHP
PAM				7/26/2021	7/29/2021	person performing surgery not listed as a surgeon	8/12/2021	amendment approved with surgeon update	Ilana Cohen	PNF
PAM				7/26/2021	7/29/2021	ROHP requirements not met by all staff listed on protocols	8/12/2021	ROHP requirements met	Ilana Cohen	ROHP

Fall 2021 Minor Findings Report

Type of Inspection	Building	Room #	Responsible Party	Date of Inspection	Deficiency Type-DEHS, OHS, etc.	Minor Deficiency * = Repeat Finding	Corrective Action	Completion Date	Inspectors	Category
Self Report	[redacted]			7/8/2021	7/8/2021	Veterinarian not contacted immediately when health issue identified	8/16/2021	in instances of health or illness, a vet will always be communicated with in a timely fashion and directly	Self Report	IPNF
Second Surgery				7/30/2021	8/2/2021	sutures not removed prior to 14 days; need to update protocol stating sutures will be left until end of parabiosis study	8/5/2021	vet recommendation submitted to extend to 21 days, will amend protocol if needed after that	Nima Estharabadi	PNF
PAM/Semi-annual				7/28/2021	8/2/2021	ROHP requirements not met by all staff listed on protocols	8/16/2021	ROHP requirements met	Paul Lindstrom	ROHP
Self Report				7/30/2021	8/5/2021	room missed during daily health checks [redacted] no animal welfare impacts occurred	8/5/2021	[redacted] animal care supervisors will have a second supervisor review all posted room schedules every day to ensure that no room is missed. Supervisors will also perform additional walk-throughs to ensure daily checks are completed	Self Report	Husbandry
Second Surgery/Semi-annual				7/19/2021	8/12/2021	BP not monitored during survival surgery as outlined in protocol	8/27/2021	protocol will be amended with optional monitoring parameters	Jennifer Borgert	PNF
Second Surgery/Semi-annual				7/30/2021	8/16/2021	Label food storage shelves and fridge "for animal use only"	8/30/2021	items labeled "for animal use only"	Jennifer Borgert	IPNF
Second Surgery/Semi-annual				7/30/2021	8/16/2021	Label Baytril 100 and Excede with opened date	8/30/2021	items labeled with open date	Jennifer Borgert	IPNF
Second Surgery				7/27/2021	8/19/2021	persons performing surgery not listed as a surgeons	9/2/2021	protocol amended with other surgeons	Jennifer Borgert	PNF
Second Surgery				7/27/2021	8/19/2021	Need to confirm 3 days post-op records will be kept going forward	9/2/2021	3 days of post-op observations will be recorded	Jennifer Borgert	IPNF-surgical records
Second Surgery				7/27/2021	8/19/2021	Surgical records missing required items	9/2/2021	surgical records will be updated with all required information	Jennifer Borgert	IPNF-surgical records
Second Surgery				7/28/2021	8/19/2021	ROHP requirements not met by all staff listed on protocols	9/2/2021	ROHP requirements met	Jennifer Borgert	ROHP
Second Surgery				7/28/2021	8/19/2021	Need to either give 72 hours of analgesic or submit an amendment requesting exemption	9/2/2021	post-operative analgesics will be administered for 72 hours	Jennifer Borgert	IPNF

Fall 2021 Minor Findings Report										
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PAM	[redacted]			8/17/2021	8/18/2021	Need to add breeding procedure to protocol	9/1/2021	amendment submitted to add breeding procedures	Nima Estharabadi	IPNF
PAM				8/17/2021	8/19/2021	Not keeping records for anesthetic procedures	9/2/2021	anesthetic records will be kept	Paul Lindstrom	IPNF-Anesthetic Records
Second Surgery				8/18/2021	8/19/2021	Required information missing from Surgical and Post-op Records	9/2/2021	surgical records revised	Paul Lindstrom	IPNF-surgical records
PAM				8/4/2021	8/23/2021	Need to use sterile, septum top vial for ketamine/xylazine cocktail	9/6/2021	sterile septum vials will be used	Ilana Cohen	IPNF
PAM				8/4/2021	8/23/2021	IACUC	need to use eye ointment when using isoflurane on nose cone	eye ointment will be used for nose cone isoflurane anesthesia	Ilana Cohen	IPNF
PAM/Semi-annual				8/19/2021	8/24/2021	IACUC	Rabbit procedure recorded for physiology lab; recording not outlined in protocol	No animal procedure recording, protcol will be amended for video of in vitro muscle bath	Megan McCoy and Henry Wong	PNF
Second Surgery				8/24/2021	8/24/2021	IACUC	person performing surgery not listed as a surgeon	amendment to add surgeon submitted	Nima Estharabadi	PNF
Second Surgery				8/25/2021	8/25/2021	IACUC	Need to include time, dose, route on surgical records for carprofen administration	analgesic administrations will be properly documented	Paul Lindstrom	IPNF-surgical records
Second Surgery				8/25/2021	8/25/2021	IACUC	surgical instruments not always autoclaved prior to survival surgery	surgical instruments will be sterilized prior to survival surgery	Paul Lindstrom	IPNF-Aseptic Technique
Second Surgery				8/25/2021	8/25/2021	IACUC	only alcohol is being used to prep surgical site; must also use a suitable antiseptic	a suitable antiseptic will be used for surgical scrub	Paul Lindstrom	IPNF-Aseptic Technique
Second Surgery				8/25/2021	8/25/2021	IACUC	Need to document three days of post-operative observations	three days of post-op observations will be recorded	Paul Lindstrom	IPNF-surgical records
Second Surgery				8/25/2021	8/25/2021	IACUC	Need to document toe pinch prior to thoracotomy and perfusion	toe pinch will be documented prior to perfusion	Paul Lindstrom	IPNF-surgical records
Self Report				8/24/2021	8/24/2021	IACUC	BRDU not administered as approved in protocol	protocol amended to give option to adminster BRDU or not	Self Report	PNF

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Self Report	[redacted]			8/5/2021	8/13/2021	IACUC	Due to very small size of mouse strain, more than one toe was accidently clipped during approved toe-clipping procedures	lab staff will not clip toes to neonatal mice if they are still webbed, rather they will consult with vet to determine the best course when the situation is encountered	Self Report	IPNF
Second Surgery				8/31/2021	9/2/2021	IACUC	No post-op records kept for two surgeries	staff reminded to keept post-op records	Nima Estharabadi	IPNF-surgical records
PAM				8/24/2021	9/21/2021	IACUC	CO2 tank needs to be calibrated to new flow rates	CO2 tank calibrated or will not be used	Jennifer Borgert	IPNF
PAM				8/25/2021	9/21/2021	IACUC	Need to ensure that standard buprenorphine is given minimum of every 4-6 hours for first 12 hours post surgery	buprenorphine will be administered per protocol	Jennifer Borgert	PNF
PAM				8/25/2021	9/21/2021	IACUC	Confirm that heat support will be used during surgical procedures	heat support will be used during surgical procedures	Jennifer Borgert	IPNF
Second Surgery				8/25/2021	9/21/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	Jennifer Borgert	ROHP
PAM				9/1/2021	9/3/2021	IACUC	Need to also record time, dose and route of SR-Buprenorphine administration	records corrected to have all required analgesic information	Nima Estharabadi	IPNF-Surgical Records
PAM				9/3/2021	9/3/2021	IACUC	eye ointment expired	new eye ointment will be obtained	Ilana Cohen	IPNF-Expired Items
PAM				9/3/2021	9/3/2021	IACUC	must wear hair covering during surgery	hair covering will be worn during survival surgery	Ilana Cohen	IPNF-Aseptic Technique
PAM				9/3/2021	9/3/2021	IACUC	Must rinse instruments with sterile water or saline after cidex soak	instruments will be rinsed with saline after cidex	Ilana Cohen	IPNF-Aseptic Technique
PAM				9/3/2021	9/3/2021	IACUC	Must inform RAR when Brdu or Edu are being used	RAR will be informed and cages labeled when BrdU/Edu used	Ilana Cohen	IPNF
PAM				9/9/2021	9/9/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	Megan McCoy	ROHP
PAM				9/8/2021	9/9/2021	IACUC	Need to keep records for BLI procedures	anesthetic records will be kept	Paul Lindstrom	IPNF-Anesthetic records

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PAM	[redacted]			9/8/2021	9/9/2021	IACUC	Need to submit an amendment updating increased frequency of BLI procedures	amendment will be submitted as soon as possible	Paul Lindstrom	PNF
PAM				9/9/2021	9/10/2021	IACUC	SR-Buprenorphine approved in protocol, but lab is using standard buprenorphine	protocol amendment submitted to add regular buprenorphine	Paul Lindstrom	PNF
PAM				9/9/2021	9/10/2021	IACUC	Isoflurane is approved anesthetic for imaging, but lab is using ketamine/xylazine	protocol amendment submitted to add alternate anesthetic	Paul Lindstrom	PNF
PAM				9/9/2021	9/10/2021	IACUC	Need to add procedure to protocol for intra-nasal administrations under anesthesia (procedure is included in experimental design)	protocol amendment submitted describing intra-nasal route as anesthetic procedure	Paul Lindstrom	PNF
PAM				9/15/2021	9/16/2021	IACUC	Aseptic Technique policy not followed (sterilization, surgical gloves, scrub)	aseptic technique training has been scheduled	Megan McCoy	IPNF-Aseptic Technique
PAM				9/15/2021	9/16/2021	IACUC	Items missing from surgical records	IACUC record forms will be used	Megan McCoy	IPNF-Surgical Records
PAM				9/16/2021	9/17/2021	IACUC	anesthetic vaporizer overdue for calibration	calibrated 9/20/2021	Paul Lindstrom	IPNF
PAM				9/7/2021	9/20/2021	IACUC	Need to document toe pinch for terminal procedures	toe pinch will be documented	Jennifer Borgert	IPNF-Surgical Records
PAM				9/14/2021	9/22/2021	IACUC	Anesthetic records not kept for certain procedures	anesthetic records will be kept	Megan McCoy	IPNF-Anesthetic records
Second Surgery				9/16/2021	9/22/2021	IACUC	sterile gloves expired	expired gloves disposed	Megan McCoy	IPNF-Expired Items
PAM				9/22/2021	9/23/2021	IACUC	Adequate training records not kept	training records updated	Nima Estharabadi	IPNF-Training records
PAM				9/22/2021	9/23/2021	IACUC	Records not kept for breeding colony	up to date breeding records will be kept	Nima Estharabadi	IPNF-Breeding records
Ag				9/22/2021	9/24/2021	Ag	section of top rail of outdoor fence needs repair (sharp objects exposed)	work order submitted	Paul Lindstrom	Ag
Ag				9/22/2021	9/24/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	Paul Lindstrom	ROHP
Ag				9/23/2021	9/24/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	Paul Lindstrom	ROHP

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PAM	[redacted]			9/24/2021	9/27/2021	IACUC	need to add 3 breeding strains to protocol	amendment submitted adding strains	Nima Estharabadi	PNF
PAM/Semi-annual				9/29/2021	9/29/2021	OHS	ROHP requirements not met by all staff listed on protocols	ROHP requirements met	Paul Lindstrom and Keith Barker	ROHP
PAM				9/27/2021	10/4/2021	IACUC	Xylazine given as premedication instead of Midazolam; need to update protocol	amendment submitted to add xylazine as premedication	Jennifer Borgert	PNF
Semi-annual				9/27/2021	10/7/2021	IACUC	Signs of rodent activity including dead mouse- need plan for better rodent control	plan submitted: call pest control, work order submitted to replace door seal	Ilana Cohen	Husbandry
PAM/Semi-annual				9/16/2021	10/13/2021	IACUC	disaster plan needs updating	disaster plan had been updated on 9/17/2021	Nima Estharabadi and Jessica Sieber	IPNF
Semi-annual				9/16/2021	10/14/2021	IACUC	needs to confirm disaster plan updated and available	disater plan updated and posted	Nima Estharabadi and Jessica Sieber	IPNF
Semi-annual				9/16/2021	10/14/2021	IACUC	Cages are corroding. Contact manufacturer and determine if they need to be replaced	manufacturer contacted, will start replacing the worst cages per recommendation	Jennifer Borgert and Jessica Sieber	Husbandry
Semi-annual				9/16/2021	10/14/2021	IACUC	Document barrel sanitizaion in [redacted]	barrel labeled with sanitization date	Jennifer Borgert and Jessica Sieber	IPNF
Semi-annual				9/16/2021	10/14/2021	IACUC	Store food away from wall in [redacted]	food moved away from wall	Jennifer Borgert and Jessica Sieber	IPNF

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PAM	[redacted]		Gianluigi Veglia	4/7/2021	Paul Lindstrom
Semi-annual			Philip Portoghese	4/9/2021	Paul Lindstrom
Second Surgery			Ned Patterson	4/12/2021	Paul Lindstrom
Second Surgery			Tim Starr	4/9/2021	Megan McCoy
Semi-annual			Dallas Dornink	4/12/2021	Megan McCoy
Semi-annual			Job Ubbink	4/12/2021	Megan McCoy
Semi-annual			Jeramy Kulesa	4/12/2021	Ilana Cohen
Semi-annual			RAR (Eric Shoen)	4/14/2021	Ilana Cohen
PAM			David Redish	4/15/2021	Ilana Cohen
Second Surgery			Rocio Gomez-Pastor	4/22/2021	Megan McCoy
Semi-annual			Terresa Xiong	4/23/2021	Ilana Cohen
Semi-annual			Terresa Xiong	4/23/2021	Ilana Cohen
Ag			David Israels-Swenson	4/26/2021	Paul Lindstrom
Ag			Bradley Heins	4/26/2021	Paul Lindstrom
Ag			Lee Johnston	4/26/2021	Paul Lindstrom

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
Semi-annual	[redacted]		Robert Denton	4/27/2021	Paul Lindstrom
Semi-annual			Heather Waye	4/27/2021	Paul Lindstrom
Semi-annual			Heather Waye	4/27/2021	Paul Lindstrom
Semi-annual			Patrice Banks	4/29/2021	Paul Lindstrom
Semi-annual			Samuel Dudley	4/30/2021	Jennifer Borgert and Liz Pluhar
PAM			Jason Bartos	4/30/2021	Jennifer Borgert
Ag			Alfredo DiCostanzo	5/5/2021	Paul Lindstrom
PAM			Beshay Zordoky	5/5/2021	Paul Lindstrom
PAM			Robert Turesky	5/6/2021	Paul Lindstrom
Second Surgery			Kurt Prins	5/5/2021	Megan McCoy
Ag			Dan Braaten	5/11/2021	Megan McCoy
Semi-annual			Maxim Cheeran	5/17/2021	Paul Lindstrom
PAM			Thomas Bastian	5/18/2021	Paul Lindstrom
Semi-annual			Mark Sanders	5/19/2021	Megan McCoy
Semi-annual			Mark Sanders	5/19/2021	Megan McCoy
Semi-annual			Max Meyers and Danielle Hyde	5/20/2021	Ilana Cohen
PAM			Sandra Armstrong	5/20/2021	Paul Lindstrom
PAM			Anna Tischler	5/21/2021	Paul Lindstrom

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
Ag	[redacted]		Samuel Baidoo	5/17/2021	Jennifer Borgert
Second Surgery			Ningling Kang	5/25/2021	Jennifer Borgert
PAM/Semi-annual			Sivaraj Sivaramakrishnan	5/18/2021	Jennifer Borgert
Semi-annual			Kim Klukas	5/21/2021	Jennifer Borgert
Semi-annual			Carrie Haskell-Luevano	5/20/2021	Jennifer Borgert
Second Surgery			Jonathan Gewirtz	5/26/2021	Jennifer Borgert
PAM/Semi-annual			Gordon Smith	5/26/2021	Paul Lindstrom and Jan Zimmerman
PAM			Ingunn Stromnes	5/27/2021	Paul Lindstrom
Semi-annual			Brooke Hart	5/21/2021	Megan McCoy and Keith Barker
Second Surgery			Samuel Dudley	5/26/2021	Ilana Cohen
Second Surgery			Sade Spencer	5/28/2021	Ilana Cohen
PAM/Semi-annual			Wei Chen	5/20/2021	Jennifer Borgert and Liz Pluhar
PAM			Paul Everson	6/1/2021	Paul Lindstrom
PAM			Katie Satrom	6/2/2021	Paul Lindstrom
PAM			Daniel Vallera	6/3/2021	Paul Lindstrom
PAM			Silvia Balbo	6/4/2021	Paul Lindstrom
PAM			Harry Orr	6/8/2021	Ilana Cohen
PAM			Eric Newman	6/9/2021	Ilana Cohen

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
PAM	[redacted]		Yun You	6/11/2021	Paul Lindstrom
Ag			Sally Noll	6/11/2021	Paul Lindstrom
Semi-annual			Scott Madill	6/9/2021	Megan McCoy and Ferenc Toth
Semi-annual			Scott Madill	6/9/2021	Megan McCoy and Ferenc Toth
PAM			Bruce Walcheck	6/16/2021	Paul Lindstrom
PAM/Semi-annual			John Bischof	6/16/2021	Megan McCoy
Semi-annual			Brooke Hart	6/18/2021	Paul Lindstrom
PAM/Semi-annual			Melanie Graham	6/18/2021	Paul Lindstrom
PAM/Semi-annual			Melanie Graham	6/18/2021	Paul Lindstrom
PAM			Thomas Griffith	6/21/2021	Megan McCoy
PAM			Timothy O'Connell	6/16/2021	Megan McCoy
PAM			Chi Chen	6/14/2021	Jennifer Borgert
PAM			Zhe Chen	6/14/2021	Jennifer Borgert
PAM			Shai Ashkenazi	6/15/2021	Jennifer Borgert
Semi-annual			Jennifer Menken	6/23/2021	Megan McCoy
Second Surgery			Michelle Willette	6/24/2021	Ilana Cohen
Second Surgery			Julia Lemos	6/22/2021	Jennifer Borgert
PAM			Steven Graves	6/22/2021	Megan McCoy

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
Semi-annual	[redacted]		Max Meyers and Danielle Hyde	6/29/2021	Ilana Cohen
Semi-annual			Karry Bazille	6/29/2021	Megan McCoy
PAM/Semi-annual			Brendan Dougherty	6/24/2021	Megan McCoy
PAM			David Largaespada	6/29/2021	Paul Lindstrom
Ag			Brian Crooker	6/28/2021	Jennifer Borgert
PAM			James Lokensgard	6/30/2021	Jennifer Borgert
Second Surgery			Mary Garry	6/30/2021	Jennifer Borgert
PAM			Naoko Shima	6/24/2021	Jennifer Borgert
PAM			Rafael Andrade	6/29/2021	Jennifer Borgert
PAM			Robert Tranquillo	6/29/2021	Jennifer Borgert
PAM			Sayeed Ikramuddin	6/29/2021	Jennifer Borgert
PAM			Alonso Guedes	7/6/2021	Paul Lindstrom
Semi-annual			Lacey Mantovani	7/8/2021	Paul Lindstrom and Sam Baidoo
Semi-annual			Karry Bazille	7/9/2021	Nima Estharabadi
Semi-annual			Karry Bazille	7/13/2021	Megan McCoy and Beverly Norris

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
Semi-annual	[redacted]		Karry Bazille	7/13/2021	Megan McCoy and Beverly Norris
Semi-annual			Karry Bazille	7/13/2021	Megan McCoy and Beverly Norris
Semi-annual			Karry Bazille	7/13/2021	Megan McCoy and Beverly Norris
PAM			Doug Yee	7/14/2021	Megan McCoy
Semi-annual			Dan Busian	7/13/2021	Megan McCoy and Beverly Norris
Semi-annual			John Ward	7/13/2021	Megan McCoy
Semi-annual			Christina Camell	7/13/2021	Jennifer Borgert
PAM			Subree Subramanian	7/14/2021	Paul Lindstrom
Second Surgery			Scott Dehm	7/7/2021	Ilana Cohen
Semi-annual			Brooke Hart	7/15/2021	Paul Lindstrom
Semi-annual			Maxim Cheeran	7/15/2021	Paul Lindstrom
Second Surgery			Nicola Grissom	7/12/2021	Ilana Cohen
Second Surgery			Alik Widge	7/16/2021	Paul Lindstrom
Second Surgery			Jocelyn Richard	7/21/2021	Nima Estharabadi
Second Surgery			Marc Jenkins	7/26/2021	Nima Estharabadi

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Semi-annual	[redacted]		Ann Fallon	7/26/2021	Paul Lindstrom
Semi-annual			Dick Bianco	7/23/2021	Paul Lindstrom and Nate Koewler
Semi-annual			Jay Maher	7/28/2021	Megan McCoy
Second Surgery			Alfonso Araque	7/29/2021	Megan McCoy
Second Surgery/Semi-			Geoffrey Ghose	7/28/2021	Paul Lindstrom and [redacted]
PAM			Erik Finger	7/28/2021	Megan McCoy
Semi-annual			Alessandro Barolomucci	7/21/2021	Megan McCoy
Semi-annual			Victoria Hall	7/22/2021	Jennifer Borgert
PAM/Semi-annual			Mark Masino	7/22/2021	AAALAC visit
PAM/Semi-annual			Mark Masino	7/22/2021	AAALAC visit
PAM			Bryce Binstadt	8/4/2021	Megan McCoy
Second Surgery			Kevin Wickman	8/5/2021	Nima Estharabadi
Second Surgery			Kevin Wickman	8/5/2021	Nima Estharabadi
PAM			Ellen Ingolfsland	8/6/2021	Paul Lindstrom
PAM			Phu Tran	8/9/2021	Nima Estharabadi
PAM			Peter Crawford	8/10/2021	Nima Estharabadi
PAM			John Belcher	8/10/2021	Paul Lindstrom

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
PAM	[redacted]		John Belcher	8/10/2021	Paul Lindstrom
PAM			DeWayne Townsend	8/12/2021	Paul Lindstrom
PAM/Semi-annual			Jan Zimmerman	8/13/2021	Paul Lindstrom
Second Surgery/Semi-annual			Benjamin Hayden	8/13/2021	Paul Lindstrom
PAM			Ryan Langlois	8/16/2021	Paul Lindstrom
PAM			Kaylee Schwertfeger	8/19/2021	Nima Estharabadi
Semi-annual			Sandy Mand	8/20/2021	Paul Lindstrom and Craig Flory
PAM			Swati More	8/6/2021	Ilana Cohen
PAM			Sunny Chan	8/23/2021	Nima Estharabadi
Second Surgery			John Collister	8/24/2021	Paul Lindstrom
Semi-annual			Karry Bazille	8/25/2021	Nima Estharabadi
Semi-annual			Karry Bazille	8/25/2021	Nima Estharabadi
PAM/Semi-annual			Esther Krook-Magnuson	8/6/2021	Ilana Cohen
PAM			Rosemary Kelly	8/26/2021	Jennifer Borgert
PAM			Sara Hamilton Hart	8/23/2021	Ilana Cohen
PAM			Jiashu Xie	8/26/2021	Ilana Cohen
Second Surgery			Curtis Hughey	8/26/2021	Megan McCoy

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
PAM	[redacted]		Christopher Staley	8/26/2021	Megan McCoy
Second Surgery			Benjamin Saunders	8/27/2021	Ilana Cohen
Second Surgery			Rita Perlingeiro	8/26/2021	Nima Estharabadi
Semi-annual			Katie Tuininga	8/31/2021	Megan McCoy
Semi-annual			Erin Larson	8/26/2021	Ilana Cohen and Dick Bianco
PAM			John Osborn	8/23/2021	Jennifer Borgert
PAM			Christopher Pennell	8/24/2021	Jennifer Borgert
PAM			Stephanie Groman	8/26/2021	Jennifer Borgert
PAM			Rachel Koski	9/1/2021	Megan McCoy
Second Surgery/Semi-annual			Alessandro Bartolomucci	9/1/2021	Megan McCoy and Laura Stone
Second Surgery			Amanda Klein	9/16/2021	Nima Estharabadi
PAM			Grant Anderson	9/16/2021	Nima Estharabadi
PAM			Anna Lee	9/16/2021	Paul Lindstrom
PAM			Jin O-Uchi	9/15/2021	Paul Lindstrom
PAM			Christina Pacak	9/17/2021	Paul Lindstrom
PAM			John Osborn	9/10/2021	Jennifer Borgert
Second Surgery			Brenda Ogle	9/10/2021	Jennifer Borgert

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Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
PAM	[redacted]		Christopher McGregor	9/10/2021	Jennifer Borgert
PAM			Massimo Costalonga	9/17/2021	Nima Estharabadi
PAM			Marija Cventanovic	9/8/2021	Jennifer Borgert
PAM			Linda McLoon	9/20/2021	Paul Lindstrom
Semi-annual			Erin Larson	9/21/2021	Megan McCoy
PAM/Semi-annual			Mark Thomas	9/20/2021	Megan McCoy
PAM			Venkatram Mereddy	9/16/2021	Megan McCoy
Second Surgery			Jean Regal	9/16/2021	Megan McCoy
PAM/Semi-annual			Frank Ondrey	9/22/2021	Ilana Cohen and Carolyn Fairbanks
PAM/Semi-annual			Hubert Lim	9/23/2021	Ilana Cohen and George Wilcox
Ag			Nicky Overgaard	9/23/2021	Paul Lindstrom
Semi-annual			Ruby Ingenthron and Bridget Nieto	9/27/2021	Nima Estharabadi and Laura Stone
PAM			Patrick Rothwell	9/28/2021	Paul Lindstrom
PAM			Erin Marcotte	9/29/2021	Ilana Cohen
Semi-annual			Antonella Borgatti	9/27/2021	Jennifer Borgert and Marilyn Bennett
Second Surgery			Casey Johnson	9/27/2021	Jennifer Borgert

Fall 2021 No Findings Report					
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
PAM	[redacted]		Yibin Deng	9/30/2021	Nima Estharabadi
PAM			Ruifeng Cao	9/16/2021	Jennifer Borgert
Semi-annual			Erin Malone	9/27/2021	Ilana Cohen
Semi-annual			Scott Madill	9/27/2021	Ilana Cohen
PAM			Tomoyuki Koga	9/29/2021	Jennifer Borgert
PAM/Semi-annual			Allen Mensinger	9/16/2021	Nima Estharabadi and Jessica Sieber
PAM/Semi-annual			Thomas Hrabik	9/16/2021	Nima Estharabadi and Jessica Sieber
Semi-annual			Ian Aldrich	9/16/2021	Jennifer Borgert and Jessica Sieber
Second Surgery			Andrew Grande	9/30/2021	Jennifer Borgert
Second Surgery			Walter Low	9/30/2021	Jennifer Borgert
Second Surgery			Ann Parr	9/30/2021	Jennifer Borgert
PAM/Semi-annual			Mark Bee	10/12/2021	Paul Lindstrom
PAM/Semi-annual			Mark Bee	10/12/2021	Paul Lindstrom
Semi-annual			Jay Maher	10/19/2021	Paul Lindstrom
PAM/Semi-annual			Suzanne McGaugh	10/8/2021	Jennifer Borgert
PAM/Semi-annual			Mark Schleiss	10/22/21 and 10/26/21	Paul Lindstrom and Laura Stone
Semi-annaul			Eric Schoen	10/26/2021	Megan McCoy and Carolyn Fairbanks

Fall 2021 No Findings Report					
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
Semi-annaul	[redacted]		Eric Schoen	10/26/2021	Megan McCoy and Carolyn Fairbanks
PAM			George Wilcox	10/26/2021	Jennifer Borgert
PAM			Carolyn Fairbanks	10/26/2021	Jennifer Borgert
Semi-annaul			Scott Madill	10/27/2021	Jennifer Borgert and Marilyn Bennett
Semi-annaul			Flannery Miley	10/27/2021	Jennifer Borgert and Marilyn Bennett
Semi-annaul			Denise Obitz-Cooney	10/27/2021	Jennifer Borgert and Marilyn Bennett
Semi-annaul			Brenda Mielke	10/27/2021	Jennifer Borgert and Marilyn Bennett

Fall 2021 Notes to File

Investigator Name	Date of Inspection/submission	Protocol number(s)	Notes written to file
Mark Thomas	4/29/2021	2011-38592A	Removing rat housing in [redacted] rats will only be in [redacted] going forward. We are no longer housing rats in [redacted], as that study is completed.
Justin Drake	6/4/2021	1802-35596A	I added 2 kinase inhibitors, BLU-667 and LOXO-292.These are similar to the previously approved kinase inhibitors.
Karam Aboudehen	6/9/2021	2004-38012A	These Pkd1 null mice were already described in the procedure (point 2) and accounted for in the total numbers; however they weren't listed in the breeding protocol since I didn't have them on hand yet.
Andrew Adams	9/13/2021	2011-38630A	Adding cold sterilant as an option for instrument sterilization prior to survival surgery. Cold sterilant does not degrade surgical instruments as much as autoclaving instruments does. Also, cold sterilant is much more convenient for the lab to use for sterilization compared to gas or autoclave sterilization.

Fall 2021 Vet Recommendations

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
4/13/2021	Andrew Grande	dog	1911-37613A	For the addition of euthanasia with Fatal-Plus (pentobarbitol sodium) euthanasia solution in addition to Beuthanasia solution currently listed on the protocol. The solution will be given at >1ml/pound IV
4/15/2021	[redacted]	NHP	1911-36714A	To use a laser pointer for target training under the already approved cooperative behavioral training program
4/19/2021	Paul Iaizzo	pig	2101-38777A	To substitute standard buprenorphine listed in the protocol to sustained-release buprenorphine (buprenorphine SR). In the 'Surgical implantation of a leadless pacemaker', the post-operative plan includes standard buprenorphine. This medication must be dosed frequently (i.e. BID to TID) for effectiveness. Buprenorphine-SR only requires one dose post-operatively, decreasing the associated handling, restraint, and stress for the animal. Post-operative analgesic: Buprenorphine SR (0.18 mg/kg SQ once at the end of surgery)
4/26/2021	[redacted]	NHP	1901-36717	Veterinary approval for use of isoflurane (1-5%) via facemask during CT scan procedure if needed. Isoflurane is to be be used in addition to the already approved Ketamine + Dexmedetomidine sedation plan in an event where the NHP is too responsive to the stereotax to safely complete the scan.
4/26/2021	[redacted]	NHP	2001-37801A	Several changes are being recommended to the anesthetic protocols for surgeries. The PI will submit an amendment to include this information: • Increase dose of ketamine from 5-10 mg/kg to 5-15 mg/kg. Sometimes this larger dose of ketamine is needed to safely sedate macaques so they can be handled prior to surgery. • Add additional sedation option of midazolam (0.05-0.25 mg/kg) to be used in combination with ketamine. Midazolam has fewer effects on the cardiovascular system than dexmedetomidine (which is currently approved), while still providing muscle relaxation that is needed for surgery prep. • IV fluids can be given at a rate of 5 ml/kg/hr throughout surgery, instead of 10ml/kg/hr. This is based on recent literature in humans and helps keep patients adequately hydrated without causing adverse effects such as pulmonary edema. • Meloxicam should be given before surgery, rather than after. Giving meloxicam before surgery helps minimize pain and inflammation from the start, rather than trying to treat them after surgery is over. Add additional peri-operative antibiotic option of ceftriaxone (50 mg/kg IV). This antibiotic has better penetration of the nervous tissue, so it is recommended for cranial procedures. • Add additional IV fluid option of 0.9% saline. Saline may be preferred when using ceftriaxone because the calcium in LRS can interact with ceftriaxone. • Add mannitol (100-400 mg/kg IV) as option during surgical procedures. Mannitol may be used to prevent or treat brain swelling during surgery

Fall 2021 Vet Recommendations

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
4/27/2021	Wei Chen	Cat	1905-37090A	This recommendation is to include the use of atipamezole (0.2-0.4 mg/kg IM) to reverse xylazine after anesthesia. This may help shorten anesthetic recovery
5/5/2021	Markus Meyer	pig	1908-37334A	This recommendation is to add aspirin to post-operative care as an adjunctive medication to prevent clotting, thus hoping to limit complications of clotting and bettering outcome for the animal and model. The lab has an amendment currently under review. See below: For swine undergoing approved renal artery stenosis with stent and coil – The animal may receive 325mg of aspirin orally one day before the procedure and daily continuing throughout the study or just starting daily after the procedure throughout the study.
5/5/2021	Rachel Koski	rat	2103-38886A	This veterinary recommendation is for the addition of the option of standard bupivacaine in addition to long lasting bupivacaine (already on protocol) at a dose of 1-2 mg/kg (0.4-0.8 mL/kg of a 0.25% solution) injected subcutaneously at the incision site for the unilateral carotid artery ligation or Sham Surgery in neonatal rats. The dose should not exceed 6 mg/kg total dose.
5/10/2021	Wei Chen	cat	1905-37090A	This veterinary recommendation will cover an antibiotic to be given preoperatively to prevent any infections that may occur from bacterial contamination of the surgical site prior to or during the procedure. This recommendation also provides a pre-operative dose of Meloxicam in order to provide analgesia perioperatively, which will significantly diminish distress and pain felt by the animal. This veterinary recommendation clarifies post-operative pain management and uses drugs that will be available to the lab and RAR to give, as well as corrects dosage and describes dosing intervals. Lastly, a post-operative antibiotic has been added to further protect against infection of the implant margin as it is healing. The veterinary recommended drug protocol for this procedure is as follows: - Ceftriaxone 25mg/kg SQ preoperatively - Lidocaine/bupivacaine line block preoperatively (already in the protocol) - Meloxicam 0.2mg/kg SQ perioperatively - Meloxicam 0.05mg/kg PO SID for 3 days following procedure - Clavamox 20mg/kg (1ml of suspension) PO BID for 7 days following procedure - Buprenorphine 0.02mg/kg SQ followed by 0.01mg/kg SQ every 6-10 hours day ofmsurgery and PRN for pain 3 days following procedure

Fall 2021 Vet Recommendations

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
6/9/2021	Dick Bianco	sheep	2001-37774A	Post-operative antiplatelet medications are being recommended to prevent clotting in order to improve the outcome for the animals and model. For sheep undergoing approved valve replacement surgery, the animal may receive the following: • Aspirin: Give 81 mg PO SID starting in the morning on the day of implant until study endpoint. • Clopidogrel: Give 225 mg PO BID starting in the morning on the day of implant until study endpoint.
6/11/2021	Dick Bianco	pig	1910-37541A	Veterinary recommendation to use atipamezole after the approved 'Sedation for Blood Collection and/or Transthoracic Echo' procedure as a reversal agent for the xylazine. Reversal of the xylazine allows for faster recovery after the procedure, benefiting the welfare of the animal. Post-procedure pigs may receive atipamezole (0.2 mg/kg IM once) to speed recovery.
6/29/2021	Wei Chen	cat	1905-37090A	These recommendations all apply to the procedure described in the protocol as "Craniotomy for chronic implantation or opto-fMRI study". The current drug protocol described is as follows: - Lidocaine/bupivacaine line block during surgery - Carprofen 1-2mg/kg PO or SQ or Meloxicam 0.1-0.2mg/kg PO or SQ on day 1 and 0.05mg/kg PO afterwards – postoperative care - Robenacoxib 2mg/kg injection (route not listed) – postoperative care - Buprenorphine 0.01mg/kg PO (applied to buccal membrane) day of surgery and PRN for 3 days following procedure This veterinary recommendation will cover an antibiotic to be given preoperatively to prevent any infections that may occur from bacterial contamination of the surgical site prior to or during the procedure. This recommendation also provides a pre-operative dose of Meloxicam in order to provide analgesia perioperatively, which will significantly diminish distress and pain felt by the animal. This veterinary recommendation clarifies post-operative pain management and uses drugs that will be available to the lab and RAR to give, as well as corrects dosage and describes dosing intervals. Lastly, a post-operative antibiotic has been added to further protect against infection of the implant margin as it is healing. The veterinary recommended drug protocol for this procedure is as follows: PI: Protocol #: Expiration: - Ceftriaxone 25mg/kg SQ preoperatively - Lidocaine/bupivacaine line block preoperatively (already in the protocol) - Meloxicam 0.2mg/kg SQ perioperatively - Meloxicam 0.05mg/kg PO SID for 3 days following procedure - Clavamox 20mg/kg (1ml of suspension) PO BID for 7 days following procedure - Buprenorphine 0.02mg/kg SQ followed by 0.01mg/kg SQ every 6-10 hours day of surgery and PRN for pain 3 days following procedure

Fall 2021 Vet Recommendations

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
6/30/2021	Wei Chen	cat	1905-37090A	Currently, the protocol lists anesthetic agents to be used as ketamine (10-25mg/kg IM) and xylazine (2.5mg/kg IM) under the general preparation for other procedures. Due to the size of kittens that the lab is currently using as opposed to the older and larger cats they have previously worked with, smaller doses can be used to achieve the same anesthetic plane. This benefits the smaller animals by not exposing them to higher doses of anesthetics than are necessary. Therefore, the anesthetic doses for ketamine and xylazine will have extended ranges, seen below. Ketamine hydrochloride: 2.5 – 10 mg/kg IM Xylazine: 1.1 – 2.2 mg/kg IM
7/28/2021	Dick Bianco	sheep	2001-37774A	Veterinary recommendation to perform a pericardial tap to remove pericardial effusion as seen on transthoracic echocardiography procedure. This procedure is performed under sedation using sterile technique with full scrub and percutaneous access to relieve cardiac tamponade. Pericardial effusion is when fluid builds up in the pericardial sac around the heart, making the heart muscle work harder to pump against that fluid buildup. The tap and removal of the fluid improves animal welfare in that it reduces the effort the heart has to do to pumpnormally. The animal was currently sedated while the echocardiography was being performed and the effusion seen, therefore needed to be performed before the animal recovered from sedation for best welfare of the animal. 3 days of carprofen(4 mg/kg SID)will begiven post procedure to reduce any potential pain or inflammation associated with the tap.
7/14/2021	Lucy Vulchanova	mouse	2002-37888A	This veterinary recommendation is to increase the analgesic dose of SR-buprenorphine in the protocol from 1 mg/kg to 2 mg/kg. RAR standard dose for mice is currently 2 mg/kg. This dose can be used for any of the surgical or painful procedures on this protocol where SR-buprenorphine (at 1 mg/kg) was previously approved.
7/27/2021	[redacted]	NHP	1904-36959	This recommendation is for the use of the antibiotic Excede (20mg/kg SC) once during DBS implantation. This single injection allows for 7 days of therapeutic coverage and is a refinement to the currently approved antibiotic plan (Rocephin 25 mg/kg IM BID the day of implantation, and then enrofloxacin 5mg/kg IM SID or ceftiofur 5-10 mg/kg SID or BID for a minimal total of 7 days).

Fall 2021 Vet Recommendations

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
7/27/2021	Wei Chen	Cat	1905-37090A	This recommendation is to replace the application of Cetacaine spray described in the protocol currently with application of 0.1ml of 2% lidocaine in a 1cc syringe prior to intubation. The AAFP (American Association of Feline Practitioners) recommends using liquid lidocaine for topical application instead of products that use a nozzle (such as Cetacaine) due to the delivery of the topical anesthetic coming from high expulsion pressures, which can damage the delicate laryngeal mucosa of a cat. This recommendation will prevent any extraneous damage from applying topical anesthetic via a high pressure nozzle.
8/2/2021	Yoji Shimizu	mice	2011-38649A	This veterinary recommendation is for mice undergoing parabiosis surgery. The intent is to minimize stress related to handling and allow for appropriate healing post-operatively. Additional supportive care steps post-surgery are provided. - Okay to leave would clips in an additional 7 days post-op (for a total of up 21 days) assuming there is good sterile technique during surgery and incision is clear from fur/debris. - Okay to remove water bottles from cage the evening after surgery and the following day assuming mice have received SQ fluids prior to recovery from anesthesia and there is moistened chow and diet gel available in the cage. This is to prevent new pairs from hitting the sipper and accidentally flooding the cage. - Okay to leave cages 1⁄2 on heat for up to 48hrs post-op for supportive care. Cages will still be housed in [redacted]
8/5/2021	Wei Chen	Cat	1905-37090A	This recommendation is to not give atropine as part of the premedication for general anesthesia procedures. Atropine may have adverse effects when administered with alpha-2 agonists such as xylazine or dexmedetomidine. Atropine (0.02-0.04 mg/kg IM) should, however, be given when neostigmine is administered to reverse the vecuronium at the end of the procedure. Neostigmine can cause a decrease in heart rate, which is counteracted by the atropine.
8/31/2021	Paul Iaizzo	swine	2101-38777A	Veterinary recommendation to add carprofen for analgesia as well as changing the dosing regimen for buprenorphine. Specifically, carprofen (2-4 mg/kg) PO/SQ SID should be given for 3 days following surgery (including the day of surgery) for post-operative pain and inflammation. Standard buprenorphine (or Buprenorphine SR) will also be given on the day of surgery and PRN (as needed) for 3 days post-op (rather than BID for 3 days as written in the protocol). As the surgical procedure itself is relatively minor, a combination of NSAIDs and opioids is more appropriate for pain control on the day of surgery with NSAIDs in the days following with opioids added for potential breakthrough pain. Post-operative analgesic: Carprofen (2-4 mg/kg SQ/PO SID) for 3 days post-op AND Standard buprenorphine (BID) day of surgery and PRN for 3 days post op OR Buprenorphine SR (once) day of surgery

Fall 2021 Vet Recommendations

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
9/16/2021	[redacted]	NHP	2001-37801A	Several changes are being recommended to the anesthetic protocols for surgeries. The PI will submit an amendment to include this information: • Increase dose range of ketamine to 5-15 mg/kg IM. Sometimes this larger dose of ketamine is needed to safely sedate macaques so they can be handled prior to surgery. • Add additional sedation option of midazolam (0.05-0.25 mg/kg IM) to be used in combination with ketamine. Midazolam has fewer effects on the cardiovascular system than dexmedetomidine (which is currently approved), while still providing muscle relaxation that is needed for surgery prep. • IV fluids can be given at a rate of 5 ml/kg/hr throughout surgery, instead of 10ml/kg/hr. This is based on recent literature in humans and helps keep patients adequately hydrated without causing adverse effects such as pulmonary edema. • Add additional intra-operative antibiotic option of ceftriaxone (50 mg/kg IV). This antibiotic has better penetration of the nervous tissue, so it is recommended for cranial procedures. • Add additional IV fluid options of Normasol-R and 0.9% saline. Non-calcium-containing fluids are required when using ceftriaxone because the calcium in LRS can interact with ceftriaxone. • Add additional antibiotic dosing regimen of Excede 20 mg/kg SC once. This reduces the amount of times that the animal has to be injected post-operatively, which helps minimize pain and distress. • Remove the dexamethasone administration the night before the procedure. Because dexamethasone may interact with the post-operative NSAIDs, it should be avoided prior to the procedure.

Repeat Significant Findings/Self Reports Fall 2021

[redacted]

6/9/21:
Self Report:

- It was noted by RAR employee that animals were left unattended for a period of 30 minutes during anesthetic recovery.

3/26/19:
Self Report:

- Two mice were anesthetized with ketamine/xylazine in preparation for transurethral infection with E. coli. Following the procedure, cages were placed on heating pads to aid recovery, but the lab failed to return the animals to the housing rack. RAR returned them the following morning.

IMHA Justifications Summary Fall 2021

Investigator	Species	Building	Room number	Protocol Number	Justification
Alejandro, Emilyn	mouse	[redacted]		2106-39213A	We need special housing for this mice that is only available in IBP Phenotyping core in [redacted]
Aliota, Matthew	mouse			2102-38855A	The experiments to be performed are to be done at [redacted]
Baldo, Caroline	sheep			2003-37957A	Long term survival animals are provided a natural environment at [redacted] This facility is capable of providing housing with pasture and appropriate shelter for a large number of farm animals. This facility also has a veterinary technician living on the grounds. The technician is capable of blood draws, treatments, observing and assessing clinical health, and is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during [redacted]. The facility does provide an excellent enriched environment for study animals. In order to maintin the quality and scientific integrity of this study as well as to generate a reliable model for future studies, we are required to follow the regulations set by FDA under 21CFR part 58. Animals may be [redacted] prior to first surgical procedure or for the duration of the study.
Bartolomucci, Alessandro	mouse			2001-37780A, 2006-38206A, 2009-38503A, 2102-38818A	Our studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor as well as weekly body composition and indirect calorimetry analysis. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Bartolomucci, Alessandro	prairie voles			2102-38818A	Our studies involve continuous monitoring of animal cardiometabolic functions. Importantly, animals fitted with radio telemetry transmitters need to be monitored by visual inspection as well as by verifying the correct function of the software over the entire acquisition period. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Barrell, Emily	horse			1905-37027A	Horses are housed in the [redacted] presently as there is no RAR housing available; they will continue to be housed in [redacted] for the duration of the study.

Investigator	Species	Building	Room number	Protocol Number	Justification
Battaglino, Ricardo	mouse	[redacted]	[redacted]	1904-36987A	(Phenotyping Core) Our studies involve continuous monitoring of mice metabolic functions including body weight monitor. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Baughn, Anthony	mouse			1810-36444A, 2104-39054A, 2110-39475A	Mice will be infected with Mycobacterium tuberculosis, a bacterium that is classified as a Risk Group 3 pathogen due to its high infectivity and transmission via the respiratory route. According to the Biosafety in Microbiological and Biomedical Laboratories 5th ed (CDC), mice infected with M. tuberculosis do not pose an aerosol infection risk and can be maintained under BSL-2 containment. However, the initial infection procedure and processing of infected mice does present a significant aerosol exposure risk and must be conducted inside [redacted] Standard operating procedures for work in [redacted] and caging equipment used for housing the infected animals are designed to reduce the risk of personnel exposure to infectious organisms during husbandry.
Bee, Mark	frogs			2001-37746A	The main reasons for the long term housing of frogs in this room are the following: A major reason for housing these animals [redacted] concerns the time of day that the animals are used. It is likely that some tests will be conducted at night (e.g., between midnight and 4am) when these frogs are naturally most active. It has been our experience that frogs are often more responsive when tested at night. Second, it is important for our experiments that we maintain some control over the acoustic environment in which the frogs are kept. We may wish to broadcast recordings of natural frog choruses at night in the animal room to acoustically simulate the situation in which females are in natural breeding chorus.
Bee, Mark	frogs			2001-37746A	The main reasons for the long term housing of frogs in this room are the following: A major reason for housing these animals [redacted] concerns the time of day that the animals are used. It is likely that some tests will be conducted at night (e.g., between midnight and 4am) when these frogs are naturally most active. It has been our experience that frogs are often more responsive when tested at night. Second, it is important for our experiments that we maintain some control over the acoustic environment in which the frogs are kept. We may wish to broadcast recordings of natural frog choruses at night in the animal room to acoustically simulate the situation in which females are in natural breeding chorus.

Investigator	Species	Building	Room number	Protocol Number	Justification
Bianco, Richard	sheep, pigs	[redacted]	[redacted]	1810-36420A, 1903-36852A, 1905-37042A, 1905-37103A, 1907-37284A, 1910-37538A, 1911-37578A, 2001-37739A, 2001-377774A, 2002-37883A, 2002-37893A, 2003-37939A, 2003-37937A, 2004-38034A, 2004-37997A, 2004-38078A, 2004-38080A, 2005-38138A, 2009-38424A, 2009-38446A, 2009-38474A, 2103-38906A, 2106	Long term survival animals are provided a natural environment at [redacted] This facility is capable of providing housing with pasture and appropriate shelter for large number of farm animals. This facility also has a veterinary technician living on the grounds. The technician is capable of blood draws, treatment, observing and assessing clinical health and is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during [redacted] The facility does provide an excellent enriched environment for the test animals. In order to maintain the quality and scientific integrity of this study as well as to generate a reliable model for future studies, we are required to follow the regulations set by FDA under 21CFR part 58.
Bischof, John	fish embryos			2007-38259A, 2104-39002A	Fish embryos will be considered vertebrates after they reach Day 3. They will be housed in [redacted] for observation. After which any surviving fish will be transferred to the [redacted] and housed in tanks and grown out til three months. We will attempt the fish to spawn and evaluate the health of the embryos (non-vertebrates). After which the adult parent fish will be euthanized. The cryopreservation and observation procedures can be handled in [redacted] whereas the housing & care of fish post [redacted] can be taken care in the [redacted]. The [redacted] has experts and an approved protocol for this procedure (#1506-32642A)
Bischof, John	zebrafish embryos			2104-39002A	Fish embryos will be considered vertebrates after they reach Day 3. They will be housed in [redacted] for observation. After which any surviving fish will be transferred to the [redacted] and housed in tanks and grown out til three months. We will attempt the fish to spawn and evaluate the health of the embryos (non-vertebrates). After which the adult parent fish will be euthanized. The cryopreservation and observation procedures can be handled in [redacted] whereas the housing & care of fish post [redacted] be taken care in the [redacted]. The [redacted] has experts and an approved protocol for this procedure (#1506-32642A)
Bold, Tyler	mouse			1812-36571A	Mice will be infected with Mycobacterium tuberculosis, a bacterium that is classified as a Risk Group 3 pathogen due to its high infectivity and transmission via the respiratory route. Mice infected with M. tuberculosis may release infectious bacteria to the air. Therefore, infected mice must be housed inside the [redacted] facility to contain the highly infectious organisms. Standard operating procedures for work in [redacted] and caging equipment used for housing the infected animals are designed to reduce the risk of personnel exposure to infectious organisms during husbandry.

Investigator	Species	Building	Room number	Protocol Number	Justification
Camell, Christina	mouse	[redacted]		1909-37389A	[redacted] is required as this will permit the investigators to perform needed experiments (cold challenge for three days)
Camell, Christina	mouse			1909-37389A	We are conducting a study that requires mice to be housed in [redacted] that cannot be serviced by RAR personnel. Therefore it is necessary to obtain clearance for the self management and maintenance of our mice housed [redacted]
Chen, Xiaoli	mouse			2102-38852A	Our studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor as well as weekly body composition and indirect calorimetry analysis. Data acquisition systems are extremely expensive and therefore must e in a secured area. Also, it is absolutely crucial to our research that the monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Chen, Chi	fish			2105-39108A	We are not aware of services and space in the campus dedicated to the feeding of tilapia, a commercial fish specie for nutrition research. [redacted] has extensive experience in growing tilapia for research. We will grow fingerling (about 5 g) in 10- gallon aquarium, which can be housed in the designated room
Chen, Clark	mouse			1906-37149A	Our experiments would comprise of electrode implantation in the mouse brain. We plan to keep a single mouse in each cage with the cage being specialized to allow enough room for the wires attached to the electrode, such that the wires do not tangle and the mouse gets enough space to roam around inside the cage. This requires special cages and [redacted]
Cvetanovic, Marija	guinea pigs, frog, rat, mouse			2002-37875A	the proposed animals will be used for a teaching lab taught at [redacted] This is sufficiently far from the Twin Cities that [redacted] housing would not be possible
Dudley, Samuel	mouse			2003-37940A	Use of telemetry system
Dougherty, Brendan	rat			2003-37989A	Rats receiving experimental spinal cord injuries receive specific post-op care and monitoring to ensure appropriate recovery. We have found this to be best handled within the laboratory environment by trained staff with access to specific equipment and drugs for the first 24-72 hours.
Ebner, Timothy	mouse			1808-36330A, 2103-38934A	We request [redacted] for up to 72 hours postop housing of animals undergoing survival surgeries. For [redacted] of mice undergoing training in behavior tasks and then studied after learning these tasks. Behavioral training requires reverse light-dark cycle, of which [redacted] is outfitted with

Investigator	Species	Building	Room number	Protocol Number	Justification
Ernst Castro, Nicolas	horse, camelids	[redacted]	[redacted]	2101-38776A	Horses and camelids that are free of infectious disease and are not intended for advanced imaging will be housed [redacted] Horses/camelids with potentially infectious disease and/or intended for practice with the advanced imaging modalities will be housed in [redacted]
Ernst Castro, Nicolas	horse, camelids, cow, goat, sheep			2101-38776A	Horses and camelids that are free of infectious disease and are not intended for advanced imaging will be housed [redacted] Horses/camelids with potentially infectious disease and/or intended for practice with the advanced imaging modalities will be housed in [redacted]
Fallon, Ann	hamsters			1902-36743A	Blood-feeding arthropods cannot be transported to another building to be provided a blood meal.
Ferrington, Deborah	mice			2004-38048A	Rooms listed is where we have a hood set up to perform light stress experiments. These experiments require stringent control of the amount and timing of light so need to be performed outside the [redacted] facility where a 12/12 cycle of light and dark is maintained.
Firshman, Anna	Horse			2008-38349A	[redacted] does not house horses
Garry, Mary	pigs			1905-37039A	Young piglets require very close attention and specialized care. This level of care is provided by laboratory personnel.
Garry, Mary	pigs			1806-36050A	Young piglets require very close attention and specialized care. This level of care is provided by laboratory personnel.
Godden, Sandra	cow			1912-37675A	The [redacted] has appropriately sized stalls and appropriate environment for neonatal calves participating on the trial. Furthermore it is very close to our lab where we mix/prepare the colostrum replacement product for administration.

Investigator	Species	Building	Room number	Protocol Number	Justification
[redacted]	NHP, mouse, rat	[redacted]	[redacted]	1808-36291A, 1902-36813A, 1902-36830A, 1903-36845A, 1904-36948A, 1905-37026A, 2001-37750A, 2001-37797A, 2003-37936A, 2004-38092A, 2005-38158A, 2006-38229A, 2007-38282A, 2007-38280A, 2008-38343A, 2009-38445A, 2011-38600A, 2102-38846A, 2103-38932A, 2104-38998A, 2104-39058A, 2105-39068A, 2105-39083A	We have modified husbandry practices to be optimal for NHP and rodents used in complex disease models. This [redacted] is capable of exceeding minimum expectations o the guide to provide our animals with varied enrichment, careful husbandry scheduling accommodating the highest level of care and complex environments/interactions that provide the best opportunity for expression of behaviors that represent the species typical repertoire.
Greising, Sarah	mouse			1803-35671A	Mice will be [redacted] for the rehabilitation wheel running procedure. Each mouse in the wheel running group will be housed individually and given free access to a running wheel (Columbus Instruments, Columbus, OH). Daily running totals will be calculated from wheel revolutions collected at 5min intervals. Wheel running will begin ~30 days post-injury and will continue for ~1 month
Griffith, Thomas	mouse			1906-37113A	We are conducting a study that requires mice to be housed in [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self management and maintenance of our mice housed in this [redacted]
Guedes, Alonso	mouse			2004-38045A	For some of the addiction studies, we will use specialized testing apparatus (conditioned place preference test apparatus) at the [redacted] where mice will be housed for up to 3 weeks.
Hall, Victoria	birds			1901-36695A	The approved housing for these education raptors by the permitting organizations (US Fish and Wildlife Service and MN Department of Natural Resources) is [redacted] has >40 years experience housing and caring for captive raptors, and staff from the center authored the book that USFWS uses as their standard for captive raptor management.

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Harmon, James	sheep	[redacted]	[redacted]	1908-37287A	Long term survival animals are provided a natural environment at [redacted] facility is capable of providing housing with pasture and appropriate shelter for a large number of farm animals. This facility also has a veterinary technician living on the grounds. The technician is capable of blood draws, treatments, observing and assessing clinical health, and is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during [redacted]. The facility does provide an excellent enriched environment for study animals.In order to maintain the quality and scientific integrity of this study as well as to generate a reliable model for future studies, we are required to follow the regulations set by FDA under 21CFRpart 58."
Hart, Geoffrey	mouse			2003-37965A, 2004-38004A	The purpose of these experiments is to try to find a 'fix' for mouse NK cells that are not performing ADCC like human NK cells. Part of the reason for mouse NK cells not performing ADCC might be genetics of their ADCC signaling. We will test that here. Also another reason may be the immune history of the mice may affect NK ability to do ADCC. We will assess the level of ADCC in dirty pet store and B6 co-housed with pet store mice in the [redacted]. We have a hypothesis that levels of infection history or genetics of the mice strain may affect the ADCC response of the NK cells. We will therefore test the ADCC response of pet store mice and also cohoused B6 animals in the [redacted] Our technician has been trained in the [redacted] procedures and future people who want to work in this space will do similar training. We will use pet store mice by euthenizing them and taking their spleen, lymph nodes, and/or liver. We will then do ADCC in vitro assays in the [redacted] space looking at NK cells. We will do similar for B6 animals that have been cohoused with pet store
Haskell-Leuvano, Carrie	mice			2002-37862A, 2004-38021A, 2009-38420A	To house and have access to the specialized TSE mouse metabolic cages described in the protocol. Depending on the experiment (exercise and feeding), the experimental mice need to be continuously housed in these cages for data collection purposes for up to 9 weeks of experimental and 1-2 weeks equilibration
Haskell-Leuvano, Carrie	mice			2002-37862A, 2009-38420A, 2108-39309A (SOP)	To acclimate the mice to a different light schedule and to acclimate the mice to the new room before the behavior testing starts.
Hecht, Stephen	rats			1908-37306A	[redacted] (external/internal service organization). [redacted] provides animal testing services, as such, the animals are [redacted] and all services are performed in [redacted]

Investigator	Species	Building	Room number	Protocol Number	Justification
Henke, Craig	mouse	[redacted]	[redacted]	1909-37429A	Hypoxia chamber studies
Hogquist, Kristin	mouse	[redacted]	[redacted]	2004-38042A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self-management and maintenance of our mice housed in this [redacted]
Hove, Mark	fish	[redacted]	[redacted]	1902-36808A	To complete the life history and behavior studies mussels, animals (fish, amphibians, and aquatic invertebrates) need to be held in aquaria for experiments and observation. Recovery of microscopic mussel larvae from laboratory and naturally infested animals needs to be done in aquaria. Observations made during these studies will be used to improve natural resource management decisions.
Hrabik, Thomas	fish	[redacted]	[redacted]	2103-38889A	Facility was built to specifically house aquatic animals
Ikramuddin, Sayeed	mouse	[redacted]	[redacted]	1912-37686A	Metabolic testing (Indirect Calorimetry, Meal pattern analysis, body composition) are only conducted at [redacted] For these evaluations only 40 mice from this protocol will be operated on and housed [redacted].
[redacted]	NHP	[redacted]	[redacted]	1901-36714A	Animals must be quarantined after MPTP injection (either IM or intracarotid) and are held in a room adjacent to the colony room [redacted] During this 72 hour period in which the animal is present, the room will be designated as an IMHA, otherwise it is managed by RAR
Kawakami, Yasuhiko	zebra fish	[redacted]	[redacted]	1908-37300A, 2004-38018A	No [redacted] housing is available for zebrafish. The zebra fish facility [redacted] has been established and utilized for years by various research groups, therefore the facility is functionally able to house zebrafish.
Kim, Do-Hyung	mouse	[redacted]	[redacted]	2012-38672A	The protocol includes analysis of mouse physiology, such as the analysis of whole body fat content and food uptake. These assays are available at [redacted] (Director [redacted]). The mice in the area will be kept 1-2 weeks before the assays are conducted. Once all the assays are completed, mice will be sacrified and tissues will be collected
Kotz, Catherine	mouse	[redacted]	[redacted]	1902-36754A	In our study we will examine effects of optogenic stimulation/inhibition of orexin neurons in context of circadian rhythm. Our studies will include both calorimetry and SPA measurements as well as running wheel studies longer than 24h. Since those kind of observations can not be performed in [redacted] we need to use [redacted]

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Kozak, Ken	salamanders	[redacted]		2010-38540A	Salamanders cannot be housed in [redacted] as they do not maintain the proper temperature and humidity for maintaining amphibians.
Krook-Magnuson, Esther	mouse			2011-38662A	Our optogenetic experiments are done with 24-7 video EEG monitoring, and animals are tethered to allow light delivery. This requires special cages and investigator managed housing.
Kurtti, Timothy	hamsters, mouse			1904-36955A, 2108-39373A	Because of difficulties and special facilities needed to contain ticks, and on occasion infected ticks, the animals will be held outside of the primary housing area. When animals are infested with ticks they need to be examined several times daily. Infected animals, cultures and ticks are handled by this team that has extensive training and experience in the handling of human and animal disease agents transmitted by arthropods.
Kyba, Michael	mouse			2009-38488A	Our studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor as well as weekly body composition and indirect calorimetry analysis. Data acquisition systems are extremely expensive and therefore must be in a secured area
Langlois, Ryan	mouse, rat, deer mice			1811-36488A	We are conducting a study that requires rats to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self-management and maintenance of our rats housed in this [redacted]
LeBeau, Aaron	mouse			2009-38426A	Mice will be injected IV with radiolabeled antibiodies. Housing in [redacted] enables them to be kept in a remote, shielded location while radioactivity is present. The mice will be injected with antibodies labeled with the long lived PET isotope Zr-89 (78.4h half life). Mice will be housed between imaging experiments (up to 144 hour post injection). Mice that are not euthanzied for excised tissue biodistribution will be housed [redacted] until the PET scans are completed, typically 144 hour. After 144 hour, the aniamls will be euthanized and the carcasses will be stroed in a freezer until they have decayed 10 half lives (784 hours).

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Lemos, Julia	mouse	[redacted]	[redacted]	1801-35436A, 2012-38674A	Many of the studies conducted in the laboratory entail prior stress or drug exposure and subsequent behavioral or electrophysiology assays. We are requesting that a subset of "in use" animals will be held in [redacted] (in a room [redacted] that is in close proximity to the behavioral and electrophysiology apparati in order to minimize/prevent extraneous forms of environmental stressors introducing variability into our experimental procedures. By reducing variability, this measure will reduce of the number of animals needed to fulfill the experimental mission of our laboratory.
Lemos, Julia	mouse			2012-38674A	We are requesting a second IMHA in what has been designated as our "stress exposure" room [redacted]. As we are doing more chronic stressor exposure (up to six weeks [redacted] that occurs daily, moving the animals back and forth from [redacted] is likely to introduce untold variance and potential confounds. This room is already equipped (floor, air exchanges) to house mice. We would like to be able to house mice in this room during chronic stress exposure. This will be the exclusive use to this IMHA. Once that animals move to the next phase of the study - physiology or behavior, they will be moved [redacted]
Liang, Jennifer	zebra fish			2002-37859A	The provided housing is a state of the art aquatic system for housing zebrafish. This is not available anywhere else on campus; [redacted] has a state of the art [redacted] There are no other appropriate facilities for zebrafish on campus. Fish before 10-14 dpf will be in petri dishes in incubators [redacted] or on a tray [redacted] After that, they will be in the recirculating aquatic system in [redacted]
Liang, Yuying	mouse			2011-38659A, 2011-38660A	The immunized mice will be challenged with infectious SARS-CoV-2, which is [redacted] As such, infection and monitoring of the infected mice needs to be conducted in [redacted]
Liang, Yuying	mouse			2011-38660A	The immunized mice will be challenged with infectious SARS-CoV-2, which is [redacted] As such, infection and monitoring of the infected mice needs to be conducted in [redacted].
Liu, Julia	mouse			2002-37905A	Our studies involve monitoring of mouse metabolic functions including daily food intake and body weight as well as weekly body composition and indirect calorimetry analysis. Data acquistion systems are extremely expensive and therefor must be in a secured area. Also, it is absolutely critical to our research that the animals are monitored in an experimentally controlled environment

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Lobo, Glenn	zebra fish	[redacted]	[redacted]	2104-38999A	Core Facility
Lokensgard, James	mouse	[redacted]	[redacted]	2001-37808A	The IMHA section will be filled out once we speak with [redacted] regarding housing availability to conduct the Barnes maze.
Lowe, Dawn	mice	[redacted]	[redacted]	1907-37248A	Testing with sensitive physiology equipment that would be better suited in an investigator managed housing area rather than an RAR run facility because access will be limited to those familiar with the study
Lund, Troy	zebra fish	[redacted]	[redacted]	1906-37111A	Core Facility
Madill, Scott	horses	[redacted]	[redacted]	1906-37132A, 1906-37140A, 1906-37178A, 1907-37280A	[redacted] does not have the space to house horses
Madill, Scott	horses	[redacted]	[redacted]	2004-38037A	Animals will be housed in these spaces when undergoing quarantine procedures prior to being introduced into the teaching herd.
Malone, Erin	horses, sheep, cow, donkey, goat, camelids	[redacted]	[redacted]	1805-35927A	Animals will be housed at [redacted] as this is also the location of [redacted] By housing the animals near [redacted] and at the lab site, we are able to minimize the risk and stress of transport across campus and to maximize animal use during the relevant time period.
Mand, Sandy	fish, axolotls, frogs, lizards, snakes, anoles	[redacted]	[redacted]	1811-36504A, 1907-37285A, 1910-37510A, 2002-37832A, 2006-38181A, 2010-38534A	These are animals in [redacted] This IS their primary housing area, but it is not an RAR facility. RAR does not typically house fish.
Mand, Sandy	fish	[redacted]	[redacted]	2002-37832A	These are animals in [redacted] This is their primary housing area but it is not an RAR facility. RAR does not typically house fish. The advantage to housing in this area is that the tanks are fed by well water.
Maragi, Frank	fish, amphibians, reptiles	[redacted]	[redacted]	2003-37976A	Fish and reptile species (i.e. turtles) are used in the [redacted] to display animals discussed in [redacted] It is necessary to house them [redacted] for students to observe during course instruction and discussion.
Mashek, Doug	mouse	[redacted]	[redacted]	2003-37921A	Our studies involve continuous monitoring of mice metabolic functions including indirect calorimetry analysis and locomotion. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.

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Mashek, Doug	mouse	[redacted]	[redacted]	2003-37921A, 2007-38274A	Our studies involve continuous monitoring of mice metabolic functions including indirect calorimetry analysis and locomotion. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Mashek, Doug	mouse			2003-37921A, 2007-38274A	Our studies involve continuous monitoring of mice metabolic functions including indirect calorimetry analysis and locomotion. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Masino, Mark	zebra fish			1904-36944A, 1905-37035A, 2104-38993A	Usage of zebrafish as a model organism requires the ability to breed fish to produce embryos for experimentation. As embryo production must be large enough to provide statistically meaningful results and embryos must be used within a few minutes of fertilization, in-house production of embryos is the only solution. This IMHA will also be housing and caring for additional animals (zebrafish) that are found on other protocols.
Masino, Mark	zebra fish embryos			1905-37035A	Our lab uses embryos/larvae from [redacted] for experiments, so we house them in the lab.
Masopust, David	mouse			1902-36825A, 1910-37451A, 1910-37452A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self-management and maintenance of our mice housed in [redacted]
Masopust, David	hamster			1910-37451A	Hamsters will be infected with SARS-CoV2 and this needs to be done in [redacted]
McGaugh, Suzanne	fish			1906-37158A, 1906-37186A, 2002-37827A	These animals need to be in a restricted and solitary space so we can easily set up and conduct behavior assays with them. RAR does not typically house fish.
McGaugh, Suzanne	fish			1906-37158A, 1906-37186A, 2002-37827A	These animals need to be in a restricted and solitary space so we can easily set up and conduct behavior assays with them. RAR does not typically house fish.
McGaugh, Suzanne	birds			2007-38317A	We house blue jays and starlings in [redacted] so that we can study their behavior as described in the accompanying protocol. [redacted] allows us to maintain our blue jay colony in a large room adjacent to the procedure rooms; that is also readily accessible to our offices and data analysis facilities.

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McGaugh, Suzanne	fish	[redacted]		2002-37827A	Facility was built to specifically house aquatic aimals.
McGregor, Christopher	pigs			2101-38791A	Long term survival animals are provided a natural environment at [redacted]. This facility is capable of providing housing with pasture and appropriate shelter for a large number of farm animals. This facility also has a veterinary technician living on the grounds. The technician is capable of blood draws, treatments, observing and assessing clinical health, and is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during off-hours. The facility does provide an excellent enriched environment for study animals.In order to maintain the quality and scientific integrity of this study as well as to generate a reliable model for future studies, we are required to follow the regulations set by FDA under 21CFRpart 58."
McPherson, Scott	mouse			2002-37909A	Light stress is considered a factor in AMD development and thus we plan experiments that involve light stress. Normal RAR housing is not sufficient to induce light stress. Conversely, we have experiments, such as electroretinograph (ERG) analysis, that must be done in he dark with dark adapted animals. Again normal RAR housing is not totally dark and/or dark long enough for dark adaption.
Menken, Jennifer	snake, turtle, salamander, toad, gecko, fish			1912-37695A	The animals listed are part of the educational programming at [redacted] They are used for display in [redacted] as well as for demonstration in on-site and off-site classroom room programs. They are an important part of our programming with the public, they are used to demonstrate anatomy, ecology, evolutionary adaptations and biological diversity
Mensinger, Allen	fish, frog			2108-39313A	The course tried to integrate physiology with behavior. We house the frogs in [redacted] so the students can observe their behavior and correlate with the experiments. The students are also instructed in basic animal handling and care techniques and by having the frogs in [redacted], we can teach the students this aspect of a science lab; we prefer the students be able to observe the behavior of the weakly electric fish
Mensinger, Allen	fish			1903-36856A, 2011-38640A	Facility was built to specifically house aquatic animals
Mensinger, Allen	fish			2103-38930A	Facility was built to specifically house aquatic animals

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Mermelstein, Paul	rat , mice	[redacted]		1811-36486A, 2101-38780A	We plan to perform behavioral testing on rats in specially-constructed operant chambers as described in Experiment 10 of the approved protocol. This testing will be performed in [redacted], which have been specifically modified to allow us to run our behavioral testing protocol. The only housing for rats in [redacted], and it will not be possible for us to maintain SPF within our operant chambers. Furthermore, SPF procedures would provide additional stress to our rats, and potentially interfere with the results of our behavioral testing.
Mermelstein, Paul	mice			2101-38780A	Our lab studies the effects of environmental experience on brain function and behavior. Our recent studies have shown that even mild stress (handling, injections, and/or novelty exposure) can have significant impact on our outcome measures. [redacted] will enable us to minimize unwanted stress (e.g., transport from housing colony to lab) and control our animals' environment to reduce variability in our data.
Metzger, Joseph	mouse			2004-38031A	Our lab recently moved to [redacted] is much more accessible for our lab. Previously we have used the [redacted] Running wheel equipment access
More, Swati	mouse			1906-37128A	The telemetry system is only offered at [redacted] so this will be the only place the core offers this service. The mice must be housed in this area during the complete period of the study and they can not be taking in and out to avoid any stress to the mice. We will use [redacted] The animal will be housed for upto 3 months in this area based on the experimental design described below.
Munderloh, Ulrike	mice, hamster			1905-37105A, 2103-38899A	Because of difficulties and special facilities needed to contain ticks, and on occasion infected ticks, the animals will be held outside of the primary housing area. When animals are infested with ticks they need to be examined several times daily.

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Nelson, Dwight	sheep	[redacted]	[redacted]	2002-37883A	Long term survival animals are provided a natural environment at [redacted] This facility is capable of providing housing with pasture and appropriate shelter for a large number of farm animals. This facility also has a veterinary technician living on the grounds. The technician is capable of blood draws, treatments, observing and assessing clinical health, and is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during [redacted]. The facility does provide an excellent enriched environment for study animals. In order to maintin the quality and scientific integrity of this study as well as to generate a reliable model for future studies, we are required to follow the regulations set by FDA under 21CFR part 58. Animals may be [redacted] prior to first surgical procedure or for
Netoff, Tay	rat			2004-38001A	We need to video record the rats 24/7 for 15 days to find whether or not they have behavioral seizures
Netoff, Tay	mice			2004-38031A	Running wheel equipment access
Niedernhofer, Laura	mouse			2003-37982A, 2107-39262A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self-management and maintenance of our mice housed in this [redacted]
Ondrey, Frank	mouse			1902-36832A, 1905-37092A, 1912-37696A, 1909-37376A, 2002-37849A, 2004-38081A, 2102-38881A, 2107-39298A	We have had our own research facility [redacted] for more than 40 years. This is our own research project, and specialized equipment is housed in the facility.
Osborn, John	rat			1812-36628A, 2008-38368A	Mice involved in this protocol will be instrumented with radio telemeter equipment which requires constant monitoring and measurement. In addition, animals waiting to be implanted with this equipment will also be housed in this room to reduce the stress of being moved prior to the study
Osborn, John	sheep, pigs			2002-37873A, 2006-38203A, 2008-38392A, 2008-38393A, 2009-38418A, 2011-38597A, 2106-39189A	Long term survival animals are provided a natural environment at [redacted] This facility is capable of providing housing with pasture and appropriate shelter for a large number of farm animals. This facility also has a veterinary technician living on the grounds. The technician is capable of blood draws, treatments, observing and assessing clinical health, and is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during [redacted]. The facility does provide an excellent enriched environment for study animals

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Pang, Hongbo	mouse	[redacted]		2107-39268A	Animals are injected with radiotracer and will be "hot", thus can not be housed [redacted]
Patterson, Ned	dog			1901-36697A	Up to 8 dogs (class B) with the EEG implants will be housed in [redacted]. Post implant surgery, for the at least the first 24 hours (and longer at the discretion of the study PI) the dogs will be in the [redacted] that is staffed 24 hours a day by certified veterinary technicians and a least one licensed veterinarian.. For the period 24-72 hours there will be at a minimum every 6 hours careful checks by [redacted] vet techs for incisional infection, meninigitis (neck pain, fever, or neurological deficits), and pain by study and once hourly generally status checks 24 hours a day. Since this surgery is intracranial brain surgery monitoring of neurologic status and any potentially issues of neurologic deterioration until fully recovered; The dogs in these studies will also be housed in the [redacted] for up to three days if there are life threatening seizures (>5 minutes of two or more
Paulsen, Megan	mouse			2007-38296A	Studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor as well as weekly body composition and indirect calorimetry analysis. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Peterson, Lisa	mouse			1910-37473A	The equipment for the exposure of animals to the inhaled aldehyde vapors is in this location, which is the [redacted]. [redacted] is an External Service Organization/Internal Service Organization for the University. This study is an ISO project.
Phelps, Nicholas	fish			1808-36276A	Fish will require high quality care to eliminate confounding variables of poor fish health for the experiment. Staff at [redacted] have the expertise and equipment required to maintain this level of care.
Pluhar, Liz	dog			1905-37009A	During the first 48 hours after the kaolin injection, the dogs need close monitoring and treatment should hypertensive hydrocephalus develop.
Ponder, Julia	birds			1906-37122A	[redacted] has cages, flight rooms and facilities specifically designed for the safe housing of raptors as well as technical staff with extensive experience in managing these birds. Specific needs include cage size, limited external visibility and perch designs

Investigator	Species	Building	Room number	Protocol Number	Justification
Potter, Lincoln	mouse	[redacted]	[redacted]	1906-37164A	mice involved in this protocol will be instrumented with radio telemeter equipment which requires constant monitoring and measurement. This equipment is housed in [redacted]. In addition, animals waiting to be implanted with this equipment will also be housed in this room to reduce the stress of being moved prior to the study
Revelo, Xavier	mice			2103-38896A	Mice will be housed in [redacted] for running wheel and calorimetry procedures that require specialized equipment in the Core facility
Ruan, Hai-Bin	mice			1811-36529A, 2001-37812A	Our studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor as well as weekly body composition and indirect calorimetry analysis. Data acquisition systems are extremely expensive and therefore must be in a secured area. Also, it is crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directly monitor the animals at all times.
Sanders, Mark	Mice			2106-39147A	This is the Housing SOP for the the [redacted]. Animals are administered radiolabeled antibodies. Housing in [redacted] enables them to be kept in a remote, shield location while radioactivity is present.
Schuldt, Nathan	mice			2106-39195A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self-management and maintenance of our mice housed in this [redacted]
Schwertfeger, Kaylee	mouse			1909-37381A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self management and maintenance of our mice housed in this [redacted]
Shimizu, Yoji	mouse			2011-38649A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self management and maintenance of our mice housed in this [redacted]
Shostell, Joseph	fish			1911-37642A	[redacted] offers a more restricted research space away from high-traffic teaching classrooms. Thus, it provides a more controlled area for the housed fish. This greenhouse area also offers the height we need for a hanging design and offers ambient conditions similar to an outside summer environment.

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Smanski, Michael	fish	[redacted]	[redacted]	1904-36985A	There is [redacted] housing for zebrafish on campus
Smanski, Michael	fish			1904-36985A	There are [redacted] facilities on campus for fathead minnows or carp.Fish need to be held in [redacted] for experiments and regular observation
Sorensen, Peter	fish			2011-38629A	[redacted] fish holding facilities that are either large enough or have well water for our carps
Sorensen, Peter	fish			2011-38629A	[redacted] fish holding facilities that are either large enough or have well water for our carps.
Stromnes, Ingunn	mouse			2005-38115A	We are conducting a study that requires mice to be housed in a [redacted] that cannot be serviced by RAR personnel. Therefore, it is necessary to obtain clearance for the self-management and maintenance of our mice housed in this [redacted]
Subramanian, Subree	mouse			2107-39273A	The [redacted] is large and cannot accommodate to the RAR room racks
Thayer, Stanley	rat and mouse			1911-37610A	These animals will be used for overnight, 24 hour sessions of EEG testing. Moving them back and forth from [redacted] will induce stress. Animals housed for three weeks [redacted]; These animals will be housed in [redacted] during testing. Moving them back and forth between the cores and standard housing will induce stress.
Thayer, Stanley	mouse			1911-37610A	These animals will be housed in the [redacted]. Moving them back and forth between the cores and standard housing will induce stress.
Thomas, Mark	mice			2011-38591A	Our lab studies the effects of environmental experience on brain function. Our recent studies have shown that even mild stress (handling, injections and/or novelty exposure) can have significant impact on our outcome measures. [redacted] will enable us to minimize unwanted stress (e.g. transport from housing colony to lab) and control our animals' environment to reduce variability in our data

Investigator	Species	Building	Room number	Protocol Number	Justification
Thomas, Mark	mice	[redacted]	[redacted]	2011-38591A	Our lab studies the effects of environmental experience on brain function. Our recent studies have shown that even mild stress (handling, injections and/or novelty exposure) can have significant impact on our outcome measures. [redacted] will enable us to minimize unwanted stress (e.g. transport from housing colony to lab) and control our animals' environment to reduce variability in our data
Tischler, Anna	mice			1912-37660A, 2004-38090A, 2005-38161A, 2102-38860A, 2107-39247A	Mice will be infected with Mycobacterium tuberculosis, a bacterium that is classified as a Risk Group 3 pathogen due to its high infectivity and transmission via the respiratory route. Mice infected with M. tuberculosis may release infectious bacteria to the air. Therefore, infected mice must be housed [redacted] to contain the highly infectious organisms. Standard operating procedures for work in [redacted] and caging equipment used for housing the infected animals are designed to reduce the risk of personnel exposure to infectious organisms during husbandry.
Todd, Jeffrey	cat, dog			1906-37145A	cats and dogs are only hospitalized within [redacted] until they are adopted or fostered as part of the blood donor program
Toth, Ferenc	Goat			1904-36947A	Not approved yet
Townsend, DeWayne	mice			1810-36460A	some of the studies proposed use specialized equipment that cannot be placed into the standard RAR managed rooms
Tranquillo, Robert	sheep			2001-37778A, 2007-38301A, 2009-38475A, 2101-38755A	[redacted] is able to provide a natural environment complete with outstanding methods of care, husbandry and research practices. It is capable of providing housing for a large number of animals with extended survival time-points. The [redacted] is GLP compliant and is inspected biannually by University of MN IACUC and monthly by RAR veterinarians
Tretyakova, Natalia	mouse			2004-38077A	The equipment for the exposure of animals for the inhalations is in this location, which is [redacted] is an External Service Organization/Internal Service Organization for the University. This study is an ISO project.
Trumble, Troy	horse			1902-36738A	RAR does not house horses
Trumble, Troy	horse			1902-36738A	No other housing option on Twin Cities/St. Paul campus for housing horses

Investigator	Species	Building	Room number	Protocol Number	Justification
[redacted]	NHP	[redacted]	[redacted]	1904-36959A	Animals must be quarantined after MPTP injection (either IM or intracarotid) and are held in a room adjacent to the colony room in [redacted] During this 72 hour period in which the animal is present, the room will be designated as an IMHA, otherwise it is managed by RAR
Ward, John	frogs			1902-36788A	Housing allows daily post operative monitoring by the PI to ensure that the frog does not have negative consequences to surgery
Waye, Heather	snakes, amphibians			1901-36655A, 1907-37208A, 2002-37863A, 2010-38529A, 2010-38559A	These animals are housed at [redacted] where they are used for display purposes or experimental subjects in a variety of classroom situations/laboratory research
Wefel, Sara	horse			2008-38340A	RAR does not house horses
Willette, Michelle	quail			1908-37293A	Quail approximate the size of many of the companion birds seen in practice by veterinarians. Quail is also a component of the diet of many native raptor species that prey on birds in the wild. Young (hatch year) raptors that have been rehabilitated and are being prepared for release need to demonstrate the ability to identify and capture prey as a criteria for being returned to the wild; this requires the use of live quail. We will be using quail that are surplus to the laboratories for this purpose. We have the knowledge and resources to house the quail for this short period of time, and it reduces their stress being adjacent to our surgical and raptor facilities rather than needing to be transported back and forth on a frequent basis
Yee, Douglas	mouse			2106-39190A	This area (suite) houses the echoMRI machine that we would like to utilize for our studies on the high fat/ high sugar diet. We would like to be able to monitor their body fat composition. This equipment is extremely expensive and therefore must be in a secured area
Zordoky, Beshay	mouse			2106-39176A	The mice for the stress studies will be housed in the [redacted] because our studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directtly monitor the animals at all times for the behavioral assessment.

Reduced Post Approval Monitoring (PAM) Inspection Summary

Fall 2021 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (April 2021—September 2021)
#DID NOT QUALIFY OR COMPLETED: 98
#QUALIFIED FOR REDUCED PAM: 0
#QUALIFIED BUT STAGGERED: 0
NO ACTIVE ANIMAL WORK, INACTIVE PROTOCOL, ETC…: 75

Note: There were no PIs that qualified for reduced PAM frequency during the Fall 2021 semi-annual period because PAM inspections were suspended last year during COVID making it necessary for everyone to receive a PAM inspection this year.

Spring 2021 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (October 2020—March 2021)
#DID NOT QUALIFY OR COMPLETED: 162
#QUALIFIED FOR REDUCED PAM: 32
#QUALIFIED BUT STAGGERED: 0
NO ACTIVE ANIMAL WORK, INACTIVE PROTOCOL, ETC…: 85

Fall 2020 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (April 2020—September 2020)
******Post Approval Monitoring Inspections were suspended due to reduced University operations during COVID 19. These inspections will resume October 2020******

Spring 2020 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (October 2019—March 2020)
#DID NOT QUALIFY OR COMPLETED: 111
#QUALIFIED FOR REDUCED PAM: 35
#QUALIFIED BUT STAGGERED: 0
NO ACTIVE ANIMAL WORK, INACTIVE PROTOCOL, ETC…: 63

Fall 2019 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (April 2019—September 2019)
#DID NOT QUALIFY OR COMPLETED: 145
#QUALIFIED FOR REDUCED PAM: 39
#QUALIFIED BUT STAGGERED: 0
NO ACTIVE ANIMAL WORK, INACTIVE PROTOCOL, ETC…: 74

Spring 2019 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (October 2018—March 2019)
#DID NOT QUALIFY OR COMPLETED: 116
#QUALIFIED FOR REDUCED PAM: 47
#QUALIFIED BUT STAGGERED: 0
NO ACTIVE ANIMAL WORK, INACTIVE PROTOCOL, ETC…: 50

Facility Inspection Dates

Facility Name	Facility Code	Spring 2021	Fall 2021
[redacted]	1	1/13/2021	8/25/2021
	1	1/15/2021	7/13/2021
	1	10/8/2020	4/14/2021
	1	1/13/2021	8/25/2021
	2	1/15/2021	7/13/2021
	2	1/15/2021	7/13/2021
	3	3/23/2021	10/26/2021
	4	1/25/2021	7/13/2021
	5	3/9/2021	10/26/2021
	6	12/14/2020	6/29/2021
	7	1/25/2021	7/9/2021 & 7/13/21
	8	12/8/2020	6/29/2021
	10	10/28/2020	4/29/2021
	10	10/28/2020	4/29/2021
	10	10/21/2020	4/23/2021
	10	10/21/2020	4/23/2021
	10	10/21/2020	4/23/2021
	10	11/20/2020	5/20/2021
	10	3/10/2021	9/27/2021
	12	11/12/2020	5/21/2021
	12	12/7/2020	6/18/2021
		11/12/2020	5/21/2021
	12	1/14/2021	10/27/2021
	12	3/26/2021	N/A - No surgery since last inspection
	12	3/26/2021	9/27/2021
	13	11/13/2020	4/12/2021
	14	2/19/21 and 2/22/21	7/22/2021
	15	3/24/2021	9/16/2021
	16	11/5/2020	5/21/2021
	17	1/7/2021	7/23/2021
	18	12/17/2020	6/9/2021
	19	10/21/2020	4/27/2021
[redacted]	20	Not applicable	Due to the pandemic, classes cancelled, no live animal work conducted
[redacted]	21	1/12/2021	7/28/2021
	22	1/28/2021	7/15/2021
	22	2/19/2021	7/15/2021

Facility Name	Facility Code	Spring 2021	Fall 2021
[redacted]		2/17/2021	7/21/2021 and 9/1/21
		3/22/2021	Not applicable
		1/13/2021	7/13/2021
		3/11/2021	9/22/2021
		1/27/2021	7/28/2021
		3/31/2021	9/29/2021
		2/9/2021	7/22/2021
		12/17/2020	6/9/2021
		3/23/2021	10/8/2021
		3/23/2021	10/8/2021
		2/11/2021	Not Applicable (facility closed)
		2/11/2021	8/26/2021
		No animals housed; Not applicable	No animals housed; Not applicable
		11/9/2020	5/17/2021
		11/17/2020	5/20/2021
		3/12/2021	10/19/2021
		12/22/2020	6/18/2021
[redacted]		Not applicable	Not applicable (no further housing)
		12/15/2020	6/10/2021
		10/13/2020	No animals housed; Not applicable
		10/13/2020	9/9/2021
		3/10/2021	Not applicable (no further housing)
		11/10/2020	5/18/2021
		2/25/2021	8/6/2021
		2/9/2021	7/22/2021
		12/17/2020	6/24/2021
		11/9/2020	5/19/2021
		2/9/2021	7/30/2021
		3/5/2021	10/12/2021
		3/5/2021	10/12/2021
		12/10/2020	6/23/2021

Facility Name	Facility Code	Spring 2021	Fall 2021
[redacted]		2/15/2021	8/20/2021
		Not applicable	Not applicable
		3/4/2021	9/20/2021
		Not applicable	10/27/2021
		2/16/2021	Not applicable
		Not applicable	Not applicable (no further housing)
		Not applicable/ no fish at this time	Not applicable/ no fish at this time
		1/28/2021	7/13/2021
		Not applicable	Not applicable
		Not applicable	Not applicable
[redacted]		3/17/2021	9/22/21 and 9/23/21
		10/21/2020	4/26/2021
		10/21/2020	4/26/2021
		1/13/2021	5/17/2021
		1/13/2021	5/17/2021
		12/2/2020	5/11/2021
		11/16/2020	5/5/2021
		Not applicable	Not applicable
		12/17/2020	6/28/2021
		12/14/2020	6/11/2021
		12/18/2020	6/30/2021
		Not applicable	Not applicable
		Not applicable	Not applicable

Protocol ID	Principal Investigator	Species	Guideline	Exception Request with Justification
1708-35069A	Kara, Prakash	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	A pharmaceutical grade is not available. As detailed in the SOP, urethane is prepared in a fume hood with PPE. After weighing the powder, e.g., 4 g, it is placed in a 50 mL Falcon centrifuge tube and distilled water is added for a total volume of 40 mL. The tube is clearly labeled and stored on a lab shelf away from sunlight.
1803-35671A	Greising, Sarah	Mice	PHYSICAL RESTRAINT	This procedure is a moderate restrain. As such the animals are still able to move about the small area, but is it merely restricted from the standard cage size. (Restricted Housing Cage)
1804-35859A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Since the experiments required for our studies last 1-3 years, there are instances when another surgical procedure will allow us to modify the implants or maintain the implant viability in order to collect the essential data for the grant project (in lieu of starting all over with another animal) with a maximum of two subsequent surgeries. This can be considered a means to reduce the overall number of animals used in our studies. Additionally, in these animals, we may perform initial chamber implants without performing the craniotomy so that we can minimize the number of times the animal needs to undergo chamber cleanings and reduce the l kelihood of infections in the chamber before that chamber needs to be used in active recording / stimulation procedures. In this case, a secondary craniotomy procedure as descr bed above would be performed at a later date (at least one month after the chamber implant surgery).
1805-35872A	Beilman, Gregory	Pig (Biomedical)	BLOOD COLLECTION LIMIT	It is necessary to collect this many bloods to adequately study the parameters outlined in our study. Animals will receive resuscitation fluids during the protocol as well as flushes after each blood draw. Animals will not be allowed to waken after the experiments. (Blood draws for experiments)
1806-35990A	Widge, Alik	Rat	72 HOUR POST-OP ANALGESIA POLICY	The animal usually does not feel pain 24 hours post-surgery, but we will monitor the rat everyday for at least 72 hours post-surgery. Analgesics will be given if the rat is still feeling the pain either 48 or 72 hours post-surgery accordingly. We will also consult with area veterinarian if pain is observed. (Electrode/opto-electrode implantation surgery and opsin delivery)
1806-35996A	Widge, Alik	Rat	MULTIPLE SURGERY	
1806-35996A	Widge, Alik	Rat	72 HOUR POST-OP ANALGESIA POLICY	The animal usually does not feel pain 24 hours post-surgery, but we will monitor the rat everyday for at least 72 hours post-surgery. Analgesics will be given if the rat is still feeling the pain either 48 or 72 hours post-surgery accordingly. (Electrode implantation surgery.)
1806-35996A	Widge, Alik	Rat	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We need to weight animal everyday to monitor their weight changes. The weight will be an important indicator on whether we should increase or decrease the daily food distribution to the rats. (Food Restriction)
1806-35996A	Widge, Alik	Rat	SOCIAL HOUSING	The animals will be singly housed during the surgery recovery period so that the animals do not injure each other as they heal or damage the acrylic head cap that is securing the electrodes/opto-electrodes.

1806-36007A	Blazar, Bruce	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Death is required to understand the effects of some of our experimental therapies on GVHD. In order to understand their effect, death must be used. See additional justification above.
1806-36007A	Blazar, Bruce	Mice	EUTHANASIA METHOD	Cervical dislocation. We are proposing to perform cervical dislocation without anesthesia due to the potential effects of anesthesia on the circulation and the induction of tissue injury. For example, we have consistently observed that lymph node, spleen, and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after elective sacrifice. We have noticed that new lab members who cannot rapidly harvest bone marrow and lymph nodes frequently have poor experimental results. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses as measured in vitro by proliferation assays and in vivo. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis, corticosteriod induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and oxygenation that will compromise our experiments, requiring more repetitions and hence more mice, reagents, space in the colony and resources. Carbon dioxide inhalation prior to cervical dislocation would adversely upset the acid-base balance resulting in acidosis which would be important on a cellular level for in vivo transfer of cells and in vitro cellular assays. Importantly, we cannot know which experiments will suffer the most since we cannot quantify these effects in an individual experiment and we cannot know if we are on the threshold of such effects in a particular experiment. WHEN DONE CORRECTLY, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the animal. The technicians and graduate students/postdocs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized. Only individuals who have become good experienced mouse handlers perform cervical dislocation. RAR is aware of our procedure and practice of using cervical dislocation for these scientific reasons. We use the moribund state to determine if euthanasia is

1806-36007A	Blazar, Bruce	Mice	SOCIAL HOUSING	Although we prefer not to house mice singly, on rare occasion there is no alternative. For example, in the event that only 1 male or female is weaned from a litter, the mouse is housed singly. To further reduce single housing, if there is a cage of recently weaned mice of the same strain, the single new weanling is added to the cage of previously weaned mice, but the age and size disparity must be very narrow or the small newly added weanling risks being bullied by the older, larger mice. With older mice, males cannot be rehoused for any reason due to their territorial nature resulting in a high incidence of fighting. Experimental mice are routinely housed 4-5 (max 4 males) per cage at the initiation of the experiment but deaths will occur at various times after transplant resulting in attrition to a single mouse per cage until death or the termination of the experiment. We do not recombine experimental mice once the experiment is underway to preserve data integrity and prevent territorial fighting or distress. Combining survivors from different groups would increase the possibility of mistakes detrimental to the study such as mixing interventions (injections) or false clinical readings (weight/death). Housing mice from different treatment groups in the same cage will lead to compromised data, which would require repeated experiments at the cost of many additional mice, time and resources. Also, mice from some groups could be healthier than mice from other groups, so that combining a sick mouse with new healthier companion might further result in territorial behavior, added stress. Social housing is preferred and broadly implemented for humane reasons however the listed circumstances are exceptions from which the sequelae of social housing are worse than those of single housing.
1806-36024A	Widge, Alik	Rat	72 HOUR POST-OP ANALGESIA POLICY	The animal usually does not feel pain 24 hours post-surgery, but we will monitor the rat everyday for at least 72 hours post-surgery. Analgesics will be given if the rat is still feeling the pain either 48 or 72 hours post-surgery accordingly. (Opto-electrode implantation)
1806-36024A	Widge, Alik	Rat	SOCIAL HOUSING	

1806-36049A	O-Uchi, Jin	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	There is no pharmaceutical grade avertin available. This animal line has high sensitivity to halogenated anesthetics (e.g. Isoflurane) to produce human malignant hyperthermia-like phenotype after exposure to these drugs (Chelu MG et al, FASEB J. 2006). In addition, in the prior studies, we have frequently experienced that this mouse lines has sensitivity to reduce cardiac function and hemodynamics during surgery (unpublished data). Only avertin among the drugs we tested did not change the basal cardiac function and hemodynamics compared to WT. Therefore, we will use avertin for all procedures we proposed in this animal protocol. 100% Tr bromoethanol (avertin) stock solution will be prepared as follows. First, we will add non-pharmaceutical grade avertin (Sigma) to non-pharmaceutical grade tertiary amyl alcohol (Sigma) and completely dissolve it by heating and stirring. To use, we will dilute 100% stock to 2.5%, v/v, in diluent (0.8% NaCl, 1mM Tris (pH 7.4), 0.25mM EDTA, check the pH and will adjust to pH 7.4.) stirring vigorously until it is dissolved. The injection solution will be filtered through a 0.22 um filter (Millex-GV, Millipore Corp). We will store both 100% avertin stock and injection solution (2.5% avertin) at 4° C wrapped in foil (light sensitive solution). 100% avertin stock solution will be stored and used within a month and 2.5% diluted avertin solution will be used within 30 days of initial preparation and be properly stored. Solution may have to be warmed before injection.
1806-36072A	Alejandro, Emilyn	Mice, Mice	SOCIAL HOUSING	The majority of our mice will be grouped: female will be combined up to five, and male up to 4 to promote social. In cases where they are separated due to fighting (common phenotype after High-fat diet treatment), mice under treatment/experiment will be caged singly, and will be provided an igloo for comfort. To assess food intake, mice will be singly house for one week during food consumption measurement, and then recombine if they are female or euthanized immediately for tissue. Male mice singly house will be euthanized when not needed for further study. In some cases, we need to assess energy expenditure using metabolic cages, where they need to be separated or singly house for up to 3-5 days prior to euthanasia. The metabolic cages can efficiently assess metabolic changes per mouse.
1806-36072A	Alejandro, Emilyn	Mice, Mice	EUTHANASIA METHOD	Only neonates (day 1) will be euthanized via decapitation.
1807-36103A	Subramanian, Subree	Mice	MULTIPLE SURGERY	The first surgery is for establishing the disease model. The secondary surgery is for treating the diseases. (Resection of mouse cecum tumor)

1807-36116A	Jenkins, Marc	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	The food consumption of the mice should not change with any of these diets and no weight loss is anticipated. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized. (Amino acid, casein and selenium deficient diets) No impact on the animals health is expected. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized. (SMZ/TMP treated water)
1807-36150A	Sachs, Zohar	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Mice will be euthanized on the same day they become moribund. Mice are allowed to reach moribund state because in order for our experiments to produce good results, AML should be as prominent in the mouse as poss ble. Often, this state co-occurs as moribundity. In our MDS mouse strains, we expect the same disease state to occur.
1807-36152A	Niedernhofer, Laura	Mice	EUTHANASIA METHOD	Culling purposes only. Preformed only on pups < 3 days.
1807-36180A	Betts, Brian	Mice	SOCIAL HOUSING	NSG, or NOD/SCID/gamma, mice will require single housing once human skin is applied (ABSL 2), up to the day 90 endpoint. This is to reduce the risk for biting or fighting, which could compromise the skin graft and/or animal health. Mice will only be single housed to study endpoint if they cannot be successfully reunited with their original cage mates. Male mice will not be reintroduced. single housing exception after skin transplant surgery Rationale: To prevent cage mates from biting or tearing bandages or skin grafts. When able, mice will be co-housed after 30 days following skin transplantation. NSG mice undergoing xenogeneic GVHD experiments will not be single housed.

1807-36193A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Prior to training an animal to control his eye position, a head post is implanted in an aseptic surgical procedure to permit monitoring of eye position (below). The animals is then trained to perform the task while maintaining fixation on a small spot on a video display under head restraint, and with some tasks to make specific eye movements to visual targets. This fixation control is necessary to insure that portion of the retina on which the stimuli fall is not an uncontrolled variable. Up to 12 months of training may be needed before an animal performs sufficiently well to allow us to collect neurophysiological data. When all training is complete, the animal undergoes another recovery surgery to implant an recording chamber. Implanting chambers in separate surgeries is scientifically justified because they have a limited useful lifetime. The multiple surgeries are needed for the scientific objectives of the experiments, and are related components of the research project. The stepwise surgical preparation of the animal also subjects the animals to a small number of short surgeries, rather than one prolonged and more traumatic surgery. Additional recovery surgeries are sometimes needed to repair implants. Surgeries will only be conducted with prior approval of the the veterinary staff.
1808-36261A	Pang, Hongbo	Mice, Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have used avertin routinely in our previous studies (Pang HB et al, 2014). It is easier to store and use in the lab. Avertin will be prepared and stored using these guidelines: 1. Sterile filter with 0.2 micron filter 2. Store and use under sterile conditions 3. Store in the dark bottle or foil covered container 4. Store stock and working stock solutions at 4°C 5. Do not use if the solution becomes discolored or has a precipitate 6. Check pH before each use and use only when greater than pH 5 7. Discard all solutions after 4 months, including the stock solution 8. Label all containers with name & concentration of drug, date prepared and initials of person making the solution

1808-36275A	Knauer, Whitney	Goat	BLOOD COLLECTION LIMIT	The aggressive sampling scheme is necessary to capture the extent and duration of stress (measured by cortisol) and pain (measured by PGE2) associated with disbudding. We need 1ml of serum for both measures, so a volume of 3ml of whole blood is necessary. This aggressive sampling method has been described (Alvarez et al, 2009; Hempstead et al., 2018) with no apparent ill effects for the kids. Kids will be monitored for pallor (pale oral mucous membranes) and lethargy throughout the sampling period. Kids will be fed a high plane of nutrition (20% BW per day) as well as have free access to water through the study period.
1808-36277A	Largaespada, David	Mice	MULTIPLE SURGERY	Amputation is performed on mice that previously received intra-osseous tumor (by surgical procedure). The mice develop primary tumors relatively quickly, but our experimental aim is to achieve metastasis. We believe that the longer the tumor is present the more likely metastasis will occur. We would perform the amputation when the mouse becomes negatively affected by the tumor such that they meet the euthanasia criteria for either size (2 cm3) or because of loss of mobility in the animal. (Coxofemoral Disarticulation Amputation of hind leg SA 18, 20)
1808-36286A	Tolar, Jakub	Mice, Rat	SOCIAL HOUSING	Animals that undergo surgery for the wound models may need to be singly housed post-op as cage mates may interfere with the healing of the surgical area and endanger the health of the animal. Only in these cases would animals need to be separated and housed singly.

1808-36286A	Tolar, Jakub	Mice, Rat	EUTHANASIA METHOD	We are proposing to perform cervical dislocation without anesthesia due to the potential effects of anesthesia on the circulation and the induction of tissue injury. For example, we have consistently observed that lymph node, spleen, and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after elective sacrifice. We have noticed that new lab members who cannot rapidly harvest bone marrow and lymph nodes frequently have poor experimental results. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis,corticosteriod-induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and oxygenation that will compromise our experiments, requiring more repetitions and hence more mice, reagents, space in the colony and resources. WHEN DONE CORRECTLY, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the animal. The technicians and graduate students/postdocs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized. Only individuals who have become proficient, experienced mouse handlers perform cervical dislocation. RAR is aware of our procedure and practice of using cervical dislocation for these scientific reasons. Euthanasia is performed by pentobarbital overdose only in those instances where cervical bleeding compromises tissue quality as in lung collection (mechanistic studies in which lung, and perhaps thymus) tissues are collected at various times after BMT)

1808-36330A	Ebner, Timothy	Mice	MULTIPLE SURGERY	Based on our initial trials of administering the AAV opsin construct followed by the immediate implantation of the fiber optic, we noticed that we were not producing any expression of the opsin in the targeted region, but only along the shaft of the f ber optic. This was also confirmed in verbal communications with the [redacted] lab. If the fiber optic is placed immediately after the delivery of the AAV, the AAV will concentrate around the fiber optic before it can be taken up by cells. Therefore, we are requesting to do an initial surgery to first inject the AAV opsin construct. This procedure is minimally invasive and typically only lasts an hour in length. The animal receives SR Buprenorphine for each surgical procedure, and in our experience, the mice handle each surgery separately extremely well and do not show signs of pain or discomfort. If any signs of pain or distress are seen following either procedure, we will euthanize the mouse. If an animal fails to gain or maintain their weight, develops an infection, or starts showing signs of pain/distress following recovery of the first surgery, it will not undergo the second survival surgery and will be euthanized. (Viral Vector Injection in Mice (Survival)) A subset of mice will have already undergone the "Viral Vector Injection in Mice (Survival)" procedure. One week following that procedure, these mice will undergo this procedure. Please see this section of the "Viral Vector Injection in Mice (Survival)" procedure.
1808-36330A	Ebner, Timothy	Mice	SOCIAL HOUSING	Mice will be housed singly during water restriction to ensure accurate water regulation. The mice will be weighed before the initiation of water restriction and this will be the pre-restriction weight (see procedure "Water Restriction"). Mice with implants are that will be housed in [redacted] are singly housed to prevent the mice from disrupting the integrity of the implants, which could cause the implant to become compromised (either physically or create a non-sterile environment). Mice without implants will be group housed.

1808-36330A	Ebner, Timothy	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Notes on use of non-pharmaceutical grade urethane: To our knowledge, there is no pharmaceutical grade urethane available. However, we believe the use of urethane is still justified in our anesthetized, non-survival surgical procedures, as alternative anesthetics have considerable negative effects on physiology of the cerebral and cerebellar cortices. For example, ketamine is well known to block NMDA receptors in the brain, which are key receptors in the neuronal circuitry that we are studying (Bengtsson & Jorntell, 2007). Barbiturates are also known to profoundly depress cerebellar circuitry (Sato, Y. et al., 1993). Additionally, isoflurane over time depresses cerebellar function (Loeb, A.L., et al., 1998), which is not ideal for our long, acute experiments. Therefore, urethane is the best available anesthetic agent for us to use to investigate cerebral and cerebellar function in our studies. Bengtsson, F. & Jorntell, H. Ketamine and xylazine depress sensory-evoked parallel fiber and climbing fiber responses. J Neurophysiol 2007, 98(3):1697-705. Sato, Y., Miura, A., Fushiki, H., & Kawasaki, T. Barbiturate depresses simple spike activity of cerebellar Purkinje cells after climbing fiber input. J Neurophysiol 1993, 69(4):1082-90. Loeb, A.L., Raj, N.R., Longnecker, D.E. Cerebellar nitric oxide is increased during isoflurane anesthesia compared to halothane anesthesia: a microdialysis study in rats.
1808-36330A	Ebner, Timothy	Mice	ENVIRONMENTAL ENRICHMENT	□ We are requesting an exemption of social housing. See question 19.

1808-36332A	Tolar, Jakub	Mice	EUTHANASIA METHOD	We are proposing to perform cervical dislocation without anesthesia due to the potential effects of anesthesia on the circulation and the induction of tissue injury. For example, we have consistently observed that lymph node, spleen, and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after elective sacrifice. We have noticed that new lab members who cannot rapidly harvest bone marrow and lymph nodes frequently have poor experimental results. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis, corticosteriod-induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and oxygenation that will compromise our experiments, requiring more repetitions and hence more mice, reagents, space in the colony and resources. WHEN DONE CORRECTLY, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the animal. The technicians and graduate students/postdocs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized. Only individuals who have become good experienced mouse handlers perform cervical dislocation. RAR is aware of our procedure and practice of using cervical dislocation for these scientific reasons. Euthanasia is performed by pentobarbital overdose only in those instances where cervical bleeding compromises tissue quality as in lung collection (mechanistic studies in which lung, and perhaps thymus) tissues are collected at various times after BMT).
1809-36344A	Liao, Dezhi	Rat, Mice	EUTHANASIA METHOD	We will harvest brain tissues from neonatal rodents younger than 1 week. According to IACUC guidelines, it can be done by decapitation with a pair of scissors.
1809-36393A	Graves, Steven	Mice	SOCIAL HOUSING	Instrument training: Mice will be singly housed and placed on a food deprivation schedule for 7-10 days prior to instrument training to reduce their weight to 80-85% of their baseline weight. During instrument training mice will be fed 1.5 -2 g of home chow each day after training. Mice will be singly housed throughout training and testing phases and training and testing will be carried out in Med Associates operant chamber.
1810-36395A	Costalonga, Massimo	Mice	TAIL BIOPSY	The exception we request to the biopsy procedure is the use of isoflurane anesthesia for tail snips over 21 days. This would only be done in the rare occasion that a second biopsy sample is needed due to inconclusive results from the earlier tail snips.

1810-36395A	Costalonga, Massimo	Mice	EUTHANASIA METHOD	AIM#2: As instructed by the inspector during the 2015 review, 17d gestation fetuses must be decapitated before disposal. The oral candidiasis cortisone-induced mouse model we are studying may induce 25% weight loss at day 5 after inoculation of C. albicans. The experiment is only 5 days long and in mice that on day 4 are at 25% wight loss will be euthanized. It is not anticipated that the estrogen-induced candidiasis mouse model will have similar weigh loss effects.
1810-36420A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively.
1810-36435A	Cvetanovic, Marija	Mice	EUTHANASIA METHOD	This will be used only for study of calcium signaling. Mice are decapitated with surgical scissors without any anesthetic, as anesthetic has been shown to alter glial calcium signaling.

1810-36447A	Rothwell, Patrick	Mice	MULTIPLE SURGERY	We are requesting exceptions for two different series of experiments, described separately below. First, Project 1 involves comparison of several patterns of opioid delivery. Our scientific objectives require strict control over the total duration of chronic morphine exposure (7 days), making it scientifically necessary to remove the pumps at this time point. The pumps must also be removed prior to testing morphine conditioned place preference, to avoid any interference with mobility during this behavioral test. Second, Projects 2 and 3 involve viral expression of light-sensitive ion channels ("opsins"), to permit "optogenetic" control of specific brain cell types and synaptic connections. One caveat to this approach is that, even with viral expression driven by a strong transcriptional promoter, it takes time to accumulate sufficient opsin expression in brain cells to enable optogenetic stimulation. Thus, in the proposed experiments, it becomes necessary to wait two weeks after intracranial virus injection before beginning opioid exposure, including implantation of pumps for opioid administration. It is not scientifically feasible to perform intracranial virus injection and minipump implantation during the same surgical procedure, as there would be insufficient opsin expression at the time points to be analyzed. In order to tightly control the total duration of chronic opioid exposure (7 days), it is also scientifically necessary to surgically remove pumps at the end of this period. This is especially critical in Project 3, which uses Alzet osomotic minipumps that have some variability in duration of drug delivery and rate of offset. However, please note that these latter surgical procedures (minipump implantation and removal) do not involve penetration of the body cavity, and generate only minor impairments of physical function, and thus are not necessarily a major survival surgery. (Subcutaneous Implantation & Removal of Miniaturized Pumps (Survival)) Project 4 involves recording brain activity with a silicon electrode during opioid exposure and naloxone-precipitated withdrawal. These recordings cannot be reliably performed until

1810-36448A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Prior to training an animal to control his eye position, a head post is implanted in an aseptic surgical procedure to permit monitoring of eye position (below). The animals is then trained to perform the task while maintaining fixation on a small spot on a video display under head restraint, and with some tasks to make specific eye movements to visual targets. This fixation control is necessary to insure that portion of the retina on which the stimuli fall is not an uncontrolled variable. Up to 12 months of training may be needed before an animal performs sufficiently well to allow us to collect neurophysiological data. When all training is complete, the animal undergoes another recovery surgery to implant an array or chamber(s). After recovery from the surgery, data collection is begun and continues for 3 to 12 months. Then the animal may have a break of 4 weeks before starting a new behavior or physiology experiment (these experiments each also take 3-12 months). A second (and occasionally third) array/chamber may be implanted over another region of cerebral cortex or the other cerebral hemisphere, and is used for further recordings for about another 3 to 12 month period if different brain areas need to be targeted or if the previous implantation needed to be removed for health reasons. If the previous implant had to be removed, then any further implants will occur after the animal is given ample time to recuperate (about 6 months). Depending on the particular experiment, retraining may be required between implantations to allow the animal to be exposed to task parameters appropriate for the particular brain area that will be studied. In the case of dual implanted recording chambers, both chambers will be placed in one surgery to reduce the number of surgeries an animal has to undergo.
1810-36460A	Townsend, DeWayne	Mice, Mice	MULTIPLE SURGERY	Ovariectomy or orchiectomy will be performed early in life and is expected to be completely healed in mice that will subsequently undergo additional surgical procedures, most commonly osmotic pump placement. See the experimental design section for more information.
1810-36460A	Townsend, DeWayne	Mice, Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Several of our assay create a significant cardiac injury. This injury can result in a moribund state. In some animals this period of mor bundity is temporary and the mice will eventually recover. In order to separate mice that will ultimately survive from those with terminal dysfunction mice are allowed to remain in a persistent mor bund state. During these times, mice are monitored frequently greater than 3 times per day. Mice remaining in a moribund state at more than 2 observations will be euthanized immediately.
1810-36461A	Parr, Ann	Rat	MULTIPLE SURGERY	The rat must first be injured and the injury allowed to become chronic to test rose bengal scar clearance efficacy, then, the animal must be allowed to recover/secondary inflammatory response must diminish before injection of cell transplants. Pain and distress will be controlled through analgesics and antibiotics.
1810-36461A	Parr, Ann	Rat	SOCIAL HOUSING	Immediately after surgery, our rats are singly housed to prevent them from licking or biting at the fresh wounds. When we remove the sutures at 2 weeks, we then typically re-house them in pairs.

1810-36480A	El-Ashry, Dorraya	Mice	TUMOR ENDPOINT CRITERIA	In order to assess the relationship between metastatic burden as measured by IVIS (photon flux) and the visualization of macrometastases, we will be performing a pilot study which will allow the animals to live up to 10 weeks past injection of tumor cells. This is necessary (Tail vein injection of breast cancer cells) In order to assess the full extent of which FAP-AT reduces tumor burden and metastases, we need to be able to observe the control animals up until the state at which they become moribund. If animals are sacrificed earlier, we may miss metastases in FAP-AT treated animals that arise late or that have acquired resistance to the treatment. (Intracardiac injection of breast cancer cells) MDA231 cells grow quickly (and even more quickly when injected with CAFs), and they are more susceptible to ulcerations. As we have begun to perform these resections we have noticed this happening. We understand that these ulcerations increase the chance of infection before they can be resected, however, as they are occurring with a fairly high frequency, we are losing a good portion of our mice and thus significantly lowering our number of animals per experimental group. If it gets too low, then we may have to repeat the experiment which in turn would cause us to have to use more mice than we originally planned for. This would be costly and would defeat the purpose of trying to reduce the number of animals used. We are trying to get these animals resected as quickly as possible before ulcerations occur, but there are many to do, we cannot reserve the isoflurane machine every day, and we can only perform the surgery on one mouse at a time. These complications slow us down so that we cannot resect them as soon as we notice ulcerations beginning. Parameters for allowable ulcerations: Size - up to 1.5 mm in diameter Time before tumor will be re-sectioned: We will try to resect tumors as quickly as possible, but since this cannot always be done for the reasons mentioned above, we will only let them go
1810-36480A	El-Ashry, Dorraya	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	In order to assess the full extent of which FAP-AT reduces tumor burden and metastases, we need to be able to determine a curve of metastatic burden as measured by IVIS versus macro metastases that can be observed by eye. This will enable us to choose an endpoint where we can measure the full extent of drug efficacy by IVIS without having large numbers of animals become moribund. However, because we have not kept injected animals past 7 weeks before, it is possible that some of these animals may become moribund
1811-36489A	Davydova, Julia	Pig (Biomedical)	MULTIPLE SURGERY	The piglet would undergo a septectomy, making the left and right atrial chambers a single chamber, which may create a hypoxic state for the piglet. We also want to band the pulmonary artery (PA) to increase the pressure on the right ventricle (RV). Our rationale is that the piglet would have time to compensate for these smaller, but still significant changes, prior to the arterial switch procedure occurring.

1811-36490A	Pravetoni, Marco	Rat, Mice	MULTIPLE SURGERY	This study requires the implantation AND explantation of an osmotic minipump. Explantation is required for two reasons. 1) If the pump remained in the rat, drug would continue to be released and would affect assay results. 2) Removal of the pump allows us to record the weight of the pump to get an accurate description of how much drug was administered within the time-frame studied (doing so following termination of the animal would add extra time for drug delivery). Signs that will prompt additional analgesia Any signs of pain, discomfort or illness such as reluctance to move, distress vocalization when touched, ruffled coat, or reduced food intake. If the aforementioned signs are present, consult the veterinarian. (Implantation of s.c. osmotic pumps for continuous morphine (or buprenorphine) infusion)
1811-36490A	Pravetoni, Marco	Rat, Mice	BLOOD COLLECTION LIMIT	Animal will be euthanized by this method and will not survive this blood collection.
1811-36490A	Pravetoni, Marco	Rat, Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	We are assessing vaccines in their prevention of opioid overdose. One endpoint of overdose is death, so assessing overdose to the point of death is important in order to determine if the vaccines will be effective in preventing overdose-related death
1811-36497A	Barker, Keith	Bird (Other)	EUTHANASIA METHOD	Field conditions without access to CO2
1811-36504A	Mand, Sandy	Fish (Zebra fish)	SANITATION FREQUENCY	We use the Pentair Z-hab system for most of the fish, fish that are not housed on the Zhab system will have daily 10% water changes and excess detritus will be removed from the bottom of the tank.
1811-36504A	Mand, Sandy	Fish (Zebra fish)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Fish will be considered recovered once they are moving in the recovery tank. This should take less than a minute. If the fish is not recovering well, we will use a transfer pipette to move water over the gills.
1811-36504A	Mand, Sandy	Fish (Zebra fish)	SOCIAL HOUSING	Adult fish will be housed singly during the immune response experiment for approximately 4-5 hours. Fish are euthanized at the end of this experiment. Fish are also housed individually during isolation of zebrafish procedure.
1811-36549A	Kerlin, Aaron	Mice	SOCIAL HOUSING	Biting or scratching from cagemates can scratch or damage the cranial window (impairing dendrite imaging) or clear dental cement (impairing optogenetics). Animals without an implant will not require an exception. Animals that are housed singly will be provided with extra enrichment that does not interfere with the study, such as a hut, extra bedding and/or a chewing block.
1812-36583A	McLoon, Linda	Rabbit, Mice	MULTIPLE SURGERY	In order to assess if eye movement function has been improved as a result of our neurotrophic or other treatment, we need to do optokinetic nystagmus testing. To perform this testing of eye movements, we need to hold the head steady, which requires the head posts to be attached. The eye movement testing is the functional readout of treatment efficacy. The treatments of the muscles within the orbit is relatively non-invasive, but since the conjunctiva must be opened, it is a surgery. We let the head post surgery site completely heal prior to treatment of the muscles in the orbit.

1812-36590A	Williams, Jesse	Mice	EUTHANASIA METHOD	This method will be used only for caesarian section procedures where we will be retrieving live pups from pregnant dams. Sedation may decrease the likelihood of survival of the pups. The Pi and Lab manager has both been previously trained in cervical dislocation method. Death will be ensured by secondary opening of the thoracic cavity and removal of vital organs- heart and lungs.
1812-36610A	Lesne, Sylvain	Mice	MULTIPLE SURGERY	One surgery is to perform AAV injections and the other is to perform the subsequent cranial window surgery. These are essential components of the same project. There will be no additional pain or distress due to having an additional survival surgery and only animals that are deemed healthy post the initial surgery will move onto the next one. We don't predict that there would be any functional deficit incurred on the mice undergoing both surgeries.
1812-36610A	Lesne, Sylvain	Mice	SOCIAL HOUSING	In the event that mice will be subjected to the Barnes Maze (BCM), then the Y-maze, then the Novel Object Recognition task (NOR) - it is possible that a given mouse could be singly housed for 4 weeks time. 2 weeks for the (BCM), and 2 weeks total for the Y-maze (1 day protocol) and (NOR) tasks. Again, the (NOR) task is a two week test when you consider a week of acclimation (with a ping pong ball) followed the next week by 4 days of habituation and testing. This sequence of tasks will depend on whether the Y-maze and (NOR) pilot tests provide usable data.
1812-36613A	Liu, Liang	Mice	MULTIPLE SURGERY	Skin biopsy will be performed up to 3 times. There are two weeks between any survival surgery. Maximum of 3 survival surgeries per animal. These are minor survival surgeries. The expected duration of anesthesia for any one of these surgeries is less than 30 minutes.
1812-36628A	Osborn Jr, John	Rat, Mice	MULTIPLE SURGERY	Some surgeries must be performed separately to establish, for example, baseline blood pressures. The DOCA model requires several surgeries to establish the model. Adverse effects of multiple surgeries will be minimized by waiting an adequate amount of time between surgeries and careful daily monitoring of animals to be sure that a full recovery is achieved between surgeries. Pain medication will be delivered 3 days post op at a minimum. Distress will be minimized by additional soft bedding during recovery.
1812-36628A	Osborn Jr, John	Rat, Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We want to use Urethane and Ketamine/Inactin as different anesthetics during our nerve recording prep. We believe that the anesthesia is having a large effect on our data so testing different anesthetic methods (all previously published) will assist in interpreting our data.
1812-36628A	Osborn Jr, John	Rat, Mice	SOCIAL HOUSING	Animals instrumented with telemeters will need to be single housed for recording of blood pressure.

1901-36654A	Grande, Andrew	Rat, Mice	MULTIPLE SURGERY	Animals will be given a small incision in the femoral vein to administer cell treatment and/or Ferumoxytol injections. This will be done to ensure complete delivery of all therapeutic cells and contrast agent. Because the incision will be small and animals will be administered analgesics, the additional pain and distress experienced should be minimal. Prior to this procedure, animals undergo controlled cortical impact, as described previously. The cutdown procedure is minimally invasive and since animals will be given analgesics, additional pain and discomfort should be minimal.
1901-36655A	Waye, Heather	salamander	ENVIRONMENTAL ENRICHMENT	□ Salamanders are not social animals. Enrichment is provided.
1901-36681A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Prior to training an animal to control his eye position, a head post is implanted in an aseptic surgical procedure to permit monitoring of eye position (below). The animals is then trained to perform the task while maintaining fixation on a small spot on a video display under head restraint, and with some tasks to make specific eye movements to visual targets. This fixation control is necessary to insure that portion of the retina on which the stimuli fall is not an uncontrolled variable. Up to 12 months of training may be needed before an animal performs sufficiently well to allow us to collect neurophysiological data. When all training is complete, the animal undergoes another recovery surgery to implant an recording chamber. Implanting chambers in separate surgeries is scientifically justified because they have a limited useful lifetime. The multiple surgeries are needed for the scientific objectives of the experiments, and are related components of the research project. The stepwise surgical preparation of the animal also subjects the animals to a small number of short surgeries, rather than one prolonged and more traumatic surgery. Additional recovery surgeries are sometimes needed to repair implants. Surgeries will only be conducted with prior approval of the the veterinary staff.
1901-36695A	Hall, Victoria	Bird (Other), Chicken	SANITATION FREQUENCY	These birds are housed in permanent outdoor enclosures which cannot be washed and sanitized in commercial systems. Areas are either sprayed down with water hoses or scrubbed using water and Envirocare disinfectant as needed
1901-36695A	Hall, Victoria	Bird (Other), Chicken	ENVIRONMENTAL ENRICHMENT	Requesting an exemption to social housing. Raptors are not social animals. They are predators and, as such, present risk to each other in a group housing situation. They do receive environmental enrichment.
1901-36695A	Hall, Victoria	Bird (Other), Chicken	SOCIAL HOUSING	Requesting an exemption to social housing. Raptors are not social animals. They are predators and, as such, present risk to each other in a group housing situation.

1901-36697A	Patterson, Ned	Dog, Dog, Dog, Dog, Dog	PRIMARY ENCLOSURE SIZE/SPACE	Yes. The size of the ICU kennels are intended for animals which are in need of intensive care and are kept in a more restricted space to keep them quiet. These animals on this protocol will be recovering from surgery therefore should be kept quiet until fully recovered.
1901-36697A	Patterson, Ned	Dog, Dog, Dog, Dog, Dog	MULTIPLE SURGERY	The main objectives for all the studies need intracranial EEG monitoring and the device working. If a device fails, then the study would end for that dog and a new dog obtained, the supply of research dogs with spontaneous seizures is not large, and to also reduce numbers of dogs we plan to re-implant the device if needed, Under the previous protocol this was permitted and we did replace the device in 2 dogs (one now deceased, the other on the current protocol). Going forward, as some of these dogs are and will be here for years, the PI will consult with the RAR vet about any concurrent health conditions, and the current seizure status of the dog before going ahead with a second intracranial surgery, and not proceeding if the concurrent conditions are deemed to be serious enough that the dog may not do well with the surgery and/or may not survive long enough post surgery to be valuable to the results. Specifically No second intracranial surgery will be performed without consultation with and approval by the RAR area vet, with their assessment that the dog likely will do fine with the surgery and have a good long term quality of life for 6 months or more after the surgery. There will be at max 2 intracranial surgeries at here under this protocol. The three current dogs had one previous intracranial surgery before coming here, and would have 2 maximum here with the second here if necessary only after the PI and RAR vet consult as indicated in the protocol. Any future dogs would only have up to 2 intracranial surgeries here and none before. These procedures are so that the dog can be adopted. (Implant removal, neutering, dental cleaning before adoption)
1901-36697A	Patterson, Ned	Dog, Dog, Dog, Dog, Dog	ENVIRONMENTAL ENRICHMENT	As the dogs are recovering from surgery, and need to be quiet and not have the EEG leads in the neck disturbed so for the 1-3 days of recovery they need to be keep quiet.
1901-36697A	Patterson, Ned	Dog, Dog, Dog, Dog, Dog	SOCIAL HOUSING	As the dogs are recovering from surgery, and need to be quiet and not have the EEG leads in the neck disturbed they need to be individually housed.

1901-36714A	[redacted]	Nonhuman Primate (Macaques)	PRIMARY ENCLOSURE SIZE/SPACE	Although a rare situation, space allocation (i.e., caging size) may temporarily be reduced during the quarantine period for larger animals that may normally be allocated more than one standard primate cage. There are multiple rationales for this change. First, it will help to ensure the safety of the affected animal post-treatment as isolating the animal to a single cage makes it more readily accessible to caretakers and, in the case of animals afforded a quad-bank arrangement, limits their ability to fall from significant heights during the acute post-treatment period. Second, the inclusion of a second cage bank in the treatment room would further limit the workable space in the room and pose a risk to the caretaker and cleaning personnel.
1901-36714A	[redacted]	Nonhuman Primate (Macaques)	SANITATION FREQUENCY	Disposal of waste is handled by lab staff, with all items placed in yellow waste bags and treated as chemotherapy waste per our approved SOP. To minimize the risk of exposure, waste is not removed from the room until after the quarantine period, following treatment of the room with the bleach solution or vapor. An exception to daily removal of excreta and food waste is required while an animal is in quarantine isolation following injection of the 1-methyl-4-phenyl-1,2,3,6- tetrahydropyridine (MPTP) neurotoxin. Because such removal significantly increase the risk of potential exposure to humans working with the quarantined animal(s), it is necessary to minimize the movement of items that have been in the animal's cage and thereby exposed to said animal's excreta. Movement can produce aerosols as the food particle and any bedding dust are disturbed, yielding a source of potential exposure to the human worker. Foods that can spoil within the time-frame of the IMHA will not be given.
1901-36714A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Since the experiments required for our studies last 1-3 years, there are instances when another surgical procedure will allow us to collect the necessary data instead of starting all over with another animal. This can be considered a means to reduce the overall number of animals used in our studies.
1901-36714A	[redacted]	Nonhuman Primate (Macaques)	SOCIAL HOUSING	All animals will be pair housed with the exception being if there are odd number of animals, attrition of a partner, or if a pair does not work and there are no other animals available for pairing. In all cases, however, the animals will have ready access (visual, smell, etc.) to other animals in the colony space.
1901-36715A	Lee, Michael	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Once the animal is under deep anesthesia, they are euthanized within 10 minutes. (Intracardial Purfusion)

1901-36716A	Morris, Rebecca	Mice	MULTIPLE SURGERY	Blood chimerism occurs at 10 to 14 days and we will be studying mammary tumor progression at different time points (up to 13 months). Keeping the mice joined together for the duration of the study, after blood chimerism has occurred, would put undue stress on the mice. Therefore, it is necessary for the mice to undergo a second survival surgery, 2 to 4 weeks after the initial surgery, to separate the joined mice. Because there will be a second survival surgery to remove and separate the mice 2 to 4 weeks after parabiosis, we are using non-absorbable sutures, which will stay in until the time of parabiosis reversal. After the joined mice are separated, they will recover for 1 to 2 weeks and cohabitate together for the duration of their different time points (up to 13 months). At which point, they will be euthanized for sample collection.
1902-36759A	Lee, Michael	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Once the animal is under deep anesthesia, they are euthanized within 10 minutes. (Intracardial Purfusion)
1902-36759A	Lee, Michael	Mice	SOCIAL HOUSING	Breeding females will be separately housed when they are pregnant
1902-36781A	Lee, Michael	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Once the animal is under deep anesthesia, they are euthanized within 10 minutes. (Intracardial Purfusion)
1902-36781A	Lee, Michael	Mice	SOCIAL HOUSING	Females that are pregnant will be separated to minimize cann balism by other adults.
1902-36788A	Ward, John	Frog (Xenopus)	MULTIPLE SURGERY	The main reason for using survival surgery in this protocol is to limit the number of frogs used. Some frogs (25%) do not have suitable oocytes, those that do can be used multiple times with good results. NIH guidelines permit 5 survival surgeries to remove oocytes and a sixth terminal surgery. If we did obtain oocytes multiple times from individual frogs we would need to use at least 6-fold more frogs. (Xenopus Laparotomy)
1902-36788A	Ward, John	Frog (Xenopus)	SOCIAL HOUSING	Xenopus frogs will be housed individually until they are acclimated: eating pelleted frog food and determined not to have diseases. This is necessary because frogs are wild-caught and occasionally frogs arrive with contagious diseases such as "red legs" that need to be treated. Then frogs will be housed in groups of 2-4 in larger tanks. Additionally, animals recovering from surgery will also be housed individually. In general, frogs are kept either 1) individually in plastic, food grade containers, 9-12 liters of water per frog, 4 inches deep or 2) in groups of 2-4 frogs in 30-40 gallon aquaria with external filters.
1902-36795A	Pravetoni, Marco	Mice	BLOOD COLLECTION LIMIT	Animal will be euthanized by this method and will not survive the decapitation and subsequent blood collection

1902-36813A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Animals have previously been instrumented with a central vascular access port. The placement of a vascular access port is considered a minor surgical procedure (peripheral limb, not entering a major body cavity), essentially similar to routine catheter placement with the notable exception that the access site is placed underneath the skin. VAPs improve safety, and increase animal comfort when intermittent or recurrent venous access is required by avoiding painful 'catheter starts'. VAPs also allow NHPs to participate fully in enrichment programs and social group activities without the restrictions inherent in conventional approaches. This procedure is required to infuse the test therapy under investigation in this study, and is designed to mimic the approach intended in subsequent clinical trials. All surgical procedures (and associated support) are performed by highly trained individuals using multimodal anesthesia and analgesics.
1903-36840A	Chan, Sunny	Mice	MULTIPLE SURGERY	In order to achieve successful engraftment of muscle stem and progenitor cells the muscle has to undergo an injury two days before transplantation to induce an essential injury response in the tissue. Muscle injection injury will be performed as described in the previous section, pain and distress in the animals will be monitored for 3 days post-procedure. Because the effects of analgesic compounds on muscle regeneration are unknown, and because we want to examine the role of inflammatory cells in skeletal muscle damage/regeneration, we cannot use analgesics for this procedure.
1903-36840A	Chan, Sunny	Mice	72 HOUR POST-OP ANALGESIA POLICY	Because the effects of analgesic compounds on muscle regeneration are unknown, and because we want to examine the role of inflammatory cells in skeletal muscle damage/regeneration, we cannot use analgesics for this procedure.
1903-36840A	Chan, Sunny	Mice	EUTHANASIA METHOD	Embryos 15 days of gestation or greater will be decapitated.

1903-36845A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	The placement of a vascular access port is considered a minor surgical procedure (peripheral limb, not entering a major body cavity), essentially similar to routine catheter placement with the notable exception that the access site is placed underneath the skin. VAPs improve safety, and increase animal comfort when intermittent or recurrent venous access is required by avoiding painful 'catheter starts'. VAPs also allow NHPs to participate fully in enrichment programs and social group activities without the restrictions inherent in conventional approaches. Animals may subsequently be instrumented with hepatic portal access if they are intended for enrollment on an islet transplantation protocol that delivers islets using the standard intraportal route. In this situation, instrumentation allows animals to complete all surgical manipulation prior to induction of the disease state. (Central vascular access port placement) Animals have previously been instrumented with a central vascular access port. Portal vascular access is used to eliminate a surgical procedure for drug administration, biologics administration (e.g. islets, vector, etc) during the period where the animal is already burdened by disease. Moreover, chronic access to the portal vein eliminates multiple laparotomies necessary for repeat biologics administration necessitated by various therapeutic approaches, therefore we consider this instrumentation a refinement - a full description is provided in this reference: Graham, M. L. et al. Long-term hepatic vascular access in the nonhuman primate for recurrent portal vein infusion. J Invest Surg 24, 59–66 (2011)
1903-36856A	Mensinger, Allen	Fish (Other), goldfish, round goby, Fish (Other), Fish (Other), Fish (Other)	NON-PHARMACAUTICAL GRADE COMPOUNDS	Not available in pharm-grade.
1903-36866A	Kyba, Michael	Mice	MULTIPLE SURGERY	In order to achieve successful engraftment of ES and iPS cells, the muscle has to undergo an injury two days before transplantation to induce an essential injury response in the tissue. Cryo-injury or muscle injection injury will be performed as described in the previous section, pain and distress in the animals will be monitored for 3 days post-procedure. In order to analyze the teratoma formed by the iPS or ES cells, a biopsy must be performed. As described in the previous section, pain and distress will be monitored for 3 days post-procedure.

1903-36866A	Kyba, Michael	Mice	TUMOR ENDPOINT CRITERIA	We expect to see weight loss while mice are on DSS, although the specific % of weight loss is not known. We will monitor weight consistently throughout the experiment. To ensure that the weight loss is not too dramatic, monitoring will increase to 3 times per week if animals lose 15% original body weight, and daily if 20% of weight is lost. Animals will be euthanized if their weight drops by 30% original body weight. For mice with acute colitis there is the potential for rectal prolapses or mucosal tears. Mice will be monitored for signs of these conditions and with be euthanized if either are observed.
1903-36866A	Kyba, Michael	Mice	EUTHANASIA METHOD	Embryos 15 days of gestation or greater will be decapitated.
1903-36867A	Hughey, Curtis	Mice	BLOOD COLLECTION LIMIT	The Metabolic flux studies require samples for analysis of liver glucose production, hormone concentration, and metabolite levels. To prevent a fall in hematocrit, donor red blood cells resuspended in 10U/ml heparinized saline will be infused venously (please see accompanying procedure). (Arterial Sampling via Carotid Artery Catheter during Metabolic Flux Study) This is a terminal blood collection under anesthesia to get donor red blood cells for metabolic flux studies (Blood collection for donor red blood cells for metabolic flux studies)
1903-36867A	Hughey, Curtis	Mice	72 HOUR POST-OP ANALGESIA POLICY	1. An extensive history of this surgery in mice (since 1999) via the NIH Mouse Metabolic Phenotyping Consortium has shown that more that 24 hours of analgesics is not necessary for the well being of the mouse. The mice do not, except in rare cases, exhibit loss of weight, piloerection, unkempt coat, hunched posture. If this occurs additional analgesic will be provided. 2. The studies within this protocol are aimed at assessing metabolism. Keeping the use of analgesics to a minimum is to avoid metabolic alterations not intended by the experimental design is imperative. *Please note that I would like to have a veterinarian assess the initial mice post-surgery to determine if the full 72 hours is required.
1903-36867A	Hughey, Curtis	Mice	SOCIAL HOUSING	Mice will be group housed prior to surgery. Following surgery, mice will be individually housed to prevent litter mates from pulling out catheters.
1903-36867A	Hughey, Curtis	Mice	EUTHANASIA METHOD	All euthanasia methods (i.e sodium pentobarbital, isoflurane, etc.) alter metabolism. Upon euthanizing the mice, we collect tissues to test the molecular regulators of metabolic flux. Given this, we aim to have the most natural tissue environment possible during collection.

1903-36867A	Hughey, Curtis	Mice	ENVIRONMENTAL ENRICHMENT	The studies are used to determine metabolic factors underlying fatty liver and liver cancer. The metabolism of mice can be very easily modulated by seemingly innocent actions. Vibrations, lighting, novel objects and scents can cause changes in the metabolic responses of mice. Also, objects placed in the cage may get caught on catheters and pull them out. Therefore, it is requested that anything provided to the animals be checked with the investigator before initiating. Exercise (such as from an in-cage exercise wheel) can even change the metabolism of mice. Since exercise is one of the things being studied, extra exercise is undesirable in our animals.
1903-36889A	Yamamoto, Masato	Mice	TUMOR ENDPOINT CRITERIA	Pain level C. This procedure in SA3f-1 and 3g-1 may lead to Pain Level C due to ulceration. When treatment works, some times ulceration is observed on the treated tumor as a result of tumor necrosis. We will observe the small ulceration up to 7 days unless continuous bleeding or infection is observed or reaching other euthanization criteria. We will give analgesics as described in Health and Monitoring. Those which show large quantity bleeding, infection, or deterioration of general condition, will be euthanized. Non-drug methods for supportive care (such as warming pad until fully recovered, soft food for 1-3 days, additional nesting material, etc.) may be given during post-operative period.
1903-36898A	Chen, Wei	Rat, Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	The pharmaceutical-grade Alpha-Chloralose does not available, thus, non-pharmaceutical compound will be used. The pharmaceutical-grade Pancuronium Bromide does not available, thus, non-pharmaceutical compound will be used.
1903-36900A	Bangalore Kodandaramaiah, Suhasa	Mice, Rat	MULTIPLE SURGERY	We seek exception in surgeries when a virus injection (S2) is performed. We have previously found that in cases where virus injection is immediately followed by the device implantation (see procedures S3, S4 or S5), that the virus labeling is altered by the small brain displacements induced by device insertion. Since the viruses can take weeks to express, implanting the device later, after the viruses have fully expressed, minimizes the chance of a device-related deterioration. Thus, it may be very useful for experiments in which both Subprocedures S2 and S3 (or S4 or S5) are required, that an initial surgery with just procedure S2 can be performed (e.g., the viral infusion), and then the animal fully recovered, and then, 7-120 days later, a second surgery with just procedure S2 (and possibly S3/S4 or S5) can be performed (e.g., the device implantation). In both cases, full surgical technique will be fully followed twice, with all documentation and follow-up.
1903-36900A	Bangalore Kodandaramaiah, Suhasa	Mice, Rat	SOCIAL HOUSING	In the past, we have observed that housing animals that have undergone headplate or device implant are often fight or rival mice chew on implanted devices thereby making them dysfunctional. To avoid such circumstances, we may in some cases keep mice in separate cages.

1903-36904A	Farrar, Michael	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We are placing them on antibiotics - this should not affect their weight significantly. We certainly don't anticipate weightloss due to antibiotic administration. The opposite is more likely.
1903-36911A	Andrade, Rafael	Rabbit	MULTIPLE SURGERY	Implantation of the construct into the omentum will allow for vascularization of the graft prior to implant into the trachea.
1903-36911A	Andrade, Rafael	Rabbit	SOCIAL HOUSING	We do not plan on housing animals singly for this study. In the event we have issues with rabbits chewing on the suture/wound of their cage mate, we may house separate these animals. We will consult our area veterinarian and will try other options e.g. e-collars, bitter spray, etc. before opting to house them singly.
1903-36919A	Willette, Michelle	Chicken, Bird (Other)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	This lab consists of 50 lightly sedated birds undergoing routine, non-painful procedures.
1903-36921A	Lim, Hubert	Guinea Pig	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	We need to be outside of our sound chamber when performing the neural recordings to avoid electrical and acoustic noise contamination. Since our protocols usually requires up to 30 minutes of recordings for each session, we need to be able to check the animal's anesthetic state every 30 minutes for some sessions. We make every effort to record all the necessary information at 15 minute intervals. However our experimental procedures are performed in a sound chamber to avoid electrical and acoustic interference. Since our stimulation paradigms sometimes can last up to 30 minutes, we are not able to enter the chamber at the required time points. For some sessions, we are only able to record the anesthetic state every 30 minutes.
1903-36921A	Lim, Hubert	Guinea Pig	SOCIAL HOUSING	For animals that have undergone a chronic implantation, we will house them in a separate cage to allow the space to recuperate and prevent any possible conflict with other animals and damage that can be caused to the animal by two animals colliding or playing/fighting. They will be housed in the same room as other guinea pigs so that they are not completely isolated.
1904-36936A	Fairbanks, Carolyn	Rat, Dog	MULTIPLE SURGERY	For the study of mecahnisms electroacupuncture-induced analgesia we need to both induce a state of hypersensitivity (reflective of neuropathic pain) requiring peripheral nerve injury surgery and then later implant spinal microdialysis fibers in order to collect neurotransmitters during and immediately following application of electroacupuncture. These procedures will be separate by a week. For the study of the efficacy of gene therapeutic intervention in rat analgesia we need to both stereotaxically inject viral vectors to specific brain regions and then later implant intravenous catheters for opioid self-administration studies. These procedures will be separate by at least two weeks.

1904-36936A	Fairbanks, Carolyn	Rat, Dog	BLOOD COLLECTION LIMIT	An individual animal will undergo a maximum of three sampling periods within a week's time. Sampling periods will be separated by at least a day. A maximum of seven samples (a baseline sample plus six post-administration samples) will be drawn within one sampling period. We will draw blood at baseline (prior to drug administration) and at selected intervals after administration up to 24 hours later. We will select a maximum of 6 sample time points from the following times: 15 minutes, 30 minutes, 90 minutes, 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 18 hours, 24 hours. No more than seven total samples will be drawn per blood collection period. Since the blood samples will be withdrawn via catheter, we will replace the removed blood volume with at least an equal volume of warmed sterile saline or lactated ringer's solution prior to refilling the catheter with the catheter locking solution, per RAR blood collection limits sampling guidelines.
1904-36936A	Fairbanks, Carolyn	Rat, Dog	72 HOUR POST-OP ANALGESIA POLICY	Subjects with peripheral neuropathy cannot receive post-operative analgesics because these will inhibit the spinal neuroplasticity intended to induce the condition of study.
1904-36936A	Fairbanks, Carolyn	Rat, Dog	EUTHANASIA METHOD	Euthanasia solution ≥86 mg/kg IP or IV. Multiple pharmaceutical grade products available. Contains sodium pentobarbital 390 mg/ml + sodium phenytoin 50 mg/ml (dosing based on barbiturate concentration). Administration of barbiturate overdose by IP or IV injection is not a painful procedure and does not require sedation for brief conscious restraint.
1904-36942A	Lim, Hubert	Mice, Rat	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Animals will be monitored for reflexivity, heart rate, blood oxygen levels and body temperature every 15 minutes during surgical experiments. In some rare instances during prolonged neural recordings it will not be possible to access the animal inside of our recording booth for 30+ minutes. In these cases, the animal's heart rate, blood oxygen levels and body temperature will still be monitored every 15 minutes, and reflexivity will be recorded at the conclusion of the neural recording session. (Acute nerve and brain surgery with stimulation
1904-36947A	Toth, Ferenc	Goat	EUTHANASIA METHOD	Barbiturate overdose will be performed by an experienced investigator with a single venipuncture. Administering a sedative before the barbiturate overdose would only prolong the stress the animal experiences and would require an additional venipuncture.
1904-36959A	[redacted]	Nonhuman Primate (Macaques)	PRIMARY ENCLOSURE SIZE/SPACE	□ Although a rare situation, space allocation (i.e., caging size) may temporarily be reduced during the quarantine period for larger animals that may normally be allocated more than one standard primate cage. There are multiple rationales for this change. First, it will help to ensure the safety of the affected animal post-treatment as isolating the animal to a single cage makes it more readily accessible to caretakers and, in the case of animals afforded a quad-bank arrangement, limits their ability to fall from significant heights during the acute post-treatment period. Second, the inclusion of a second cage bank in the treatment room would further limit the workable space in the room and pose a risk to the caretaker and cleaning personnel.

1904-36959A	[redacted]	Nonhuman Primate (Macaques)	SANITATION FREQUENCY	Disposal of waste is handled by lab staff, with all items placed in yellow waste bags and treated as chemotherapy waste per our approved SOP. To minimize the risk of exposure, waste is not removed from the room until after the quarantine period, following treatment of the room with the bleach solution or vapor. An exception to daily removal of excreta and food waste is required while an animal is in quarantine isolation following injection of the 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) neurotoxin. Because such removal significantly increase the risk of potential exposure to humans working with the quarantined animal(s), it is necessary to minimize the movement of items that have been in the animal's cage and thereby exposed to said animal's excreta. Movement can produce aerosols as the food particle and any bedding dust are disturbed, yielding a source of potential exposure to the human worker. Foods that can spoil within the time-frame of the IMHA will not be given.
1904-36959A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Excluding the MPTP surgeries, a total of three pr mary (i.e., not repair/replacement) surgical procedures may be performed to properly instrument the animal to achieve the experimental aims. This includes 1) placement of the head restraint post, 2) chamber/micro-array placement, and 3) pulse generator implantation. Although it is possible that these procedures may be combined, thereby reducing the total number of surgeries required, it is more often the case that they are performed separately. The motivating factors for separating these procedures include: 1) limiting the overall duration of any one surgical procedure (anesthetic episode), and 2) maximizing the overall integrity and lifespan of the implant. Additional surgeries are required for induction of the parkinsonian state. Response to the MPTP neurotoxin varies across animals and it is considered best practice to approach the desired severity level gradually rather than risk overshooting the behavioral target and inducing an unnecessarily severe parkinsonian state. This approach typically requires multiple intra-carotid surgical procedures combined, in some cases, with systemic injections to safely achieve the desired severity level. Chamber/headpost repairs, though rare, may be necessary if either is damaged by the animal. We justify the repairs as they limit the number of animals used in the study. As illustrated in the Experiment Design section, we typically do instrumentation survival surgeries in animals prior to MPTP administration, in part so that they are as healthy as possible and recovery from the surgical procedures is not complicated by the animal's parkinsonian condition. If parkinsonian animals do require additional survival surgeries (e.g. unexpected headcap repair), the RAR veterinary staff will be consulted and a determination will be made as to whether the additional survival surgery is appropriate given the animal's current health status. Typically two-three primary (i.e., not repair/replacement) surgical procedures are performed to properly instrument the animal to achieve the experimental aims. This includes 1) chamber / headcap placement 2) micro-array placement 3) microdrive placement. The motivating factors for separating these procedures include: 1) limiting the overall duration of any

1904-36960A	O'Connell, Timothy	Mice	SOCIAL HOUSING	Similar to all our prior TAC studies, we request that the mice be individually housed post-surgery for the following reasons: 1. Group housed mice will groom each other and this excessive grooming of the surgical wound can impede healing and increase risk of infection. 2. Group housed mice will always work towards defining a social hierarchy. In an effort to establish this hierarchy, the mice fight with each other. This added stress will confound our ability to assess/record/monitor the cardiac physiology of each individual mouse which is the entire foundation of our proposed study. If we are not able to differentiate the cardiac physiological differences (measured via echocardiography--wall thicknesses, fractional shortening, ejection fraction, global longitudinal strain, stroke volume, etc) between the genetically different mice undergoing MI-I/R, we will not be able to report/publish any data. {Keep in mind that the mice requested in this protocol are only for learning the surgical technique and will not undergo the Echo procedures--we are operating this protocol as though it was the "real" thing, hence the need for individual housing justifications). 3. We have attached a review from Neuroscience and Biobehavioral Reviews that beautifully summarizes the cardiac complications that manifest in social housing situations in rodents. The increased f brosis (Fig 6 and 7) and the increased arrhythmias in Fig 11. It is these confounding factors we need to avoid in our study.
1904-36978A	van Berlo, Jop	Mice, Rat	MULTIPLE SURGERY	We sometimes add osmotic minipumps to other more invasive procedures, such as cardiac pressure overload (TAC) or cardiac ischemic injury. The goal would be to add thymidine anologs such as BrdU or EdU to perform pulse chase experiments of proliferative cells to measure regeneration. Alternatively, we could add neurohormonal stimulation in strains of mice that are especially resistant to cardiac injury.
1904-36978A	van Berlo, Jop	Mice, Rat	EUTHANASIA METHOD	We will only use this method of euthanasia in newborn pups younger than post-natal day 7, where we will use sharp scissors to quickly decapitate the pup.
1904-36985A	Smanski, Michael	Fish (Zebra fish), Fish (Other), Fish (Other)	EUTHANASIA DEATH/MORIBUND ENDPOINT	We are testing embryonic lethality of gene overexpression. Typically this will be assessed before 72 hrs post fertilization, but in rare cases we might need to look for lethality in embryos less than 7 days post fertilization.
1904-36985A	Smanski, Michael	Fish (Zebra fish), Fish (Other), Fish (Other)	NON-PHARMACAUTICAL GRADE COMPOUNDS	Clove oil is ordered from Sigma in 500 mL bottles and stored at room temperature in a chemical cabinet in [redacted]. It is not listed as pharmaceutical grade on the Sigma website.
1904-36985A	Smanski, Michael	Fish (Zebra fish), Fish (Other), Fish (Other)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Our anesthesia protocol only lasts 3-5 minutes, with a maximum of 10 minutes. After that protocol, fish are returned back into a holding tank. We currently record what happens after that protocol, which technically meets the 15 min reporting interval requirement.

1904-37005A	Kozak, Kenneth	Amphibian (Other), Rodent (Other - Non-USDA), Bird (Other), Fish (Other), Reptile (Other), Other* (Non-USDA), Mid-sized and large mammals	EUTHANASIA METHOD	Eurthanized animals will be preserved as scientific museum specimen. Additional methods to ensure euthanasia (e.g. decapitation, cervical dislocation) will destroy the future scientific value of animals as museum specimens. Decapitation and/or cervical dislocation will destroy the value of euthanized animals as scientific museum specimens.
1905-37026A	Segura, Bradley	Mice	EUTHANASIA METHOD	P (postnatal day) P0, P3,P5, and P7 are euthanized by decapitation using scissors. Resistance to hypoxia at this age results in a prolonged time to unconsciousness when CO2 is used as a euthanasia agent therefore decapitation is the appropriate method of Euthanasia at P0,P3, P5,P7. Death will be verified after euthanasia and prior to disposal.
1905-37028A	Finger, Er k	Mice	MULTIPLE SURGERY	In order to validate tolerance in long term graft survivors, a small subset of long term survivors will have a second skin grafting or islet transplant performed. This is to document donor specific tolerance and is an crucial immunologic outcome. Additionally, some islet transplant recipients will have a unilateral nephrectomy in order to document that long term graft function is due to the graft and not regeneration of native pancreas islets. In these mice the islet transplant will be removed and the following day the mouse will be sacrificed after determination of blood glucose.
1905-37028A	Finger, Er k	Mice	72 HOUR POST-OP ANALGESIA POLICY	No incisions are made. Insulin pellets are placed by subcutaneous injection (with 14 g trochar). No pain medication has been required and pellets are well tolerated in many 100's of mice.
1905-37028A	Finger, Er k	Mice	EUTHANASIA METHOD	Sedation is used for training the cervical dislocation technique. Isoflurane is used at 3-4X MAC and then dislocation performed under anesthesia. In accordance with changes in IACUC policy, technicians proficient in cervical dislocation may forgo isoflurane.
1905-37029A	Finger, Er k	Mice, Rat	EUTHANASIA METHOD	Sedation is used for training the cervical dislocation technique. Isoflurane is used at 3-4X MAC and then dislocation performed under anesthesia. In accordance with changes in IACUC policy, technicians proficient in cervical dislocation may forgo isoflurane.
1905-37035A	Masino, Mark	Fish (Zebra fish), zebrafish embryos/larvae	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	NA; these are larval fish. NA; Tricaine used to euthanize fish.
1905-37039A	Garry, Mary	Pig (Biomedical), Pig (Biomedical)	ENVIRONMENTAL ENRICHMENT	It is possible that single housing will be required if: 1) there is only one animal in the litter 2) littermates die or are euthanized 3) single housing is needed to minimize transmission of illness among piglets or 4) if directed for the welfare of the animal by the RAR Vet.

1905-37039A	Garry, Mary	Pig (Biomedical), Pig (Biomedical)	SOCIAL HOUSING	It is possible that we will need an exception to social housing for the reasons stated in 17B. If possible, however, we will house socially.
1905-37046A	Sorensen, Peter	Fish (Other)	72 HOUR POST-OP ANALGESIA POLICY	Fish will be released in the wild making detailed monitoring and administration of analgesics imposs ble
1905-37046A	Sorensen, Peter	Fish (Other)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Fish will be released in the wild. The movement of all fish will then be monitored as part of the experiment.
1905-37059A	Wilcox, George	Rat, Mice	72 HOUR POST-OP ANALGESIA POLICY	The intention of the spared nerve injury is to induce a state simulating the hyperalgesia experienced in neuropathic pain. Administration of analgesics would be likely to alter the course of hyperalgesia development, defeating the goal of the experiment.
1905-37059A	Wilcox, George	Rat, Mice	EUTHANASIA METHOD	Cervical dislocation may be indicated at times for emergency humane euthanasia where provision of prior isoflurane anesthesia is either not possible or would prolong the suffiering of the mouse unnecessarily.
1905-37059A	Wilcox, George	Rat, Mice	SOCIAL HOUSING	The only animals to be housed singly will be the rats with exteriorized catheters that might be damaged in a social housing situation.
1905-37062A	Zhang, Tianshun	Mice	MULTIPLE SURGERY	We must perform multiple biopsies in order to track hair growth related marker protein expression between control animals and those receiving inhibitor over time. These samples are superficial and should heal completely within 7 days.
1905-37075A	Cramer, Gerard	Cow (Agricultural)	PHYSICAL RESTRAINT	The only restraint to normal movement the cow will have is an inability to access their normal lying down area. Cows will have access to feed and water and be able to move freely in the temporary pen created for them. Approximate area of pen is 4-500 square feet. Exact duration of time in temporary pen will be vary but is expected to be 12-14 hours at max as for 3-4 hours daily cows will be removed from their normal area for milking. The total time cows will not have access to the their normal area(experimental and normal procedures) will not exceed 18 hours/d in a max of 9 hours/session. Animals will be monitored hourly via camera or direct observation and cows that attempt to lie 2x during session will be allowed to return to their normal lying area. This lying area is next to the temporary restriction pen.

1905-37092A	Ondrey, Frank	Mice	TUMOR ENDPOINT CRITERIA	Endpoint criteria include >20% weight loss; a body condition score of less than or equal to 2 (based on Ullman-Cullere 1999); primary flank solid tumor tissue measured by calipers to be of excessive size (>2cm length in any dimension) or impairing mobility; any health problems refractory to medical intervention such as labored breathing; or on recommendation of the veterinary staff. Swollen tissue, but palpably fluid-containing, either underneath or adjoining solid tumor tissue will not be considered solid tissue in immunocompetent mice bearing tumors as this study is investigating an immunotherapy where enhanced infiltrates and edema concurrent with necrosis are features of enhanced T-cell activity described as pseudoprogression (Journal of Clinical Oncology, Vol 33, No 31 (November 1), 2015: pp 3541-3543). See http://jco.ascopubs.org/content/33/31/3541.full. Mice bearing swollen tissue will still be subject to all other endpoints including impaired gait, labored breathing, and recommendation of veterinary staff. As this study involves administration of tumor therapy in which tumor necrosis/ulceration may be a feature of regression, ulceration of skin overlying a tumor by itself will not constitute endpoint. Tumors with ulcerations will be given basic wound care by laboratory staff (including cleaning and application of topical medications as directed by the veterinary staff) but will not be considered an endpoint unless they are severe (such as an ulceration that erodes through to the peritoneum) or accompany other clinical signs, such as weight loss or lethargy. However, additional changes to the tumor such as evidence of infection (tumor has pus, it is hot to the touch, painful on palpation) or when tumor has persistent active bleeding (especially if mouse appears pale and anemic) instead of just scabbing will constitute endpoint criteria.
1905-37094A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Animals have previously been instrumented with a central vascular access port. The placement of a vascular access port is considered a minor surgical procedure (peripheral limb, not entering a major body cavity), essentially similar to routine catheter placement with the notable exception that the access site is placed underneath the skin. VAPs improve safety, and increase animal comfort when intermittent or recurrent venous access is required by avoiding painful 'catheter starts'. VAPs also allow NHPs to participate fully in enrichment programs and social group activities without the restrictions inherent in conventional approaches. This procedure is required to infuse the test chemical ablation under investigation in this study and is designed to mimic the approach intended in subsequent clinical trials. All surgical procedures (and associated support) are performed by highly trained individuals using multimodal anesthesia and analgesics.

1905-37103A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	As described in procedure, goal is to evaluated autologous stem cells in vascular graft after in vitro differentiation. In Vitro harvest and differentation take upto 2 weeks. The fat is harvested from each animal, isolated, and coated on graft's lumen surface prior to being implanted back in the same animal. Hence this require two procedures on each animal. (Adipose Fat Harvest) As described in study design, animals are implanted with engineered graft coated with autologous stem cells. To evaluate presence of cells on the graft surface, optical coherence imaging will be utilized, which require access into vascular lumen. The frequency of every 2 weeks allows for insertion site to heal. (Angiogram and/or OCT survival)
1905-37105A	Munderloh, Ulr ke	Hamster, Llama	SOCIAL HOUSING	Tick-infested animals are housed individually until all ticks have dropped off, after 5 days at most.
1906-37111A	Lund, Troy	Fish (Zebra fish)	72 HOUR POST-OP ANALGESIA POLICY	An IACUC exception is required for non-administration of analgesics after surgery, but is not required for tail snips in other situations where bone is not cut. In this scenario, zebrafish tails are comprised of cartilage and soft tissues (like the tip of a tail of a pre-weaning mouse pup), and the IACUC may not necessarily require 72 hours of post-operative analgesia for a fin clip.
1906-37113A	Griffith, Thomas	Mice	EUTHANASIA METHOD	All staff have been trained in and are competent at cervical dislocation.
1906-37116A	Greising, Sarah	Pig (Biomedical)	MULTIPLE SURGERY	Animal will undergo 2 survival procedures 6 weeks apart. This surgery is minimally invasive and animals will received adequate pain management to prevent or relieve any pain for surgeries. Furthermore, the subsequent procedures to evaluate muscle function only at 6 weeks requires only sub-dermal electrode placement and no incision to the animal. Although the animal is intubated for delivery of anesthesia this is a procedure more than a surgery.
1906-37124A	Cheeran, Maxim	Mice	MULTIPLE SURGERY	The objective of this project is to study neuroinflammation after second injury and therefore it is essential to do second surgery on the same animal. We will perform craniotomy on both sides during the first surgery itself in order to minimize pain and distress during second surgery. The mice will be placed on a heating pad or under a heating lamp for recovery. Mice will be administered topical analgesic for pain control before surgery. Mice will be assessed daily for hydration and signs of distress. If animal cannot stand to reach food or water, moistened food and/or hydrating gel will be placed in a petri dish on the floor of the box. If irreversible autophagia occurs, the animal is euthanized.

1906-37124A	Cheeran, Maxim	Mice	72 HOUR POST-OP ANALGESIA POLICY	The animals will be monitored until they can independently maintain sternal recumbency or can stand and move about before leaving the surgery room. Pain post-surgery is expected due to injury to the scalp/skin incision. Animals will receive an application of lidocaine gel (2%) in and around the skin incision every 2 hours post-op as needed (evidence of discomfort, prolonged anorexia, etc.) to alleviate the irritation and pain associated with the surgery. From past experience animals recover from the surgery and return to normal behaviors (feeding, etc) within 12-24 h. In addition to normal food and water, moist food will be provided in a petri dish on the floor of the cage during first 24 hours to facilitate easy access to water and food and prevent dehydration. Mice will be assessed daily for hydration and signs of distress. If required 1cc fluids will be given SQ in consultation with the veterinarian. NSAIDs or other antiinflammatory drugs will not be administered to these animals at any point in the study as they will interfere with the immunological parameters that are central to this study (Gomaa, S. JoBAZ. Adverse effects induced by diclofenac, buprofen, and paracetamol toxicity on immunological and biochemical parameters in Swiss albino mice. The J. Basic and applied Zoology (2018) 79: 5.; Eisenstein T.K., Hilburger M.E. Opioid modulation of Immune responses: effect on phagocyte and lymphoid cell populations. J. Neuroimmunol. (1998) 83: 36-44). In addition to monitoring animals post-anesthesia, daily monitoring for neurological symptoms that may be associated with complications resulting from injury will be done up to 7 d.
1906-37128A	More, Swati	Mice, Mice	SOCIAL HOUSING	In Aim D part 2 the mice will be recovering from a surgical procedure that will leave a temporary wound. To prevent aggravation of the wound, we request individual housing.
1906-37132A	Madill, Scott	Horse, Cow (Biomedical)	NON-PHARMACAUTICAL GRADE COMPOUNDS	Our standard pharm grade KCl used for adding to IV solutions for deficient animals is 20mEq/10 ml. This is equivalent to 1500 mg of KCl per 10 ml or sufficient for 10 kg at the upper dose range above. A 600 kg horse would thus require 600 ml of this solution (or 60 vials). The AAEP guidelines from Iowa state University (attached) use a saturated solution of non-pharm grade KCl. This would be made up as needed (on the day) and not in advance so would not be stored. Please note this is our least favored method and would only be used when others were not an option.
1906-37132A	Madill, Scott	Horse, Cow (Biomedical)	SOCIAL HOUSING	While not in RAR housing we do house our stallion separately to the rest of our horse herd to prevent unscheduled breeding (mares) and antagonistic interractions (geldings). He is housed adjacent conspecific with both direct sightline and sound (distance across 2 fences separating is approimately 8-10 feet). This is typical industry housing for stallions.
1906-37132A	Madill, Scott	Horse, Cow (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	standing sedation and sampling only, entire procedure less than 5 minutes
1906-37139A	Franzen-Klein, Dana	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	The goal is to determine if a hatch year raptor has the instinct to take live prey by demonstrating the ability to capture and kill said prey.

1906-37140A	Madill, Scott	Horse	MULTIPLE SURGERY	In veterinary practice, brood mares with a Caslick have it replaced each year (it is opened prior to foaling so the tissue does not tear and replaced subsequently). While our mares are unlikely to get a Caslick each year it is possible they could get another surgery related to their general care on the governing protocol. This would most l kely be to sew up a laceration experienced through mishap or potentially placement of a subpalpebral lavage system to treat an ulcerated cornea. These are rare (generally <1-2 per year) but might happen and since our horses stay in the herd a long time it is possible that over multiple years a mare may have several minor surgeries to repair various problems. Not fixing those issues is a greater welfare issue than using minor surgery to fix them. The alternative would be to euthanize a mare when she gets her second problem, even if it is several years after the first, which does not make a lot of sense.
1906-37140A	Madill, Scott	Horse	72 HOUR POST-OP ANALGESIA POLICY	This is a simple skin incision and suturing, standard of care in veterinary practice for this surgery is no analgesia beyond the local anesthetic used at the time of surgery.
1906-37140A	Madill, Scott	Horse	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	This is a simple skin-deep incision and suturing performed under local anesthesia (with sedation if required). Standard of care in veterinary practice for this surgery is the animal is not specifically re-examined until suture removal. Should the incision break down there is no danger to the animal and the surgery cannot be repaired until second intention healing has occured.
1906-37140A	Madill, Scott	Horse	SOCIAL HOUSING	Our stallion is housed separately from other horses, though within direct sight and auditory contact. Housing with mares would result in unwanted pregnancies and repeated uterine infections, housing with geldings results in antagostic interractions and resultant injuries (we did try it when [redacted] first opened). Individual housing of stallions is typical for equine operations.
1906-37143A	Gallaher, Dan	Rat	SOCIAL HOUSING	Animals need to be individually housed in order to individually measure food intake and do individual fecal collections. All rats are provided with enrichment in the form of Nylabones and a plastic box to allow them to get off the wire bottom of the cage.

1906-37149A	Chen, Clark	Mice	MULTIPLE SURGERY	The two surgeries which are to be performed on the mice are a part of the same project. First, a brain tumor would be grown by intracranially implanting tumor cells. The intracranial implantation of the electrodes (see attached figure) (Surgery #2) would be done at Day 4 after injecting the tumor cells in the mice brain. The electrodes would be inserted on the two sides of the region of tumor cell implantation, such that this area lies (in its entirety) between the two electrodes. The procedure has been explained in the surgery section in detail. The electrodes would be fixed to the scalp and a dental cement would be used to fix the electrodes on the scalp, to make them immovable. The electrodes would be implanted both in the control group and the experimental group. However, the control group will not undergo electric field therapy. Since both the surgeries are intracranial, there might be functional deficit during or after the procedure. In case there is functional deficit or the mice cannot move they could not reach for food or water, they would be immediately euthanized.
1906-37149A	Chen, Clark	Mice	SOCIAL HOUSING	There will only be one mouse in each cage after the 2nd surgery (for both experiment and control groups). For the mice in the control group, the electrodes would be implanted after intracranial tumor cells implantation but the electrodes would not be connected to the generator.
1906-37149A	Chen, Clark	Mice	ENVIRONMENTAL ENRICHMENT	□ Animals will be implanted with electrodes and must be housed singly to avoid harming each other or damaging the implants.
1906-37154A	Cheeran, Maxim	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	This is a simple procedure taht is completed in less than a minute. anesthesia (if given) depth will only be measured at the beginning of the procedure.
1906-37158A	McGaugh, Suzanne	Fish (Other)	SANITATION FREQUENCY	We use either or both under-gravel filters where the sediment waste on the gravel is siphoned out monthly or hang-on-tank charcoal filter systems where the charcoal cartridges are changed ~monthly. We will also have zeolite on hand to add to filters as needed, to protect further against ammonia build up in the tanks. Outside of tanks and the space in general will be cleaned on a regular basis, and as needed.
1906-37158A	McGaugh, Suzanne	Fish (Other)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Weighing fish is exceptionally stressful as the fish has to be netted and transferred to a weigh cup. We will test sleep in these animals at 0days, 15days, and 30days at which point weight will be measured. Aside from those time points, we would like to not disturb the fish.

1906-37162A	Cheeran, Maxim	Mice	MULTIPLE SURGERY	For the self-administration protocol, the mice will have a patent catheter placed in their jugular vein to administer opiates. Those mice will receive a TBI either before or after catheter placement. We intend to start with the catheter placement prior to TBI surgery so the mice can have more complete pain control (with analgesics) that does not impact the inflammatory response to TBI (which is the outcome of our study). However, if maintaining patency for extended periods proves difficult, we will have to move catheter placement after the TBI surgery. Performing both surgeries on the mice at the same time would require repositioning the mouse during the procedure, and increases the risk of contaminating instruments, surgical site, and surgeon. In the alternate approach, we would first perform the TBI and allow for the animals to recover for 5-7 days prior to the catheter placement, thereby reducing the stress level of the animals and to ensure a healthy recovery from TBI. In this latter case, no analgesics will be given to the animal as that will impact inflammation resulting from TBI. The TBI surgeries and catheter placement surgeries are both stressful on the mice. By separating the procedures and allowing the mice to heal, we can limit the distress caused by each procedure. We can limit the amount of position changes needed during surgery by separating the procedures as well, thus maintaining a more sterile surgical field without compromising the experimental design or research question. Animals will be given analgesics for the catheterization surgery with a 3 days withdrawal period prior to TBI. This is an alternate procedure: We intend to start with the catheter placement prior to TBI so the mice can have more complete pain control with 7 day rest between surgeries and the impact on inflammatory response due to TBI is minimal. However, if maintaining patency for extended periods proves difficult, we will move catheter placement to a time after the TBI, using this procedure. In this case, administration of analgesics will interfere with the inflammatory outcomes of the experiemnt, so will be avoided.

1906-37162A	Cheeran, Maxim	Mice	72 HOUR POST-OP ANALGESIA POLICY	The animals will be monitored until they can independently maintain sternal recumbency or can stand and move about before leaving the surgery room. Pain post-surgery is expected due to injury to the scalp/skin incision. Animals will receive an application of lidocaine gel (2%) in and around the skin incision every 2 hours post-op as needed (evidence of discomfort, prolonged anorexia, etc.) to alleviate the irritation and pain associated with the surgery. From past experience animals recover from the surgery and return to normal behaviors (feeding, etc) within 12-24 h. In addition to normal food and water, moist food will be provided in a petri dish on the floor of the cage during first 24 hours to facilitate easy access to water and food and prevent dehydration. Mice will be assessed daily for hydration and signs of distress. If required 1cc fluids will be given SQ in consultation with the veterinarian. NSAIDs or other antiinflammatory drugs will not be administered to these animals at any point in the study as they will interfere with the immunological parameters that are central to this study (Gomaa, S. JoBAZ. Adverse effects induced by diclofenac, buprofen, and paracetamol toxicity on immunological and biochemical parameters in Swiss albino mice. The J. Basic and applied Zoology (2018) 79: 5.; Eisenstein T.K., Hilburger M.E. Opioid modulation of Immune responses: effect on phagocyte and lymphoid cell populations. J. Neuroimmunol. (1998) 83: 36-44). In addition to monitoring animals post-anesthesia, daily monitoring for neurological symptoms that may be associated with complications resulting from injury will be done up to 7 d.
1906-37178A	Madill, Scott	Horse, Cow (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Caudal epidural analgesia only, animal is awake and standing
1906-37178A	Madill, Scott	Horse, Cow (Biomedical)	SOCIAL HOUSING	If we have mares in stalls at night for the purpose of light exposure they will be housed individually (i.e. the stalls fit one horse) but will be in sight and sound of compatible conspecifics. They will then be turned out with their pen mates during the day into regular housing dry-lots.
1906-37180A	More, Swati	Mice	FOOD/FLUID RESTRICTION RECORDKEEPING	I don't think we need a justification, but to clarify- lab staff will remove food from select cages 16 hours prior to testing and replace food at the appropriate time. These cages will be marked by lab staff. During all other times and for all un-marked cages, RAR will feed and water as usual.
1906-37182A	Hecht, Stephen	Rat	ENVIRONMENTAL ENRICHMENT	□ Bedding would absorb urine, preventing its collection in the metabolism cages. Therefore, bedding must be withheld during the study.
1906-37182A	Hecht, Stephen	Rat	SOCIAL HOUSING	Each rat will be housed in a metabolism cage so that urine samples from each rat can be collected. To avoid confusion during any washout period they will be housed individually in their normal cages. They will be housed in pairs while they acclimate after arrival, but will be housed individually once the experiment begins.

1906-37184A	Ning, Jianfang	Mice	MULTIPLE SURGERY	Intratumoral injection is the only approach for NK cells or oHSV effectively getting to GBM in orthotopic tumor model due to blood-brain barrier. Mice will be treated with Buprenorphine SR to cover the 72 hour post-operative period. Mice will be observed and weighed everyday between both surgeries.
1906-37189A	Ponder, Julia	Bird (Other)	EUTHANASIA METHOD	Grouse are being captured in the field with a noose pole - if a rare injury occurs, there are limited options in the field. Rapid cervical dislocation is the most expedient and humane method of euthanasia, and will be done by experience personnel.
1906-37191A	Pravetoni, Marco	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	In order to assess the efficacy of the vaccine, the infection must be allowed to progress for 72 hours to analyze the difference between vaccinated and unvaccinated groups. While death will not be the primary endpoint, it is known in this disease model that some mice succumb to the infection before the end of the 72 hour period.
1907-37197A	Ikramuddin, Sayeed	Mice	SOCIAL HOUSING	Because of monitoring of fecal and urinary out put after surgery, as well as feeding an iso-caloric diet after the VSSG/Sham surgery - we will need to house these mice individually after the surgical intervention in this study. If the mice are cohoused it can cause inappropriate shifts in the microbiome leading to altered study endpoints.
1907-37212A	Dickerson, Erin	Mice	EUTHANASIA METHOD	Sedation if not normally used in combination with barbiturate overdose.
1907-37213A	Junge, Harald	Mice	TAIL BIOPSY	We require a method of animal identification that is unambiguous and permanent and can be used for mice in developmental studies (postnatal pups, genotyping results required at P8) or in aging studies over 1 year. We will cut toes after they are no longer webbed in mice P6-P8 and use the toes for genotyping. Pups older than P8 will not be toe clipped. In neonatal mice before 8 days of age toe clipping appears to have few adverse effects on behavior and well-being. We will also use ear punch for genotyping if the mice are of 21 days or older, or tail snips with appropriate anesthesia as described in the IACUC Guideline on Rodent Tail Biopsy Procedures (https://docs.google.com/document/d/14RZQyVYCrM_sCqqKojilTTBF_nfCKPkafnIlPqn5KJ0/edit)
1907-37213A	Junge, Harald	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	We observed in preliminary experiments that Mdm2 ECKO mice die about 1 week after tamoxifen induced recombination using a Cdh5-ERT2 Cre driver. The cause of death appears to be pleural effusion. We euthanize the mice 5-6 days after tamoxifen injection, at which time animals are showing the first sign of being lethargic. We euthanize them as early as possible to prevent distress but as late as necessary until the relevant phenotype (blood-retina barrier defects) manifests. If the animal does not move freely through the cage even after gentle stimulation (e.g., after holding the tail base and lifting it up), the animal will be subjected to the transcardial perfusion procedure or euthanized.
1907-37213A	Junge, Harald	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	anesthesia is performed immediately before euthanasia

1907-37213A	Junge, Harald	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	sulfo-NHS biotin is not available USP grade, it will be ordered from Sigma. It will be made up fresh from powder in PBS (0.3 mg/ml) and sterile filtered. This agent is frequently used in blood-brain barrier or blood-retina barrier assays. No adverse effects have been reported.
1907-37217A	Koewler, Nathan	Mice, Rat	EUTHANASIA METHOD	RAR veterinary staff are proficient in this procedure and in the case of health conditions where CO2 may not be readily available this procedure will be used to provide immediate euthanasia.
1907-37234A	Garry, Mary	Mice	EUTHANASIA METHOD	Cervical dislocation is rapid and humane and sedation is not required.
1907-37234A	Garry, Mary	Mice	SOCIAL HOUSING	Following LAD ligation or femoral artery ligation, animals must be housed singly to prevent removal of closures
1907-37236A	Wise, Eric	Rat	ENVIRONMENTAL ENRICHMENT	We have progressed with the RNY model in rats. Two rats survived their surgical procedures but died post -operative days 3 and 4. Upon necropsy it was found that both rats ate a large amount of paper towels and completely over filled their stomachs (the surgical sites/anastomoses were all intact). This option was discussed in consultation with our area veterinarian. The wire inserts come from the Thomas Lab and are used for behavioral testing.
1907-37236A	Wise, Eric	Rat	SOCIAL HOUSING	Animals may remain pair housed until the day of surgery. Once the procedure is complete and animals have recovered from the surgical procedure, they will be housed singly when returned to RAR housing. We would l ke to monitor food intake, and fecal and urine out put to ensure they are recovering normally from surgery. They can be returned to pair housing after it is clear animals are eating, drinking, and ambulating normally.
1907-37238A	Chen, Chi	Mice	SOCIAL HOUSING	Mice of all treatment groups will be housed individually in metabolic cage on day 1 and day 4. Then on day 2 and day 5, or after being housed in metabolic cage for 24 hours, individual urine samples will be collected. When not housed in metabolic cage, mice will be group housed.

1907-37248A	Lowe, Dawn	Mice, Mice	MULTIPLE SURGERY	One goal of the project is to determine the effect of estrogen on muscle regeneration. A second surgery we are requesting is freeze injury or cardiotoxin injury to the tibialis anterior muscle, which are minimally invasive surgeries. That is, each involves making a skin incision and then placing a freezing probe on the muscle or injecting the muscle with cardiotoxin to induce injury and subsequent muscle regeneration. Mice will be 2-8 weeks post-ovariectomy before either type injury is induced. A subset of cardiotoxin injured mice will be transplanted as well. A subset of mice will have nerve cuffs implanted. Because ovariectomy procedure takes less than 5 minutes beyond the nerve cuff these will be done together and it is less stressful for the mouse than having separate surgical interventions. 4-8 weeks later, freeze injury will be induced. BaCl injury may be done in mice that have previously had ovaries removed (OVX surgeries 2-8 weeks prior) allowing for determination of ovarian hormone impact on muscle injury and regeneration. A subset of mice will have transplantation done 24 hours post BaCl injury. Mice will have transplantation done 24 hours post cardiotoxin injury. A subset of these mice will have previously had ovaries removed (OVX surgeries 2-8 weeks prior) allowing for determination of ovarian hormone impact on muscle regeneration.

1907-37248A	Lowe, Dawn	Mice, Mice	72 HOUR POST-OP ANALGESIA POLICY	Antibiotics and anti-inflammatory reagents are acceptable if necessary for the first surgery nerve cuff/ovariectomy, but are not acceptable after freeze injury or cardiotoxin injury because we are studying the inflammation. We will not give injections of Buprenorphine after the injury or transplantation surgery because the surgery is minimal (no body cavity is opened) and we do not notice signs of post-surgical distress. Antibiotics and anti-inflammatory reagents are not acceptable after cardiotoxin injury and transplantation because we are studying the inflammation and regeneration. Thus, in consultation with vet staff, if pain is apparent as detailed in post-operative care parameter, the mouse will be euthanized. We will not give injections of Buprenorphine after the BaCl injury because the surgery is minimal (no body cavity is opened) and we have not noticed signs of post-surgical distress. Further, the BaCl injury is toone specific muscle in a group of muscles that cause dorsiflexion. We will continually work with the vet staff in order to be sure that there is adequate attention paid to the extent of post-surgical pain and function (ambulation). Parameters that will be continually monitored in these mice include impaired circulation in the foot, intense lethargy (as indicated by limited mobility, hunched posture, limited grooming), severe inflammation (as indicated by bright red coloration of the local tissue with swelling), or lack of ambulation on the BaCl-injured limb. To note, BaCl to the tibialis anterior muscle affects only about 1/3 of the muscle volume and not any of the other agonists muscles that the mouse needs to ambulate. As such, ambulation should not be impaired. However, close attention to all of these parameters will be given and used as indicators that a mouse is not recovering well. If two or more of the above symptoms are present, the mouse will be euthanized by our research group.
1907-37248A	Lowe, Dawn	Mice, Mice	SOCIAL HOUSING	To monitor physical activities (wheel running capacity or cage activities), mice will be housed individually.
1907-37248A	Lowe, Dawn	Mice, Mice	ENVIRONMENTAL ENRICHMENT	To monitor physical activities (wheel running capacity or cage activities), mice will be housed individually. The environment will influence the physical activity of the mice which in turn will affect skeletal muscle function. Because the magnitude of physical activities will likely vary depending on hormonal status, an enriched environment would add another level of variables that at this time we do not wish to explore. Placing nestlets etc in the cages for mice to shred is OK, but further enhancement of the environment needs to be avoided in our studies.
1907-37257A	Felices, Martin	Mice	EUTHANASIA METHOD	only individuals with proper training and a high degree of technical proficiency will perform cervical dislocation

1907-37261A	Zhang, Tianshun	Mice	MULTIPLE SURGERY	We will attempt to increase vascularity by first inducing a stromal reaction by implanting either a subcutaneous glass disc or Gelfoam dressing 2 weeks prior to the xenograft. Patel, Girish K et al. “A Humanized Stromal Bed Is Required for Engraftment of Isolated Human Primary Squamous Cell Carcinoma Cells in Immunocompromised Mice.” The Journal of investigative dermatology 132.2 (2012): 284–290. PMC. Web. 30 May 2017. The implant will sit in the subcutaneous space and the incision will be small, therefore we do not anticipate much pain or distress as this type of procedure is generally well tolerated. Sustained release buprenorphine will be given at 2mg/kg prior to both procedures.
1907-37262A	Schleiss, Mark	Guinea Pig	SOCIAL HOUSING	Males fight when caged together, often resulting in extreme injury, bleeding, and occasional death. To minimize the pain and trauma to male breeder animals, they are not housed together with other males.
1907-37275A	O'Connell, Timothy	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Our lab has found in the preliminary studies from the expiring protocol that the frequent handling of the mice (weekly weighing and cage changes, monthly echocardiography, echo-MRI and blood pressure monitoring) has hindered the mice from gaining the weight we would expect on this HFD. In consultation with Dr. Cathy Kotz, an expert in obese mouse models, she suggested that we only weigh the mice bi-weekly. This bi-weekly weighing, along with our decrease in data collection as spelled out in this renewal (baseline, 8-weeks and final collection point at 20 weeks; instead of every four weeks) will hopefully lessen the handling stress the mice endure and allow them to gain weight more closely reflected in the literature.
1907-37285A	Mand, Sandy	Fish (Other)	SANITATION FREQUENCY	We use either under-gravel filters where the sediment waste on the gravel is siphoned out monthly or above-tank charcoal filter systems (especially for the marine tanks) where the charcoal cartridges are changed based on manufacturer's recommendations. We have protein skimmers for the marine tanks. We also have an Z-Hab system in [redacted] which includes a bio filter, filter, charcoal filter and UV light sterilization for our zebrafish. This also has automatic temperature control, pH and conductivity.
1907-37285A	Mand, Sandy	Fish (Other)	SOCIAL HOUSING	We are using IMHA and the fish are all housed socially except the male beta fish and electric fish which are housed in separate tanks.
1908-37287A	Harmon, James	Sheep (Biomedical)	MULTIPLE SURGERY	The rational for two separate procedures is that we want the hernia to mature. We believe that by letting the hernia mature it will allow the defect to mimic the loading characteristics of a hernia and provide a more realistic comparison to the human abdominal space.

1908-37300A	Kawakami, Yasu	Fish (Zebra fish)	72 HOUR POST-OP ANALGESIA POLICY	For zebrafish, the same treatment for other animals, such as mice, are not available, because zebrafish are aquatic animals. In addition, it is unknown whether analgesics have no effects on regeneration at all. Introducing unknown factors is detrimental to the entire experimental design, because results may or may not include effects by analgesics. Thus, analgesia cannot be provided to zebrafish. If fish show distress or abnormal behavior after surgery (off-balance swimming, loss of equilibrium, or rubbing of lips against the aquarium wall), we will euthanize the fish. We will also monitor fish for lethargic swimming (as sign of pain) and organ prolapse (as signs of incision complications).
1908-37303A	Geller, Melissa	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	As we are not changing the food, and the water is given ad libitum, there is no expectation or historical record of weight loss, dehydration, behavioral, or clincial changes.
1908-37308A	Madill, Scott	Horse	NON-PHARMACAUTICAL GRADE COMPOUNDS	Our standard pharm grade KCl used for adding to IV solutions for deficient animals is 20mEq/10 ml. This is equivalent to 1500 mg of KCl per 10 ml or sufficient for 10 kg at the upper dose range above. A 600 kg horse would thus require 600 ml of this solution (or 60 vials). The AAEP guidelines from Iowa state University (attached) use a saturated solution of non-pharm grade KCl. This would be made up as needed (on the day) and not in advance so would not be stored. Please note this is our least favored method and would only be used when others were not an option.
1908-37310A	Li, Ling	Mice	MULTIPLE SURGERY	For the parabiotic pairing/separation procedure, two surgeries will need to be performed on the mice. First is parabiotic surgery to join the two mice. After 1-6 months, the parabiosed mice will need to undergo second surgery to be separated for neurobehavioral assessments as described in the neurobehavioral testing procedure. Thus, the parabiotic pairing/separation surgeries are essential components of the same project. The separation surgery will not cause any more pain and distress than the first parabiotic surgery. Functionally, it will restore the functionality of the individual mice. During the parabiosed period, some of the mice will be subjected to intracerebral injection of amyloid-beta (to induce Alzheimer's-type pathology including neuroinflammation). These procedures are necessary to study the mechanisms of recruitment of immune cells in the brain. The parabiosed mice are the best models to elucidate the role of peripheral immune cells in neuroinflammation. To achieve effective anesthesia, a controlled flow of isoflurane 1-3% with oxygen through a cone device will be administered to each of the parabiosed mice during stereotaxic procedure for intracerebral injection of amyloid-beta peptide. We have used this approach and successfully performed the procedure with no complications.

1908-37334A	Meyer, Markus	Pig (Biomedical)	MULTIPLE SURGERY	At weeks 3, 5 and 8 after initial surgery animals will be placed under anesthesia for an Echocardiogram and endocardial heart biopsy. At week 8 the animal will be euthanized after procedure. After initial surgery animals will be placed under anesthesia at week 1, week 2 and 3 for visualization of the stenosis with fluroscopy.
1908-37346A	Robinson, James	Mice	TUMOR ENDPOINT CRITERIA	Mice will develop glioma (20-70% of all cohorts) and the accompanying CNS symptoms - part paralysis (30%), seizures (1%), head tilting (20%), running/walking in circles (5%), cerebral edema (20%). Pronounced CNS symptoms will cause mice to be euthanized; however, we will not euthanized mice with moderate paralysis, head tilting or cerebral edema as long as they can access food and water and do not otherwise seam in distress. Mice in this state will be monitored for dresses progression. Although, the gliomas are not expected to cause the mice any direct pain mice with pronounced cranial swelling, extra cranial tumor growth, debilitating paralysis or edema maybe in pain and will be euthanized. The paralysis of a single back leg we consider nondebilitating- two legs or a single front leg debilitating. Can't climb =debilitating. Can't access food or water = debilitating. Can't run =debilitating. Mice with head tiling will be assessed using the same criteria.
1908-37348A	Newman, Eric	Mice	MULTIPLE SURGERY	Mice will be prepared for chronic awake cortical imaging in two steps. In the first surgery, the skin over the scalp will be removed and a metal head bar will be permanently attached to the skull with cyanoacrylate glue and dental cement. The animal will then be allowed to recover and given adequate ant biotics and pain medication SR-Buprenex (2mg/kg) so that it fully recovers and is pain-free. The animal will then be acclimated to being fixed to a frame under a microscope for several days. Following acclimation, a second surgery will be performed to create a thinned-skull cranial window for imaging the cortex. The third surgery will be creating a burr hole for the injury model. The reason to perform the surgery in three steps is that following the creation of the cranial window and recovery from the second surgery, which will take 2 to 3 days, we can immediately begin our imaging sessions on the awake animal. The animal will have already been acclimated to being fixed under the microscope. However, this immediate imaging paradigm may not always be necessary and we will also perform both surgical steps in a single session. If this proves successful, we will perform, whenever possible, future surgeries in a single session.
1908-37348A	Newman, Eric	Mice	SOCIAL HOUSING	Post-surgery animals will be single housed for 7 days. After 7 days, we will introduce another animal had the same procedure. Co-housing is beneficial for post-operative cranial window animals. We limit each cage has two post-surgery mice together. Social house will improve their grooming, play, and interactions.

1909-37364A	Deng, Yibin	Mice	MULTIPLE SURGERY	Once the transplanted tumor (PDX) grow up in mouse cohorts (up to 1cm with maximum diameters, it may take 4 to 16 weeks depends on transplanted original tumor tissues), we will determine whether and how surgical castration affect prostate tumor growth in vivo to recapitulate human castration-resistant prostate cancer development. This is an essential experimental procedure to address how castration contributes to prostate tumirogenesis in vivo.
1909-37384A	Yang, Yi-Mei (Amy)	Mice	SOCIAL HOUSING	Autism is a prevalent neurodevelopmental disorder. The causes for autism include genetic and environmental risks. While it is evident that social deprivation during early childhood increases the incidence of autism, the underlying mechanisms remain elusive. To reveal the epigenetic regulation of brain functions, we propose to generate a mouse model by isolating pups at postnatal day 21 in a singly housed opaque cage for 2-3 weeks. Then we will perform behavioral tests while keeping them singly housed. At the endpoint, we will do electrophysiological recordings from brains slices after decapitation. The results will provide novel strategies for clinical interventions of autism. As to the choice of opaque cages, we have searched the literature regarding the rearing conditions to induce the behavioral deficits. In most studies, the mice were isolated in opaque cages to limit any contact (including visual contact) with other mice or humans. The reason is that the neurological changes underlying mouse behaviors are very sensitive to the caging environment. Any variables in handling or housing could reverse the animal responses to social isolation. I list two examples descr bing the experimental details for social isolation (see Methods) and an article discussing the environmental influences on animal behaviors. In light of these reports, we will keep the same environment between socially reared and socially isolated groups. If social isolation causes severe distress to the mice, such as poor body condition, paleness, dehydration, decreased activity or lethargy, excessive licking and scratching and self-mutilation, we will terminate the experiments and euthanize the animals as soon as poss ble. Ibi et al. Social isolation rearing-induced impairment of the hippocampal neurogenesis is associated with deficits in spatial memory and emotion-related behaviors in juvenile mice. JOURNAL OF NEUROCHEMISTRY (2008): 921-932 Puglisi-Allegra and Mandel. Effects of Sodium n-Dipropylacetate, Muscimol Hydrobromide and (R,S)Nipecotic Acid Amide on Isolation-induced Aggressive Behavior in Mice. Psychopharmacology 70, 287-290 (1980) Lapiz et al. Influence of Postweaning Social Isolation in the Rat
1909-37384A	Yang, Yi-Mei (Amy)	Mice	EUTHANASIA METHOD	Mice are sacrificed by decapitation using a DecapiCone and a sterile sharp blade. The DecapiCone is a plastic conical rodent restraint device that is commonly used to restrain animals in order to reduce stress from handling, and to minimize the chance of injury to experimenters. This way, a rapid loss of consciousness is accomplished and the harvested brain tissue is not chemically contaminated.

1909-37389A	Camell, Christina	Mice, Mice, Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Moribundity as an experimental endpoint is required in experiments that desire to address whether age or GDF3 accelerates LPS-induced lethality and the metabolic changes that occur due to this challenge. An appropriate timepoint for examining these changes in old mice is not clear. Initial experiments will identify that timepoint by establishing the time of moribundity. Follow-up experiments will be performed at the time when 50% of the old mice were moribund. These experiments are required to identify molecular and cellular characteristics that are induced by age or GDF3. Identification of these characteristics may lead to therapeutic candidates to improve responses to bacteria in the aged.
1909-37389A	Camell, Christina	Mice, Mice, Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Animals will be euthanized 3 minutes after the injection is performed. (Retro-orbital Injection) Animals will be euthanized immediately after blood collection. They will not survive this procedure. (Blood Collection)
1909-37389A	Camell, Christina	Mice, Mice, Mice	EUTHANASIA METHOD	This method will be used with cohorts receiving a cold challenge (challenged or control mice). Tissue are needed for analysis prior to the warming from the cold challenge. This method will provide for euthanasia without removal from the cold room, which means tissues will be analyzed directly from the challenge. Removal from the cold room, and warming of the mouse, which happens instantly, would alter the results. Control mice that are kept at room temperature will receive the same method of euthanasia to ensure identical and comparable methods performed. All lab personnel are trained in this method. This interference only applies for experimental objectives in the lethal LPS challenge. All other experiments will follow IACUC Criteria for Euthanasia. Body-weight, body-temperature and visual monitoring will occur in the lethal LPS challenge.previous data from Starr et al and Lamkanfi et al show that, 18mg/kg LPS is nearly 75% fatal to 3-month-old C57BL6/J mice beginning at 48-72 hours after LPS injection. It is not clear at what time point the older animals would succumb to the 18mg/kg dose. These experiments are required because they permit testing for and identification of molecular and cellular therapeutic candidates that may contr bute to protection against bacteria challenge in the elderly/
1909-37392A	Garry, Daniel	Pig (Biomedical)	MULTIPLE SURGERY	Each animal will undergo an electrocardiogram to asses cardiac function after initial surgery at 4 days, 14 days, 28 days post op and be euthanized on the 42nd day after the procedure. (Prep and intubation for STEMI LAD) After initial procedure each animal is required to have an echocardiogram to asses cardiac function. (Ultrasound and Fluoroscopy) Each animal will undergo an electrocardiogram to asses cardiac function after initial surgery at 4 days, 14 days, 28 days post op and be euthanized on the 42nd day after the procedure. (Prep and Intubation for Permanent LAD Ligation)

1909-37411A	Gallaher, Dan	Rat	SOCIAL HOUSING	For the protein quality assessment (PDCAAS), we need to do fecal collections from each animal separately. For the microbiome study (2nd part), we need to measure food intake individually, and do not want the microbiome of one animal to be transmitted to another.
1910-37451A	Masopust, David	Mice, Hamster	MULTIPLE SURGERY	The purpose of the second surgical procedure (Peptide Injection into Tumor (Intra-cranial)) is to re-activate immune cells within the tumor as an immunotherapy to reduce or eliminate tumors. Jianfang Ning has extensive experience with this procedure in her previous position at Massachusetts General Hospital. Peptide injection into Tumor will be performed within the same injection site with topical or systemic bupivicaine. Animals will be monitored post surgery and receive Buprinorphine for 3 days after both procedures to limit pain. If animals evidence signs of pain, distress or functional deficits they will be evaluated by veterinarian technician and euthanized at standard endpoints (weight loss, morbididty etc) outlined by RAR. (Orthotopic Brain Tumor Model) The experiment is designed to test if intra-tumoral injection of peptide can re-activate memory lymphocytes within the brain tumor to reduce tumor burden as an immunotherapy. Our lab has shown that intra-tumoral injection of peptide in a skin model can reduce and eliminate tumor in some cases as well as provide protection from subsequent tumor growth. The initial survival surgery will implant the tumor while this subsequent surgery will inject tumor in the same injection site to reduce tumor growth through stimulating the immune system. Animals will be treated with bupivicaine daily for 3 days post surgery. Animals evidencing undue pain or distress will be euthanized in accordance with RAR endpoints (weight loss, moribund, etc.) (Peptide Injection into Tumor (Intra-Cranial) Surgery)

1910-37451A	Masopust, David	Mice, Hamster	EUTHANASIA DEATH/MORIBUND ENDPOINT	We need to know if the immunizations are working or not. We also need to know if the control group without immunization is morbund or not to know if the infection is working. COVID-19 is fatal in a fraction of humans. We will assess the dynamics of the immune response, in relation to disease outcome, and death is a relevant disease outcome, as our analyses that proceed death in mice that are experiencing severe disease. To evaluate vaccine efficacy, immunized and unimmunized animals will be challenged with SARS-COV-2. At this time, we do not know if our vaccine will elicit full or partial protection from infection and disease severity in mice. It is possible our vaccine may not protect from infection but may reduce severe disease outcomes. In order to compare, there must be a control vaccinated group that is inoculated and becomes severely sick to evaluate that outcome. Because we are evaluating this vaccine's efficacy for greater than 7 days, it is likely that animals in the control arm will reach mor bundity or succumb to disease while we expect vaccinated mice to survive with less weight loss and less disease. Ref: Zheng, J., Wong, LY.R., Li, K. et al. COVID-19 treatments and pathogenesis including anosmia in K18-hACE2 mice. Nature (2020). https://doi.org/10.1038/s41586-020-2943-z From days 5-21: Once animals are observed to become ataxic, suffocating (labored breathing), paralyzed, lose 25% of their body weight, or can't right themselves, they will be euthanized. If they do not show these symptoms by day 21, they will be euthanized.
1910-37451A	Masopust, David	Mice, Hamster	SOCIAL HOUSING	We wil house female hamsters singly if they are used in experiments because they are aggressive and males in pairs.
1910-37451A	Masopust, David	Mice, Hamster	NON-PHARMACAUTICAL GRADE COMPOUNDS	Pharmaceutical grade Avertin is no longer available. Therefore, it is necessary that we mix our own stocks from non-pharmaceutical grade Avertin. All stocks are kept sterile and are only used for two weeks. Avertin is required for the experiments outlined in this protocol since isoflurane causes muscle contractions and prevent accurate data acquisition. Avertin has been used in procedures for several years and is listed as an anesthetic in order to maintain consistency across previous experiments. Avertin will be stored in a light resistant container and pH will be tested every use prior to administration.

1910-37452A	Masopust, David	Mice	MULTIPLE SURGERY	In some parabionts pairs will be separated to further residency studies. To best understand the residency of cells parabiosis is a critical step in assessing the origin of cells, however after the parabionts stabilize it is necessary to separate the parabionts to further analyze the cells that migrated to the partner, such as their location, duration, expression of unique cellular factors, and response to stimuli. Although the separation of the parabionts is a less invasive procedure than the original parabiosis we still proceed with identical treatment regarding pain or distress that we use when joining the parabionts. We do not anticipate any excess pain or discomfort besides the suture or staples used to close the skin where attachment was originally made. Additionally, we allow for 1-2 months between parabiosis and separation to reduce the impact on the animal from consecutive surgeries.
1910-37452A	Masopust, David	Mice	72 HOUR POST-OP ANALGESIA POLICY	Post-operative analgesic therapy is contraindicated because the objective of the procedure is to determine whether the experimental treatment causes hypersensitivity. Provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied.
1910-37452A	Masopust, David	Mice	EUTHANASIA METHOD	All personnel performing cervical dislocation must prove themselves extremely competent to prevent inhumane euthanasia
1910-37452A	Masopust, David	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Our previous studies have utilized Avertin as the sole anesthetic and switching to a Ketamine/Xylazine anesthetic agent would make comparisons between studies invalid necessitating a very large increase in experimental animals to replicate previous experiments. This combined with our attempt to minimize the use or sharps inside [redacted] by using a single injection of Avertin as opposed to an injection of Ketamine/Xylazine and an injection of Yohimbine makes Avertin our preferred choice. Preparation Sterile filter with 0.2 micron filter. Store and use under sterile conditions. Store in the dark bottle or foil covered container. Store stock and working stock solutions at 4oC. Do not use if the solution becomes discolored or has a precipitate. Check pH before each use and use only when greater than pH 5. Discard all solutions after 4 months, including the stock solution. Label all containers with name and concentration of drug, date prepared and initials of person making the solution.

1910-37455A	Bianco, Alex	Horse, Cow (Biomedical), Sheep (Biomedical), Other* (USDA), Goat	72 HOUR POST-OP ANALGESIA POLICY	Flunixin meglumine will be given if needed. However, part of the goal of this lab is student monitoring for pain and distress. If such is identified, animals will be treated. In general, this procedure is well tolerated and analgesics (off label use in cattle) are not required. (Bovine omentopexy lab) Animals will be euthanized shortly after recovery. (Pony Castration, Donkey Castration)
1910-37455A	Bianco, Alex	Horse, Cow (Biomedical), Sheep (Biomedical), Other* (USDA), Goat	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Animals will be euthanized shortly after recovery. Nothing to monitor. (Pony Castration, Donkey Castration)
1910-37455A	Bianco, Alex	Horse, Cow (Biomedical), Sheep (Biomedical), Other* (USDA), Goat	NON-PHARMACAUTICAL GRADE COMPOUNDS	The following justification only applies to option 2: The use of non-pharmaceutical grade potassium chloride and/or magnesium salts is acceptable for euthanasia per AVMA guidelines (2020) and is only used after the animal has been rendered unconscious.
1910-37455A	Bianco, Alex	Horse, Cow (Biomedical), Sheep (Biomedical), Other* (USDA), Goat	SOCIAL HOUSING	Ponies and donkeys are intact males and need to be housed individually for their own health and safety. Ponies and donkeys should also be housed separately from the main teaching herd.
1910-37464A	Cao, Ruifeng	Mice	EUTHANASIA METHOD	We need to look at protein kinase activation in the brain after acute stimulation, such as a light pulse. Due to the transient nature of the protein kinase activities, animals must be euthanized immediately and brain tissue must be harvested and processed within minutes after light exposure. The time it takes to sedate the animals are too long for our experiment purpose. Also, sedatives can induce changes in the brain that may interfere with experimental treatments. Cervical dislocation and decapitation are commonly used in neuroscience research. To keep the kinases and signaling molecules in the brain as close to the physiological conditions as possible, mice need to be killed and brains need to be harvested and processed as quickly as possible(usually in 3 minutes). Anesthesia will affect the neuronal signals in the brain and it will take too long to capture the rapid changes in the brain proteins.

1910-37469A	Redish, David	Rat	MULTIPLE SURGERY	Some animals will receive two surgeries – one to provide DREADD-based or optogenetic virus to transfect cells and the second to implant the hyperdrive device. The transfection takes 3-4 weeks to take full effect, and the hyperdrive takes 1-2 weeks to reach its target, with the best recordings occurring during the subsequent several weeks. This means that if we did both procedures in the same surgery, the optimal time for DREADD transfection and hyperdrive recording will be mismatched. Therefore, we will do two surgeries, one, first to transfect with DREADDs and the second to implant the hyperdrive. Rats will have at least 2 weeks between surgeries. This procedure will (by definition) be a second surgery. This procedure should not include any additional pain, distress, or functional deficit beyond a normal single surgery. Both surgeries will be done under full anesthesia and with all appropriate analgesics. We do not expect additional distress from the procedure.
1910-37483A	Largaespada, David	Pig (Biomedical)	SOCIAL HOUSING	Whenever possible, pigs will be group housed. However, pigs may have to be physically separated during drug administration to ensure that each animal receives the entire dose. It may also be necessary to separate animals during blood collection procedures. Animals will be placed in a separate kennel where they can still see each other and then be released into group housing immediately after blood collection/drug administration.
1910-37487A	Freedman, Tanya	Mice	MULTIPLE SURGERY	Because the primary tumors reach endpoint prior to establishment of robust metastasis, primary tumor resection will be necessary to assess metastatic growth and burden in these models. All procedures for tumor resection will include anesthesia and pain relief in the same manner as provided for the initial surgery. Due to the increased blood vessel growth associated with primary tumors, cauterization of blood vessels may be required.

1910-37487A	Freedman, Tanya	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Based on previously published data, we expect nearly 100% of wild type mice will survive a 5 mg/kg dose and 75% of wild-type mice to survive a 10 mg/kg dose. However, it is possible that some of the Lyn knockout animals used for this study may have defects in inflammation regulation and it is possible they may not survive to the 120 hour endpoint. Although we strive to use models that do not administer untoward discomfort, the LPS injection model is a commonly used research model designed to mimic the effects of Toxic shock syndrome or sepsis commonly seen in human patients. Sepsis is a deadly disease with few treatment options and LPS challenge has proven useful for testing the effects of different genetic manipulations on the immune system's response to inflammatory stimuli. At the doses we plan to use in this study, we expect that even at the highest dose, roughly 75% of wild-type mice will survive the procedure. However, because this procedure may lead to death, we plan to monitor the mice closely, every hour for the first 24 hrs, to ensure animal well being. If an animal has a lack of responsiveness to manual stimulation, immobility, and/or an inability to eat or drink, the animal will be Euthanized to limit the potential for harm. We believe monitoring every hour for the first 24 hrs is sufficient to prevent suffering in the event an animal is unable to control the immune response. After 24 hrs, the likelihood of death decreases dramatically and it would be safe to monitor the mice every 4-6 hours for the next 24 hrs and after that time period, daily checks should be sufficient.
1910-37493A	Lim, Hubert	Mice, Rat	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Animals will be monitored for reflexivity, heart rate, blood oxygen levels and body temperature every 15 minutes during surgical experiments. In some rare instances during prolonged neural recordings it will not be possible to access the animal inside of our recording booth for 30+ minutes. In these cases, the animal's heart rate, blood oxygen levels and body temperature will still be monitored every 15 minutes, and reflexivity will be recorded at the conclusion of the neural recording session.
1910-37510A	Mand, Sandy	Fish (Other)	SANITATION FREQUENCY	We use under-gravel filters where the sediment waste on the gravel is siphoned out monthly and above-tank charcoal filter systems where the charcoal cartridges are changed based on manufacturer's recommendations. Water is changed out on a weekly basis and each week the water is tested.

1910-37510A	Mand, Sandy	Fish (Other)	SOCIAL HOUSING	We have a few varieties of electric fish. As mentioned elsewhere in this protocol, when electric fish are presented with the electrical signal of another fish, one will change its signal in the "jamming avoidance response." Since this is what we study in the class, it is important to allow the fish time alone before we begin our experiments. The ghost knives and elephant noses usually can be socially housed except just before and during the experimental period when we need their electrical signalling to settle into their innate pattern. So we take these fish out of social housing during the experimental period, returning them to social housing afterward if they will settle in together. We need to be able to use our best judgement on putting individual fish together. The third variety of electric fish we have, the glass knives, are too aggressive to be housed together. While the ghost knives and elephant noses will be initially aggressive when put into the same tank, they will settle in okay provided there are enough hiding places (which we provide.) The glass knives never settle in and within a month, one or more of the fish will be dead. Thus we request to keep the glass knives in separate tanks.
1910-37539A	Steer, Clifford	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Preparation: Before a surgery, Avertin solution pH will be evaluated by pH paper. When the pH of the Avertin solution is lower than 6, MGL will discard all the Avertin solution and new one will be prepared. It is known that Avertin adverse effects are caused by toxic products generated by light or heat of the Avertin solution and those toxic products will lower the solution pH below 6. Justification: The MGL uses Avertin (222 tribromoethanol/ tert. Amyl alcohol) for our anesthetic. This anesthetic allows us to anesthetize our animals below toe inch response in a minimal amount of time. We require our animals to be below toe inch response because residual nerve responses cause flinching of the animal tissue and make the microsurgical procedures – vasectomies and embryo transfer – very ineffective. Avertin has the qualities of placing the animals under toe pinch response with a minimum of stress, usually 2-3 minutes for complete effect. Avertin is metabolized very rapidly and these animals recover to the point of ambulation within 45 minutes. This very rapid recovery helps reduce stresses to the animal that may impact the ability of the animal to maintain the pregnancy from embryo transfer. Use of other standard anesthetics ie: Ketamine, etc, require very high doses to bring the animal under toe pinch response, resulting in a very prolonged recovery period and subsequent stressor induced loss of pregnancies.
1910-37539A	Steer, Clifford	Mice	EUTHANASIA METHOD	Procedure is instant. Mice are dispatched immediately. Also, we do not want the embryos to be anesthetized upon harvest. We will only use decapitation for embryos, as described in the procedures.

1911-37578A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	Two separate surgical events are required for this experiment. The valve scaffold is implanted so that 'in vivo' engineering, or autologus cellular integration of the scaffold will happen in the time the valve is in the pocket. This initial procedure is required for the valve to be fully 'created" prior to valve replacement. (Data from Exp 1 may allow refinements to this time frame, if so, this will be amended)
1911-37613A	Grande, Andrew	Dog	MULTIPLE SURGERY	We need to induce stroke in our animals. This is done through the described surgical procedure. Following stroke there is an inflammatory reaction which occurs including upregulation of astrocytes. Our therapy is based on targeting these astrocytes with an adenoassociated virus to transduce the cells with a neurogenic transcription factor. We will target astrocytes at 7 days after stroke when the astrocytic response is at its peak. In order to inject adenoassociated virus we need to expose the brain surrounding the infarct and to do so at 7 days after the stroke. The procedure is done under general anesthesia which minimizes pain associated with it. We will reopen our original incision to expose the brain underneath. Following the initial surgery the bone is not replaced (allowing the brain to swell) so there is no bone to be removed. Virus will be injected with a small Hamilton syringe to minimize injury to the brain. While there is a risk that these injections could cause bleeding our experience is that this is extremely rare. As such we would not anticipate any additional functional deficits in these animals. Following surgery animals are allowed to recover and there may be some additional peri-incisional pain. One week after the stroke surgeries the viral treatment will take place. We have designed a two-part system, such that the reprogramming factor is only active in presence of a Cre recombinase enzyme. Specifically 1.5 µl of either mGfap::Cre AAV9 virus (plasmid from addgene: #1505550) or hGfap (plasmid from invivogen: # pdrive-hgfap) will co-injected with 1.5 µl of the CAG::DIO-NeuroD1-mRuby2 AAV9 virus (modified plasmid from inserting the ND1cassette from plasmid from addgene: #52052 into the addgene plasmid: #104058) for a total of 3 µl per injections. Based on the volume of each virus to be injected and the respective viral titer, the total genome content (GC) per injection will be approximately 5.24 11 . This volume was determined based on a study from Swain and colleagues, which
1911-37613A	Grande, Andrew	Dog	SOCIAL HOUSING	Canines in this study may need an exemption to social housing. Given the condition that they are in following the stroke induction procedure (see above for detailed timeline of events), it may be best to keep them separate. As they recover, interacting with other canines could be detrimental to their IV catheters and surgical site.

1911-37623A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	The placement of a vascular access port is considered a minor surgical procedure (peripheral, not entering a major body cavity), essentially similar to routine catheter placement with the notable exception that the access site is placed underneath the skin. VAPs improve safety, and increase animal comfort when intermittent or recurrent venous access is required by avoiding painful 'catheter starts'. VAPs also allow NHPs to participate fully in enrichment programs and social group activities without the restrictions inherent in conventional approaches. (Placement of Vascular Access Port) In order to safely undergo MRIs, animals will need to have their microchips removed. MRI scans are needed to provide accurate models of the brain and cranium to facilitate surgical plans that precisely target brain areas and structures that are of interest to us and/or to evaluate changes to the brain over time as a result of study treatments. Many of these subsequent procedures are survival surgeries. This is a minimally invasive minor surgery, and pain and recovery time are expected to be minimal. Animals will be monitored and receive analgesics (Meloxicam) for three days following surgery. (Microchip removal)
1911-37638A	Grande, Andrew	Mice, Rat	MULTIPLE SURGERY	We are tasked with determining which time point of AAV injection post-injury yields the optimum therapeutic response. This may be anytime from the time of CCI (in which AAV would be injected before closing incision), up to 28 days after CCI. Injury will occur at Day 0. The incision area will be reopened and virus will be injected intracranially around the area of CCI on Day 7. We are tasked with determining which time point of AAV injection post-injury yields the optimum therapeutic response. This may be anytime from the time of CCI (in which AAV would be injected before closing incision), up to 28 days after CCI.
1911-37638A	Grande, Andrew	Mice, Rat	EUTHANASIA METHOD	Euthanasia occurs instantly.
1912-37649A	Whitley, Chester	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	NA (AAV vector administration)

1912-37666A	Regal, Jean	Rat	MULTIPLE SURGERY	In this procedure, animals undergo surgery with anesthesia on gestation day 14 to cause placental ischemia. Then on gestation day 17 or 18 a carotid artery catheter is placed under isoflurane anesthesia for monitoring of blood pressure on gestation day 19 prior to exsanguination under anesthesia and necropsy. The carotid artery catheter is not placed at time of RUPP surgery on day 14 of gestation because maintaining patency of the catheters for prolonged periods of time is difficult in the rat and previous experiments have revealed that an extra surgery on day 17 or 18 significantly increases the overall success rates of the experiments and reduces the number of animals required to complete studies overall. Animals that are allowed to give birth for use of the offspring will not undergo carotid artery placement.
1912-37666A	Regal, Jean	Rat	SOCIAL HOUSING	I request an exception for the pregnant animals having undergone survival surgery with catheters in place. They need to be housed singly. ********** For offspring they will be group housed after weaning, with sex appropriate companions. ********** I have consulted with RAR veterinarian Jen Hubbard and she recommended the following exception since single housing of animals postoperatively is the norm. Animals either undergo one survival surgery on gestation day 14 or two survival surgeries - gestation day 14 and gestation day 18 (carotid catheter placement). Animals with one surgery are allowed to give birth spontaneously on approximately gestation day 21. After consultation with the veterinarian, I am requesting single housing for both of these following situations with pregnant rats: 1. Post op pregnant rats from gestation day 14 (surgery) until necropsy (gestation day 19) with carotid catheters (surgery at gestation day 18) or without carotid catheters (no second survival surgery). 2. Post op pregnant rats from gestation day 14 (surgery) until pups are born and necropsied at either postnatal day 13 or weaned at 21 days.
1912-37667A	Vezys, Vaiva	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	In our model of intestinal pathology and autoimmunity, we use death as an endpoint, especially when we are testing any interventions to alleviate intestinal pathology. This is because rescuing animals from death is a very high bar for efficacy. The endpoints are death or recovery from having malaise or being moribund. We have often seem mor bund recover and become completely healthy with our various interventions.

1912-37667A	Vezys, Vaiva	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Pharmaceutical grade Avertin is no longer available. Therefore, it is necessary that we mix our own stocks from non-pharmaceutical grade Avertin. All stocks are sterile filtered and IACUC guidelines will be followed. Avertin will be kept sterile and are only used for two weeks. Avertin is required for the experiments outlined in this protocol since isoflurane causes muscle contractions and prevent accurate data acquisition. Additionally, isoflurane inhalation via a bell jar only lasts a short time period. Since a vaporizer is not available for use in RAR spaces, avertin will be used to ensure adequate timing for procedure to be performed. Avertin has been used in procedures for several years and is listed as an anesthetic in order to maintain consistency across previous experiments. Avertin will be stored in a light resistant container and pH will be tested every use prior to administration.
1912-37675A	Godden, Sandra	Cow (Biomedical)	SOCIAL HOUSING	Calves will be housed individually for the 72 hour trial period. This is because illness (e.g. scours) is one of our major outcomes to monitor for, and if one calf gets sick, we don't want it getting another calf sick. After the 72 hour trial period is completed, the calves can be moved together and pair-housed until they leave the premises.
1912-37696A	Ondrey, Frank	Rat, Mice	BLOOD COLLECTION LIMIT	Blood collection is terminal (Sacrifice by exsanguination)
1912-37696A	Ondrey, Frank	Rat, Mice	ENVIRONMENTAL ENRICHMENT	We will continue to use 1/4 inch ground corn cob bedding, with an igloo in each cage. As the majority of our work is lung cancer prevention, vapor toxicity exposure, and Maximum Tolerated Dose studies, all involving lung function and sample taking, we do not want to introduce any other fine particulate matter into the cages, as this may introduce variables that would complicate data comparison between our previous work and our future work.
1912-37717A	Grissom, Nicola	Mice	SOCIAL HOUSING	In special circumstances, the welfare of the animals requires the need for individual housing instead of group housing. This could include instances of aggression/injury from cagemates, post-operative recovery of a single surgical subject, or behavioral monitoring in a home cage environment.
1912-37717A	Grissom, Nicola	Mice	EUTHANASIA METHOD	Certain molecular indices, for example protein phosphorylation states, are especially sensitive to external manipulations and can change rapidly as a result of drug/anesthetic exposure or CO2 exposure. While the preferred method of euthanasia in the laboratory will be CO2 exposure followed by decapitation to ensure death, when the experiment requires that we measure protein phosphorylation or activity changes, or changes in the expression of immediate early genes, we will employ cervical dislocation followed immediately by decapitation to maximize the speed of tissue collection. Dr. Grissom has extensive experience (6+ years) with this approach, and she will perform these procedures herself until such time as she is confident in the ability of other approved members of the protocol to execute this method with the speed necessary to both 1) ensure the humane and immediate death of the animal and 2) to ensure the quality of the brain tissue collected as a result.

2001-37736A	Schumacher, Robert	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	The recording frequency for this procedure will only be once at drug administration since this is mild sedation and not anesthesia for a procedure lasting less than 10 seconds.
2001-37746A	Bee, Mark	Amphibian (Other)	SANITATION FREQUENCY	A small net or gloved hand is used to remove large debris (e.g., leftover cricket carcasses, feces) from each tank on a daily basis. On a designated “cleaning day” each week, frogs are temporarily housed in small plastic containers (identical to the containers used to collect them from the field) while their home tank, including perches and refugia, is cleaned using hot water and vigorously scrubbing with a brush or sponge. A minimum of 2 times/year, each tank, including perches and refugia, is sanitized using a 10% bleach solution and hot water followed by extensive and repeated rinsing with hot water to remove chemical residues. We do not use soaps/detergents/bleach during weekly cleanings to avoid the possibility of harming the frogs by exposing their porous skin to potentially harmful chemicals. Compared to other vertebrates, frogs are FAR more sensitive to chemicals in their environment, which is what makes them such important "canaries in the coal mine" to monitor the health of natural environments. Thus, with frogs, there is potentially a trade-off between cleanliness and chemical toxicity. Based on our experience running the IMHA since 2006, and based on conversations with our area veterinarians over this time frame (Drs. Allison Jarvis, Paul Berger, Angie Craig, and Felicia Boynton), we believe our current sanitation practices balance this trade-off quite well.
2001-37746A	Bee, Mark	Amphibian (Other)	BLOOD COLLECTION LIMIT	We do NOT actually need an exception to the blood collection limit. Instead, we are using this space to provide additional information on this procedure. Previous stipulations about making these blood draws under anesthesia as a terminal procedure suggest this additional information might be helpful. (Is there a better place for this somewhere else in e-protocol??) We are interested in examining the effects of endogenous and exogneous hormones on behavior. Survival blood draws are necessary because we often draw blood prior to conducting behavioral experiments. More importantly, we are interested in the possibility of using experimental designs that balance the order of behavior testing and hormone sampling, which allows us to control for the effects of one on the other. We recently showed that 10 tested females unanimously exhibited robust behavioral approaches toward male mating calls when tested immediately (< 2 min) following cardiac puncture (Gall et al. 2019). That is, within less than 2 min of having blood drawn from their hearts, females were interested in mating and exhibited normal mating behavior. This suggests to us that frogs may be more tolerant of cardiac puncture than other laboratory animals.

2001-37746A	Bee, Mark	Amphibian (Other)	NON-PHARMACAUTICAL GRADE COMPOUNDS	Based on previous conversations with Kristin Pilon, our understanding is that pharmaceutical-grade tubocurarine is not available. Paralytics must also be prepared in amph bian ringers solution. When conducting experiments that require immobilization, we prepare fresh tubocurarine solutions (tubocurarine as powder dissolved in amphibian ringers solution) on a monthly basis and autoclave these solutions prior to use in animals. Paralytics must be prepared in amph bian ringers solution. When conducting experiments that require immobilization, we prepare fresh succinylcholine solutions (succinylcholine chloride as powder dissolved in amphibian ringers solution) on a monthly basis and autoclave these solutions prior to use in animals.
2001-37750A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Animals have previously been implanted using minimally invasive technique with a vascular access port to ensure proper delivery of the planned immunosuppression regimen prior to transplant and facilitate cooperation with ongoing clinical care related to fluid administration and clinical monitoring in the absence of chemical or physical restraint. (Group B recipients only: Kidney transplant and naive kidney nephrectomy)
2001-37778A	Tranquillo, Robert	Sheep (Biomedical)	MULTIPLE SURGERY	It is important to understand if the conduit can support a transcatheter valve implant, as this would be the expectation clinically.
2001-37780A	Bartolomucci, Alessandro	Mice	MULTIPLE SURGERY	We request an exception to allow for our use of AAV viral infusion and chronic icv peptide delivery in otherwise undisturbed animals. Use of two separate surgical procedures (AAV + minipump implantation) is beneficial, as it will reduce the amount surgery done at one time (reduces potential for tissue trauma), minimizes the need for anesthesia supplements during surgery, allow animals to fully recover between each class B surgery. It also maximizes the potential for animals to reach the study completion. Maximal viral-mediated gene transfer occurs approximately 3-8 weeks after infection, depending on the brain region and neuronal process (cell body versus terminals) being targeted. In vitro and in vivo studies begin at this time, but require up to 4 weeks of additional time for completion. This method will substantially reduce the overall number of animals required to complete experimental studies. This conservation of animal resources is particularly useful when studies occur in transgenic animals, which require considerable time and money to generate. The time between individual surgeries will be at ~4 weeks. We do not anticipate two individual survival procedures to produce any functional deficits. Animals will be monitored after each surgery as descr bed above, and will be given saline (0.5 ml, s.c.) and ketoprofen (5 mg/kg, s.c.) to counteract any post-operative dehydration or pain, respectively.

2001-37780A	Bartolomucci, Alessandro	Mice	SOCIAL HOUSING	Animals may be singly housed at times to prevent stress, injury and death due to same-sex incompat bility between male mice that can be experienced even in groups of male siblings in some strains of mice. Animals may be singly housed at times to allow full recovery from surgery during the immediate post-surgical phase and as required for the accurate assessment of indirect calorimetry, food intake and locomotor activity during the duration of the recording (up to 8 weeks).
2001-37790A	Goyal, Sagar	Pig (Agricultural)	EUTHANASIA METHOD	The veins of these animals are easily accessible for the administration of euthanasia solution.
2001-37795A	Pang, Hongbo	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have used avertin routinely in our previous studies (Pang HB et al, 2014). It is easier to store and use in the lab. Avertin will be prepared and stored using these guidelines: 1. Sterile filter with 0.2 micron filter 2. Store and use under sterile conditions 3. Store in the dark bottle or foil covered container 4. Store stock and working stock solutions at 4°C 5. Do not use if the solution becomes discolored or has a precipitate 6. Check pH before each use and use only when greater than pH 5 7. Discard all solutions after 4 months, including the stock solution 8. Label all containers with name & concentration of drug, date prepared and initials of person making the solution
2001-37795A	Pang, Hongbo	Mice	SOCIAL HOUSING	The group house could not guarantee the same alcoholic dosage in the liquid diet for every animal. So according to reference 1, the mice need to be separated into every single cage (1 mouse in 1 cage with a liquid diet feeding-tube inside) for the same alcohol treatment to each animal. 1. Adeline B, et.al. Nature Protocols, Vol.8 No.3, 2013, 627-637

2001-37798A	Brady, Valerie	Fish (Other)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	We will follow INAD policy on anesthesia data recording (added as attachment). We are inducing minor sedation to make fish handleable, so their time in anesthesia until recovered is expected to be less than 15 minutes. INAD policy states that individual fish records do not need to be collected for fishes immersed in 40 mg/L solution, become handleable within 5 minutes and are therefore removed from immersion, and time to recovery does not exceed 20 minutes (pg. 11 of INAD:AQUI-S 20E - Study Protocol). Deviations outside these parameters will be recorded to comply with INAD program. At minimum, we will be collecting and reporting information on dosage, fish species, numbers of each species treated, and whether the outcome was satisfactory (i.e. did fish become handleable within 5 minutes and did they recover within 20?). We will start with 40 mg/L solution strength but can adjust in the field. For example, trout may enter unintended deep sedation in a 40 mg/L solution, and non-trout fishes may take longer than 5 minutes to attain adequate sedation. If that occurs we will start treating trout first at a 30 mg/L, and after all trout are tagged, double the solution strength to 60 mg/L to accommodate non-trout fishes. Dosage adjustments will always remain within the accepted ranges for trout and non-trout fishes provided in INAD Study Protocol pg. 11.

2001-37801A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Excluding the MPTP surgeries, a total of three pr mary (i.e., not repair/replacement) surgical procedures may be performed to properly instrument the animal to achieve the experimental aims. This includes 1) placement of the head restraint post, 2) chamber/micro-array placement, and 3) pulse generator implantation. Although it is possible that these procedures may be combined, thereby reducing the total number of surgeries required, it is more often the case that they are performed separately. The motivating factors for separating these procedures include: 1) limiting the overall duration of any one surgical procedure (anesthetic episode), and 2) maximizing the overall integrity and lifespan of the implant. Additional surgeries are required for induction of the parkinsonian state. Response to the MPTP neurotoxin varies across animals and it is considered best practice to approach the desired severity level gradually rather than risk overshooting the behavioral target and inducing an unnecessarily severe parkinsonian state. This approach typically requires multiple intra-carotid surgical procedures combined, in some cases, with systemic injections to safely achieve the desired severity level. Chamber/headpost repairs, though rare, may be necessary if either is damaged by the animal. We justify the repairs as they limit the number of animals used in the study. As illustrated in the Experiment Design section, we typically do instrumentation survival surgeries in animals prior to MPTP administration, in part so that they are as healthy as possible and recovery from the surgical procedures is not complicated by the animal's parkinsonian condition. If parkinsonian animals do require additional survival surgeries (e.g. unexpected headcap repair), the RAR veterinary staff will be consulted and a determination will be made as to whether the additional survival surgery is appropriate given the animal's current health status. Typically two-three primary (i.e., not repair/replacement) surgical procedures are performed to properly instrument the animal to achieve the experimental aims. This includes 1) chamber / headcap placement 2) micro-array placement 3) microdrive placement. The motivating factors for separating these procedures include: 1) limiting the overall duration of any one
2001-37801A	[redacted]	Nonhuman Primate (Macaques)	SOCIAL HOUSING	All animals will be pair housed with the exception those animals who have repeatedly shown an inability to accept paired housing (excessive and sustained aggression/injury, self-injury, or persistent antisocial behaviors). Odd numbers of animals or attrition of a partner may also result in singly house animals until a suitable new match/pairing can be determined. Some pair-housed animals may be temporarily separated during surgical recovery and/or based on experimental demands. In all cases, however, the animals will have ready access (visual, smell, etc.) to other animals in the colony space.

2001-37802A	Tran, Phu	Mice, Rat	EUTHANASIA METHOD	Dr. Tran and his staff are experienced in performing mouse decapitation proficiently. Rapid decapitation without sedation is performed with large sharp scissors only in juvenile rats (P0, P7, or P15 timepoints in our experimental design). All laboratory personnel who perform this euthanasia method have demonstrated technical skill with the method. All rat pups undergoing rapid decapitation are significantly under 200g (as stipulated by the University of Minnesota RAR decapitation guidelines). Staff performing decapitation will have demonstrated technical skill to be able to do this. Also, E17 mice are small, allowing for extremely rapid decapitation.
2001-37804A	Fife, Brian	Mice	MULTIPLE SURGERY	Animals will undergo subsequent nephrectomy to assess the viability of the islets (day +30-100), essential to the research question of this study.
2001-37804A	Fife, Brian	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Bromodeoxyuridine is not acutely toxic to mice at the dose being given and no impact on the animals health is expected. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized. The water consumption of the mice should not change with the addition of these antibiotics and no weight loss is anticiptated. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized.
2001-37804A	Fife, Brian	Mice	EUTHANASIA METHOD	RAR protocol no longer requires sedation prior to cervical dislocation for trained lab staff. Per email from Dr. Gillett DVM: As a result of changes in the 2013 report of the Americal Veterinary Medical Association Panel on Euthanasia, the IACUC and RAR have made revisions to the chart of Acceptable methods of euthanasia for research and teaching animals. Cervical dislocation and decapitation of small rodents no longer require scientific justification or an explanation of why other methods are not suitable. With some exceptions small rodents may be euthanized by these physical methods if performed by individuals with a demonstrated high degree of technical proficiency.

2001-37805A	Ingolfsland, Ellen	Rat	BLOOD COLLECTION LIMIT	Severe anemia is desired to mimic the degree of anemia seen clinically in preterm neonates. This phlebotomy protocol has been validated and published (Wallin DJ, Tkac I, Stucker S, et al. Phlebotomy-induced anemia alters hippocampal neurochemistry in neonatal mice. Pediatric research. 2015;77(6):765-771.) and is used in our lab under IACUC protocol 1711-35329A in mice. Mice in that protocol, and rats in our protocol tolerate this procedure well. Phlebotomized rats who are put in the hyperoxia/hypoxia chamber have a small increased risk of death (approximately 1 pup per 36 per our previous experience). Further, a study of iron deficiency anemia which fed dams an iron deficient diet and then after weaning, fed pups an iron deficient diet, found pups to have hematocrits of 18% at 6 weeks of life (Oh S, Shin P, Chung J. Effects of developmental iron deficiency and post-weaning iron repletion on the levels of iron transporter proteins in rats. Nutr Res Pract. 2015; 9(6):613-618.)
2002-37827A	McGaugh, Suzanne	Fish (Other), Fish (Other), Mexican cave tetra	NON-PHARMACAUTICAL GRADE COMPOUNDS	Not available in pharm-grade
2002-37832A	Mand, Sandy	Fish (Other)	SANITATION FREQUENCY	We use either under-gravel filters where the sediment waste on the gravel is siphoned out monthly or above-tank charcoal filter systems where the charcoal cartridges are changed based on manufacturer's recommendations.
2002-37833A	Perlingeiro, Rita	Mice	MULTIPLE SURGERY	In some few cases (Serial Injury) we will re-injure the muscle with cardiotoxin after 8-weeks, then 3-week, then 3 more weeks. This is to test if the cells are capable of regenerating under for stringent conditions after multiple injuries. As stated elsewhere, the the surgery is minor, involving a small incision with little noticeable pain, distress and functional deficit similar to the first cardiotoxin injection that has been descr bed elsewhere.

2002-37833A	Perlingeiro, Rita	Mice	72 HOUR POST-OP ANALGESIA POLICY	Because the effect of analgesics on muscle regeneration is unknown, and because we want to examine the role of inflammatory cells in skeletal muscle damage/regeneration, we cannot use any agents that may interfere with inflammation. These mice can therefore not be treated with analgesics. The surgeries that required post-op analgesics are minimally invasive requiring only a small (~0.5cm) incision and needle injection. The veterinarian Dr. Hashway has commented that the surgery would cause very minor pain and therefore should not substantially negatively affect the welfare of the animals. If going forward, we find that we cannot perform these experiments due to excessive pain/distress we will then add an analgesic. However, since we do not know the effects of opioids or local analgesics on muscle regeneration, in addition to the strong effect of addiction and dependence that the mice may experience, we request a switch to Pain class C without the administration of any analgesics. We have been having low engraftment since using oral Ibuprofen and have some evidence that analgesics could interfere with our experiments: Stem Cells. 2015 Apr;33(4):1173-86. doi: 10.1002/stem.1927. Cyclooxygenase-2 or tumor necrosis factor-α inhibitors attenuate the mechanotransductive effects of pulsed focused ultrasound to suppress mesenchymal stromal cell homing to healthy and dystrophic muscle. (see attachment) This reference shows the effect of ibuprofen on muscle cells migration: https://www.ncbi.nlm.nih.gov/pubmed/31464636 As such, the use of ibuprofin has been removed from the protocol.

2002-37833A	Perlingeiro, Rita	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Our justification is that TBE is only used as anesthetic in non survival procedure in the context of physiological recording of muscle force using an organ bath, where our usual anesthetic ketamine/xylazine is not indicated due to its potential muscle relaxant effect as well as its sensory and motor uncoupling activity from the brain. The alternative of isoflurane pose special challenges with the scavenging of waste anesthetic gases and the requirement of an apparatus/system that is only located in our RAR facility that is too distant from our complex Organ Bath apparatus, neither of which can be moved. Additionally, TBE has been approved by our IACUC on our protocol. TBE is reconstituted in sterile conditions as 2,2,2 Tribromoethanol 0.5 g in 1 mL of 2 methyl-2 butanol, mixed at 37 C and diluted with 40 mL distilled sterile water. The final solution is then filtered through 0.22 micron filter and kept refrigerated (4c) and protected from light. It can be stored up to 2 weeks but it is generally freshly prepared prior to use. Additionally, we do not use if the solution becomes discolored or has a precipitate and we check pH before each use and use only when greater than pH 5. We discard all solutions after 4 months, including the stock solution and label all containers with name and concentration of drug, date prepared and initials of person making the solution. (see attached SOP for prep) Our justification is that TBE is only used as anesthetic in non survival procedure in the context of physiological recording of muscle force using an organ bath, where our usual anesthetic ketamine/xylazine is not indicated due to its potential muscle relaxant effect as well as its sensory and motor uncoupling activity from the brain. The alternative of isoflurane pose special challenges with the scavenging of waste anesthetic gases and the requirement of an apparatus/system that is only located in our RAR facility that is too distant from our complex Organ Bath apparatus, neither of which can be moved. Additionally, TBE has been approved by our IACUC on our protocol.
2002-37847A	Whittaker, Joe	Mice, Voles, Ground Squirrels, etc, Shrews, various species, Bats, various species, Small to Medium Carnivores	PHYSICAL RESTRAINT	There will be no intermittent release. Once set traps will remain undisturbed. Any more frequent checks would impact other animals entering traps and lower capture rates. Our goal is to capture as many individuals and different species as possible. Extra time in the field would negatively impact this goal. Traps are routinely left overnight when trapping nocturnal or crepuscular animals. For the overnight traps there will not be any release. The squirrels will have food and room to move around the inside of the trap.

2002-37847A	Whittaker, Joe	Mice, Voles, Ground Squirrels, etc, Shrews, various species, Bats, various species, Small to Medium Carnivores	EUTHANASIA METHOD	We will only use cervical dislocation in the event of a severe injury and to bring about an immediate end to suffering. Attempts to provide any anesthesia would further prolong suffering. I have never had to do this procedure on any of the medium carnivores I have captured. If a medium-sized carnivore is in such distress to warrant euthanasia it will l kely already be unconscious or debilitated and in such distress that attempts to sedate or use anesthesia would prolong suffering. If found in the field and in this level of distress immediate severing of the spinal cord would be performed. Any animal capable of moving and showing any potential for release would never need to be euthanized.
2002-37849A	Ondrey, Frank	Mice	SOCIAL HOUSING	We request to house one female mouse, singly, once smoking exposures begin. We have 7 female and six male mice for this experiment. One female is our naive mouse, with no experimental procedures performed. This mouse is the first mouse we will scan, acquiring parameters for the remaining scans. Initially, this mouse will be housed with another 3 females. On the Monday when the 12 other mice begin cigarette smoke exposures, we want to begin the single housing of the naive mouse. She will be housed singly for 15 to 20 days, until the smoke exposures are complete. Scans are performed after the smoke exposures are complete. We have determined that this mouse should not be exposed to the residual components on the fur of the smoke exposed mice. Communal grooming will expose this mouse to smoke components. She must be completely naive for the scanning parameters.
2002-37859A	Liang, Jennifer	Fish (Zebra fish)	MULTIPLE SURGERY	The fish recover from this procedure in a couple of minutes, and will breed and eat immediately after they wake up. There are no signs of any affects after they wake up.
2002-37859A	Liang, Jennifer	Fish (Zebra fish)	72 HOUR POST-OP ANALGESIA POLICY	The fish completely recover after 1-2 minutes. They behave normally, including eating and spawning. Thus, there is no sign that they are in pain.
2002-37859A	Liang, Jennifer	Fish (Zebra fish)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	The fish immediately recover and are not altered in any way, so do not need pain management. (Anesthesia and imaging of developing fish) The fish are not harmed by this procedure and typically recover completely in a few minutes. They do not need long term pain management. (Anesthesia and imaging of adult fish) The fish completely recover after 1-2 minutes. They behave normally, including eating and spawning. Thus, there is no sign that they are in pain. (Fin clips for genotyping)
2002-37873A	Osborn Jr, John	Sheep (Biomedical)	SOCIAL HOUSING	Sheep on special diet will need to be housed with only other sheep on special diet, if no other sheep are currently in RAR that are on this diet than single housing will be necessary. We also perform balance measurements on this diet and the need for single housing is necessary for this. Single housing will also be used to determine food/water intake for diagnostic purposes.

2002-37875A	Cvetanovic, Marija	Frog (Other), Rat, Guinea Pig, Mice, Mice	SOCIAL HOUSING	Mice with implants may need to be singly housed to avoid cage mates chewing on the implants.
2002-37875A	Cvetanovic, Marija	Frog (Other), Rat, Guinea Pig, Mice, Mice	EUTHANASIA METHOD	Frogs will be euthanized by double-pithing followed by decapitation. We have to resort to physical methods for euthanasia as chemical methods such as barbiturates, tricaine or benzocaine produce long-lasting blockade of voltage-dependent and ligand-dependent ion channels which would confound the experiments aimed to measure the excitability of neurons and axons.
2002-37877A	Jenkins, Marc	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	The food consumption of the mice should not change with these diets and no weight loss is anticiptated. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized.
2002-37878A	Pieters, Maria	Pig (Agricultural)	EUTHANASIA DEATH/MORIBUND ENDPOINT	Mortality will be recorded. However this will be regular farm mortality.
2002-37885A	Dudley, Samuel	Mice	MULTIPLE SURGERY	Mice may receive multiple survival surgeries, including: coronary ligation or uninephrectomy + DOCA implantations, AAV9 jugular vein injection, and transmitter subcutaneous implantation. Mice will undergo either coronary ligation to induce myocardial infarction, or uninephrectomy plus DOCA pellet implantation to induce hypertension. Both surgeries will cause heart failure (HF) in 4-8 weeks. Mice will receive intravenous injection of AAV9 vector before or after HF-inducing surgery to alter the expression of specific genes. Subcutaneous implantation of transmitters will be performed before the experiment endpoint to assess the arrhythmic risk in mice. At least 1-2 weeks of recovery time will be allowed between any two survival surgeries to minimize the stress. Mice will be closely monitored after survival surgery. Any signs of ill health will exclude the animal from following study. Mice will undergo uninephrectomy plus DOCA pellet implantation to induce hypertension leading to heart failure (HF) in 6-8 weeks. DOCA pellets will be implanted every 21 days to cover the time period (6-8 weeks) required for HF to develop.
2002-37885A	Dudley, Samuel	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	We noticed that myocardial infarction induced by coronary ligation led to increased mortality in mice. We suspect that lethal arrhythmia may be the cause of the death. To prove that, we need to record the heart rhythm by telemetry when death happens.
2002-37885A	Dudley, Samuel	Mice	ENVIRONMENTAL ENRICHMENT	□ To avoid signal cross talking between the transmitter inside each individual mouse and receiver, mouse has to be housed singly.

2002-37885A	Dudley, Samuel	Mice	SOCIAL HOUSING	Mouse during telemetry recording will be housed singly to avoid cross ta kings between transmitters. Mouse with uninephrectomy plus DOCA pellet implantation will be housed singly to avoid the fight between mice which may cause skin damage where the DOCA pellet is implanted.
2002-37888A	Vulchanova, Lucy	Mice	MULTIPLE SURGERY	In some mice, brain injections of viral vectors or neuronal tracers will precede (1-6 weeks) or follow (2-4 weeks) Spared Nerve Injury. The addition of these injections are not expected to exacerbate the level of pain and distress associated with spared nerve injury. The rationale for injection in VPL or parabrachial nucleus prior to SNI is: 1) to label projection neurons for identification in subsequent ex vivo physiological experiments, and 2) to deliver neuromodulatory genes to projection neurons for subsequent behavioral or ex vivo physiological experiments. 1. In some mice, brain injections of viral vectors or neuronal tracers will precede (1-8 weeks) or follow (2-8 weeks) Spared Nerve Injury. The addition of these injections are not expected to exacerbate the level of pain and distress associated with spared nerve injury. The rationale for administering the two survival surgeries in the same animal is that the viral injections will allow us to study and manipulate specific neurons within the circuits that mediate chronic hypersensitivity in the SNI model. 2. In some mice that receive a brain injection, it will be necessary to administer a second viral injection in the same location 2-4 weeks after the first injection. Although we originally proposed to administer the two viral injections through an in-dwelling cannula and have approval for this approach, we are concerned that we don't know how the scar tissue that forms around the cannula will affect the distribution of the second vector. Therefore, we would like to compare the dual injection approach to the in-dwelling cannula approach. We do not expect that the second injection will result in additional pain or distress. 3. In some mice that receive a brain injection, it will be necessary to administer a second viral injection in the spinal cord 2-8 weeks after the first injection. Two viral vector injections are needed for monosynaptic gene transfer. (Injection of viral vectors or neuronal tracers in brain nuclei) The mice undergoing this non-survival procedure may have had
2002-37888A	Vulchanova, Lucy	Mice	72 HOUR POST-OP ANALGESIA POLICY	Post-operative analgesic therapy is contraindicated because the objective of the procedure is to determine whether the experimental treatment causes hypersensitivity. Provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied.
2002-37888A	Vulchanova, Lucy	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Exception is requested for the use of non-pharmaceutical grade urethane for non-survival surgeries. In our experience, this usually produces a very stable and long-lasting (8-16 hours) state of anesthesia, which is the reason for choosing this non-pharmaceutical grade anesthetic agent for these experiments.
2002-37888A	Vulchanova, Lucy	Mice	SOCIAL HOUSING	Mice with in-dwelling canullae will be single-housed for approximately 3 weeks.

2002-37893A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (Angiography and pulmonary valve expansion (with balloon)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this interpositional pulmonary conduit would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the conduit. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (CT imaging)
2002-37897A	Sachdev, Deepali	Mice	TUMOR ENDPOINT CRITERIA	While the injection itself should not cause significant pain (since the animal is anesthetized), we will be allowing these tumors to grow (in control animals) until the tumor burden necessitates euthanasia, i.e. the animal becomes mor bund. Hence, we have designated this procedure as pain Class C. In order to assess the full extent of which IGF1R targeted drugs and CDK4/6i reduce established bone metastases, we need to be able to observe the control animals up until the state at which they become moribund. If animals are sacrificed earlier, we may miss metastases in drug treated animals that arise late or that have acquired resistance to the treatment. The term moribund refers to an animal that is near death or in the process of dying. Animals in this state are often comatose (unresponsive and unaware of stimuli). When we first notice signs of lethargy, lack of eating/drinking, ruffled fur, posture, increased respiratory rate, and lack of grooming in these subset of animals, we will begin monitoring animals twice daily (holidays and weekends included). Other clinical signs that indicate the primary tumor(s) has metastasized may include seizures, swollen abdomen, labored breathing. We will communicate with RAR extensively when any of the above symptoms are observed and are open to treatment options at onset of symptoms outlined (analgesia, soft bedding, moist food, easy to reach food/water, etc).

2002-37897A	Sachdev, Deepali	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	For 50 mice injected intracardiac with MDA-MB-231-BoM: While the injection itself should not cause significant pain (since the animal is anesthetized), we will be allowing these tumors to grow (in control animals) until the disease burden necessitates euthanasia, i.e. the animal becomes mor bund. Hence, we have designated this procedure as pain Class C. In order to assess the full extent of which IGF1R targeted drugs and CDK4/6i reduce established bone metastases, we need to be able to observe the control animals up until the state at which they become mor bund. If animals are sacrificed earlier, we may miss metastases in drug treated animals that arise late or that have acquired resistance to the treatment. Frequency of observation of these animals in outlined in the health and monitoring section. Death is not an endpoint for these animals.
2002-37899A	Kelly, Rosemary	Pig (Biomedical)	MULTIPLE SURGERY	The placement of the constrictor on the LAD is an essential component to the creation of hibernating myocardium. Pain and distress will be minimized by using a multi modal ,balanced anesthetic protocol. The pig are socialized with with people to decrease the fear response before and after the procedure to ease in handling and transport. The pigs are monitored closely in recovery until they can stand on their own. (Thoracotomy - LAD Hibernation) The revascularization procedure is an essential component of this study to evaluate the effects of bypass on hibernating myocardium and how mitochondrial transplant may serve as an adjunctive therapy. Pain and distress will be minimized by using a multi modal ,balanced anesthetic protocol. The pig are socialized with with people to decrease the fear response before and after the procedure to ease in handling and transport. The pigs are monitored closely in recovery until they can stand on their own. (Revascularization or Off Pump Bypass- Sternotomy and femoral cut down)
2002-37899A	Kelly, Rosemary	Pig (Biomedical)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	The process of loading the animals and weighing them has the potential of causing distress. Decreasing the frequency will provide RAR and the lab the objective data needed without stressing the animals more than necessary.
2002-37899A	Kelly, Rosemary	Pig (Biomedical)	SOCIAL HOUSING	After the hibernation and revascularization procedures, pigs will be singly housed for 7 days while the incision(s) heal to reduce the risk that incisions could be disrupted by another animal, and to protect the incision(s) from infection during the healing phase. After 7 days, pigs are returned to group housing. The pigs will still have visual, auditory, and olfactory contact with other pigs in the room during the post-operative single housing.

2002-37901A	Kim, Jong Hyuk	Mice	EUTHANASIA METHOD	1. Cervical dislocation is used because organ congestion must be avoided to assess tumor dissemination and architecture. A common side effect of sedatives, barbiturates, and CO2 inhalation is congestion, which can obscures pathologic changes in vascular organs and tumor vasculature, and can thus render experiments moot (unable to analyze vascular effects of genetic alteration or treatment). □ □ 2. When performed by experienced personnel, cervical dislocation leads to instantaneous death. Sedation can increase anxiety.
2002-37905A	Liu, Julia	Mice	SOCIAL HOUSING	In Aim 3, mice will undergo indirect calorimetry and placed individually in automated metabolic cages (see procedure for indirect calorimetry). After the period of monitoring (maximum 5 days), female mice will be recombined with their previous cagemates.
2002-37907A	Andersen, David	Bird (Other)	EUTHANASIA METHOD	We do not anticipate needing to euthanize any animals (no animals were injured in our previous study of red-headed woodpeckers). Nevertheless, in the unl kely event that a researcher encounters a severely debilitated animal, cervical dislocation is the only technique that can be quickly and reliably administered in the field. Carrying a CO2 tank, barbiturates, or anesthesia in the field would be impractical and potentially dangerous.
2002-37909A	Mc Pherson, Scott	Mice	72 HOUR POST-OP ANALGESIA POLICY	Post-operative pain management for this procedure has been addressed in the IACUC applications (latest is #1706-34882A) of Dr. Dale Gregerson, University of Minnesota, Dept. of Ophth. To reiterate regarding use of buprenorphine or other post-operative analgesics, Dr, Steven Kaufman (Ophthalmologist-cornea surgeon, University of Minnesota) and Dr. Roland Gunther, (Veterinarian, University of Minnesota RAR) have been consulted. Both agree that only topical proparacaine is needed (which we have included in the procedure details) and no other post-operative analgesics are needed. For reference, note that human patients do not receive general anesthesia or post-operative analgesics for such injections, even when done repeatedly and for months to years. Only topical anesthetic drops, such as proparacaine, are used. For these reasons, we see no need for additional post-operative analgesics in these mice. Further, there is a growing literature on the effects of opioid receptor agonists on the survival of stressed or injured neurons. This would be an unwanted effect that could confuse and compromise the results of our experiments designed to test retinal function. The use of NSAIDS and glucocorticosteroids as post-operative analgesics has been considered but they have also been shown to affect neuron survival post-injury, For these reasons, plus the short time from injection to experiment endpoint, we request suspension of use of buprenorphine or similar post-operative analgesics (opiates) for this survival surgery procedure.

2003-37916A	Fairbanks, Carolyn	Mice, Rat	MULTIPLE SURGERY	For the study of mecahnisms electroacupuncture-induced analgesia we need to both induce a state of hypersensitivity (reflective of neuropathic pain) requiring peripheral nerve injury surgery and then later implant spinal microdialysis fibers in order to collect neurotransmitters during and immediately following application of electroacupuncture. These procedures will be separate by a week. For the study of the efficacy of gene therapeutic intervention in rat analgesia we need to both stereotaxically inject viral vectors to specific brain regions and then later implant intravenous catheters for opioid self-administration studies. These procedures will be separate by at least two weeks.
2003-37916A	Fairbanks, Carolyn	Mice, Rat	72 HOUR POST-OP ANALGESIA POLICY	Subjects with peripheral neuropathy cannot receive post-operative analgesics because these will inhibit the spinal neuroplasticity intended to induce the condition of study.
2003-37916A	Fairbanks, Carolyn	Mice, Rat	EUTHANASIA METHOD	We are trained and experienced in the appropriate technique and anesthetization and sedation elevates the stress to the subject. We only intend to use cervical dislocation as an emergency method to alleviate unanticipated distress of the subject (rare instances).
2003-37921A	Mashek, Douglas	Mice, Mice	BLOOD COLLECTION LIMIT	This is a terminal blood collection under anesthesia to get donor red blood cells (Blood collection for donor red blood cells for metabolic clamp studies) The metabolic studies require samples for analysis of liver glucose production, kidney glucose production, intestine glucose production, hormone concentrations, and metabolite levels. To prevent a fall in hematocrit, donor red blood cells resuspended in 10U/ml heparinized saline will be infused venously (please see accompanying procedure) (Arterial sampling via carotid artery catheter during metabolic clamp studies)
2003-37921A	Mashek, Douglas	Mice, Mice	72 HOUR POST-OP ANALGESIA POLICY	1. An extensive history of this surgery in mice (since 1999) via the NIH Mouse Metabolic Phenotyping Consortium has shown that more that 24 hours of analgesics is not necessary for the well being of the mouse. The mice do not, except in rare cases, exhibit loss of weight, piloerection, unkempt coat, hunched posture. If this occurs additional analgesic will be provided. 2. The studies within this protocol are aimed at assessing metabolism. Keeping the use of analgesics to a minimum is to avoid metabolic alterations not intended by the experimental design is imperative. *Please note that I would like to have a veterinarian assess the initial mice post-surgery to determine if the full 72 hours is required. (Jugular Vein and Carotid Artery Catheter Placement)
2003-37921A	Mashek, Douglas	Mice, Mice	ENVIRONMENTAL ENRICHMENT	□ Individual housing is mandated by some of the instrumentation in use for the determination of accurate metabolic responses such as Indirect calorimetry, locomotor activity or meal pattern analysis, where both energy expenditure and mouse eating behavior can be evaluated accurately only for individual subjects.

2003-37921A	Mashek, Douglas	Mice, Mice	SOCIAL HOUSING	Some feeding studies involving caloric restriction (protocol 2) will require individual housing since we need to know exactly what control mice are eating so we limit the restriction group to 70% of control.
2003-37929A	Starr, Tim	Mice	TUMOR ENDPOINT CRITERIA	Note regarding small ulcerations: A small subset of mice with tumors may develop minor skin ulceration over the tumor. This is not an expected complication. The tumors appear to be getting rubbed against the cage wire bar during normal ambulation. The mice are otherwise active, alert, and normal. For tumor ulcerations that are superficial, dry, and not bleeding, RAR staff will administer treatments such as topical application of dilute chlorhexidine or ointments In cases where the tumor volume cannot be measured externally and mice do not display any of the specific tumor endpoint criteria, we will use moribundity as a terminal endpoint in the study. The nature of the cancers we work with (gastrointestinal tract, lung, and ovarian) do not generally manifest as measurable tumors and the other tumor endpoint criteria are not evident. For these animals we cannot easily determine morbidity or tumor mass as a percentage of body weight, as it is currently not feasible to conduct advanced imaging such as MRIs or CT scans. Animals will be considered moribund if they do not respond to manual stimulation, are immobile, and/or they are unable to eat or drink.
2003-37929A	Starr, Tim	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	In cases where the tumor volume cannot be measured externally and mice do not display any of the specific tumor endpoint criteria, we will use moribundity as a terminal endpoint in the study. The nature of the cancers we work with (gastrointestinal tract, lung, and ovarian) do not generally manifest as measurable tumors and the other tumor endpoint criteria are not evident. For these animals we cannot easily determine morbidity or tumor mass as a percentage of body weight, as it is currently not feasible to conduct advanced imaging such as MRIs or CT scans. Animals will be considered moribund if they do not respond to manual stimulation, are immobile, and/or they are unable to eat or drink.

2003-37929A	Starr, Tim	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	The choice of general anesthetic agents can be difficult and confusing since every agent has specific strengths and weaknesses. Avertin has been used as an anesthetic in many labs for many years at the University of Minnesota and was routinely approved under IACUC protocols. Avertin has also been used at many other institutions, including the University of Wisconsin and Jackson Laboratories, where it was the "anesthetic of choice" for mice undergoing short surgical procedures. I have personally used Avertin under IACUC approved protocols in the past and it has worked well with no untoward or unexpected events. Avertin does not cause as much bradycardia including effects on loading conditions and ventricular function compared to ketamine (Hart, et al., Am J Physiol Heart Circ Physiol 2001) and Avertin has a lower mortality rate than Ketamine (Harrison, et al., Investigative Ophthalmology & Visual Science May 2008, and personal experience). Avertin not only acts as a general anesthetic, it also provides good analgesia, relatively rapid onset (5 minutes), and appropriate time of effect for procedures outlined in this protocol (30-60 minutes). Moreover, the ability to give avertin by i.v. or i.p. injection avoids exposure to inhalation of volatile gases. Avertin was previously supplied in a pharmaceutical grade by Winthrop Laboratories. While no longer available from that source, the 2 components are available in a high-quality form from Aldrich Chemicals. Importantly, the solution is sterile filtered (0.2 micron filter) before use, eliminating the risk of infection from the drug. To prepare a 50X stock we dissolve 2.5g of 2,2,2-tribromoethanol in 5 mL of tert-amyl alcohol in a 20 ml glass vial. The stock solution is stored in dark at 4ºC for up to 4 months. The working solution is prepared by diluting the stock 1:50 into PBS and warmed to 37ºC to avoid formation of crystals. This diluted working stock is then kept in the dark at 4-8 degrees C and used within 2-3 weeks. Prior to use, the working solution is sterile filtered (0.2 micron). Any solution demonstrating discoloration or precipitate is discarded. Furthermore, the working solution is tested for pH, and discarded if pH <5. All containers are labeled with name and
2003-37940A	Dudley, Samuel	Mice	MULTIPLE SURGERY	Mice will undergo 2 survival surgeries, jugular vein injection and subcutaneous transmitter implantation. Mice will receive jugular vein injection of AAV9 vectors to alter the expression of specific genes. Subcutaneous transmitter implantation will be performed before the endpoint of experiment to assess the arrhythmic risk in mice. At least 1 week of recovery time will be allowed between the two survival surgeries to minimize the stress. Mice will be closely monitored after survival surgery. Any signs of ill health will exclude the animal from following study. Jugular vein injection will used to deliver AAV9 to manipulate gene expression in heart tissue. Compared to traditional peripheral vein routes, for example, tail vein injection, jugular vein injection, has less systemic retention of virus in peripheral organs and thus allows more virus arrive heart to effect. After AAV9 jugular vein injection, mice will be given 1-2 weeks to recover before receive transmitter subcutaneous implantation. Transmitter can record electrocardiogram signals for assessment of arrhythmic risk.

2003-37940A	Dudley, Samuel	Mice	ENVIRONMENTAL ENRICHMENT	To avoid signal cross talking between the transmitter inside each individual mouse and receiver. They have to be housed singly.
2003-37940A	Dudley, Samuel	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Before surgery and during surgery, continuous documentation of appropriate anesthesia will be recorded every 10 minutes (at least every 15 minutes).
2003-37940A	Dudley, Samuel	Mice	SOCIAL HOUSING	Mouse during telemetry recording will be housed singly to avoid cross ta kings between transmitters.
2003-37957A	Baldo, Caroline	Sheep (Biomedical), Pig (Biomedical)	MULTIPLE SURGERY	There is no surgical procedure on this protocol. Animals may undergo more than one anesthetic event to evaluate the prototype device. Since there is no surgery, it is poss ble to recover the animal from anesthesia and utilize them for more research.
2003-37967A	Garry, Mary	Mice	TAIL BIOPSY	the lidocaine cream will be "applied once 5 minutes prior to the tail biopsy procedure.
2003-37970A	Garry, Daniel	Mice	EUTHANASIA METHOD	Cervical dislocation will be performed by technically competent staff to ensure quick and complete euthanasia
2004-37999A	Parr, Ann	Rat	MULTIPLE SURGERY	The rat must first be injured and recover to model a spinal cord injury so that we can test our cell transplants. Pain and distress will be controlled through analgesics and antibiotics. Three survival surgeries are necessary because a spinal cord injury is necessary to evaluate whether sNPC/scaffold transplantation is effective at resolving the CNS deficits associated with spinal cord injury. Then, anterograde axonal tracing is utilized to confirm that transplanted sNPCs are forming functional synaptic connections with the endogenous corticospinal tract (by injecting virus into the motor cortex) - thus repairing some of the lost circuitry involved in contusive spinal cord injury damage. Pain and distress will be controlled through the use of analgesics and antibiotics.
2004-37999A	Parr, Ann	Rat	SOCIAL HOUSING	Immediately after surgery, our rats are singly housed to prevent them from licking or biting at the fresh wounds. When we remove the sutures at 2 weeks, we then typically re-house them in pairs.
2004-38001A	Netoff, Tay	Rat	MULTIPLE SURGERY	Two surgeries are required as part of the same project: 1 epilepsy induction surgery and 2 implantation surgery. Epilepsy induction must be done separately from implantation because it is essential for rat to be quickly recovered for the kainic acid to work properly.

2004-38004A	Hart, Geoffrey	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	2.10 We need to know if the immunizations are working or not. We also need to know if the control group without immunization is morbid or not to know if the infection is working. From days 5-21: Once animals are observed to become ataxic, suffocating (labored breathing), paralyzed, lose 25% of their body weight, or can't right themselves, they will be euthanized. If they do not show these symptoms by day 21, they will be euthanized. 2.11. We need to know if the immunizations are working or not. We also need to know if the control group without immunization is morbid or not to know if the infection is working. From days 5-21: Once animals are observed to become ataxic, suffocating (labored breathing), paralyzed, lose 25% of their body weight, or can't right themselves, they will be euthanized. If they do not show these symptoms by day 21, they will be euthanized. This enumeration of days is the enumeration after SARS-Cov-2 infection. The mice will be infected with adenovirus 5 days prior (day -5).
2004-38004A	Hart, Geoffrey	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	The procedure proposed is not a restriction in access to water, but instead is provision of water containing antibiotics. We have never seen evidence that decrease their water intake in the past when using this procedure (when water bottles were the norm - the consumption rate seemed similar to regular water).
2004-38012A	Aboudehen, Karam	Mice	EUTHANASIA METHOD	embryonic mice starting at E14.5 and early newborn mice that are less than 10 days of age will decapitated post CO2 to ensure complete euthanasia.
2004-38012A	Aboudehen, Karam	Mice	SOCIAL HOUSING	Female mice used for timed pregnancies will be housed individually after the plug date. This is done to ensure the accuracy of the timed collection of embryos. If left with a male mouse a plug that failed to produce a pregnancy could result in a successful pregnancy at a later day. The female would be needlessly sacrificed if this were the case. By separating the pair we can monitor for pregnancy and if none is seen the female can be bred again, there by reducing the number of animals used overall.
2004-38018A	Kawakami, Yasu	Fish (Zebra fish)	72 HOUR POST-OP ANALGESIA POLICY	For zebrafish, the same treatment for other animals, such as mice, are not available, because zebrafish are aquatic animals. Thus, analgesia cannot be provided to zebrafish. In addition, adding chemicals may interfere with regeneration of the fin. If fish show distress or abnormal behavior after surgery (floating belly up or random swimming among the group of fish in a tank), we will euthanize the fish.

2004-38021A	Haskell-Luevano, Carrie	Mice	SANITATION FREQUENCY	Sanitation: The cages supplied from the RAR facility will be cleaned by RAR staff. TSE cages/running wheels/feeders/water bottles that will be damaged by use of a cage washer are washed by hand with water and anti-bacterial soap. The cages are then sprayed down thoroughly with 70% isopropanol and allowed to air dry. If such cages house a single mouse, they will be cleaned weekly according to RAR policy. Microbiological assessment will be routinely done quarterly (or more frequently if requested), in conjunction with RAR.
2004-38021A	Haskell-Luevano, Carrie	Mice	SOCIAL HOUSING	The mice housed in the TSE cages and on the feeding studies will be single housed to insure proper measurements of food intake for each animal.
2004-38021A	Haskell-Luevano, Carrie	Mice	ENVIRONMENTAL ENRICHMENT	□ Single housed mice will be utilized, mice will need to have food weighed to see how much is consumed. Please see social housing exception.
2004-38021A	Haskell-Luevano, Carrie	Mice	EUTHANASIA METHOD	Using anesthesia interferes with gene expression for certain brain tissues collected and glucose measurements. For Decapitation of the mice, scissors are preferred to limit damage that can occur to the brain when using a guillotine and scissors are easier to clean in between animals to remove blood that can cause unnecessary stress on the mouse. All personnel using this method demonstrate a high degree of technical proficiency.

2004-38031A	Metzger, Joseph	Mice, Rat, Mice	TUMOR ENDPOINT CRITERIA	Endpoint criteria that we will follow for this study are as follows: 1. Inability to move or perform normal body functions 2. Skin necrosis and/or ulceration over the tumor 3. Clinical signs indicating tumor has metastasized (ie seizures, swollen abdomen, labored breathing and secondary masses) Endpoint criteria that we cannot follow: 1. At the end of the study, mice consume less food and are not as active as mice without tumors. 2. Tumor burden that causes a significant loss of body mass - adipose and muscle mass. Scientific justification for not following these criteria: Cancer cachexia is a clinical syndrome characterized by weakness, fatigue, poor appetite, and muscle and adipose wasting (Fearon KC et al. Am J Clin Nutr 2006;83:1345-50). The model we propose to use in our studies - male CD2F1 mice with colon-26 adenocarcinoma tumors is one of the most commonly studied models of cancer cachexia and represents many facets of the human syndrome. Weakness in late stage cachexia is documented by decreased grip strength, anorexia is indicated by decreased food intake, and wasting is shown in decreased body, muscle and adipose masses (1. Asp ML et al. Int J Cancer. 2010;126:756-63. 2. Acharyya S. et al. J Clin Invest. 2004;113:370-8. 3. Talbert EE et al. J Cachexia Sarcopenia Muscle. 2014;5:321-8). A more recent study shows that severely cachectic mice (late-stage cachexia) move at a slower rate of speed than mice without tumors, but the amount of time moving over a 24 hour period is not different from mice without tumors (Murphy KT, et al. Dis Model Mech. 2012;5:533-45). Because the experiments specifically involve using a model of cancer cachexia, mice are expected to lose a significant amount of body weight, including both adipose and muscle mass. Therefore we cannot follow the first criteria for euthanasia of weight loss in the animals. Additionally, anorexia (decreased food intake) is a natural part of the progression of cachexia in
2004-38031A	Metzger, Joseph	Mice, Rat, Mice	SOCIAL HOUSING	[redacted] will only be used for running wheel experiments,plethsmography and indirect calorimetry which will be no longer than two weeks. Prior to this, all animals will be in standard social housing according to the Animal Use Guidelines on Housing and Husbandry. Due to the nature of the running wheel experiments requiring the monitoring of each individual mouse's running wheel activity singly housing them is unavoidable. All animals will be euthanized at the end of the two week experiment

2004-38031A	Metzger, Joseph	Mice, Rat, Mice	EUTHANASIA METHOD	Only performed on mice younger than P7 Because the experiments specifically involve using a model of cancer cachexia, mice are expected to lose a significant amount of body weight, including both adipose and muscle mass. Therefore we cannot follow the first criteria for euthanasia of weight loss in the animals. Additionally, anorexia (decreased food intake) is a natural part of the progression of cachexia in this model. Because mice are not housed individually, food intake for the cage can be monitored but not for individual mice. Moistened food can be placed in a petri dish at the bottom of the cage to facilitate food/water intake in late stage cachexia. However, mice will be monitored for all other euthanasia criteria (inability to obtain food/water, moribund state, infection and signs of organ system dysfunction), and will be euthanized immediately if one or more criteria are met.
2004-38033A	Modiano, Jaime	Mice, Dog	EUTHANASIA METHOD	Euthanasia solution itself causes sedation, so the same procedure that leads to humane death by euthanasia causes sedation. The animals are not sedated in advance by other methods because the euthanasia solution is injected by the intraperitoneal route, which causes no to minimal, momentary discomfort. The active ingredient in the solution is the equivalent of 86 mg/kg pentobarbital. The process of additional sedation would increase the animal's stress and discomfort far beyond the momentary injection of euthanasia solution. The action of the euthanasia solution is quite rapid and equivalent to other methods of sedation or anesthesia. As needed, euthanasia will be ensured by cervical dislocation.
2004-38044A	Pennell, Christopher	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	To determine if mice in our model experience the same toxicities as patients, we request that we are allowed to use 25% weight loss as a criterion for morbidity and euthanasia. If mice can spontaneously recover after losing 20% of their body weight, then our model would not be that great. We wouldn't know this if we had to euthanize them at the 20% weight loss level. However, we think it unlikely they could spontaneously recover after losing 25%. Since one of our goals is to reverse such side effects, we'd like to apply our proposed treatment at a time when the mouse could not otherwise recover.

				Cervical dislocation is rapid and apparently painless. I have over 30 years experience using this method of euthanasia. Our model replicates the clinical side effects of CAR immunotherapy. These side effects are CRS and neurologic adverse effects. Patients rapidly lose weight and experience systemic organ failure due to a sudden and systemic cytokine release. If left untreated, these toxicities are often fatal. To determine if mice in our model experience the same toxicities, we again request that we are allowed to use 25% weight loss as one criterion for euthanasia. If mice can spontaneously recover after losing 20% of their body weight, then our model would not be that great. We wouldn't know this if we had to euthanize them at the 20% weight loss level. However, we think it unlikely they could spontaneously recover after losing 25%. Since one of our goals is to reverse toxicity, we'd like to apply our proposed treatment at a time when the mouse could not otherwise recover. However, we recognize that mice may become moribund and require euthanasia prior to losing 25% body weight. Therefore, mice will be euthanized when one or more of the following criteria are met: 1) they appear morbund 2) they have lost 25% of their body weight 3) they score 7 in our clinical scoring system (see below; the weight criterion in this scoring system requires 25% weight loss for the maximum [worst] score of 8) Our clinical scoring system is based on a well-established system used to assess graft versus host disease in mice. Scores of 0-2 are assigned to each of four criteria: activity, fur texture, posture, and weight. Summed scores of 0 and 8 indicate healthy and moribund mice, respectively. Score assignment follows.
2004-38044A	Pennell, Christopher	Mice	EUTHANASIA METHOD	Activity: "0" if normal; "1" mild to moderately decreased; "2"

2004-38045A	Guedes, Alonso	Mice	72 HOUR POST-OP ANALGESIA POLICY	This is a model of evoked hyperalgesia that is being used to investigate the CD38/opioid signaling crossta k in chronic neuropathic pain. The scientific justification for not providing extended post-surgical analgesia at this stage of our experiments is that provision of available analgesics will highly likely preclude proper interpretation of our results. Opioids cannot be used since they would interfere with one of the main goals of our experiments, which is to understand the CD38/opioid signaling crosstalk. Non-steroidal anti-inflammatory drugs are not good analgesics for neuropathic pain and blocking COX activity could likely affect opioid/CD38 crosstalk (e.g., see Wong CS, Hsu MM, Chou R, et al. Intrathecal cyclooxygenase inhibitor administration attenuates morphine antinociceptive tolerance in rats. Br J Anaesth. 2000; 85: 747-51). We would need to determine first if there is no interaction between COX and CD38 or opioid signaling in spinal cord. Mice will be provided with a local anesthetic block at the time of surgery, which is expected to last for 6-12 hours, and provided with soft bedding to minimize discomfort. Based on our previous experiments, which not included extended post-surgical analgesia, the SNI mice appeared not to be in overt pain as they maintained active mobility, appearance and behavior. The hyperalgesia is only observed when a small area of the paw is probed with the use of von Frey filaments.
2004-38045A	Guedes, Alonso	Mice	EUTHANASIA METHOD	Will be performed only by staff with demonstrated technical proficiency. Used for harvesting spinal cord slices for calcium imaging.
2004-38045A	Guedes, Alonso	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Since animals wont have diet restriction and wont loose weight, and due to the potential long duration of the study, we would ask to measure body weight every month instead of every week.
2004-38045A	Guedes, Alonso	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We request an exception for the use of non-pharmaceutical grade compounds for this procedure. Avertin (tribromoethanol) is an effective anesthetic agent for this procedure due to the fact that this procedure, is not a survival procedure and therefore there is no risk for ulcers or tissue necrosis at site of injection. Further Avertin is not harmful or a controlled substance and under proper preparation it is a potent anesthetic. Preparation of Avertin will be made following the university and IACUC guidelines: -Sterile fileter with 0.2 micron filter. -Store and use under sterile conditions. -Store in the dark bottle of foil covered container -Do not use if the solution becomes discolored or has a precipitate. -Check pH before each use and use only when greater than pH 5 -Discard all solutions after 4 months, including the stock solution. -Label all containers with name and concentration of drug, date prepared and initials of person making the solution.

2004-38048A	Ferrington, Deborah	Mice	72 HOUR POST-OP ANALGESIA POLICY	Post-operative pain management has been addressed by our collaborator, Dr. Dale Gregerson. In their protocol, Dr. Gregerson explains the following. Regarding use of buprenorphine: An ophthalmologist (cornea surgeon), Dr. Steven Kaufman, at U of M, and also Dr. Roland Gunther, have been consulted about post-surgical analgesia for the intraocular injections we have proposed. Both confirm that only topical proparacaine is needed. We proposed to use topical proparacaine, and also ketamine & xylazine for restraint, as the procedure requires precision. No post-operative analgesia is needed. For reference, note that patients do not receive general anesthesia or post-op meds for such injections, even when done repeatedly and for months to years. Only topical anesthetic drops, such as proparacaine, is used for them. For these reasons, we see no need for post-op meds in these mice. Further, there is a growing literature on the beneficial effects of opioid receptor agonists on the survival of stress or injured neurons. Since the goal of this research is to discover the activities of the endogenous factors that support neuron survival, these new findings raise the possibility that the use of buprenorphine, or other opiates, will complicate our findings. Further, a recent paper suggests that opiates given at the time of injury, which would be post-op in our case, have the most significant effect. As a result, we request suspension of use of buprenorphine or similar agents post-op for this survival surgeical procedure. Use of anti-inflammatories as post-op analgesics have been considered, including NSAIDS and glucocorticosteroids, but they have also been shown to affect neuron survival post-injurery, For these reasons, we request exception to the common practice of using opiates for this post-op procedure.
2004-38048A	Ferrington, Deborah	Mice	EUTHANASIA METHOD	Any chemicals used for euthanasia and/or sedation may affect the cells and inhibit the success of cell growth
2004-38049A	Harris, Reuben	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	This is not a surgical procedure, therefore detailed surgical records are not required beyond the record for usage of controlled substances and time to complete recovery (typically <30 minutes) (Hydrodynamic injections) Animals undergoing this procedure should never reach complete unconsciousness. Because they will only become drowsy, 15 min documentation should not be required. However, documentation will provide date and volume of anesthetic cocktail, and time required to return to normal behavior.
2004-38049A	Harris, Reuben	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	NTBC supplemented water will be provided without restriction and will not cause any adverse health effects. As no potential discomfort of health changes will occur due to treatment, weekly weights do not need to be recorded.
2004-38060A	Moriarity, Branden	Mice	TUMOR ENDPOINT CRITERIA	With approval we will be following our attached Mouse Tumor Burden Scoring Document created and approved with RAR Veterinarian staff member Jessica Felgenhauer that outlines tumor ulceration endpoint criteria.

2004-38061A	Webber, Beau	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Pending overall health evaluation of animals in consultation with veterinary staff, animal experiments will be carried out up to 6-months post-infusion. At this time, animals will be sacrificed for histopathological examination. Thus, the duration of animal experiments will be approximately 6 months. For the EB mouse strains, we will be closely monitoring pups for sores and swelling. The lab will ensure that pups are able to eat and drink (they may need food in crocks or food may need to be moistened) and that they are not exhibiting signs of pain or distress such as hunched posture, lethargy, and weight loss of 20% or more. Any mice that continue to develop sores and swelling that prevent them from normal function (moving around easily, eating, and drinking); will be euthanized by lab staff.
2004-38061A	Webber, Beau	Mice	EUTHANASIA METHOD	cervical dislocation will be used Pending overall health evaluation of animals in consultation with veterinary staff, animal experiments will be carried out up to 6-months post-infusion. At this time, animals will be sacrificed for histopathological examination. Thus, the duration of animal experiments will be approximately 6 months. For the EB mouse strains, we will be closely monitoring pups for sores and swelling. The lab will ensure that pups are able to eat and drink (they may need food in crocks or food may need to be moistened) and that they are not exhibiting signs of pain or distress such as hunched posture, lethargy, and weight loss of 20% or more. Any mice that continue to develop sores and swelling that prevent them from normal function (moving around easily, eating, and drinking); will be euthanized by lab staff.
2004-38064A	Schwertfeger, Kaylee	Mice	MULTIPLE SURGERY	Because the primary tumors reach endpoint prior to establishment of robust metastasis, primary tumor resection will be necessary to assess metastatic growth and burden in these models. All procedures for tumor resection will include anesthesia and pain relief in the same manner as provided for the initial surgery. Due to the increased blood vessel growth associated with primary tumors, cauterization of blood vessels may be required.
2004-38075A	Widge, Alik	Rat	72 HOUR POST-OP ANALGESIA POLICY	The animal usually does not feel pain 24 hours post-surgery, but we will monitor the rat for at least 72 hours post-surgery. Analgesics will be given if the rat is still feeling the pain either 48 or 72 hours post-surgery accordingly.
2004-38075A	Widge, Alik	Rat	SOCIAL HOUSING	The animals will be singly housed for the duration of the study after electrode implantation so that the animals do not injure each other as they heal or damage the acrylic head cap that is securing the electrodes.

2004-38078A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (Angiography and pulmonary valve expansion (with balloon)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this interpositional pulmonary conduit would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the conduit. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (CT imaging)
2004-38092A	[redacted]	Nonhuman Primate (Macaques)	BLOOD COLLECTION LIMIT	Multiple blood draws are planned to evaluate safety required to support a regulatory submission, please see attachment that details the combination of planned blood draws and relationship with average weight of animals. Sampling will be up to 0.5% weekly or 1% with equivalent fluid replacement (normal saline or LRS IV or SC) and normal HgB levels (>10g/dL) observed in CBC safety sampling at previous timepoint.
2004-38104A	Chen, Zhe	Mice	EUTHANASIA METHOD	Mice under 10 days of age are fairly resistant to CO2 euthanasia, so it may take up to 20 minutes or longer to effectively euthanize the mice. □ □ Decapitation as a primary method for neonatal mice up to P7 is an acceptable method of euthanasia per IACUC guidelines. All personnel carrying out decapitation are proficient and trained to carry out decapitation with scissors. Training will be documented in lab training records.
2005-38108A	Koewler, Nathan	Mice	EUTHANASIA METHOD	I have discontinued use of Isofluorane, since it is not necessary prior to euthanasia by cervical dislocation.
2005-38115A	Stromnes, Ingunn	Mice, Mice	MULTIPLE SURGERY	In Aim 9 we will assess the ability of "cured" mice to respond to tumor rechallenge. In this case, we perform a second survival surgery in the case of pancreas cancer in which we orthotopically implant KPC cell line. Alternatively, tumors may be placed subcutaneously. (Orthotopic injection of tumor cell lines into mouse pancreas) One prior surgery to implant orthotopic tumors into the pancreas will be performed 80-120 days prior to parabiosis. The parabiosis experiments will be performed to determine if pancreas-residing tumor-specific T cells have differentiated into resident memory T cells.

2005-38117A	Bischof, John	Mice, Rat	EUTHANASIA METHOD	The lab staffs are well trained and proficient enough to perform the procedure quickly and effectively.
2005-38117A	Bischof, John	Mice, Rat	SOCIAL HOUSING	For the procedure of "Telemetric temperature monitor", animals will be housed individually after chip implantation, to eliminate interference of RFID recording signal from multiple mice. When extra mice from the same cohort, without the sensing chip, are available, the mouse with chip will be housed together with those without to allow for social housing.
2005-38127A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Multiple surgeries are required for two main reasons: In many cases animals need at least one procedure to implant a head holder to allow for proper gaze position training that is done prior to chamber implantation to reduce infection risks. Prior to training an animal to control his eye position, a head post is implanted in an aseptic surgical procedure to permit monitoring of eye position (below). The animals are then trained to perform the task while maintaining fixation on a small spot on a video display under head restraint, and with some tasks to make specific eye movements to visual targets. This fixation control is necessary to insure that portion of the retina on which the stimuli fall is not an uncontrolled variable. Up to 12 months of training may be needed before an animal performs sufficiently well to allow us to collect neurophysiological data. Depend on the particular experiment, retraining may be required between implantations to allow the animal to be exposed to task parameters appropriate for the particular brain area that will be studied. In cases where the chamber is implanted at the same time as the head holder, a second surgery is required to perform a craniotomy. In these procedures it is absolutely vital to have a fully sealed and aseptic chamber since the implant is chronic. We thus need to wait for proper healing of the chamber to occur to test for potential contamination before the microdrive is attached. Up to 12 months of training may be needed before an animal performs sufficiently well to allow us to collect neurophysiological data. When all training is complete, the animal undergoes another recovery surgery to implant an array or chamber(s). After recovery from the surgery, data collection is begun and continues for 3 to 6 months. Then the animal may have a break of 4 weeks before starting a new behavior or physiology experiment (these experiments each also take 3-6 months). A second (and occasionally third) array/chamber may be implanted over another region of cerebral cortex or the other cerebral hemisphere, and is used for further recordings for about another 3 to 6 month period if different brain areas need to be targeted or if the previous implantation needed to be

2005-38138A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (Angiography and pulmonary valve expansion (with balloon)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this interpositional pulmonary conduit would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the conduit. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (CT imaging)
2005-38153A	Baidoo, Samuel	Pig (Agricultural)	72 HOUR POST-OP ANALGESIA POLICY	Banamine S (long lasting analgesic; 1.1 mL/25-kg body weight, i.m)
2005-38153A	Baidoo, Samuel	Pig (Agricultural)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Pigs will be weighed every two weeks to minimize interference with their behavior.
2005-38158A	Graham, Melanie	Mice	MULTIPLE SURGERY	Following transplant, after demonstration of a prolonged period of normoglycemia or insulin reduction greater than 50%, animals will undergo graft explant by removing the graft and following up the animals subsequent reversion to the diabetic state the functional state can be (or not) attributed to the graft. Animals that do not demonstrate prolonged normoglycemia or insulin reduction greater than 50% will not undergo graft removal.
2005-38167A	Gallaher, Dan	Rat	SOCIAL HOUSING	For the protein quality assessment (PDCAAS), we need to do fecal collections from each animal. For the health effects study (2nd part), we need to house animals individually, as the microbiome of an animal can be changed if there is cohabitation.
2006-38173A	Liang, Yuying	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	For arenavirus (PICV and LCMV)-infected mice, we will use death as endpoints, which is the established practice for LCMV-mouse model ((von Herrath and Whitton. Animal models using lymphocytic choriomeningitis virus. Curr Protoc Immunol. 2001. Chapter 19: Unit 19). After LCMV infection intracranially, mice will begin to show signs of morbidity (ruffled fur, hunched posture, reduced mobility) around day 6 to 7 post-challenge, and will succumb rapidly thereafter. Death may be delayed in certain genetically modified strains and/or treatment with inh bitors. The differences in the mortality rate and the days of survival are the scientific goals of the experiment. Early termination of mice would invalidate the results of the experiment.

2006-38175A	Liang, Yuying	Guinea Pig, Mice, Turkey, Rabbit	EUTHANASIA DEATH/MORIBUND ENDPOINT	For arenavirus (PICV and LCMV)-infected mice, we will use death as the endpoint, which is the established practice for LCMV-mouse model (von Herrath and Whitton. Animal models using lymphocytic choriomeningitis virus. Curr Protoc Immunol. 2001. Chapter 19: Unit 19). After LCMV infection intracranially, mice will begin to show signs of morbidity (ruffled fur, hunched posture, reduced mobility) around day 6 to 7 post-challenge, and will succumb rapidly thereafter (by 8-9 dpi). Death may be delayed in certain genetically modified strains and/or treatment with inhibitors. The differences in the mortality rate and the days of survival are the scientific goals of the experiment. Early termination of mice would invalidate the results of the experiment.
2006-38181A	Mand, Sandy	Fish (Zebra fish)	SANITATION FREQUENCY	We use the Pentair Z-hab system for most of the fish, fish that are not housed on the Zhab system will have daily 10% water changes and excess detritus will be removed from the bottom of the tank.
2006-38181A	Mand, Sandy	Fish (Zebra fish)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Fish will be considered recovered once they are moving in the recovery tank. This should take less than a minute. If the fish is not recovering well, we will use a transfer pipette to move water over the gills. Any complications will be recorded.
2006-38182A	Garry, Daniel	Pig (Biomedical)	SOCIAL HOUSING	Animals will only be housed at the UMN for the 24 hr period prior to testing. They will be housed for this brief period, singly as they will be delivered singly to the UMN as only one animal per day can be tested.
2006-38190A	Clarkson, Christina	Horse, Cow (Biomedical), Pig (Biomedical), Goat, Sheep (Biomedical), Donkey	EUTHANASIA DEATH/MORIBUND ENDPOINT	In this teaching protocol the animals are euthanized upon arrival and then embalmed for dissection in our veterinary anatomy course. Indicated 'Yes' since we are NOT waiting for one of the endpoints as described above.
2006-38190A	Clarkson, Christina	Horse, Cow (Biomedical), Pig (Biomedical), Goat, Sheep (Biomedical), Donkey	EUTHANASIA METHOD	Animals are sedated by vendor prior to transport. This allows for ease in transport and negates the need for us to use a sedative. In this teaching protocol the animals are euthanized upon arrival and then embalmed for dissection in our veterinary anatomy course. Indicated 'Yes' since we are NOT waiting for one of the endpoints as described above.
2006-38191A	Lekatz, Leslie	Goat	SOCIAL HOUSING	In order to obtain individual fecal samples, goats will be housed individually for 72 hours. They will be housed according to the SOP for lambing and kidding (SOP#1801B12021)

2006-38206A	Bartolomucci, Alessandro	Mice	MULTIPLE SURGERY	We request an exception to allow for our use of AAV viral infusion and surgical optic fiber implantation for optogenetic studies. Use of two separate surgical procedures (AAV + fiber implantation) is beneficial, as it will reduce the amount surgery done at one time (reduces potential for tissue trauma), minimizes the need for anesthesia supplements during surgery, allow animals to fully recover between each class B surgery. It also maximizes the potential for animals to reach the study completion. Maximal viral-mediated gene transfer occurs approximately 3-8 weeks after infection, depending on the brain region and neuronal process (cell body versus terminals) being targeted. In vitro and in vivo studies begin at this time, but require up to 4 weeks of additional time for completion. However, optical implants are delicate, and generally only have reliable function for ~ 4 weeks. Therefore, is advantageous to implant them at a time when viral expression is maximal. This method will prevent subject loss due to optical implant failure, and will substantially reduce the overall number of animals required to complete experimental studies. This conservation of animal resources is particularly useful when studies occur in transgenic animals, which require considerable time and money to generate. The time between individual surgeries will be a minimum of 3 weeks, up to a maximum of 8 weeks. We do not anticipate two individual survival procedures to produce any functional deficits. Animals will be monitored after each surgery as described above, and will be given saline (0.5 ml, s.c.) and carprofen (5 mg/kg, ip) to counteract any post-operative dehydration or pain, respectively.
2006-38206A	Bartolomucci, Alessandro	Mice	SOCIAL HOUSING	Animals may be singly housed at times to prevent stress, injury and death due to same-sex incompat bility between male mice that can be experienced even in groups of male siblings in some strains of mice. Animals may be singly housed at times to allow full recovery from surgery during the immediate post-surgical phase and as required for the accurate assessment of indirect calorimetry, food intake and locomotor activity during the duration of the recording (up to 8 weeks).
2006-38206A	Bartolomucci, Alessandro	Mice	EUTHANASIA METHOD	Cervical dislocation is among the fastest euthanasia methods, that, when performed as in our case, by personnel trained and experienced with the procedure.
2006-38215A	Herzberg, Mark	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	No adverse affects are expected with the addition of antibiotics which are known to be well tolerated. (Ant biotic Feeding) No adverse impact on animal health is expected. (Sucrose and/or Fructose Feeding)

2006-38219A	Zhang, Tianshun	Mice	SOCIAL HOUSING	For reduction of the number of surplus animals, female may need to be separated from males once pregnancy is confirmed and single housed until giving birth to avoid second pregnancy. Additionally, genetically modified mice may need to be single housed after genotyping if only one mouse in cage is needed to keep for next breeding. Due to complex breeding schemes involving multiple genes of interest, harem breeding is employed and pregnant females will be housed separately until pups can be weaned and a suitable male becomes available.
2006-38231A	Mc Pherson, Scott	Mice	MULTIPLE SURGERY	Some of our experiments are designed to answer questions about whether a stimulating event to the eye can alter autoimmune disease and the what cells are important to the process. An ONC could be followed by an intraocular injection(s) designed to augment, counteract, or deplete a particular cell with the eye with the idea that it could tell us about the importance or necessity of a particular cell or factor in the disease process. For this reason, we ask that we be permitted do to a second surgery (one/multiple AC injections or adoptive transfer of cells) following the ONC. The AC injections will be done as described for that procedure. As we are highly experience in all the procedures and rarely have problems we do not anticipate having problems in ONC mice that receive a secondary procedure. (Optic Nerve Crush (ONC)) Some experiments require multiple AC injections in order to maintain depletion of a particular cell from the retina. Other experiments require optic nerve crush (ONC), adoptive transfer of cells, or EAU induction protocol along with AC injection(s). All procedures are simple and minimally stressful to the mice. Further, we highly experience in all procedures and rarely experience complications even with multiple procedures. (Intraocular injections) Most mice will receive multiple procedures; the most complicated of these experiments are mice that are made to be radiation bone marrow chimeras, followed by the optic nerve crush, followed by depletion of Tg cells. The bone marrow chimeras are done to introduce specific populations of immune cells (from Tg mice) that are sensitive to DTx, so that they can be eliminated upon toxin administration. The optic nerve crush is then done to stimulate recruitment of immune cells to the retina. In this protocol, we use mice that are > 6 wks of age to reduce radiation sensitivity. We use a large inoculum of BM cells (5-10 x 10^6) to promote rapid engraftment and recovery. Our previous experience with the diphtheria toxin allows us to use the minimum dose that is effective for either intraocular or iv administration, and the kinetics of its activity.

2006-38231A	Mc Pherson, Scott	Mice	72 HOUR POST-OP ANALGESIA POLICY	We request an exemption from the use of analgesics for 72 hours post-operatively for the optic nerve crush protocol. This request has been granted to us in all IACUC applications since Feb 2011. The results of our research with the ONC procedure are dependent upon inducing a partial, limited death of retinal ganglion cells (RGC) to stimulate and/or recruit innate immune cell to the retina. Any factor(s) that could exacerbate the death or enhance the survival of RGC will affect the response of retinal innate immune cells, thus complicating our findings or even leading to erroneous findings. Over the years there is a growing body of literature suggesting the beneficial effects of opioid receptor agonists on the survival of stressed or injured neurons. Further it has been suggested that opiates given at the time of surgery had the most significant effect on neurons. Other anti-inflammatories such as NSAIDs or glucocorticoids have also been shown to affect neuron survival, and may affect immune responses, which would be self-defeating for the protocol. For these reasons we requested and received an exemption for post-operative analgesics with the ONC procedure. We ask that this exemption be continued for this application. In our long-term experience with this procedure we have observed little if any post-operative distress to the mice. Some of the relevant literature is cited below. Avdoshina V, et al. Morphine induces the release of CCL5 from astrocytes: potential neuroprotective mechanism against the HIV protein gp120. Glia. 2010. 58:1630-9. Abdul Y, et al. Delta-opioid agonist SNC-121 protects retinal ganglion cell function in a chronic ocular hypertensive rat model. Invest Ophthalmol Vis Sci. 2013. 54:1816-28. Kaneko Y, et al. Combination treatment of hypothermia and mesenchymal stromal cells amplifies neuroprotection in primary rat neurons exposed to hypoxic-ischemic-like injury in vitro: role of the opioid system. PLoS One. 2012;7(10):e47583. He X, et al. Neuroprotection against hypoxia/ischemia: δ-opioid receptor-mediated cellular/molecular events. Cell Mol Life Sci. 2012.
2006-38231A	Mc Pherson, Scott	Mice	EUTHANASIA METHOD	Dr. McPherson has over 25 years of experience doing cervical dislocations of mice. CO2 inhalation is the preferred method of euthanasia but cervical dislocation will be used as the alternative. Please note that if an animal is euthanized due to a problem during surgery it will already be anesthetized or under sedation.
2007-38243A	Jameson, Stephen	Mice	72 HOUR POST-OP ANALGESIA POLICY	Post-operative analgesic therapy is contraindicated because the objective of the procedure is to determine whether the experimental treatment causes hypersensitivity. Provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied (see Ji et al. 2014 Nat. Rev. Drug. Disc. 13:533). Furthermore, some commonly used analgesics (e.g. lidocaine: Okura et al. 2015 Anesth. Analg. 120:597)have been found to target the P2xr7 receptor under investigation. For these reasons, treatment with typical analgesics may undermine the goals of these studies.

2007-38243A	Jameson, Stephen	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Avertin is no longer available as a pharmaceutical grade anesthetic. However, as a short-term, non-inhaled anesthetic that is not a controlled substance it is very useful in certain applications. We propose to add use of Avertin as an anesthetic for work involving influenza infection, in order to generate data that are directly comparable to studies being conducted in [redacted] "dirty mouse" project (under protocol 1609-34184A). Avertin was approved for use in that protocol. We are concerned that use of alternative anesthetics (e.g. isoflurane or ketamine/xylazine) in the studies we propose here (working with SPF mice, in [redacted] housing) will compromise our ability to compare with the outcomes of the two parallel studies. Hence, we propose use of Avertin only in the case of some of the proposed studies using influenza infection. Provided below (and in the attachment "Avertin preparation and use for mouse anesthesia") is the detailed description of Avertin preparation, storage and control steps we use to make sure this non-pharmaceutical grade compound is suitable for anesthesia in mice: 1. Add 15.5 ml tert-amyl alcohol (Sigma - 721123) to 25g Avertin (2-2-2 Tribromoethanol) (Sigma – T48402) 2. Stir on magnetic stirrer until Avertin is completely dissolved. This will probably take overnight. This produces a 1.6 g/ml stock. 3. Keep the stock in the dark bottle and capped tightly at room temperature. This stock is photosensitive and hydroscopic. The photo-oxidation products are lethal. Layering dry nitrogen gas or Freon from an aerosol duster over the solution is an excellent idea. Stock solution can last about 1 year. 4. To prepare a working solution, add 0.5ml Avertin stock dropwise to 39.5ml sterile saline using magnetic stir bar to help dissolve the Avertin stock. Stir on magnetic stirrer overnight at room temperature. Seal container with parafilm and cover completely with tinfoil to block out all light. This produces the 20 mg/ml working stock. 5. Filter the working solution through a 0.2um filter into a dark bottle, or other container covered with foil. Keep working
2007-38243A	Jameson, Stephen	Mice	EUTHANASIA METHOD	Personnel will be trained to efficiently restrain mice and rapidly perform cervical dislocation minimizing the need for sedation. This protocol will only be used for fetal mice, retrieved from pregnant dams (which will themselves be euthanized via CO2 inhalation) and neonatal mice (after chilling on ice). Day 12-13 mouse fetuses and neonates are poorly responsive to CO2 as a euthanization method, hence we decapitate the pups prior to cell isolation.
2007-38247A	Bradley, Elizabeth	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Failure of engraftment may result in mortality. As suggested after consult with RAR Veterinarians, some mortality is expect within this protocol.
2007-38253A	Lowe, Dawn	Mice	MULTIPLE SURGERY	The goal of one study is to determine plasmalemma excitability and the only way to do this is my activating muscle contraction via the implanted nerve cuff and simultaneously recording electrical activity of the muscle via the EMG electrodes. Thus, this second surgery to implant EMG recording electrodes, which is minimally invasive, is needed following nerve cuff surgery (which also has an incision in one hindlimb).

2007-38253A	Lowe, Dawn	Mice	ENVIRONMENTAL ENRICHMENT	The environment will influence the physical activity and mice with muscular dystrophy are susceptible to exercise-induced muscle injury, which could confound our studies. Placing paper towels or gauze in the cages for mice to shred is OK, but further enhancement of the environment needs to be avoided in our studies.
2007-38253A	Lowe, Dawn	Mice	SOCIAL HOUSING	Mice may be single housed up to seven days if surgical wound trauma is noted due to cage mates. Also, mice are temporarily singly housed during plethysmography procedure during both preconditioning to the chambers and during the respiratory assessments. Animals will not be in the plethysmograph for longer than 8 hours at any given time. Food and water (hydrogel or dietgel) will be provided if a mouse is in the chamber >4 hours.
2007-38259A	Bischof, John	Fish (Other)	SANITATION FREQUENCY	Petri dishes are replaced every day and not used again. Tanks are replaced and cleaned at sign of algal growth. Floors are washed monthly.
2007-38261A	Moen, Ron	Fisher, Bobcat, Rodent (Other - Non-USDA), Rodent (Other - Non-USDA), Other* (Non-USDA)	EUTHANASIA DEATH/MORIBUND ENDPOINT	Death is the endpoint for lethally captured small mammals; for bobcats and fishers, death will not be the endpoint and IACUC criteria for Euthanasia guidelines will be followed.
2007-38268A	Parr, Ann	Rat	MULTIPLE SURGERY	The rat must first be injured and recover to model a spinal cord injury so that we can test our optical stimulation. Pain and distress will be controlled through analgesics and antibiotics.
2007-38270A	Largaespada, David	Hamster	MULTIPLE SURGERY	Intratumoral injection is the only approach for NK cells effectively getting to GBM in orthotopic tumor model due to blood-brain barrier. Mice will be treated with Buprenorphine SR to cover the 72 hour post-operative period. Mice will be observed and weighed everyday between both surgeries.
2007-38270A	Largaespada, David	Hamster	SOCIAL HOUSING	Single housing of animals who are found to be incompatible for conspecifics
2007-38272A	Clark, Mark	Fish (Other)	72 HOUR POST-OP ANALGESIA POLICY	This tagging has been done in our previous research as a part of our work at NDSU (see Lackmann et al. 2019). Analgesics are not used. (Microsurgery in the fin rays of some fish for tagging purposes (i.e. using VIE Elastomer tags, which are non-invasive, subcutaneous markers commonly used and one of the safest ways for tagging fish))

2007-38274A	Mashek, Douglas	Mice	BLOOD COLLECTION LIMIT	This is a terminal blood collection under anesthesia to get donor red blood cells (Blood collection for donor red blood cells for metabolic clamp studies) The metabolic studies require samples for analysis of liver glucose production, kidney glucose production, intestine glucose production, hormone concentrations, and metabolite levels. To prevent a fall in hematocrit, donor red blood cells resuspended in 10U/ml heparinized saline will be infused venously (please see accompanying procedure) (Arterial sampling via carotid artery catheter during metabolic clamp studies)
2007-38274A	Mashek, Douglas	Mice	72 HOUR POST-OP ANALGESIA POLICY	1. An extensive history of this surgery in mice (since 1999) via the NIH Mouse Metabolic Phenotyping Consortium has shown that more that 24 hours of analgesics is not necessary for the well being of the mouse. The mice do not, except in rare cases, exhibit loss of weight, piloerection, unkempt coat, hunched posture. If this occurs additional analgesic will be provided. 2. The studies within this protocol are aimed at assessing metabolism. Keeping the use of analgesics to a minimum is to avoid metabolic alterations not intended by the experimental design is imperative. *Please note that I would like to have a veterinarian assess the initial mice post-surgery to determine if the full 72 hours is required.
2007-38274A	Mashek, Douglas	Mice	ENVIRONMENTAL ENRICHMENT	Some feeding studies involving caloric restriction (protocol 4) will require individual housing since we need to know exactly what control mice are eating so we limit the restriction group to 70% of control. Individual housing is mandated by some of the instrumentation in use for the determination of accurate metabolic responses such as Indirect calorimetry, locomotor activity or meal pattern analysis, where both energy expenditure and mouse eating behavior can be evaluated accurately only for individual subjects.
2007-38285A	Klein, Amanda	Mice	72 HOUR POST-OP ANALGESIA POLICY	The neuropathic pain model, spinal nerve ligation, proposed herein will cause some pain. Using analgesic drugs may antagonize the pain hypersensitivity and spinal neuronal (i.e. central) sensitization that is developed after injury over time. Administration of analgesic drugs post surgery, however, would confound our behavioral experiments in which we like to determine the efficacy of KATP channel agonists/antagonists on neuropathic pain models.

2007-38292A	Dehm, Scott	Mice	MULTIPLE SURGERY	Two surgical procedures are necessary to mirror the clinical course of human prostrate cancer. One surgery is necessary to implant tumors at orthotopic or subcutaneous sites in the mouse. The second surgery, castration, is used to mimic androgen depletion therapy. Longitudinal biopsies may be performed to reduce numbers of mice needed for studies monitoring the evolution of tumor subclonal architecture during experimental therapy. Two surgical procedures are necessary to mirror the clinical course of human prostrate cancer. One surgery is necessary to implant tumors at orthotopic or subcutaneous sites in the mouse. The second surgery, castration, is used to mimic androgen depletion therapy. Castration will be performed at the same time as CRISPR/Cas9 injection.
2007-38296A	Paulsen, Megan	Mice	BLOOD COLLECTION LIMIT	The collection will be from a euthanized pregnant dam including euthanized fetal parts. Additionally, exsanguination/decapitation is a secondary accepted form of euthanasia for mice.
2007-38296A	Paulsen, Megan	Mice	EUTHANASIA METHOD	Decapitation is justified for the studies requiring endocrine, metabolic and undamaged and uncontaminated brain tissue (such as measurement of serum cortisol and hypothalamic signaling). Decapitation is the only euthanasia method (compared to phenobarbital, isoflurane, CO2 inhalation) that does not induce changes in serum biomarkers or brain receptor signaling. Therefore, we feel the best methodology for accurate informative data is to use a combination of CO2 exposure (rather than euthanasia) following by decapitation without anesthetic.
2007-38296A	Paulsen, Megan	Mice	SOCIAL HOUSING	Assessment of energy expenditure will be obtained with indirect calorimetry in freely-moving animals (Oxymax, Columbus Instruments, Ohio) that will be housed in individual cages consisting of an indirect open circuit calorimeter that provides measures of O2 consumption and CO2 production. The cages are provided with ad libitum access to food and water throughout the procedure. Mice are held in the chambers for a maximum of 5 days and checked daily. Because this is a closed circuit system nothing will be done on the animals while in the cages." Animals will be housed singly for 5 days. These studies will be carried out under the supervision of the metabolic phenotyping core. Individually houses animals will also be provided with contact bedding that provides opportunities for digging and nesting. Small tubes and cardboard can also be provided for enrichment. These studies will be carried out under the supervision of the metabolic phenotyping core.
2007-38314A	Morris, Rebecca	Mice	EUTHANASIA METHOD	Early newborn mice that are less than 10 days of age will decapitated post CO2 to ensure complete euthanasia.

2007-38314A	Morris, Rebecca	Mice	SOCIAL HOUSING	Pregnant or expected to be pregnant female breeder mice may need to be housed alone to prevent excess pups. Single housed females breeders will be paired with their mate or another female once possible. Retired female breeders will be placed with other retired female breeders. Retired male breeders will be kept separate to prevent fighting.
2007-38316A	Gomez-Pastor, Rocio	Mice, Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Avertin is appropriate for short procedures in mice, especially surgical procedures where no survival is required. It's best used in situations where it will be given only on a single occasion. Two chemicals are necessary to prepare Avertin. The first is 2,2,2 Tribromoethanol; the second is 2-methyl-2-buthanol, both obtainable from Aldrich Chemical. The preparation of Avertin will be conducted following IACUC guidelines. A filtered sterile solution will be administered by IP injection at a dose of 250 mg/Kg. This amounts to 0.5 ml of the described solution to a 25 g mouse. The solution will be kept under refrigeration in the dark and it will be replaced every 14 days. Due to the experiments proposed in the protocol, where rapid preparation of the brain tissue is requested in order to preserve synapse formation and neuronal morphology as well as the integrity of the proteins that are studied, using a rapid anesthetic is necessary. Induction with Avertin requires only 1-2 minutes and allows surgical anesthesia lasts for 15-45 minutes with a sleep time of 60-120 minutes. This anesthetic provides rapid anesthesia and it is appropriate to conduct non-survival surgery as proposed in the protocol using intracardiac perfusion. The use of Avertin will only be used for non-survival procedures as described in the protocol. In addition, I have previously conducted a long-term ongoing study where a significant amount of data has been collected with the use of avertin (Gomez-Pastor et al., 2017 Nature Communications). Therefore, the new data generated in the studies conducted in this protocol must be compared with historic data collected using this anesthetic.
2007-38316A	Gomez-Pastor, Rocio	Mice, Rat	EUTHANASIA METHOD	Decapitation without euthanasia will be used for the Neuroanatomical analysis using Golgi cox staining and for primary neurons and glial cells isolation. This procedure is highly important for our research goals since it determines the morphology and maturation of essential neurons that are affected by Huntington´s disease. It has been proven that sedation interferes and compromise the scientific goals of the experiment [Potez and Larkum (2008) Effect of Common Anesthetics on Dendritic Properties in Layer 5 Neocortical Pyramidal Neurons. Journal of Neurophysiology, 99:1394-1407]. Therefore we will not administer anesthesia for these experiments. Decapitation will be performed with a certified guillotine and no anticipated pain or distress during the procedure is expected. All personnel will be specifically trained to perform such procedure.
2008-38320A	Chen, Clark	Mice	MULTIPLE SURGERY	The first surgery is to implant the tumor, the second is to deliver the drug (Intracranial injections (two surgeries))

2008-38352A	Gorr, Sven-Ulrik	Pig (Biomedical)	SOCIAL HOUSING	To avoid disruption to wound/ surgery sites, pigs need to be singly housed for duration of study. Additional enrichment will be provided to these pigs when singly housed. If there is only one pig on study, a mirror will be placed in the room.
2008-38356A	Clark, Mark	Fish (Other), Fish (Other)	EUTHANASIA DEATH/MORIBUND ENDPOINT	Some fish will l kely hatch out from eggs and then succumb to natural predation within an enclosure at various stages of their ontogeny
2008-38358A	Crawford, Peter	Mice	72 HOUR POST-OP ANALGESIA POLICY	1. An extensive history of this surgery in mice (since 1999) via the NIH Mouse Metabolic Phenotyping Consortium has shown that more that 24 hours of analgesics is not necessary for the well being of the mouse. The mice do not, except in rare cases, exhibit loss of weight, piloerection, unkempt coat, hunched posture. If this occurs additional analgesic will be provided. 2. The studies within this protocol are aimed at assessing metabolism. Keeping the use of analgesics to a minimum is to avoid metabolic alterations not intended by the experimental design is imperative. *Please note that we would like to have a veterinarian assess the initial mice post-surgery to determine if the full 72 hours is required.
2008-38358A	Crawford, Peter	Mice	EUTHANASIA METHOD	A subset of adult mice animals (approximately 40%) will be euthanized by cervical dislocation. This method is selected because does not chemically contaminate tissue (including hypoxia and acidosis), which is critical for metabolic studies involving high resolution chemical profiling of extracts derived from the tissues (e.g., LC/MS metabolomics and magnetic resonance spectroscopy). Moreover, cervical dislocation induces rapid loss of consciousness, and is rapidly accomplished. As stated on p. 49 of AVMA Guidelines for the Euthanasia of Animals: 2013 Edition, '...cervical dislocation is acceptable with conditions for mice.... Personnel should be trained on anesthetized and/or dead animals to demonstrate proficiency.' The PI will be personally respons ble for this training. Death will be immediately ensured by bilateral pneumothorax and cardiectomy.
2008-38368A	Osborn Jr, John	Mice	SOCIAL HOUSING	Mice undergoing radio telemetry will need to be single housed, additional enrichment will be provided.
2008-38393A	Osborn Jr, John	Sheep (Biomedical)	MULTIPLE SURGERY	We are developing a model of sheep hypertension. We would like this time to implant the transmitter sheep with DOCA and diet to determine if and to what degree the DOCA/diet creates hypertension. If we are successful creating a hypertension model, 1-2 months later we will perform a renal denervation procedure to assess if hypertension can be resolved. Transmitter replacement or repair is necessary if the original transmitter fails, since blood pressure is the primary measurement in this study.
2008-38393A	Osborn Jr, John	Sheep (Biomedical)	SOCIAL HOUSING	Sheep on special diet will need to be housed with only other sheep on special diet, if no other sheep are currently in RAR that are on this diet than single housing will be necessary. We also perform balance measurements on this diet and the need for single housing is necessary for this. Single housing will also be used to determine food/water intake for diagnostic purposes.

2008-38393A	Osborn Jr, John	Sheep (Biomedical)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We do not anticipate any weight loss with the administration of this diet, as their food intake is not being limited beyond a normal diet.
2008-38402A	Vannucci, Fabio	Pig (Agricultural)	EUTHANASIA METHOD	Per the AVMA guidelines, barbiturates have "a rapid onset of action, and loss of consciousness induced by barbiturates results in minimal or transient pain associated with venipuncture." In the event that an animal cannot be safely restrained for venipuncture, the animal may be sedated with Telazol (2 mg/kg IM).
2009-38418A	Osborn Jr, John	Sheep (Biomedical)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We do not anticipate any weight loss with the administration of this diet, as their food intake is not being limited beyond a normal diet.
2009-38426A	LeBeau, Aaron	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	It is highly possible that the treatments administered to the animals could result in adverse health effect such as drug-related toxicities as well as mortality
2009-38447A	Groman, Stephanie	Rat	MULTIPLE SURGERY	For experiments involving drug self-administration, it will be necessary to perform two separate survival surgeries. During the first surgery, replication deficient adeno-associated virus (AAV) will be infused into the target brain region and relevant intracranial implants placed (e.g., optical fiber). Because adequate expression of viral constructs can require 4-8 weeks after viral infusion, jugular catheters will be implanted in separate survival surgery. It is not possible to maintain the integrity of jugular catheters for more than 8 weeks, so we must implant the jugular catheters near the time when optimal viral expression occurs. This will necessitate a second survival surgery. Placing the intrajugular catheters in the same surgery would result in a large attrition of experimental subjects due to loss of catheter patency. For each surgery, we will minimize the pain and discomfort of the animals, as descr bed below.
2009-38447A	Groman, Stephanie	Rat	SOCIAL HOUSING	Rats with surgical implants may need to be singly housed after implantation to avoid damage to the implants by cage mates.
2009-38450A	Guedes, Alonso	Mice	72 HOUR POST-OP ANALGESIA POLICY	This is a model of hyperalgesia that is being used to investigate the role of CD38 in neuropathic pain. The use of analgesics will preclude achieving this goal.
2009-38450A	Guedes, Alonso	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Since animals won't have diet restriction and won't lose weight, and due to the potential long duration of the study, we would ask to measure body weight every month instead of every week.

2009-38450A	Guedes, Alonso	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We request an exception for the use of non-pharmaceutical grade compounds for this procedure. Avertin (tribromoethanol) is an effective anesthetic agent for this procedure due to the fact that this procedure, is not a survival procedure and therefore there is no risk for ulcers or tissue necrosis at site of injection. Further Avertin is not harmful or a controlled substance and under proper preparation it is a potent anesthetic. Preparation of Avertin will be made following the university and IACUC guidelines: -Sterile fileter with 0.2 micron filter. -Store and use under sterile conditions. -Store in the dark bottle of foil covered container -Do not use if the solution becomes discolored or has a precipitate. -Check pH before each use and use only when greater than pH 5 -Discard all solutions after 4 months, including the stock solution. -Label all containers with name and concentration of drug, date prepared and initials of person making the solution.
2009-38452A	Koewler, Nathan	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	We have never observed moribund mice in the UTI model unless it was due to a technical error such as lack of water over a weekend. If that occurs, we will euthanize the animal and it would be censored from the study. For the sepsis model, mice will need to reach a mor bund state before being euthanized in order to measure the protective efficacy of our experimental vaccines.Thus, we will not use death as an endpoint and will accept any additional recommendations by RAR to limit the stress to the mice (e.g.. warming pads, soft bedding, etc.).
2009-38458A	Impelluso, Lynn	Mice	MULTIPLE SURGERY	This is required to study metastatic disese progression in mice. Some cell lines develop metastatic lesions after a few weeks of cell inoculaton. However, by the time metsatasis develop, primary tumor often exceeds clinical endpoints (tumors exceeding 10% of body weight), so animals need to be euthanized often before metastasis are present. One way to avoid this, is to perform primary tumor removal after orthotopic tumors reach 400-600mm^, by doing so, we can observe animals longer and study drug effects on metastatic lesions. In most cases, a cople of surgeries will be perfomed, orthotopic cell implantation followed by tumor removal. And almost all cases, both surgeries are minor surgeries.
2009-38488A	Kyba, Michael	Mice, Mice	MULTIPLE SURGERY	In order to achieve successful engraftment of muscle stem and progenitor cells the muscle has to undergo an injury two days before transplantation to induce an essential injury response in the tissue. Cryo-injury or muscle injection injury will be performed as descr bed in the previous section, pain and distress in the animals will be monitored for 3 days post-procedure. Because the effects of analgesic compounds on muscle regeneration are unknown, and because we want to examine the role of inflammatory cells in skeletal muscle damage/regeneration such as cryo-injury, we cannot use analgesics for this procedure.

2009-38488A	Kyba, Michael	Mice, Mice	72 HOUR POST-OP ANALGESIA POLICY	Because the effects of analgesic compounds on muscle regeneration are unknown, and because we want to examine the role of inflammatory cells in skeletal muscle damage/regeneration, we cannot use analgesics for this procedure.
2009-38488A	Kyba, Michael	Mice, Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Our objective is not to have any moribund animals, but on occasion, due to unforseen effects of particular treatments, death is possible, and we would euthanize mice prior to death, i.e. if they should enter a moribund state.
2009-38488A	Kyba, Michael	Mice, Mice	SOCIAL HOUSING	Necessary for housing mice in environmental chambers to study metabolism.
2009-38488A	Kyba, Michael	Mice, Mice	EUTHANASIA METHOD	Embryos 15 days of gestation or greater will be decapitated.
2009-38491A	Smith, Gordon	Other* (USDA)	MULTIPLE SURGERY	The motivation for adding mult ple survival surgeries is that optical clarity of the cranial window is most optimal after implantation, and degrades over time. One important factor that degrades the optical clarity of the cranial window is new dural membrane regrowth and invasion of the resected dura (typically occurs within l-3 weeks). Following a viral microinjection, a period of time (24 hours to several weeks) is required for sufficient viral expression to permit successful imaging. By performing a microinjection followed by a cranial window implant as two separate surgeries separated by an interval, this allows the period of optimal window clarity to begin only once viral expression has reached sufficient levels. The duration of the 'Survival Procedures' will often span many weeks across repeated imaging experiments; Thus, maximizing optical clarity of the cranial window for as long as possible will lead to an improvement in both the quality and quantity of imaging data we can collect from a single animal. We also would like to emphasize that this procedure is l kely to minimize maintenance of the imaging chamber. Minimizing maintenance of the imaging chamber is a crucial step in some imaging experiments, such as in vivo chronic imaging, where the imaging plane can be adversely altered after chamber maintenance. Most animals in our protocols (except animal for terminal studies, histology) may be part of this situation. In another scenario, the cranial window chamber may become loose or compromised requiring a repair. Because this is an opening to a major body cavity that would be exposed, it would classify as an additional major survival surgery. This is not anticipated as a common occurrence but we need to anticipate for the possibility. Eyelids may be re-opened and re-sutured multiple times in order to monitor visual responses during imaging sessions, while restricting normal visual experience in the home cage. In animals where repeated suturing will occur, the lid margins will not be removed.

2009-38491A	Smith, Gordon	Other* (USDA)	72 HOUR POST-OP ANALGESIA POLICY	Ferrets (and other carnivores) are particularly susceptible to GI distress with prolonged treatment with NSAIDs. Prior experience has suggested that 48 hours is well tolerated, so a 2-day treatment with meloxicam will be the standard procedure. If pain or distress is noted beyond 48 hours, meloxicam will be continued up to 5 days. If longer treatment is needed, veterinary staff will be consulted and additional treatments my be given based on veterinary recommendation. Meloxicam vs. Buprenorphrine SR A major factor in the successful recovery from surgery in young animals is the alertness and activity level of the kit. Kits that are less alert or have lower activity can be rejected by the jill, potentially leading to death. Buprenorphrine SR can reduce alertness levels and lead to weight loss, and will therefore only be given when pain is not well controlled by meloxicam. However, given the efficacy of Buprenorphrine SR in pain management, it is important to have it as an option when needed. Due to the extremely young ages of some of the animals used in this procedure (<P8) the analgesic approaches typically applied in older animals carry increased risk of adverse side effects. Carnivores are already sensitive to NSAIDs, which can cause gastrointestinal distress, which is expected to be more severe and deleterious in extremely young animals. Buprenorphine can cause bradycardia and respiratory supression, which are also expected to be more severe and potentially fatal in extremely young animals. Therefore, neither metacam nor buprenorphrine will not be administered in very young animals (<P8) if evidence of unaddressed pain is observed. It should be noted that this procedure does not involve making a crainiotomy, or opening a major body cavity. Instead, this procedure consists of scalp inscisions and an injection with a small pipette, and will be conduced with local analgesics (lidocaine and bupivicaine). We therefore anticipate that the pain associated with this procedure will be less than that of
2009-38491A	Smith, Gordon	Other* (USDA)	NON-PHARMACAUTICAL GRADE COMPOUNDS	We will make every effort to obtain pharmaceutical grade pancuronium bromide. In some instances, pharmaceutical grade reagents are not available, in which case research grade reagents may be used. Sterilizations of solutions other than virus solutions will be performed by filtration using 0.22um filters. All chemicals are stored according to manufacturer recommendations. Paralytic agents, such as pancuronium bromide, can be prohibitively difficult to obtain in USP grade. In such cases, we will use research-grade compounds. Sterilizations of solutions will be performed by filtration using 0.22um filters. Solutions will be stored according to manufacture recommendations.
2010-38514A	Farrar, Michael	Mice	SOCIAL HOUSING	In general we will house mice in pairs or groups. The only potential exception might be a circumstance where a number of male mice are co-housed and all but one are euthanized as they reach our experimental endpoint. The remaining mouse would need to be kept alive until the final study endpoint. We can't simply add new males to the cage as they would fight. Adding females would cause issues with pregnancy.

2010-38544A	Robinson, James	Mice	TUMOR ENDPOINT CRITERIA	The following conditions will be used as criteria for euthanasia: Tumor size of 2500 cubic millimeter (1000 for immunotherapy exp.) or tumors greater than 10 percent body weight; 20 percent loss of body weight in one week; inability to eat or drink; behavior abnormality; slow, shallow, labored breathing; hunched posture; hypo- or hyper-thermia; diarrhea or constipation (3 days); skin sores (ulcerated tumors), infections; lethargy (for 3 days); impaired mobility; persistent bleeding; paralysis or CNS signs (persistent seizures, spasticity, weakness). The melanomas in our model are treated with doxycycline to suppress oncogene expression when they reach at 1 cm3.Following oncogene inhibition they grow very rapidly for 72 hours before very rapidly and completely regressing. Tumors only become resistant and reoccur with a mean latency of 6 months. Mice are culled when the recurrent tumors reach 1 cm3. Due the initial treatment period tumors may briefly exceed 2cm they are not in pain or showing any signs of distress.
2010-38544A	Robinson, James	Mice	EUTHANASIA METHOD	A painless and instant form of death - used in the UK were C02 is considered considered cruel. If carbon dioxide is not available due to emergence conditions or engineering failures -mice will be culled by cervical dislocation. New born pubs 0-7 days old will be decapitated as Carbon dioxide is not effective for new born pubs
2010-38546A	Cureoglu, Sebahattin	Rat	MULTIPLE SURGERY	The purpose of this experiment is to evaluate treatment of ear infections. The first procedure is to produce the infection. The second procecure 2 days later is the treatment. The treatment is via the tympanic membrane and is considered a relatively non-invasive procedure (not a surgery); however, anesthesia is required to prevent movement. Animals will be euthanized 2 days after treatment.
2010-38552A	Patnayak, Devi	Pig (Agricultural)	EUTHANASIA METHOD	After being held properly, animals will be euthanized by Intravenous administration of barbiturate.
2010-38553A	Jameson, Stephen	Mice	MULTIPLE SURGERY	These studies are necessary for testing how the animals control pathogen infection (testing whether cells that exchange between the parabiotic pairs are functionally distinct from cells that do not exchange between the animals.
2010-38564A	Hilakivi-Clarke, Leena	Mice	72 HOUR POST-OP ANALGESIA POLICY	This procedure is not expected to cause pain in the animals after procedure since there is no incision. However, if we observe any signal of pain, Buprenorphine will be administered.
2011-38591A	Thomas, Mark	Mice, Mice	MULTIPLE SURGERY	A subset of animals will receive virus infusion and optical fiber implantation in separate surgeries. This is experimentally necessary because it takes several weeks for AAV genetic payloads to express. For the animals' well being and to maximize experimental success, we minimize the time that it carries fiber implants. Pain and distress will be monitored identically for each individual procedure, and animals will receive the same postoperative care, monitoring, and pain management.

2011-38592A	Thomas, Mark	Rat	MULTIPLE SURGERY	Animals will receive virus infusion and optical fiber implantation in separate surgeries. This is experimentally necessary because it takes several weeks for AAV genetic payloads to express. For the animals' well being and to maximize experimental success, we minimize the time that it carries f ber implants. Pain and distress will be monitored identically for each individual procedure, and animals will receive the same postoperative care, monitoring, and pain management.
2011-38600A	[redacted]	Nonhuman Primate (Macaques), Pig (Biomedical)	MULTIPLE SURGERY	Second surgical procedure will be a bilateral nephrectomy (acute) procedure. (Donor: Splenectomy) Animals have previously been implanted using minimally invasive technique with a vascular access port to ensure proper delivery of the planned immunosuppression regimen prior to transplant and facilitate cooperation with ongoing clinical care related to fluid administration and clinical monitoring in the absence of chemical or physical restraint. (Recipient: Kidney transplant and naive kidney nephrectomy)
2011-38606A	Igarashi, Peter	Mice	SOCIAL HOUSING	Female mice used for timed pregnancies will be housed individually after the plug date. This is done to ensure the accuracy of the timed collection of embryos. By separating the pair, we can monitor for pregnancy and if none is seen the female can be bred again, thereby reducing the number of animals used overall.
2011-38630A	Adams, Andrew	Mice	MULTIPLE SURGERY	In specific targeted experiments, some mice (up to 10% of all skin graft recipients) will receive a secondary skin graft challenge. This is a common immunological technique to assess the ability of recipient to respond to a second immunological challenge.
2011-38649A	Shimizu, Yoji	Mice, Mice	MULTIPLE SURGERY	Wound healing will be carefully assessed in the days following surgery, to include integrity of sutures and wound clips and cohesion and apposition of the entire length of incision. Given the relatively short duration of the proposed experiments, wound dehiscence is not expected. In the event of wound dehiscence we will consult the veterinarian to determine if this is a good candidate pair for repair, or if the experiment should be terminated and the animals euthanized humanely. When surgical repair is advised by the veterinarian, the repair would use the same anesthetics/analgesics/post-care as the initial surgery.
2011-38649A	Shimizu, Yoji	Mice, Mice	72 HOUR POST-OP ANALGESIA POLICY	Per veterinarian consult, the use of 72 hour analgesia seemed to be unnecessary in this situation as the surgery is minor. The use of topical analgesia immediately following the procedure was recommended, to reduce the extent of irritation and allow full hemostasis and healing of the small wound.

2011-38660A	Liang, Yuying	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	SARS-CoV-2 infected mice are expected to lose weight at day 4 and most become mor bund at day 7. Death may be delayed in vaccine- or antiviral-treated mice. The differences in the mortality rate and the days of survival are the scientific goals of the experiment. Early termination of mice would invalidate the results of the experiment. As no specific physiologic parameters can be used for euthanasia (mice losing 25% body weight may still be able to recover), death is generally used as an objective outcome of lethal infection. We will, however, evaluate both body weight and the health status conditions of the infected mice, and determine whether they are moribund, for example, 25% body weight loss and signs of neurological damage such as tremor, we will euthanize the mice.
2011-38662A	Krook-Magnuson, Esther	Mice	MULTIPLE SURGERY	For experiments in chronically epileptic animals, separate surgical procedures are needed for the induction of epilepsy, the implantation of optrodes/electrodes or headbar, and/or the introduction of viruses or tracers. The induction of epilepsy is done via the intracerebral injection of kainate (a brief surgery typically lasting less than half an hour). For the welfare of the animal, this is done under isoflurane anesthesia, but requires rapid removal from anesthesia after the surgical procedure (precluding e.g. the simultaneous implantation of an optical f ber). After a period of weeks, the animal is epileptic (i.e., display spontaneous seizures). Animals are then implanted, and recordings are done during this chronic phase (i.e., weeks after kainate injection), when spontaneous seizures are present. Additionally, the introduction of viruses (in cases where a pure transgenic approach is not feasible) or tracers may need to occur prior to (or sufficiently after) the circuit changes that occur with the induction of epilepsy (and therefore, cannot be combined with the surgery inducing epilepsy). Some viral based approaches (e.g., those using modified rabies) require two separate injections, to allow sufficient expression time (2-6weeks) after the first vector injection before the second occurs. In the case of juxtacellular recordings, the headbar implantation surgery typically occurs day(s) before the juxtacellular recording. This helps ensure the stability of the implant. In order to prevent the skull from being open an unnecessarily long period of time, the craniotomy may be done in a second, brief surgery, which can occur as little as 24hrs after the firs. Note that in this case, the animal is place under anesthesia, and a small hole (craniotomy) is drilled through the skull (+dental cement), but otherwise no opening of body cavities etc is required (as the area has already been prepped).

2011-38662A	Krook-Magnuson, Esther	Mice	72 HOUR POST-OP ANALGESIA POLICY	In cases of surgery for the purposes of epilepsy induction (e.g., intracerebral kainate injection), an exception is necessary as systemic analgesics interfere with epileptogenesis and the neuronal systems studied. For example, cox inh bitors change the excitatory properties of cells in the hippocampus CA1 area and potentiate cannabinoid effects in the hippocampus (Kim & Alger, 2004; Slanina & Schweitzer, 2005). However, Neopredef (topical, contains both an antimicrobial agent as well as tetracaine, a local analgesic) will be used peri-operatively and the local anesthetic bupivacaine will be injected prior to and at the site of incision. This method of pain management has been used successfully at a previous institution. In cases of surgery that do not include the induction of epilepsy, carprofen will be given acutely; however the use of opioids, including sustained release opioids, remains incompatible with our scientific aims as these alter neuronal activity, including of hippocampal interneurons (e.g., Krook-Magnuson et al, J Neurosci, 2011) and behavior (e.g. Falcon et al, 2015). Delivery of analgesics in water bottles for group housed animals was discouraged, and singly housing animals which could otherwise be group housed or additional handling of animals for repeated s.c. or i.p. injections are stressors which could impact findings and importantly may represent more harm to the animals than good. Given that a single dose s.c. analgesic, in combination with local bupivacaine and tetracaine, appears to provide adequate pain relief, after consultation with University Veterinarians, it was determined that the best course of action is to use this approach with increased monitoring and a rescue plan, including supplemental analgesics as required, for intracerebral injection surgeries. For implantation surgeries, where animals are group housed and there is an increased chance for postoperative pain in the days after surgery, three days of post-op analgesia will be given in the drinking water, with appropriate monitoring, as detailed in the implantation procedure description.
2011-38662A	Krook-Magnuson, Esther	Mice	SOCIAL HOUSING	Once implanted, animals must be singly housed. This protects the implant and the animals by preventing gnawing on the implant by cage mates. During chronic recordings, animals must be singly housed to avoid entanglement of cords.
2011-38662A	Krook-Magnuson, Esther	Mice	ENVIRONMENTAL ENRICHMENT	□ Animals will be implanted and tethered to allow light delivery, and must be housed singly to avoid harming each other or damaging the implants.
2011-38662A	Krook-Magnuson, Esther	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We are unable to purchase this anesthetic solution commercially (formerly known under its commercial name Avertin). Therefore, it must be made for use in the lab. Please see attachements section for preparation and storage of this anesthetic solution.

2012-38672A	Kim, Do-Hyung	Mice, Mice	EUTHANASIA METHOD	Our research requires euthanization by cervical dislocation without anesthsia. Anesthesia and carbon dioxide asphyxiation lead to an increase in catecholamine levels, which in turn stimulate lipolysis in adipose and glycogenolysis in liver. These alterations in lipolysis and blood glucose interfere with the analysis of insulin sensitivity. Immediately following euthanization mice are bled through the orbital plexus. Anesthetics are known to increase catecholamine release which will interfere with our experiments. Blood collection will happen right after cervical dislocation. The mice for tissue collection will be euthanized by cervical dislocation as anesthesia can influence biochemical events in the brain and disturb the analysis of signaling events that occur in the neuron and glial cells.
2012-38674A	Lemos, Julia	Mice	TAIL BIOPSY	Occasionally animals will have to be genotyped post-weaning if we require RAR staff to wean animals as opposed to laboratory staff or if we need to redo the biopsy due to accidental contamination. We will take every measure to minimize post-weaning tail biopsies as they can lead to additional stress and pain to the animals. In all cases we will use QuickStop cauderizing sticks to stop bleeding following tail biopsy.
2012-38674A	Lemos, Julia	Mice	SOCIAL HOUSING	While we will try and keep animals group housed, individuals with fiber implantations may need to be individual housed if we observe that mice are chewing on each others implantations, rendering them unusable. While not ideal, we may be forced to individually house mice to prevent additional attrition from the study.
2012-38674A	Lemos, Julia	Mice	ENVIRONMENTAL ENRICHMENT	□ Animals recovering from surgery will be placed on an isopad for the first 24 hours post surgery instead of normal bedding and nesting material. Experience with this method at the investigator's prior institute (National Institutes of Health) demonstrated less attrition, less infection around the incision and headcaps, and an overall better ability to assess health (i.e. normal urination/defecation) immediately post-surgery.
2012-38678A	Klein, Amanda	Mice	MULTIPLE SURGERY	These procedures will allow for a viral vector to be injected intracranially while establishment of a chronic pain model is in place. Animals will be accessed for altertness, eating/drinking, feces/urine, breathing, gait and will be accessed for any changes on a daily basis for at least 3 days following either surgery or until wound healing is complete.

2012-38678A	Klein, Amanda	Mice	72 HOUR POST-OP ANALGESIA POLICY	The neuropathic pain model (SNL) proposed herein will cause some pain. Administration of analgesic drugs, however, would confound our electrophysiological experiments in which we like to determine the effects of KATP channel modulators on peripheral nerve f ber function after injury. (Spinal Nerve Ligation) The goal of this study is to access the effects of KATP channel downregulation in chronic pain and opioid tolerance. Exogenous analgesics may confound the results of our study. Previous reports suggest that administration of opioids or NSAIDs shortly after surgery can affect hormone levels and/or paw withdrawal sensitivity in rodents (Wilson et al., 2016, Pain Res Treatment; Celerier et al., 2006, Anesthesiology). Current clinical theories suggest that blocking or limiting persistent pain immediately after surgery is clearly important in the persistence of chronic pain (Richebe et al., 2018, Anesthesiology). (Intracranial injections)
2012-38697A	Iaizzo, Paul	Other* (USDA)	MULTIPLE SURGERY	We are monitoring these animals over their lifetime, these are minimally invasive procedures and the animals are undergoing anesthesia for other biometric monitoring by the DNR. We monitor the animal for approximately 20 minutes after the surgery, however, we need to put him/her back in their den prior to emerging from anesthesia as not to disturb their h bernation pattern. From our loop recorders and other monitoring we have determined that they resume hibernation after the anesthetic has warn off within 2-3 hours. This is very exciting data that we have obtained because they go into a deep hibernation within hours of us leaving the den and gives us confidence that our visit did not effect their hibernation behaviors. (Implantation of loop recorder or other telemetry device)
2012-38697A	Iaizzo, Paul	Other* (USDA)	72 HOUR POST-OP ANALGESIA POLICY	We will not be going back to the bear's den and administering analgesia to the bear, the bear will be hibernating.
2012-38697A	Iaizzo, Paul	Other* (USDA)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	We will not be going back to the bear's den for post-surgical record keeping.
2012-38703A	Bianco, Richard	Rat	72 HOUR POST-OP ANALGESIA POLICY	We are implanting subdermal implants which is a simple skin incision and pocket creation. We are not incising into muscle or a body cavity. Based on observations of rat behavior (including but not limited to, decreased activity, hunched posture, poor grooming, and decrease in food/water consumption, weight loss, and dehydration) we have observed that rats do not appear painful after the initial dose of medications at the time of surgery. Rats will be observed for the first three post operative days, if they do appear painful, we can give them more buprenorphine or carprofen on an "as needed" basis.
2012-38703A	Bianco, Richard	Rat	SOCIAL HOUSING	We do not plan on housing animals singly for this study. In the event we have issues rats chewing on the suture/wound clips of their cage mate, we may house these animals separately.

2012-38705A	Yamamoto, Masato	Mice, Hamster	TUMOR ENDPOINT CRITERIA	When treatment works, some times ulceration is observed on the treated tumor as a result of tumor necrosis. We will observe the small ulceration up to 7 days unless continuous bleeding or infection is observed or reaching other euthanization criteria. We will give Carprofen 5mg/kg SC q24hrs when necessary. Pain level C. Oncolytic adenoviruses occationally induce tumor ulceration when anti-tumor effect is strong. Usually, ulceration is seen before the tumor disappears. This is a part of therapeutic effect and the ulceration is self limiting. We want to observe ulcerated tumor up to 7 days unless continuous oozing (>24hrs) or infection is observed or reaching other euthanization criteria. Signs of bleeding: Observation of bleeding from tumor, Blood on bedding, Euthanasia criteria for tumor ulcer bleeding: 1) oozing without complete hemostasis from tumor ulceration more than 3 hrs, or 2) bleeding more than 50ul (makes 6mm diameter stein on Kim Wipe) in 30min. Signs of Infection: Observation of pus, pus on bedding Euthanasia criteria for tumor infection: when any sign of infection was observed. For analgesia, one of these 3 shown below will be used. □ Buprenorphine 0.1mg/kg Subcutaneous (SC) q6-12h Ketoprofen 5mg/kg Subcutaneous (SC) q12-24h Buprenorphine SR 1 mg/kg Subcutaneous (SC) Every 72 hrs. Administer the first dose 2-4 hrs before painful procedures. Effect will be monitored and the dose will beadjusted along with the attached protocol.
2012-38712A	Ashe, Karen	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Inducing seizures by treating animals with PTZ (as described in the Procedures section) will cause unrelieved distress possibly resulting in death. Both seizure severity and death are measurable metrics of susceptibility to seizures in our mouse model of Alzheimer's disease. Clearly observing and recording these outcomes is necessary to investigate treatments that may reduce seizure susceptibility or genetic pathways that are involved in AD related seizures. Thus, relieving pain or preventing death would be counter productive to this line of investigation. Therefore, animal suffering will be minimized by euthanizing all animals undergoing treatment with PTZ as soon as possible, which will be up to 40 mins after injection with PTZ.
2012-38712A	Ashe, Karen	Mice	SOCIAL HOUSING	Mice receiving stereotaxic surgery will have sutures or wound clips for up to 1 week following surgery, and cannot be group housed since social grooming could interfere with healing and closure of the scalp incision site. Female can be recombined once the wound is fully healed, however males tend to be aggressive if they are recombined and will continue to be singly housed until experiments are complete.

2012-38712A	Ashe, Karen	Mice	EUTHANASIA METHOD	Embryos (~E14-E15)) and Neonates (P1-P4) will be decapitated without anesthesia. Rapid decapitation is the preferred method to sacrifice pups of this age since it is the most rapid method, does not introduce adverse substances or gases that would affect sensitive neonatal neurons, and avoids any discomfort associated with injections. All individuals performing decapitation without anesthesia will be properly trained.
2012-38713A	Bernlohr, David	Mice	EUTHANASIA METHOD	Altered lipolytic activity and metabolites have been demonstrated in tissues and blood after anesthesia and sedation. This euthanasia method will be used when determined to be necessary by the researcher based on experimental goals. It is included here to incorporate flexibility in the protocol. The procedure will NOT be used until the researcher has been properly trained on the technique.
2012-38717A	Pacak, Christina	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We have used this mouse model for 7 years and have not observed any issues with weight loss from the diet. Mice will be assessed regularly (2x per week) but likely do not require weekly recorded weighing.
2012-38723A	Wilson, Robert	Pig (Biomedical)	MULTIPLE SURGERY	Additional survival procedures are required for direct visualization of the stent. The animal must be anaesthetized in order to do these checks It is essential that the stents are checked weekly to ensure the placement is still correct and to monitor the performance of the stent.
2012-38723A	Wilson, Robert	Pig (Biomedical)	72 HOUR POST-OP ANALGESIA POLICY	If biopsies are not taken, this is a minimally invasive procedure. The PI would like to avoid the potential side effects of unnecessary analgesics.
2012-38723A	Wilson, Robert	Pig (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	If biopsies are not taken, this is a minimally invasive procedure where percutaneous femoral access is used for blood pressure and the stents are viewed with a bronchoscope. Request exception to the 3 days of post op monitoring for weekly checks that do not involve biopsies.

2012-38734A	Pang, Hongbo	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have used avertin routinely in our previous studies (Pang HB et al, 2014). It is easier to store and use in the lab. Avertin dose for rodents is 225-240 mg/kg IP Avertin will be prepared and stored using these guidelines: 1.Sterile filter with 0.2 micron filter 2.Store and use under sterile conditions 3.Store in the dark bottle or foil covered container 4.Store stock and working stock solutions at 4°C 5.Do not use if the solution becomes discolored or has a precipitate 6.Check pH before each use and use only when greater than pH 5 7.Discard all solutions after 4 months, including the stock solution 8.Label all containers with name & concentration of drug, date prepared and initials of person making the solution The animals will be injected Avertin and then subjected to heart perfusion before major organs are excised. In brief, the Avertin is used with single dose for anesthesia of mice before euthanization. The tissue will be collected after perfusion. Although ketamine/xylazine is suggested to use for anesthesia, ketamine/xylazine is known to cause bradycardia and to affect cardiac function (Experimental and Therapeutic Medicine, 6: 641 648, 2013). Isoflurane is good for shorter term of anesthesia, which is not suitable for perfusion procedure in our project. Compared with ketamine/xylazine, the hemodynamic effects of Avertin are less severe, with the milder systemic effects and the reduced mortality rate (Investigative Ophthalmology & Visual Science May 2008, Vol.49, 2009). This helps our perfusion procedure done more successfully than ketamine/xylazine. In our study, we will collect tumor tissues after perfusion so that the cardiac function parameter will not impact the results of study. (Imaging) The avertin is used with single dose for anesthesia of mice before euthanization in our project. Before euthanization, we need to do perfusion followed by tissue collection. Although
2101-38762A	Czyzyk, Jan	Mice	BLOOD COLLECTION LIMIT	This procedure will be performed in mice with diabetes to measure effects of anti-diabetic therapy. Random checking will involve weekly measurements. For glucose tolerance test mice will be bled at 0, 30, 60, 90 and 120 minutes after glucose intake. Each bleed is 5 microliters only. This is standard GTT assay, which allows for evaluation of severity of diabetes. 1-2 mm of tissue will be cut from the tail tip distal to the bone with sharp scissors, and then blood will be obtained by direct flow or gently massaging the tail.
2101-38763A	Culhane, Marie	Pig (Agricultural), Turkey, Cow (Agricultural)	EUTHANASIA DEATH/MORIBUND ENDPOINT	To assess the efficacy of nitrogen gas-filled high expansion foam for depopulation, animals must be euthanized by this route. In the event that anoxia by nitrogen gas inhalation is unsuccessful, pigs and cattle will be euthanized by penetrating captive bolt, and turkeys will be euthanized by nonpenetrating captive bolt.

2101-38787A	Ji, Yinduo	Mice, Chicken, Turkey	EUTHANASIA DEATH/MORIBUND ENDPOINT	In project 4, for mouse sepsis protection model, we expect the control infected mice without treatment will die within 48 hours after infection. This protection model is a gold standard approach for validation of the efficacy of novel antibacterial agents (Ling et al. 2015 Nature 517:455). The mice will suffer from infections including pain and distress; however, we will monitor the mice every two hours and terminate the mice if any infected mice show ruffled fur, lack active movement, appear difficulty of breath, and become moribund in order to minimize the pain and stress.
2101-38791A	McGregor, Christopher	Pig (Biomedical)	SOCIAL HOUSING	The boars will be housed singly so as not to have unwanted litters of pigs. He will be housed singly in the same room with the herd so that he has their company. Animals may also be housed singly if there is a health concern where more monitoring is required.
2101-38796A	Bereiter, David	Rat	MULTIPLE SURGERY	Exorbital gland removal and intra-CNS cannula placement will be performed concurrently. This may not qualify as multiple survival surgeries as there is no inter-procedure interval. Exorbital glands are removed on day 0, but siRNA cannot be given until 3-4 days prior to the recording session due to known duration of effectiveness of siRNA to interfere with transcription
2101-38796A	Bereiter, David	Rat	72 HOUR POST-OP ANALGESIA POLICY	We have received previous permission (7.22.13) from IACUC that a single dose of ketoprofen is sufficient for the minor surgeries we propose. We will change the protocol to use carprofen instead.
2101-38796A	Bereiter, David	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Exorbitant cost increases effectively makes pharmaceutical grade formulations unavailable. Pharmaceutical grade formulations do not exist. Barbiturates are not used here since they cause spontaneous muscle twitching that interferes with the evoked activity.
2101-38797A	Bereiter, David	Rat	MULTIPLE SURGERY	A single microinjection of siRNA is made to block transcription in CFA-treated rats. The effectiveness of siRNA lasts for only a few days and cannot be given at the time CFA injection.
2101-38797A	Bereiter, David	Rat	72 HOUR POST-OP ANALGESIA POLICY	We have received previous permission (7.22.13) from IACUC that a single dose of ketoprofen is sufficient for the surgeries we propose. (Intra-cerebral drug administration) This is a single injection and not a surgical procedure. (intra-TMJ injection of Complete Freund's Adjuvant) A 3 day regimen of carprofen would interfere with our TMJ inflammatory model. We will give a single dose on the day of surgery. (Jaw tracking: magnet and electrode placement)
2101-38797A	Bereiter, David	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Exorbitant cost increases effectively makes pharmaceutical grade formulations unavailable. Pharmaceutical grade formulations do not exist

2101-38800A	Pacak, Christina	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We have used this mouse model for 7 years and have not observed any issues with weight loss from the diet. Mice will be assessed regularly (2x per week) but likely do not require weekly recorded weighing.
2102-38818A	Bartolomucci, Alessandro	Other* (USDA)	SOCIAL HOUSING	Animals may be singly housed at times to allow full recovery from surgery during the immediate post-surgical phase. For isolation of experimental purposes, animals may be singly housed for 1h before the resident intruder assay; and for 1 week for the cardiometabolic responses to separation.
2102-38821A	Crooker, Brian	Cow (Agricultural)	EUTHANASIA METHOD	Anesthesia or sedation is generally not needed for iv administration of barbituates to dairy cattle. If the animal is not calm, gentle restraint should be sufficient for iv administration.
2102-38830A	Olin, Michael	Mice	MULTIPLE SURGERY	Pumps will be implanted 3-5 days post tumor inoculation. This allows us the time to image mice to ensure tumor growth. Tumors need to be established prior to use of the SPDT
2102-38837A	Zhang, Tianshun	Mice	TUMOR ENDPOINT CRITERIA	In order to "reduce and refine" these studies, we would like to keep animals on study that have non-cavitated ulcerations <1cm2. The animals will be treated with collasate ointment and monitored three times weekly by lab staff. Certain cell lines have a tendency to ulcerate the skin before the tumor is an adequate size, ergo if we treat the minor ulcerations we can keep the animals on the study and preserve the data preventing the need to replace or repeat.
2102-38852A	Chen, Xiaoli	Mice	EUTHANASIA METHOD	Our technical person has been working on mice for more than 8 years and has a high degree of mouse handling technical proficiency. In addition, we will combine this method (cervical dislocation) with decapitation

2102-38852A	Chen, Xiaoli	Mice	SOCIAL HOUSING	Mice will be singly housed for 5 hours during the cold exposure experiment. Since we attempt to determine the effect of the gene Knocking out on energy metabolism and the ability of mice to maintain their body temperature, group housing will significantly affect this assessment. Thus, single housing is required for this experiment. And also the experiment period is short (only 5 hours). We don't think this will have a significant impact on social behavior of mice. For the cold exposure that is one week in duration, the mice will be housed individually with free access to water and regular chow diet at 4C. The rectal temperature will be monitored twice a day for 7 days. The activity, mental attitude, food consumption, and elimination will be evaluated daily with each mouse for 7 days. Animals will also need to be singly housed during the behavioral procedures in the core. Fighting among adult male mice is a well-documented behavior and can result in severe wounding and death. We will try to prevent the occurrence of fighting and interevent the fighting if that happens. The following group-housing practices will be followed. 1.If previously-compatible group housed mice begin fighting and become wounded, they may remain in their cage and be treated, or removed depending upon the severity of the wounds. 2. If the “aggressor” mouse (or mice) can be identified (typically the one(s) with no wounds), it/they may be moved to another cage and singly-housed so that the rest of the mice can remain group-housed. 3. Mice observed with fight wounds: Mild to moderate wounds (those involving minimal damage to the epidermis) necessitates consultation with the veterinary personnel for determination of appropriate therapy. Severe wounds assessed by the veterinary personnel must be euthanized promptly.
2102-38855A	Aliota, Matthew	Mice	SOCIAL HOUSING	For experiments assessing the capacity of viruses to cause fetal harm, pregnant dams need to be housed individually to keep litters separate. This is to ensure that litters are succumbing to viral infection and not because of an artifact of being-housed with another dam.
2102-38860A	Tischler, Anna	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	We will perform experiments with small numbers of immune-deficient NOS2-/- and Irgm1-/- mice to measure virulence of M. tuberculosis mutant strains by monitoring survival of animals. We have also categorized all NOS2-/- and Irgm1-/- animals that will be used for the 6 week time points as Pain Class C, since this end point is close to the expected time of onset of disease symptoms (7 weeks for Irgm1-/- mice, 9 weeks for NOS2-/- mice), so these mice may experience some overt signs of clinical illness prior to the defined end point. Animals will be euthanized if they either become mor bund (defined as immobility and hunched posture) or lose >20% of their body weight, according to the IACUC euthansia criteria.

2102-38863A	Spencer, Sade	Rat	MULTIPLE SURGERY	Re-catheterization in case of catheter failure. Intervals are based on the animals catheter patentcy. Typically recatheterization surgeries only occur within the 3 weeks of the original surgery if at all. Each rat would undergo a maximum of 1 re-catheterization using the alternate jugular vein. The initial surgery utilizes the rat's right jugular vein and the re-catheterization surgery (if necessary) uses the left side. Animals are anesthetized for the procedure. Breathing rate and animals sensitivity to touch will be monitored to determine the state of anesthesia and overall well being of the animal. We will use a heating pad from the time of anesthesia till the animal is awake and moving around normally. Multiple surgical procedures are usually performed in immediate succession (i.e. catheter surgery be followed by viral injection). (Intracranial surgery: virus, cannula, optrode, fiber-optic light guide, or optical lens implant) Not applicable to non-survival surgical procedure.
2102-38863A	Spencer, Sade	Rat	TAIL BIOPSY	Occasionally animals will have to be genotyped post-weaning if we require RAR staff to wean animals as opposed to laboratory staff or if we need to redo the biopsy due to accidental contamination. We will take every measure to minimize post-weaning tail biopsies as they can lead to additional stress and pain to the animals. In all cases we will use QuickStop cauderizing sticks to stop bleeding following tail biopsy.
2102-38863A	Spencer, Sade	Rat	ENVIRONMENTAL ENRICHMENT	Enrichment is prohibited for rats in behavioral and drug addiction studies including operant self-administration, locomotor sensitization and conditioned place preference. However, breeders are permitted to have nesting material and other enrichment. Environmental enrichment alters brain function and reduces drug reward and reinforcement and drug-seeking behavior. Enrichment can be used as an intervention to reduce addiction-related processes (see Thiel et al, 2009, IJNP) therefore it may confound interpretation of our results. ndividuals with catheter and/or fiber implantations often need to be individual housed because we observe that rats are chewing on each others implantations, rendering them unusable. We also single house in some cases to facilitate drug self-administration. Rats that are single housed and without enrichment tend to show higher levels of drug self-administration.

2102-38868A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Typically, two surgeries are performed. In the first, a post to stabilize head position is implanted onto the surface of the skull and skin sutured around the post. Stabilizing head position can improve video recording and monitoring of eye position, as needed to train animals to fixate their gaze on visual targets during task performance. After training with gaze fixation is complete, a second surgery is performed in which we make craniotomies and implant recording chambers over target brain areas for neural recording. Doing the two surgeries limits the amount of time that craniotomies are open before recording begins (since by the time craniotomies are made, gaze fixation training is complete). That is advantageous as the dura mater within the craniotomy thickens over time, making it increasingly difficult to penetrate the dura for neural recording. Depending on the behavior of the animal and difficulty of the task, it may be possible to complete behavioral training with gaze fixation without stabilizing head position (using eye tracking systems that also track head position that allow the head to move). In that case, we will combine head post and recording chamber implantation into a single surgery. An additional survival surgery may be required if due to error in chamber placement(s), it is not possible for electrodes to reach their intended target brain areas. It may also be necessary to perform an additional survival surgery to either remove the implant, or repair it, if the cranial implant becomes loose or damaged. Finally, it may be advantageous to perform an additional survival surgery to make craniotomies and implant recording chambers in the opposite cerebral hemisphere (relative to the initial sites of neural recording) to acquire additional neural data from trained monkeys. In the case of tasks that take a long period to train, or where the number of neurons successfully recorded from is lower than planned in the initial recordings, continuing neural recording in the opposite cerebral hemisphere can help reach the quantity of neural data needed to meet the experimental objectives of the study, while minimizing the number of animals
2102-38868A	[redacted]	Nonhuman Primate (Macaques)	SOCIAL HOUSING	Every effort will be made to maintain nonhuman primates in pair housing. Occasionally, aggressive interactions develop between pair-housed primates that can result in significant injury and the pair has to be separated to prevent this. This can impose particular risks after cranial implantation (as violent interactions can damage the implant preventing data collection). If aggressive interactions emerge in pair-housed animals, we will consult with RAR veterinarians and staff to seek either single housing or alternative pair housing to mitigate the risk of violent interactions, injury, and implant damage.

2102-38880A	Kim, Jong Hyuk	Mice	EUTHANASIA METHOD	1. Cervical dislocation is used because organ congestion must be avoided to assess tumor dissemination and architecture. A common side effect of sedatives, barbiturates, and CO2 inhalation is congestion, which can obscures pathologic changes in vascular organs and tumor vasculature, and can thus render experiments moot (unable to analyze vascular effects of genetic alteration or treatment). 2. When performed by experienced personnel, cervical dislocation leads to instantaneous death. Sedation can increase anxiety.
2102-38885A	Modiano, Jaime	Mice	EUTHANASIA METHOD	Cervical dislocation can be accomplished without additional sedation, but will only be used in exceptional circumstances. Euthanasia solution itself causes sedation, so the same procedure that leads to humane death by euthanasia causes sedation. The animals are not sedated in advance by other methods because the euthanasia solution is injected by the intraperitoneal route, which causes no to minimal, momentary discomfort. The active ingredient in the solution is the equivalent of 86 mg/kg pentobarbital. The process of additional sedation would increase the animal's stress and discomfort far beyond the momentary injection of euthanasia solution. The action of the euthanasia solution is quite rapid and equivalent to other methods of sedation or anesthesia. As needed, euthanasia will be ensured by cervical dislocation.
2103-38886A	Koski, Rachel	Rat	72 HOUR POST-OP ANALGESIA POLICY	Buprenorphine SR may have anti-inflammatory effects and based on my previous experience the compound may affect my study looking at the caffeine citrates anti-inflammatory effects post surgical administration. Also in Gauther, EA et al. 2011.Buprenorphine Disrupts Sleep and Decreases Adenosine Levels in Sleep-Regulating Brain Regions of Sprague Dawley Rat. Anesthesiology; October; 115(4): 743-753 found Buprenorphine affects adenosine levels in the brain. Caffeine is known as a nonselective adenosine antagonist but the the complete mechanism of action is unknown therefore use of buprenorphine or other systemic agents such as Metacam or similar, are agents that have known anti-inflammatory properties therefore could exert neuroprotective properties that would interfere with the experimental HI condition.

2103-38887A	Blazar, Bruce	Mice	TUMOR ENDPOINT CRITERIA	Sick mice cannot euthanized. These experiments are based upon treatment-related survival. In addition, the overall goal of these tumor induction experiments is to study the combined effect of GVL and GVHD. We tried correlating GVHD histology to survival and surprisingly, did not find a correlation. It may be useful corollary data providing information as to specific tissue site destruction but it does not correlate to survival. Nor do data from in vitro assays (disparagingly referred to as 96-well plate immunology) correlate to survival. GVHD is a complex pathophysiological process for which there is no good substitute endpoint for survival. However, we certainly understand that we need to minimize animal suffering. One mitigating factor for GVL pathophysiology, in comparison to GVHD, is that individual tumor lines induce death at relatively specific intervals of 2-5 days, whereas GVHD symptoms can go on for 30+ days.
2103-38887A	Blazar, Bruce	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Sick mice cannot euthanized.We tried correlating histology to survival and surprisingly, did not find a correlation. It may be useful corollary data providing information as to specific tissue site destruction but it does not correlate to survival. Nor do data from in vitro assays (disparagingly referred to as 96-well plate immunology) correlate to survival. GVHD is a complex pathophysiological process for which there is no good substitute endpoint for survival.
2103-38887A	Blazar, Bruce	Mice	SOCIAL HOUSING	Although we prefer not to house mice singly, sometimes there's no alternative. In the event that only 1 male or female is weaned from a litter then the mouse is housed singly. If there is a cage of recently weaned mice, the single new weanling is added to the cage of previously weaned mice but the age and size disparity must be very narrow or the small newly added weanling is bullied by the older, larger mice. With older mice, males cannot be rehoused for any reason due to the high incidence of fighting and truly gruesome injuries. Experimental mice are routinely housed 4-5 per cage at the initiation of the experiment but deaths will occur at various times after transplant leaving 1 mouse per cage until its death or the termination of the experiment. We do not recombine experimental mice once the experiment is underway to preserve data integrity. Combining survivors from different groups would increase the likelihood of mistakes (e.g., injecting mice with the wrong solution, taking wrong mouse for study, recording wrong GVHD scores, death dates or weights) due to misidentification even though mice are ear-punched. Housing mice from different treatment groups in the same cage is a mistake waiting to happen. Also, mice from some groups could be healthier than mice from other groups and combining a sick mouse with new healthier companions can result in bullying and these mice are sick enough without having to contend with bullying. Social housing is preferred for humane reasons but there are circumstances in which the sequelae of social housing are worse than those of single housing.

2103-38887A	Blazar, Bruce	Mice	EUTHANASIA METHOD	We use cervical dislocation without anesthesia due to the potential depressive effects on the circulation and induction of tissue injury. We have consistently observed that lymph node, spleen and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after euthanasia. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses as measured in vitro by proliferation assays and in vivo by GVHD effects. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis, corticosteroid-induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and poor oxygenation that will compromise our experiments. Carbon dioxide inhalation prior to cervical dislocation would adversely upset the acid-base balance resulting in acidosis which would be important on a cellular level for in vivo transfer of cells and in vitro assays. When done correctly, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the mouse. The technicians, graduate students and post-docs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized with isofluorane. Only individuals who have become good experienced mouse handlers perform cervical dislocation. Since GVHD is a complex pathophysiological processes which in its most severe state results in mortality or a mor bund state, lethality evaluation is a requisite and the only accepted endpoint of our studies. This has been validated by discussions with peers, numerous GVHD and BMT complications workshops (some NIH sponsored), peer review of grants and papers and unfavorable peer reviews of grants and papers that do not have death as an endpoint for acute GVHD models. Weight loss, diarrhea, extensive skin lesions, anemia, pale mucous membranes, and lethargy do not justify euthanizing mice as mice may live for many months with subacute/chronic GVHD
2103-38889A	Hrab k, Thomas	Fish (Other), Fish (Other)	72 HOUR POST-OP ANALGESIA POLICY	Based on previous work we have done, tag implantation takes less than 30 seconds with a small incision with 100% survival. Fish recover within 30 minutes and show no signs of stress after 1 hour. The only stress observed is due to handling the fish. Finally, we add API Stress Coat plus which is not a true analgesic, but has been known to increase slime coat for protection and reduces stress (50 mL StressCoat per 150 gallons water).
2103-38900A	Wisenden, Brian	Fish (Other), Rodent (Other - Non-USDA), Fish (Other), Rodent (Other - Non-USDA)	EUTHANASIA METHOD	Field conditions, and because we have never had an animal be injured or die in 21 years. This is under field conditions, and because we have never had an animal injured or die in 21 years.

2103-38904A	Blazar, Bruce	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	The exception for death as an endpoint will be pre-determined endpoint for the experiment, typically 100 days post transplant. As stated, control transplanted animals (BM only) are not expected to show signs of GvHD, and as such will typically survive for the term of the experiment. Additionally, if all relevant experimental groups have succumbed to GvHD by, for example, day 60 it would not be meaningful to carry out the remainder of the experiment for the control BM only group. Under such circumstances, remaining animals would be euthanized earlier.
2103-38904A	Blazar, Bruce	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Mice are euthanized with an avertin overdose for lung dissections. The use of avertin permits for cardiac perfusions to clear the lungs of blood. This is a published method by the Carla Kim lab at the Boston Children's Hospital (PMID: 15960971, 24497554).
2103-38904A	Blazar, Bruce	Mice	EUTHANASIA METHOD	We use cervical dislocation without anesthesia due to the potential depressive effects on the circulation and induction of tissue injury. We have consistently observed that lymph node, spleen and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after euthanasia. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses as measured in vitro by proliferation assays and in vivo by GVHD effects. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis, corticosteroid-induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and poor oxygenation that will compromise our experiments. Carbon dioxide inhalation prior to cervical dislocation would adversely upset the acid-base balance resulting in acidosis which would be important on a cellular level for in vivo transfer of cells and in vitro assays. Other inhaled anesthetics such as isoflurane can severely impact histology of the lung which is a critical terminal readout that we use following termination. Injected anesthetics such as pentobarbital can cause respiratory distress which would also disrupt lung histology. When done correctly, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the mouse. The technicians, graduate students and post-docs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized with pentobarbital (as described in the Procedure). Only individuals who have become good experienced mouse handlers perform cervical dislocation. Since GVHD is a complex pathophysiological processes which in its most severe state results in mortality or a mor bund state, lethality evaluation is a requisite and the only accepted endpoint of our studies. This has been validated by discussions with peers, numerous GVHD and BMT complications workshops (some NIH sponsored), peer review of grants and papers and unfavorable peer reviews of grants and papers that do not have

2103-38905A	Blazar, Bruce	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	The exception for death as an endpoint will be pre-determined endpoint for the experiment, typically 100 days post transplant. As stated, control transplanted animals (BM only) are not expected to show signs of GvHD, and as such will typically survive for the term of the experiment. Additionally, if all relevant experimental groups have succumbed to GvHD by, for example, day 60 it would not be meaningful to carry out the remainder of the experiment for the control BM only group. Under such circumstances, remaining animals would be euthanized earlier.
2103-38905A	Blazar, Bruce	Mice	EUTHANASIA METHOD	We use cervical dislocation without anesthesia due to the potential depressive effects on the circulation and induction of tissue injury. We have consistently observed that lymph node, spleen and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after euthanasia. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses as measured in vitro by proliferation assays and in vivo by GVHD effects. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis, corticosteroid-induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and poor oxygenation that will compromise our experiments. Carbon dioxide inhalation prior to cervical dislocation would adversely upset the acid-base balance resulting in acidosis which would be important on a cellular level for in vivo transfer of cells and in vitro assays. When done correctly, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the mouse. The technicians, graduate students and post-docs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized with pentobarbital (as described in a Procedure). Only individuals who have become good experienced mouse handlers perform cervical dislocation. Since GVHD is a complex pathophysiological processes which in its most severe state results in mortality or a mor bund state, lethality evaluation is a requisite and the only accepted endpoint of our studies. This has been validated by discussions with peers, numerous GVHD and BMT complications workshops (some NIH sponsored), peer review of grants and papers and unfavorable peer reviews of grants and papers that do not have death as an endpoint for acute GVHD models. Weight loss, diarrhea, extensive skin lesions, anemia, pale mucous membranes, and lethargy do not justify euthanizing mice as mice may live for many months with subacute/chronic GVHD

2103-38905A	Blazar, Bruce	Mice	SOCIAL HOUSING	Although we prefer not to house mice singly, on rare occasion there is no alternative. For example, in the event that only 1 male or female is weaned from a litter, the mouse is housed singly. To further reduce single housing, if there is a cage of recently weaned mice of the same strain, the single new weanling is added to the cage of previously weaned mice, but the age and size disparity must be very narrow or the small newly added weanling risks being bullied by the older, larger mice. With older mice, males cannot be rehoused for any reason due to their territorial nature resulting in a high incidence of fighting. Experimental mice are routinely housed 4-5 (max 4 males) per cage at the initiation of the experiment but deaths will occur at various times after transplant resulting in attrition to a single mouse per cage until death or the termination of the experiment. We do not recombine experimental mice once the experiment is underway to preserve data integrity and prevent territorial fighting or distress. Combining survivors from different groups would increase the possibility mistakes detrimental to the study such as mixing interventions (injections) or false clinical readings (weight/death). Housing mice from different treatment groups in the same cage will lead to compromised data, which would require repeated experiments at the cost of many additional mice, time and resources. Also, mice from some groups could be healthier than mice from other groups, so that combining a sick mouse with new healthier companion might further result in territorial behavior, added stress. Social housing is preferred and broadly implemented for humane reasons however the listed circumstances are exceptions from which the sequelae of social housing are worse than those of single housing.
2103-38914A	Garry, Daniel	Mice	TAIL BIOPSY	Mice will be genotyped by tail snip. If a tail biopsy is taken after 21 days of age, mice will receive appropriate anesthesia (lidocaine).
2103-38914A	Garry, Daniel	Mice	EUTHANASIA METHOD	Cervical dislocation will be performed by technically competent staff to ensure quick and complete euthanasia

2103-38924A	Ghose, Geoff	Cat	MULTIPLE SURGERY	Excluding the MPTP surgeries, a total of three pr mary (i.e., not repair/replacement) surgical procedures may be performed to properly instrument the animal to achieve the experimental aims. This includes 1) placement of the head restraint post, 2) chamber/micro-array placement, and 3) pulse generator implantation. Although it is possible that these procedures may be combined, thereby reducing the total number of surgeries required, it is more often the case that they are performed separately. The motivating factors for separating these procedures include: 1) limiting the overall duration of any one surgical procedure (anesthetic episode), and 2) maximizing the overall integrity and lifespan of the implant. Additional surgeries are required for induction of the parkinsonian state. Response to the MPTP neurotoxin varies across animals and it is considered best practice to approach the desired severity level gradually rather than risk overshooting the behavioral target and inducing an unnecessarily severe parkinsonian state. This approach typically requires multiple intra-carotid surgical procedures combined, in some cases, with systemic injections to safely achieve the desired severity level. Chamber/headpost repairs, though rare, may be necessary if either is damaged by the animal. We justify the repairs as they limit the number of animals used in the study. As illustrated in the Experiment Design section, we typically do instrumentation survival surgeries in animals prior to MPTP administration, in part so that they are as healthy as possible and recovery from the surgical procedures is not complicated by the animal's parkinsonian condition. If parkinsonian animals do require additional survival surgeries (e.g. unexpected headcap repair), the RAR veterinary staff will be consulted and a determination will be made as to whether the additional survival surgery is appropriate given the animal's current health status. For the hemiparkinsonian model, additional surgeries are required for induction of the parkinsonian state. Response to the MPTP neurotoxin varies across animals and it is considered best practice to approach the desired severity level gradually rather than risk overshooting the behavioral target and inducing an unnecessarily severe parkinsonian state. This approach
2103-38924A	Ghose, Geoff	Cat	SOCIAL HOUSING	Animals will be single housed overnight for a preparatory period before a surgical procedure. The rationale for single housing an animal prior to a procedure under anesthesia is to assure that the animal does not eat any food while also allowing other animals to access food. If an animal eats food within 8 hours of a procedure, there is a risk that incompletely digested food will be regurgitated and occlude the respiratory tract. Although occlusion of the respiratory track can managed intraoperatively, it is far better for the health of the animal to remove this risk by temporarily single housing the animal without access to food. While single housed, the animal will be housed in an isolation cage in the same room as other similar animals, which allows for visual, auditory, and olfactory sensory stimulation more closely similar to group housing.
2103-38929A	Baidoo, Samuel	Pig (Agricultural)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Pigs will be weighed every two week to minimize interference with their behavior.

2103-38934A	Ebner, Timothy	Mice	MULTIPLE SURGERY	For our awake imaging studies and histology experiments, it is essential we obtain both pre and post-TBI imaging data. Both of these experiments requiring an initial survival surgery to affix one of the implants, descr bed above, followed by a second surgical procedure to perform the Controlled Cortical Impact procedure to induce the TBIs. (Brain Window Implantation (Survival)) For this experimental procedure, it is essential that animals serve as their own controls pre and post-TBI. Furthermore, employing an experimental design in which animals serve as their own control reduces the total number of animals needed to accomplish the proposed study. In order to accomplish this, the animals must undergo separate, survival surgeries. Pain and distress post-operatively associated with multiple procedures will be mitigated appropriately as outlined in the individual procedure protocols.
2103-38934A	Ebner, Timothy	Mice	ENVIRONMENTAL ENRICHMENT	We are requesting an exemption of social housing. See question 19.
2103-38934A	Ebner, Timothy	Mice	SOCIAL HOUSING	Mice will be housed singly during water restriction to ensure accurate water regulation. The mice will be weighed before the initiation of water restriction and this will be the pre-restriction weight (see procedure "Water Restriction"). Mice with implants are that will be housed in [redacted] are singly housed to prevent the mice from disrupting the integrity of the implants, which could cause the implant to become compromised (either physically or create a non-sterile environment). Mice without implants will be group housed.

2103-38934A	Ebner, Timothy	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	To our knowledge, there is no pharmaceutical grade urethane available. However, we believe the use of urethane is still justified in our anesthetized, non-survival surgical procedures, as alternative anesthetics have considerable negative effects on physiology of the cerebral and cerebellar cortices. For example, ketamine is well known to block NMDA receptors in the brain, which are key receptors in the neuronal circuitry that we are studying (Bengtsson & Jorntell, 2007). Barbiturates are also known to profoundly depress cerebellar circuitry (Sato, Y. et al., 1993). Additionally, isoflurane over time depresses cerebellar function (Loeb, A.L., et al., 1998), which is not ideal for our long, acute experiments. Therefore, urethane is the best available anesthetic agent for us to use to investigate cerebral and cerebellar function in our studies. The procedure will also be carried out in [redacted] Bengtsson, F. & Jorntell, H. Ketamine and xylazine depress sensory-evoked parallel fiber and climbing fiber responses. J Neurophysiol 2007, 98(3):1697-705. Sato, Y., Miura, A., Fushiki, H., & Kawasaki, T. Barbiturate depresses simple spike activity of cerebellar Purkinje cells after climbing fiber input. J Neurophysiol 1993, 69(4):1082-90. Loeb, A.L., Raj, N.R., Longnecker, D.E. Cerebellar nitric oxide is increased during isoflurane anesthesia compared to halothane anesthesia: a microdialysis study in rats.
2103-38938A	Toth, Ferenc	Pig (Biomedical)	MULTIPLE SURGERY	In the proposed research project, we intend to perform a primary surgical procedure during which an intravascular micro catheter inserted through the carotid artery is used to embolize the vascular supply of the femoral head. Monitoring the effects of the primary surgical procedure requires subsequent angiographic studies that also require access to the carotid artery. Thus, the second and potentially third and fourth surgical procedures (performed at least 7 days apart) will entail only a minor cut-down procedure to the carotid artery (alternating the left and the right side) in anesthetized animals to allow insertion of the angiographic catheter and completion of the angiography. These follow up surgeries are expected to be of very short duration (15-20 min) and expected to cause only minimum morbidity, stress, and discomfort. These 2nd, 3rd, and 4th surgical procedures that are limited to surgical access to the carotid artery at the ventral aspect of the next should result in no functional deficit. During and after the surgical procedures the same anesthetic and analgesic procedures will be used as described for the primary surgery.
2103-38939A	Goldschmidt, Stephanie	Dog	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Dental extractions are out-patient procedures not requiring hospitalization, therefore post-operative records will not be possible for a minimum of 3 days. Post-operative records will be recorded throughout the time spent in the hospital as a day patient.

2103-38940A	Michaeli, Shalom	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Urethane is a widely used anesthetic in laboratory an mal practice, especially in electrophysiologic studies (Maggi and Meli, 1986). Urethane has several advantages, including several possible administration routes, steady and long lasting (6–12 h) surgical level of anesthesia, minimal effects on respiration and cardiovascular system, and muscle relaxation (Maggi and Meli, 1986, Hara and Harris, 2002). Although some thalamic and cortical suppression has been identified, several regions are only minimally modulated by urethane, and peripheral stimuli produce reflexes at the central nervous system level that modulate autonomic functions (Maggi and Meli, 1986). Nevertheless, urethane also has undesirable side effects. It causes hyperglycemia, and intraperitoneal injection induces necrosis in intra-abdominal organs (Maggi and Meli, 1986, Field and Lang, 1988). Urethane anesthesia is thus recommended to be terminal, which precludes follow-up studies (Field and Lang, 1988). Urethane has mild effects on multiple ion channels, a feature distinguishing it from many other anesthetics (Hara and Harris, 2002, Masamoto and Kanno, 2012). At an anesthetic concentration, GABAA and glycine receptors are only slightly enhanced (20%–30%), while certain glutamate and α-amino-3-hydroxy 5-methyl- 4-isoxazolepropionic acid receptors are only modestly inh bited (10%–20%) (Maggi and Meli, 1986, Hara and Harris, 2002). In addition, the anesthetic concentration of urethane slightly (15%) enhances the function of nAChRs (Hara and Harris, 2002). Therefore, urethane at a concentration near the surgical level anesthesia may be more suitable for electrophysiologic measurements and pharmacologic studies than other anesthetics (Maggi and Meli, 1986, Hara and Harris, 2002, Masamoto and Kanno, 2012). References 1. Cortical spreading depression induces oxidative stress in the trigeminal nociceptive system. Shatillo A, Koroleva K, Giniatullina R, Naumenko N, Slastnikova AA, Aliev RR, Bart G, Atalay M, Gu C, Khazipov R, Davletov B, Grohn O, Giniatullin R.
2103-38942A	Sachs, Zohar	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Mice will be euthanized on the same day they become moribund. Mice are allowed to reach moribund state because in order for our experiments to produce good results, AML should be as prominent in the mouse as poss ble. Often, this state co-occurs as moribundity. In our MDS mouse strains, we expect the same disease state to occur.
2103-38943A	Lange, Carol	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	E2 in drinking water should not have an effect on the well-being of the mouse and is used to supplement estrogen levels needed for tumor cell growth. Once visible tumors form, mice will be weighed to monitor health with the tumor induction. For intraductal tumor growth is very slow and often palpable tumors are not observed within the first 10-12 weeks of tumor induction.

2103-38962A	Vulchanova, Lucy	Mice	MULTIPLE SURGERY	In some mice, brain injections of viral vectors or neuronal tracers will precede (1-6 weeks) or follow (2-4 weeks) Spared Nerve Injury. The addition of these injections are not expected to exacerbate the level of pain and distress associated with spared nerve injury. The rationale for injection in VPL or parabrachial nucleus prior to SNI is: 1) to label projection neurons for identification in subsequent ex vivo physiological experiments, and 2) to deliver neuromodulatory genes to projection neurons for subsequent behavioral or ex vivo physiological experiments. 1. In some mice, brain injections of viral vectors or neuronal tracers will precede (1-8 weeks) or follow (2-8 weeks) Spared Nerve Injury. The addition of these injections are not expected to exacerbate the level of pain and distress associated with spared nerve injury. The rationale for administering the two survival surgeries in the same animal is that the viral injections will allow us to study and manipulate specific neurons within the circuits that mediate chronic hypersensitivity in the SNI model. 2. In some mice that receive a brain injection, it will be necessary to administer a second viral injection in the same location 2-4 weeks after the first injection. Although we originally proposed to administer the two viral injections through an in-dwelling cannula and have approval for this approach, we are concerned that we don't know how the scar tissue that forms around the cannula will affect the distribution of the second vector. Therefore, we would like to compare the dual injection approach to the in-dwelling cannula approach. We do not expect that the second injection will result in additional pain or distress. 3. In some mice that receive a brain injection, it will be necessary to administer a second viral injection in the spinal cord 2-8 weeks after the first injection. Two viral vector injections are needed for monosynaptic gene transfer. (Injection of viral vectors or neuronal tracers in brain nuclei) The mice undergoing this non-survival procedure may have had
2103-38962A	Vulchanova, Lucy	Mice	72 HOUR POST-OP ANALGESIA POLICY	Post-operative analgesic therapy is contraindicated because the objective of the procedure is to determine whether the experimental treatment causes hypersensitivity. Provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied.
2103-38962A	Vulchanova, Lucy	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Exception is requested for the use of non-pharmaceutical grade urethane for non-survival surgeries. In our experience, this usually produces a very stable and long-lasting (8-16 hours) state of anesthesia, which is the reason for choosing this non-pharmaceutical grade anesthetic agent for these experiments.

2103-38965A	Taylor, Raye	Cat, Dog	72 HOUR POST-OP ANALGESIA POLICY	Currently our shelter cats (non-feral) are receiving an IV dose of buprenorphine after induction then an oral dose of 0.1 mg/kg meloxicam after recovery and another 0.05 mg/kg dose of meloxicam to go home and administered 24 hours later. Unfortunately, there are no great take-home analgesics which are entirely safe to use in cats. NSAIDs are safe to use short-term but are not recommended to be used for multiple days in a row. Sublingual buprenorphine is a controlled substance and should not be dispensed to local rescue groups and shelters. Keeping these facts in mind, we consulted with a board-certified veterinary anesthesiologist and they recommended providing 2 doses of oral meloxicam for pain in cats; they did not recommend providing a 3rd dose. This exact protocol has been approved by IACUC for this teaching lab for multiple years and we have not had any issues with post operative pain in our cats. This pain protocol is also what is used at the Animal Humane Society (where most of our surgery patients are obtained from) and in many veterinary hospitals throughout the United States and Europe. Currently our feral cats receive a one-time dose of SQ meloxicam at 0.3 mg/kg after induction. This pain protocol was approved by IACUC for our feral cat pain management last year and the following justification was provided. Since the approval of this pain protocol last year, we have spayed and neutered over 50 feral cats and no issues with post surgical pain has been observed. • Unfortunately, there are no licensed injectable pain medications which will provide 72 hours of analgesia in cats • Currently, a single dose of meloxicam (5 mg/ml) at 0.3 mg/kg is the only injectable NSAID licensed for use in cats and is labelled by the FDA to control post-operative pain and inflammation associated with orthopedic surgery, ovariohysterectomy, and castration when administered prior to surgery • Additional doses of meloxicam or any other NSAIDs are contraindicated

2103-38965A	Taylor, Raye	Cat, Dog	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	The 3 day post-operative monitoring of patients will be performed by the rescue groups, foster parents, and local animal shelter staff. Each patient is discharged with detailed post-operative directions (see attachment labelled "detailed post operative care instructions") and caretakers are expected to review these documents and report any abnormalities to the U of MN faculty veterinarian via the emergency care phone line. Caretakers are expected to monitor each animal's activity level, mental attitude, elimination habits and food consumption and report any concerns. They are encouraged to check the incision daily and to report any redness, swelling, or discharge. They are also required to report any signs of pain or discomfort so additional pain medications can be prescribed. Last year, we added feral / community cat spay and neuter surgery to our teaching protocol. These cats are discharged to a designated "feral cat coordinator" who is employed by the Animal Humane Society or another rescue group. After discharge the following steps are put into place to ensure proper monitoring after surgery: • The feral cats will be returned to their rescue groups after surgery and will be held by the rescue groups and monitored overnight then returned to their colonies the next day • If the rescue group feels the cats are painful or uncomfortable after surgery, they will be returned to the University of MN Spay and Neuter Veterinarian for further monitoring and additional pain medication will be administered. • After returning to their colonies, a designated "colony caretaker" will monitor these cats daily during feeding time for any signs of discomfort and / or pain • If a particular cat appears to be in pain or in distress following its spay and neuter surgery, this cat will be re-trapped and checked by the University of MN Spay and Neuter Veterinarian, additional medical attention including additional doses of analgesia will be administered (Spay and Neuter Cat) The 3 day post-operative monitoring of patients will be performed by the rescue groups, foster parents, and local
2103-38970A	Pacak, Christina	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We have used this mouse model for 7 years and have not observed any issues with weight loss or failure to gain from the diet. Mice will be assessed regularly (2x per week). This will include weekly body weight recording.
2104-38971A	Klein, Amanda	Mice	72 HOUR POST-OP ANALGESIA POLICY	The goal of this study is to access the effects of KATP channel downregulation in chronic pain. Exogenous analgesics may confound the results of our study. Previous reports suggest that administration of opioids or NSAIDs shortly after surgery can affect hormone levels and/or paw withdrawal sensitivity in rodents (Wilson et al., 2016, Pain Res Treatment; Celerier et al., 2006, Anesthesiology). Current clinical theories suggest that blocking or limiting persistent pain immediately after surgery is clearly important in the persistence of chronic pain (Richebe et al., 2018, Anesthesiology).
2104-38973A	Remmel, Rory	Rat, Guinea Pig	SOCIAL HOUSING	Because animals are cannulated, they will need to be housed individually for their own safety/well-being.

2104-38974A	Davydova, Julia	Mice, Hamster	TUMOR ENDPOINT CRITERIA	As we stated above, along with the tumor lysis caused by hypoxia, tumor ulceration might be observed in animals receiving subcutaneous tumor cells. Tumor necrosis could be also an indicator of the successful therapeutic effect of the suggested treatment. In some cases, tumor necrosis leads to the ulceration of the tumor. Usually, this is the phenomenon observed in the process of tumor suppressive effect. We would like to observe the rodents with ulcers without antibiotics or analgesia in order to avoid possible effect of those drugs to the tumor response. Thus, pain level C is requested in order to observe the ulcerated tumor without antibiotics or analgesia. Animals will be monitored as their tumor grows for assessment of tumor size and overall animal condition every second day and/or as frequently as is required by the area veterinarian after a treatment plan is discussed. This monitoring will include weekends and holidays. Animals will be isolated to ensure recovery, if necessary. If visible tissue damage develops, we will consult with the veterinary staff about use of analgesics or ant biotics. Any animals that appear ill will be examined by an RAR veterinarian to determine the nature of any secondary toxicity and euthanized or treated accordingly. The following criteria will be used to determine euthanasia for the animals with ulcerated tumors: 1. Animals with ulcerated tumors who developed continuous bleeding (more than 3 days). 2. If ulceration is more than ½ of the tumor nodule diameter.
2104-38979A	Torres, Sheila	Dog, Cat, Guinea Pig, Rabbit, Gerbil, Hamster, Mice, Rat, Other* (USDA), Rodent (Other - Non-USDA), Reptile (Other), Chinchilla	SOCIAL HOUSING	these will be client owned animals and will be housed only for a short time.

2104-38979A	Torres, Sheila	Dog, Cat, Guinea Pig, Rabbit, Gerbil, Hamster, Mice, Rat, Other* (USDA), Rodent (Other - Non-USDA), Reptile (Other), Chinchilla	ENVIRONMENTAL ENRICHMENT	These will be client owned animals housed for <8 hours.
2104-38980A	Firshman, Anna	Horse, Cow (Biomedical), Goat, Sheep, Camelid (llamas & alpacas)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Standing sedation only. Clinical cases are not monitored to this level. Sedation is only used to the level needed to relax the animal, not to perform surgery
2104-38986A	Lin, Wensheng	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	EAE is a paralytic disease that affects predominantly mobility of the experimental animals. Transient Dehydration, fatigue and muscle waste are expected symptoms when mice reach a score of 3.0 (complete paralysis of hind limbs) and beyond. These mice will receive supplemental nutrition, fluids and care on a twice daily basis. Animals that reach a score of 4.0 (complete paralysis of four limbs) or a moribund state will be euthanized.
2104-38986A	Lin, Wensheng	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Mice will be deeply anesthetized with intraperitoneal injections of Avertin (425 mg/kg) prior to transcardial perfusion. Depth of anesthesia will be confirmed via lack of toe pinch reflex. Euthanasia is achieved by loss of blood and perfusion.

2104-38986A	Lin, Wensheng	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Avertin has been the standard anesthetic in much mouse transgenic work. Advantages of Avertin are that it produces short-term (15-20 minutes) surgical anesthesia with good muscle relaxation and moderate respiratory depression, and that the mouse received it will recover within 30-60 minutes. Usually, it takes less than 5 minutes to perform EAE immunization. Moreover, we have used Avertin for EAE experiments for over 10 years (Avertin was approved for EAE experiments in our previous protocols 1209A21055,1507-32810A, and 1806-36038A). It is extremely important to use Avertin for our current and future EAE experiments, so that we make direct comparisons our previous, current, and future EAE work. Therefore, Avertin is selected due to its rapid induction of short-term anesthesia, quick recovery, low complication rate, and continuity of our EAE work. Avertin will be prepared according to the IACUC Guidelines. Briefly, ten grams of 2,2,2-Tribromoethanol will be suspended in 10 ml of tert-amyl alcohol and serves as the stock solution. The working solution is made by diluting the stock to 2.5% in PBS, filter sterilized through a 0.2 um filter, and stored at 4 C in a dark bottle. The working solution is used for no more than 2 weeks. Mice will be deeply anesthetized with intraperitoneal injections of the high dose of Avertin (425 mg/kg) prior to perfusion. Avertin has been the standard anesthetic in much mouse transgenic work. Advantage of Avertin is that the high dose of Avertin leads to rapid induction of deep anesthesia for transcardial perfusion.
2104-38986A	Lin, Wensheng	Mice	EUTHANASIA METHOD	When properly used by skilled personnel with well-maintained equipment, cervical dislocation may result in less fear and anxiety and be more rapid, painless, humane, and practical than other forms of euthanasia. Younger than 14-day-old pups will be will be euthanized by decapitation with scissors. Decapitation results in less fear and anxiety and be more rapid, painless, humane, and practical than other forms of euthanasia. EAE is a paralytic disease that affects predominantly mobility of the experimental animals. Transient Dehydration, fatigue and muscle waste are expected symptoms when mice reach a score of 3.0 (complete paralysis of hind limbs)and beyond. These mice will receive supplemental nutrition, fluids and care on a twice daily basis. Animals that reach a score of 4.0 (complete paralysis of four limbs) or a moribund state will be euthanized.

2104-38998A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Second surgical procedure will be a bilateral nephrectomy (acute) procedure. (Donor: Splenectomy) Vascular access is an essential component of supporting animals that have previously been transplanted with either a life-supporting kidney or liver. Implant with a vascular access port is a refined approach to ensure proper delivery of the immunosuppressive drugs, antibiotics or other supportive therapies (e.g. IV fluid rehydration) and facilitates cooperation clinical monitoring in the absence of chemical or physical restraint. (Vascular access port placement)
2104-39000A	Lanier, Lorene	Mice	EUTHANASIA METHOD	Cervical dislocation is faster than asphixiation with CO2 and, when done properly, the animal experiences□ less distress than with asphixiation. I have >25 years experience with this techniques.
2104-39005A	Gordon-Evans, Wanda	Dog, Cat	EUTHANASIA METHOD	unlikely needed if owner has decided to euthanize
2104-39016A	Nielsen, Kirsten	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	According to new University of Minnesota guidelines described at my last annual review, pentobarbitol can be purchased from Sigma, prepared in small filter-sterilized batches, and stored in injection vials. Because commercial pentobarbitol requires purchase in large quantities (10ml) we typically see variability in the potency of the drug over the lifetime of the vial. The ability to make smaller batches of drug, that can be used more rapidly, will allow us to more accurately dose our mice. “We request the use of non-pharmaceutical grade pentobarbital for survival procedures in place of the pharmaceutical grade in light of, and in following the guidelines of, the RAR's recent statement, ‘Recent exorbitant cost increases of pentobarbital have placed it logistically into the unavailable category. Pentobarbital from a reagent or analytical-grade powder, properly prepared by a pharmacist or other knowledgeable individual (e.g., chemist, veterinarian, researcher), with assurance of appropriate storage and handling, and approval by the IACUC is acceptable." [March 2012 NIH/OLAW Webinar]’
2104-39025A	Widge, Alik	Rat	72 HOUR POST-OP ANALGESIA POLICY	The animal usually does not feel pain 24 hours post-surgery, but we will monitor the rat everyday for at least 72 hours post-surgery. Analgesics will be given if the rat is still feeling the pain either 48 or 72 hours post-surgery accordingly.
2104-39037A	Cetera, Maureen	Guinea Pig, Mice	TAIL BIOPSY	Ear punch and tail snips at two weeks.
2104-39043A	Blazar, Bruce	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Death is required to understand the effects of some of our experimental therapies on GVHD. In order to understand their effect, death must be used. See additional justification above.

				Cervical dislocation. We are proposing to perform cervical dislocation without anesthesia due to the potential effects of anesthesia on the circulation and the induction of tissue injury. For example, we have consistently observed that lymph node, spleen, and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after elective sacrifice. We have noticed that new lab members who cannot rapidly harvest bone marrow and lymph nodes frequently have poor experimental results. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses as measured in vitro by proliferation assays and in vivo. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis, corticosteriod induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and oxygenation that will compromise our experiments, requiring more repetitions and hence more mice, reagents, space in the colony and resources. Carbon dioxide inhalation prior to cervical dislocation would adversely upset the acid-base balance resulting in acidosis which would be important on a cellular level for in vivo transfer of cells and in vitro cellular assays. Importantly, we cannot know which experiments will suffer the most since we cannot quantify these effects in an individual experiment and we cannot know if we are on the threshold of such effects in a particular experiment. WHEN DONE CORRECTLY, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the animal. The technicians and graduate students/postdocs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized. Only individuals who have become good experienced mouse handlers perform cervical dislocation. RAR is aware of our procedure and practice of using cervical dislocation for these scientific reasons.
2104-39043A	Blazar, Bruce	Mice	EUTHANASIA METHOD	We use the moribund state to determine if euthanasia is

2104-39043A	Blazar, Bruce	Mice	SOCIAL HOUSING	Although we prefer not to house mice singly, on rare occasion there is no alternative. For example, in the event that only 1 male or female is weaned from a litter, the mouse is housed singly. To further reduce single housing, if there is a cage of recently weaned mice of the same strain, the single new weanling is added to the cage of previously weaned mice, but the age and size disparity must be very narrow or the small newly added weanling risks being bullied by the older, larger mice. With older mice, males cannot be rehoused for any reason due to their territorial nature resulting in a high incidence of fighting. Experimental mice are routinely housed 4-5 (max 4 males) per cage at the initiation of the experiment but deaths will occur at various times after transplant resulting in attrition to a single mouse per cage until death or the termination of the experiment. We do not recombine experimental mice once the experiment is underway to preserve data integrity and prevent territorial fighting or distress. Combining survivors from different groups would increase the possibility of mistakes detrimental to the study such as mixing interventions (injections) or false clinical readings (weight/death). Housing mice from different treatment groups in the same cage will lead to compromised data, which would require repeated experiments at the cost of many additional mice, time and resources. Also, mice from some groups could be healthier than mice from other groups, so that combining a sick mouse with new healthier companion might further result in territorial behavior, added stress. Social housing is preferred and broadly implemented for humane reasons however the listed circumstances are exceptions from which the sequelae of social housing are worse than those of single housing.
2104-39044A	Stromnes, Ingunn	Mice	MULTIPLE SURGERY	One prior surgery to implant orthotopic tumors into the pancreas will be performed 80-120 days prior to parabionts.
2104-39046A	Osborn Jr, John	Sheep (Biomedical)	MULTIPLE SURGERY	We are developing a model of sheep hypertension. We would like this time to implant the transmitter sheep with DOCA and diet to determine if and to what degree the DOCA/diet creates hypertension. If we are successful creating a hypertension model, 1-2 months later we will perform a renal denervation procedure to assess if hypertension can be resolved. Transmitter replacement or repair is necessary if the original transmitter fails, since blood pressure is the primary measurement in this study.
2104-39046A	Osborn Jr, John	Sheep (Biomedical)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We do not anticipate any weight loss with the administration of this diet, as their food intake is not being limited beyond a normal diet. (salt in drinking water; salt in feed) We do not anticipate any weight loss with the administration of this diet, as their food intake is not being limited beyond a normal diet. (salt in drinking water; salt in feed)

2104-39056A	Osborn Jr, John	Rat	SANITATION FREQUENCY	In the "servo-control" cages, cleaning of the upper part of the cage can only be performed at the end of each study (approximately 2 weeks) as removing the animal from the cage would not be possible while the study is ongoing. The lower part of the cage is changed out frequently. At the end of each study, the cage is disassembled and cleaned by lab staff following the RAR guidelines.
2104-39056A	Osborn Jr, John	Rat	MULTIPLE SURGERY	Uninephrectomy is required to study the effects of compounds on the left kidney, in isolation from any contralateral right kidney effects. Following uninephtrectomy the remaining left kidney undergoes hypertrophy. After 7-10 days hypertrophy is complete and a catheter can be placed into the outer medulla of the left kidney for compound administration. If the catheter was inserted during the same surgery as the uninephrectomy it's position would be displaced by the compensatory hypertrophy. In studies in which iv drug administration will be used as a control for intra-renal drug administration prior uninephrectomy is required as is performed to ensure that these rats are appropriate controls and undergo the same surgical procedures as the rats in which drugs are delivered intra-renally.
2104-39056A	Osborn Jr, John	Rat	ENVIRONMENTAL ENRICHMENT	Rats will be single housed in metabolic cages. In these studies it is essential the urine collection volumes are accurate and represent all of the urine produced during the collection period. For this reason, we request an exception to the social housing and environment enrichment guidelines. The inclusion of enrichment in the cage, and the group housing of rats would not permit accurate assessment of urine volumes.
2104-39056A	Osborn Jr, John	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Inactin is non pharmaceutical and will be prepared in a manner that makes it compatible for animal use. As such we will take into account sterility, pH, purity and osmolarity when preparing the Inactin. New solutions will be made up daily.
2104-39056A	Osborn Jr, John	Rat	SOCIAL HOUSING	Rats in study will need to be single housed, additional enrichment will be provided.
2104-39057A	Betts, Brian	Mice	SOCIAL HOUSING	NSG, or NOD/SCID/gamma, mice will require single housing once human skin is applied (ABSL 2), up to the day 90 endpoint. This is to reduce the risk for biting or fighting, which could compromise the skin graft and/or animal health. Mice will only be single housed to study endpoint if they cannot be successfully reunited with their original cage mates. Male mice will not be reintroduced. single housing exception after skin transplant surgery Rationale: To prevent cage mates from biting or tearing bandages or skin grafts. When able, mice will be co-housed after 30 days following skin transplantation. NSG mice undergoing xenogeneic GVHD experiments will not be single housed.

2105-39068A	[redacted]	Nonhuman Primate (Macaques), Pig (Biomedical)	MULTIPLE SURGERY	Second surgical procedure will be a bilateral nephrectomy (acute) procedure. (Donor: Splenectomy) Animals have previously been implanted using minimally invasive technique with a vascular access port to ensure proper delivery of the planned immunosuppression regimen prior to transplant and facilitate cooperation with ongoing clinical care related to fluid administration and clinical monitoring in the absence of chemical or physical restraint. (Recipient: Arterial line placement, native liver hepatectomy, and liver transplant)
2105-39077A	Li, Yuzhi	Pig (Agricultural)	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	Because there will be no food restrictions for this study, pigs will be weighed every four weeks according to the experimental design. All pigs will be health checked daily according to the SOP (IACUC#2003-37993A).
2105-39080A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	This is a model development protocol. One of the primary difficulties in assessing transcatheter valves is the inability to anchor them in the annulus of a healthy animal. Other methods are used to mimic aortic stenosis e.g. external banding. This model most closely mimics the clinical condition and is as successful as other models currently used.
2105-39085A	Netoff, Tay	Rat	MULTIPLE SURGERY	We need two surgeries. First one is to induce pathological state in the brain. We predict that it will take 2-5 days until the symptoms of the pathology appear. The second surgery is to alleviate the symptoms by our neuromodulation algorithm. In order to verify our treatment, we need to do both surgeries on the same animals. Some signs of pain may appear between two surgeries, including reduced level of spontaneous activity, increased back arching, horizontal stretching, abdominal writhing, falling/staggering, poor gait and twitching. Animals will be monitored everyday, and analgesic drugs will be used as needed.
2105-39086A	Satrom, Katie	Rat	EUTHANASIA METHOD	CO2 Euthanasia will only be used for non-study animals (breeders, etc.) This will be done by RAR staff when indicated, according to their usual protocol.
2105-39098A	Meisel, Robert	Hamster	EUTHANASIA METHOD	The animals will simply be receiving an injection of a euthanasia solution. This method will only be used in Experiment 2. Here because we are measuring very labile molecular events that require precise timing of sacrifice, sedatives or anesthetics would interfere with the goals of the experiment.
2105-39098A	Meisel, Robert	Hamster	SOCIAL HOUSING	Hamsters live alone in the wild so singly housing our experimental animals reflects their normal social condition. Stimulus males will be group-housed up to 4 males/cage. This group housing drastically reduces the levels of aggression in male hamsters meaning that our stimulus aniimals neven initiate fights. We are asking for an exception to group house our male stimulus hamsters.
2105-39104A	Li, Faqian	Mice	EUTHANASIA METHOD	Fetuses are neither sentient nor conscious prior to birth and thus incapable of actually perceiving pain.□ When fetuses (mouse>E15) are needed for study, euthanasia of individual fetuses induced by decapitation with surgical scissors is an acceptable physical method of euthanasia according to NIH guide.

2105-39119A	Widge, Alik	Rat	72 HOUR POST-OP ANALGESIA POLICY	The animal usually does not feel pain 24 hours post-surgery, but we will monitor the rat everyday for at least 72 hours post-surgery. Analgesics will be given if the rat is still feeling the pain either 48 or 72 hours post-surgery accordingly.
2105-39119A	Widge, Alik	Rat	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	We need to weight animal everyday to monitor their weight changes. The weight will be an important indicator on whether we should increase or decrease the daily food distribution to the rats.
2105-39119A	Widge, Alik	Rat	SOCIAL HOUSING	The animals will be singly housed during the surgery recovery period so that the animals do not injure each other as they heal or damage the acrylic head cap that is securing the electrodes/opto-electrodes.
2105-39121A	Elmquist, William	Mice	BLOOD COLLECTION LIMIT	Blood collection will be performed post euthanasia.
2105-39124A	Klein, Amanda	Mice	72 HOUR POST-OP ANALGESIA POLICY	The goal of this study is to access the effects of KATP channel downregulation in chronic pain. Exogenous analgesics may confound the results of our study. Previous reports suggest that administration of opioids or NSAIDs shortly after surgery can affect hormone levels and/or paw withdrawal sensitivity in rodents (Wilson et al., 2016, Pain Res Treatment; Celerier et al., 2006, Anesthesiology). Current clinical theories suggest that blocking or limiting persistent pain immediately after surgery is clearly important in the persistence of chronic pain (Richebe et al., 2018, Anesthesiology).
2105-39130A	Forester, James	Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Other* (Non-USDA), Bird (Other), Fish (Other), Fish (Other)	EUTHANASIA METHOD	The animal will be euthanized via cervical dislocation. This is nearly 100% effective and immediate. We cannot use blunt force trauma before because we use all dead animals as study skins and skulls are important components of the specimen.

2106-39156A	Tolar, Jakub	Mice, Rat	EUTHANASIA METHOD	We are proposing to perform cervical dislocation without anesthesia due to the potential effects of anesthesia on the circulation and the induction of tissue injury. For example, we have consistently observed that lymph node, spleen, and bone marrow cell viability and function are adversely affected in situations in which cells are not rapidly obtained from the animal after elective sacrifice. We have noticed that new lab members who cannot rapidly harvest bone marrow and lymph nodes frequently have poor experimental results. Rapid acquisition of cells and tissues after circulation and oxygenation ceases is critical to preserve normal immune responses. The data are striking and illustrate that stem cells and lymphocytes are highly susceptible to apoptosis,corticosteriod-induced immune suppression as well as the well-known accumulation of nitric oxide and oxygen radicals that can occur with low circulation and oxygenation that will compromise our experiments, requiring more repetitions and hence more mice, reagents, space in the colony and resources. WHEN DONE CORRECTLY, cervical dislocation is extremely rapid resulting in an immediate and painless death with minimum stress to the animal. The technicians and graduate students/postdocs doing this procedure are highly skilled and experienced, each having been trained in the procedure with a skilled person prior to implementation. For training in the technique of cervical dislocation, mice are anesthetized. Only individuals who have become proficient, experienced mouse handlers perform cervical dislocation. RAR is aware of our procedure and practice of using cervical dislocation for these scientific reasons. Euthanasia is performed by pentobarbital overdose only in those instances where cervical bleeding compromises tissue quality as in lung collection (mechanistic studies in which lung, and perhaps thymus) tissues are collected at various times after BMT)
2106-39156A	Tolar, Jakub	Mice, Rat	SOCIAL HOUSING	Animals that undergo surgery for the wound models may need to be singly housed post-op as cage mates may interfere with the healing of the surgical area and endanger the health of the animal. Only in these cases would animals need to be separated and housed singly.

2106-39159A	Cormier, Robert	Mice, Hamster	SOCIAL HOUSING	there are situations where both mice and hamsters will be housed singly. Mice. Depending on litter size and informative genotypes there will be situations where a single male mouse will be housed alone as we do not house unrelated males together due to the likelihood they will fight. Unrelated females can be housed together. Another instance where a mouse may be housed singly is if we intend to study changes in their microbiome. As mice are coporophagic in order to assess whether there are differences in the microbiomes of test mice of specific genotypes it is necessary to house them singly. This would apply to both males and females. Hamsters. Similar to mice we generally house males and females from the same litter together separate only by gender. Again, depending on informative genotypes there will be situations where only one animal in a litter of a specific gender is kept for experimental purposes, so they would be housed singly. In hamsters females are far more aggressive and unrelated females definitely cannot be housed together. We follow a similar rule for males even though they are less aggressive than females. Even for related females we have had situations where they start fighting and then the most aggressive female has to be separated into a separate cage. We needed to do that just recently.
2106-39169A	Ervasti, James	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have read the Avertin guidelines in USDA Policy #3, Pharmaceutical-Grade Compounds in Research. However, we strongly feel that our planned use of Avertin is justified for the following reasons. First, Avertin is the most widely used anesthetic in transgenic mouse research and is recommended by The Jackson Laboratory because it is easy to master administration, it is very fast acting and produces minimal obvious discomfort to the animal. In our experience with mouse anesthetics over the last 11 years at the University of Wisconsin and University of Minnesota, we have not experienced the significant post-procedural mortality noted in the Guidelines for the Use of Anesthetics, Analgesics and Tranquilizers in Laboratory Animals web page of RAR (http://www.ahc.umn.edu/rar/anesthesia.html). Our success with Avertin is likely due to the fact that my staff was trained in its use by Dr. A bee Messing, DVM at the University of Wisconsin who routinely uses Avertin in his own research with mice and also to the fact that its mode of administration is easy to master for non-veterinarians. We are also well aware of Avertin's instability and take great pains to administer from fresh stocks prepared as described on the RAR website (http://www.ahc.umn.edu/rar/avertin.html). Finally, as the experiments proposed here build on the results of experiments using Avertin approved in IACUC protocol number 1207A17501 and 1506-32699A, we feel that changing to another anesthesia now could compromise the outcome of our study, which would result in the use of even greater numbers of animals used.

2106-39174A	Beckman, Joan	Mice	72 HOUR POST-OP ANALGESIA POLICY	A major endpoint for our research is microvascular stasis. In our SCD model, we have published numerous papers demonstrating that pro-inflammatory compounds increase stasis and anti-inflammatory compounds inh bit stasis in our SCD mouse models. Thus the interventions that we evaluate for treating SCD are all anti-inflammatory drugs. Use of anti-inflammatory drugs post-surgery will interfere with our measurement of microvascular stasis in our dorsal skin-fold chamber model. Buprenorphine has anti-inflammatory activity (Volker D,Bate M, Gentle R, Garg M. Oral buprenorphine is anti-inflammatory and modulates the pathogenesis of streptococcal cell wall polymer-induced arthritis in the Lew/SSN rat. Lab Anim. 2000 Oct;34(4):423-9). Unfortunately all of the analgesic choices for rats and mice found on the RAR website (http://www.ahc.umn.edu/rar/documents/Analgesiainratsandmice2.11.doc) have documented anti-inflammatory activity that will interfere with the measurement of microvascular stasis in our model.
2106-39174A	Beckman, Joan	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	The following is our scientific justification for the use of non-pharm grade chemicals. Urethane is widely used as an anesthetic for animal studies because of its minimal effects on cardiovascular and respiratory systems and maintenance of spinal reflexes. Alpha-chloralose is an anesthetic characterized by its ability to maintain animals in physiological conditions though immobilized and anesthetized. In addition, alpha-chloralose induces a loss of consciousness with little influence on either pain response or cardiovascular reflexes. We use highly pure urethane and alpha-chloralose purchased from Sigma-Aldrich as do publications in the literature studying the anesthetic properties of these compounds. We were unable to find any pharmaceutical grade sources of these compounds.
2106-39176A	Zordoky, Beshay	Mice	SOCIAL HOUSING	Non-stressed control mice in experiment number 7 will be individually housed during the time of the procedure (2 - 6 weeks). Control mice will be individually housed to control for all experimental conditions, and to monitor food intake and activity level for individual mice. The mice for the stress studies will be housed in the [redacted] because our studies involve continuous monitoring of mice metabolic functions including daily food intake and body weight monitor. Also, it is absolutely crucial to our research that the animals are monitored in an experimentally controlled environment and that we are able to directtly monitor the animals at all times for the behavioral assessment.
2106-39185A	Tran, Phu	Mice	72 HOUR POST-OP ANALGESIA POLICY	We request not to give analgesics because we need for hyperalgesia to fully develop and analgesics may interfere with this process. Analgesic will be used if animals show excessive pain like behaviors (e.g. vocalization, restlessness, etc.). We and others lab extensively used this model. Based on our experience and available data, animals tolerate well this surgical procedure and do not show excessive pain behaviors.
2106-39185A	Tran, Phu	Mice	EUTHANASIA METHOD	Sedation may interfere with plasma hormone analysis. A large pair scissors will be used to decapitate mice at the end of the experiment.

2106-39206A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (Angiography and pulmonary valve expansion (with balloon)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this interpositional pulmonary conduit would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the conduit. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (CT imaging)
2106-39208A	Largaespada, David	Mice	MULTIPLE SURGERY	Amputation is performed on mice that previously received intra-osseous tumor (by surgical procedure). The mice develop primary tumors relatively quickly, but our experimental aim is to achieve metastasis. We believe that the longer the tumor is present the more likely metastasis will occur. We would perform the amputation when the mouse becomes negatively affected by the tumor such that they meet the euthanasia criteria for either size (2 cm3) or because of loss of mobility in the animal.
2106-39213A	Alejandro, Emilyn	Mice, Mice	SOCIAL HOUSING	The majority of our mice will be grouped: female will be combined up to five, and male up to 4 to promote social. In cases where they are separated due to fighting (common phenotype after High-fat diet treatment), mice under treatment/experiment will be caged singly, and will be provided an igloo for comfort. To assess food intake, mice will be singly house for one week during food consumption measurement, and then recombine if they are female or euthanized immediately for tissue. Male mice singly house will be euthanized when not needed for further study. In some cases, we need to assess energy expenditure using metabolic cages, where they need to be separated or singly house for up to 3-5 days prior to euthanasia. The metabolic cages can efficiently assess metabolic changes per mouse.
2106-39213A	Alejandro, Emilyn	Mice, Mice	EUTHANASIA METHOD	Only neonates (day 1) will be euthanized via decapitation.

2106-39219A	Junge, Harald	Mice	TAIL BIOPSY	We require a method of animal identification that is unambiguous and permanent and can be used for mice in developmental studies (postnatal pups, genotyping results required at P8). We will cut toes after they are no longer webbed in mice P6 or P7 and use the toes for genotyping. Pups older than P7 will not be toe clipped. In neonatal mice before 7 days of age toe clipping appears to have few adverse effects on behavior and well-being. We will also use ear punch for genotyping if the mice are of 21 days or older, or tail snips with appropriate anesthesia as descr bed in the UMN IACUC Guideline on Rodent Tail Biopsy Procedures (https://docs.google.com/document/d/14RZQyVYCrM_sCqqKojilTTBF_nfCKPkafnIlPqn5KJ0/edit)
2106-39219A	Junge, Harald	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	anesthesia is performed immediately before euthanasia
2106-39219A	Junge, Harald	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	sulfo-NHS biotin is not available USP grade, it will be ordered from Sigma. It will be made up fresh from powder in PBS (0.3 mg/ml) and sterile filtered. This agent is frequently used in blood-brain barrier or blood-retina barrier assays. No adverse effects have been reported.
2107-39236A	Jenkins, Marc	Mice	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	The food consumption of the mice should not change with any of these diets and no weight loss is anticipated. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized. (Amino acid, casein and selenium deficient diets) No impact on the animals health is expected. If a mouse is found to be in distress, an RAR vet or vet tech will be consulted and allowed to treat as needed or the mouse will be euthanized.
2107-39237A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (Angiography and pulmonary valve expansion (with balloon)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this interpositional pulmonary conduit would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the conduit. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (CT imaging)

2107-39251A	Michaeli, Shalom	Rat	MULTIPLE SURGERY	We need to wait for the chronic pain state to develop following SNI.
2107-39251A	Michaeli, Shalom	Rat	72 HOUR POST-OP ANALGESIA POLICY	Subjects with peripheral neuropathy cannot receive post-operative analgesics because these will inhibit the spinal neuroplasticity intended to induce the condition of study.
2107-39251A	Michaeli, Shalom	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Urethane is a widely used anesthetic in laboratory an mal practice, especially in electrophysiologic studies (Maggi and Meli, 1986). Urethane has several advantages, including several possible administration routes, steady and long-lasting (6–12 h) surgical level of anesthesia, minimal effects on respiration and cardiovascular system, and muscle relaxation (Maggi and Meli, 1986, Hara and Harris, 2002). Although some thalamic and cortical suppression has been identified, several regions are only minimally modulated by urethane, and peripheral stimuli produce reflexes at the central nervous system level that modulate autonomic functions (Maggi and Meli, 1986). Nevertheless, urethane also has undesirable side effects. It causes hyperglycemia, and intraperitoneal injection induces necrosis in intra-abdominal organs (Maggi and Meli, 1986, Field and Lang, 1988). Urethane anesthesia is thus recommended to be terminal, which precludes follow-up studies (Field and Lang, 1988). Urethane has mild effects on multiple ion channels, a feature distinguishing it from many other anesthetics (Hara and Harris, 2002, Masamoto and Kanno, 2012). At an anesthetic concentration, GABAA and glycine receptors are only slightly enhanced (20%–30%), while certain glutamate and α-amino-3-hydroxy 5-methyl- 4-isoxazolepropionic acid receptors are only modestly inh bited (10%–20%) (Maggi and Meli, 1986, Hara and Harris, 2002). In addition, the anesthetic concentration of urethane slightly (15%) enhances the function of nAChRs (Hara and Harris, 2002). Therefore, urethane at a concentration near the surgical level anesthesia may be more suitable for electrophysiologic measurements and pharmacologic studies than other anesthetics (Maggi and Meli, 1986, Hara and Harris, 2002, Masamoto and Kanno, 2012). References 1. Cortical spreading depression induces oxidative stress in the trigeminal nociceptive system. Shatillo A, Koroleva K, Giniatullina R, Naumenko N, Slastnikova AA, Aliev RR, Bart G, Atalay M, Gu C, Khazipov R, Davletov B, Grohn O, Giniatullin R. 2. Evoked local field potentials can explain temporal variation in
2107-39251A	Michaeli, Shalom	Rat	SOCIAL HOUSING	Animals undergoing survival DBS/SCS implantation may need to be singly housed post-implantation to avoid damaging each other's implants.

2107-39268A	Pang, Hongbo	Mice, Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have used avertin routinely in our previous studies (Pang HB et al, 2014). It is easier to store and use in the lab. Avertin will be prepared and stored using these guidelines: 1. Sterile filter with 0.2 micron filter 2. Store and use under sterile conditions 3. Store in the dark bottle or foil covered container 4. Store stock and working stock solutions at 4°C 5. Do not use if the solution becomes discolored or has a precipitate 6. Check pH before each use and use only when greater than pH 5 7. Discard all solutions after 4 months, including the stock solution 8. Label all containers with name & concentration of drug, date prepared and initials of person making the solution
2107-39297A	Noll, Sally	Turkey, Chicken	WEEKLY WEIGHING EXCEPTION (FOOD/FLUID)	As indicated the birds are at a minimum of 2.5 Kg at the time of initial 24 hr fast. Once in the cages, we don't weigh them any more as there is an increased risk of injury taking them in and out of the cage repeatedly. Also with handling, feathers, scale, dander will contaminate the excreta collected leading to increased variability in the chemical composition.
2107-39297A	Noll, Sally	Turkey, Chicken	SOCIAL HOUSING	In this method, the birds are housed individually in cages to allow for collection of excreta from individual birds. The cages measure 12” x 16.25” x 20” (LWH) and are of sufficient size to allow the bird to turn around in the cage, sit/rest/sleep, and stand without touching the top of the cage.

2108-39311A	Bianco, Richard	Sheep (Biomedical)	MULTIPLE SURGERY	Intracardiac echo (ICE) may be necessary for high-quality ultrasound views of the test article with better definition and detail than the images provided by TTE. Due to scheduling constraints, we would like the ability to perform ICE in the days prior to scheduled animal term and recover the animal. A description of the procedure is included in the attached documents. (Right Ventricular Outflow Tract Reconstruction (RVOT Reconstruction)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this pulmonary valve would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the valve. The subsequent expansions are to determine if the valve can be expanded multiple times, as this is the performance expectation for this device for clinical patients. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (Angiography and pulmonary valve expansion (with balloon)) All of the procedures performed on one animal are directly related to evaluation of the device. Clinically, this interpositional pulmonary conduit would be implanted in a child, and when that child grows, they would undergo a minimally invasive procedure to increase the diameter of the conduit. The second procedure is a cut down to a vein and is minimally invasive. This procedure will be performed under sterile conditions and analgesia will be administered post operatively. (CT imaging) ICE with recovery (not performed on the date of termination) may be necessary for the sponsor to make critical decisions as to data and tests to be collected at the terminal surgical procedure. (Intracardiac echo (with recovery))

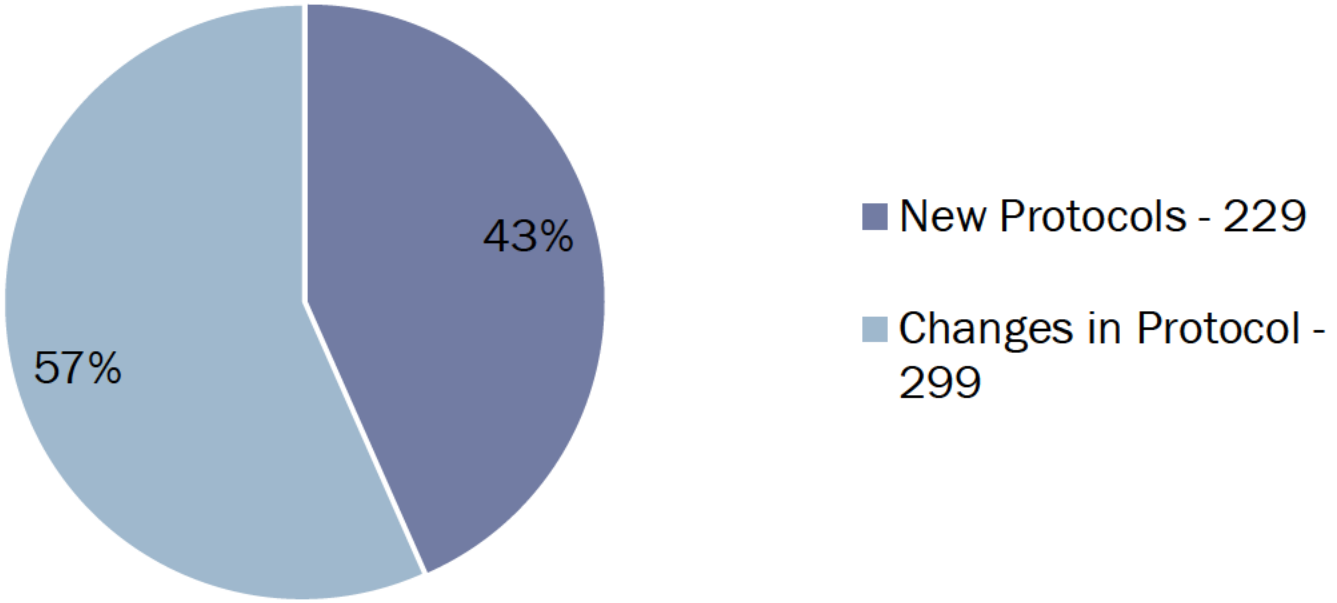
2108-39342A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Since the experiments required for our studies last 1-3 years, there are instances when another surgical procedure will allow us to modify the implants or maintain the implant viability in order to collect the essential data for the grant project (in lieu of starting all over with another animal) with a maximum of two subsequent surgeries. This can be considered a means to reduce the overall number of animals used in our studies. Additionally, in these animals, we may perform initial chamber implants without performing the craniotomy so that we can minimize the number of times the animal needs to undergo chamber cleanings and reduce the l kelihood of infections in the chamber before that chamber needs to be used in active recording / stimulation procedures. In this case, a secondary craniotomy procedure as descr bed above would be performed at a later date (at least one month after the chamber implant surgery). A maximum of four intracranial access chambers will be implanted on an NHP with the typical craniotomy within each chamber being roughly 7 cm^2. For reference the total surface area of cranium in a typical adult rhesus macaque is ~135 cm^2. Smaller chambers may be used should a chamber only require DBS lead implantation or limited electrophysiological recording access. Typically, all chambers will be affixed to the headcap within a single anesthetized chamber surgery procedure. However, to limit the likelihood of chamber infections and the amount of time each NHP is required to be away from their home cage for chamber cleanings, we may leave the cranium intact within one or more chambers during that initial chamber surgery procedure. In such cases, medical-grade silicone or a thin layer of acrylic may be left in the chamber to protect the cranium until a subsequent craniotomy procedure for that chamber under general anesthesia. Beyond the initial chamber surgery procedure, up to 2 procedures may be required to perform the craniotomies or other headcap repair procedures under general anesthesia. If additional procedures are necessary for the well-being of the animal and viability of the implants, we will consult with the veterinary staff. For any such future craniotomy or
2108-39357A	[redacted]	Mice, Rat, Dog, Cat, Rabbit, Guinea Pig, Chinchilla, Nonhuman Primate (Macaques), Pig (Biomedical), Sheep (Biomedical), Chicken, Turkey	SOCIAL HOUSING	Every effort will be made to socially house animals. However, animals transferred to this protocol from protocols with approved social housing exceptions may require continuation of that exception while on this protocol.

2108-39378A	Harris, Reuben	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	We aim to study the aggressiveness (growth and metastasis) of the tumor, and we will therefore have to monitor the animals until they have become visibly compromised (complications defecating, tumor ulceration, meets endpoint tumor size or otherwise specified by RAR Veterinary staff) and/or morbidity. When this is applicable, the animals will be monitored daily for signs of compromise/mor bundity. If RAR veterinary staff require euthanasia of moribund mice, we will follow through in the allowed time.
2109-39393A	Chen, Chi	Mice	SOCIAL HOUSING	Mice will be housed in metabolic cages individually for 24 hours on day 1, 7, 14, 28, 42, 56, 70, 84 of experiments. When not housed in metabolic cage, mice will be group housed. Metabolic cages will be placed in the room of mouse cages [redacted]) for sample collection.
2109-39393A	Chen, Chi	Mice	ENVIRONMENTAL ENRICHMENT	For urine and feces collection, mice will be housed in metabolic cages individually for 24 hours on day 1, 7, 14, 28, 42, 56, 70, 84 of experiments. The nesting materials will not be placed in the metabolic cages to avoid contaminating the samples. This practice is routinely used in metabolism studies. No significant adverse health conditions were reported. Each animal will not be housed outside of RAR space for longer than 24 hours at one time. ---Wang L, Yao D, Urriola P E, Hanson A R, Saqui-Salces M, Kerr B J, Shurson G C, Chen C. Identification of activation of tryptophan–NAD+ pathway as a prominent metabolic response to thermally oxidized oil through metabolomics-guided biochemical analysis. The Journal of Nutritional Biochemistry, 2018, 57: 255-267.

IACUC RESEARCH SUBMISSIONS

APRIL 1, 2021– SEPTEMBER 30, 2021

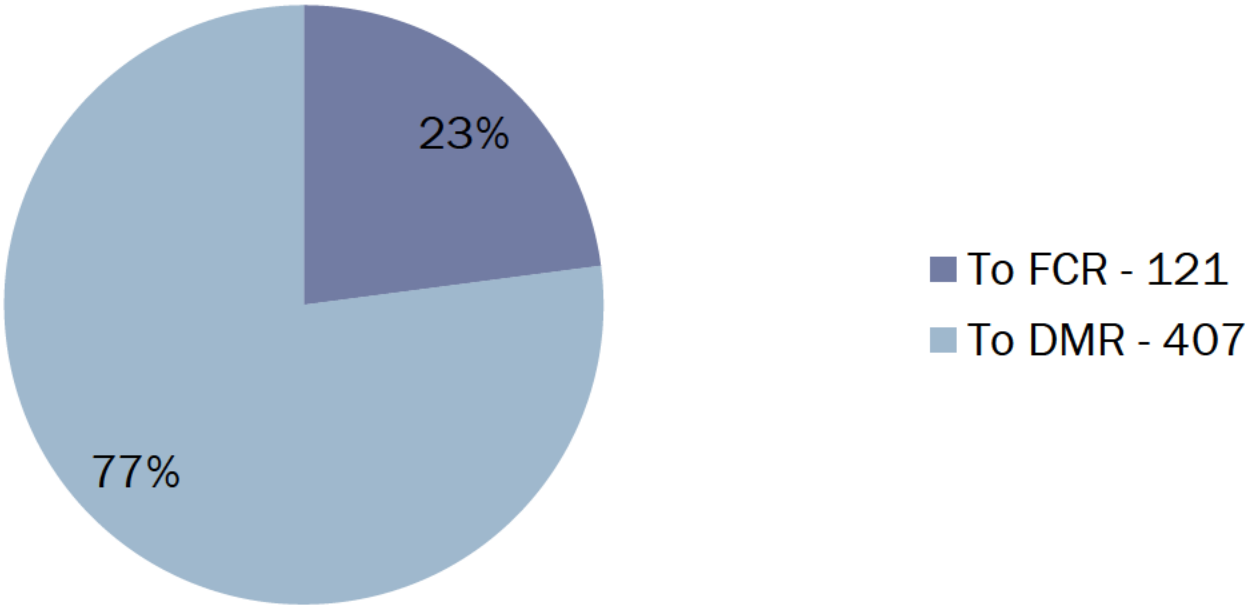
TOTAL SUBMISSIONS: 528



TOTAL SUBMISSIONS – 528

BY SUBMISSION TYPE

APRIL 1, 2021– SEPTEMBER 30, 2021

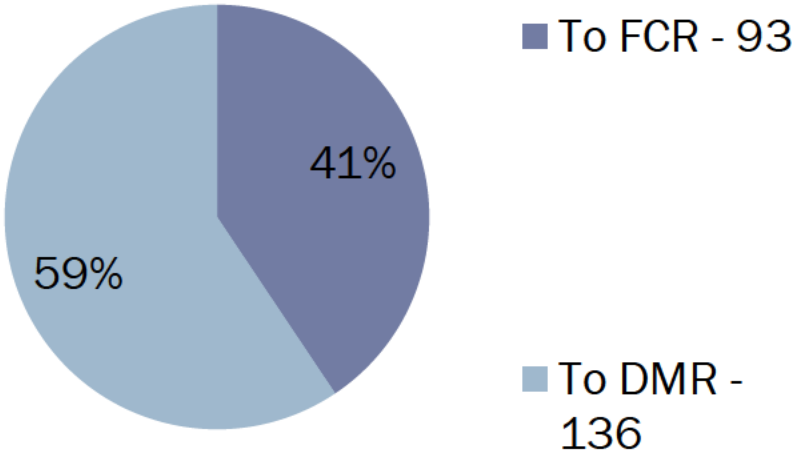


TOTAL SUBMISSIONS – 528

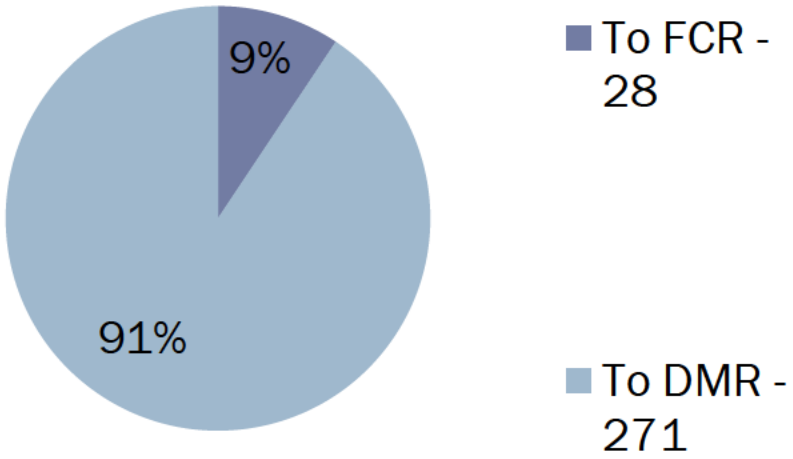
BY SUBMISSION TYPE

APRIL 1, 2021– SEPTEMBER 30, 2021

NEW PROTOCOLS – 229



AMENDMENTS – 299

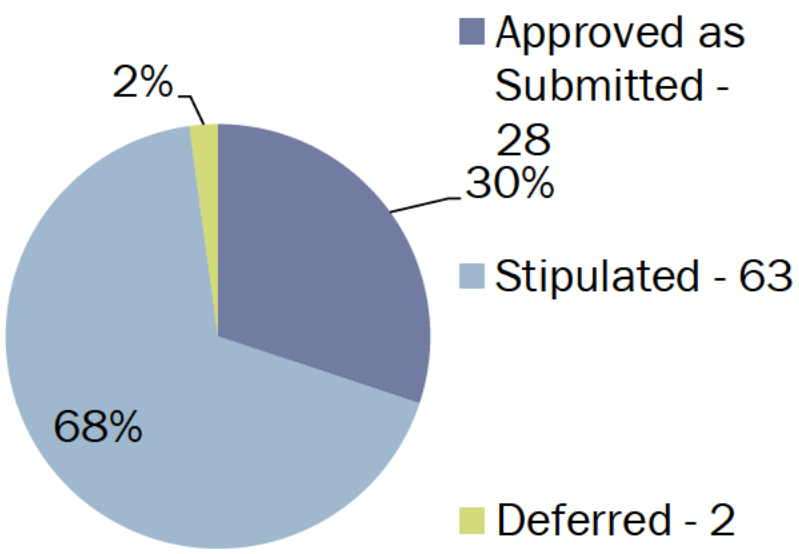


TOTAL SUBMISSIONS – 528

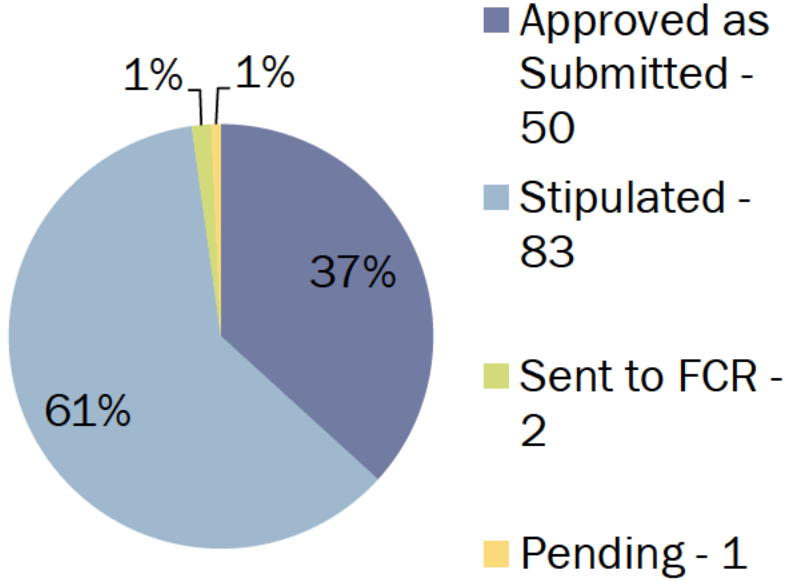
BY SUBMISSION TYPE

APRIL 1, 2021– SEPTEMBER 30, 2021

FCR NEW –93



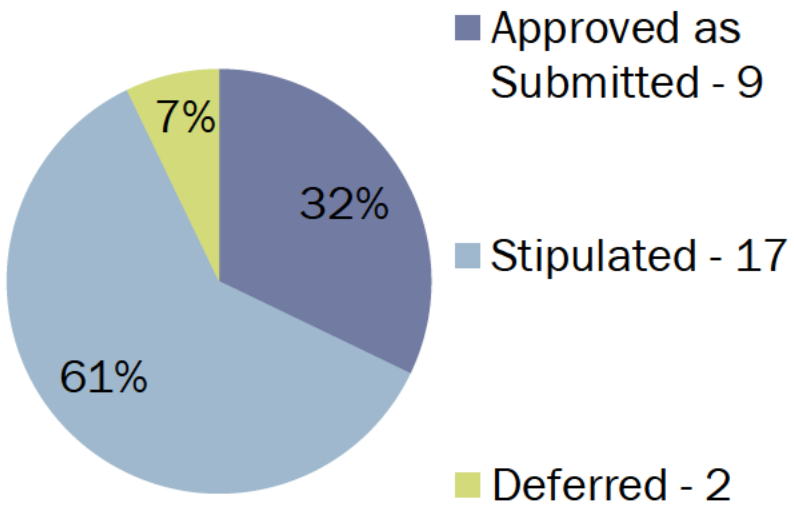
DMR NEW – 136



REVIEW OUTCOMES- NEW STUDIES

APRIL 1, 2021– SEPTEMBER 30, 2021

FCR AMENDMENTS – 28



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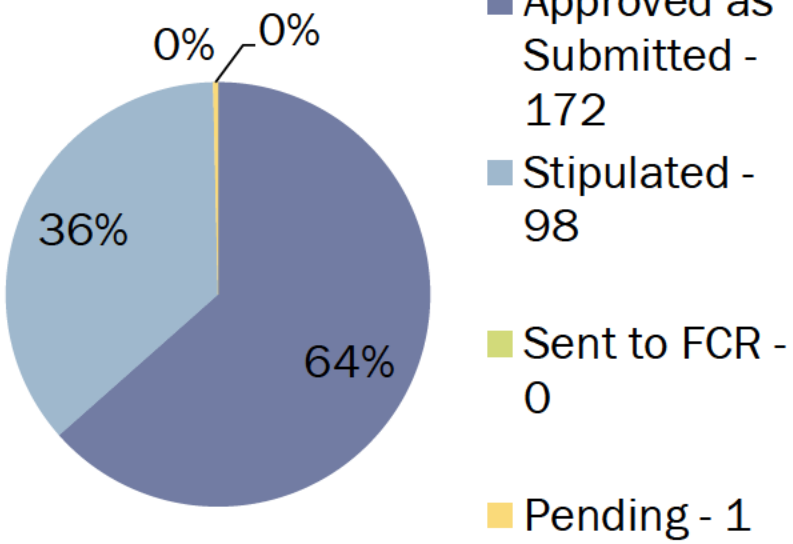
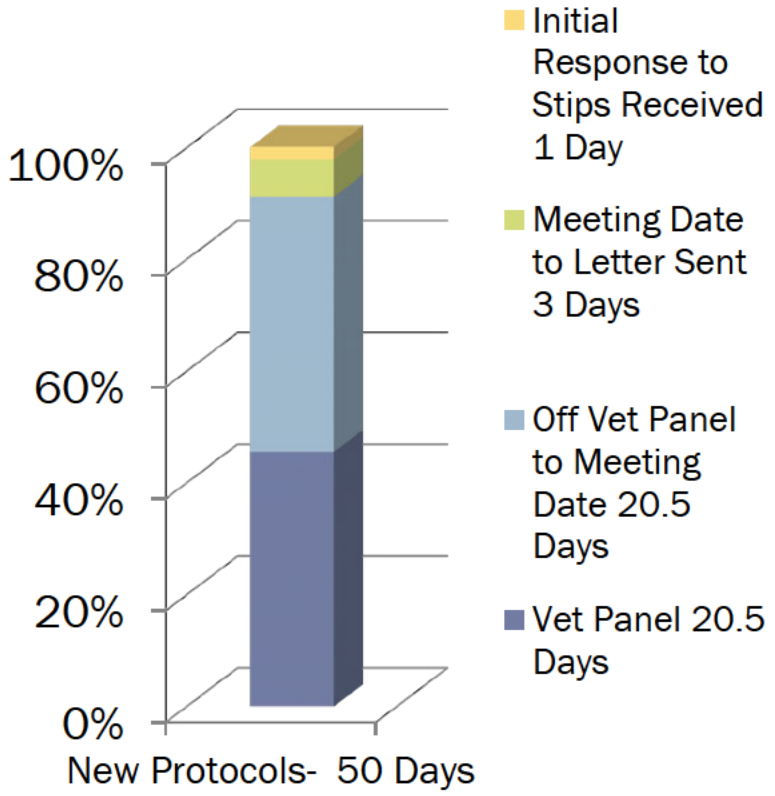
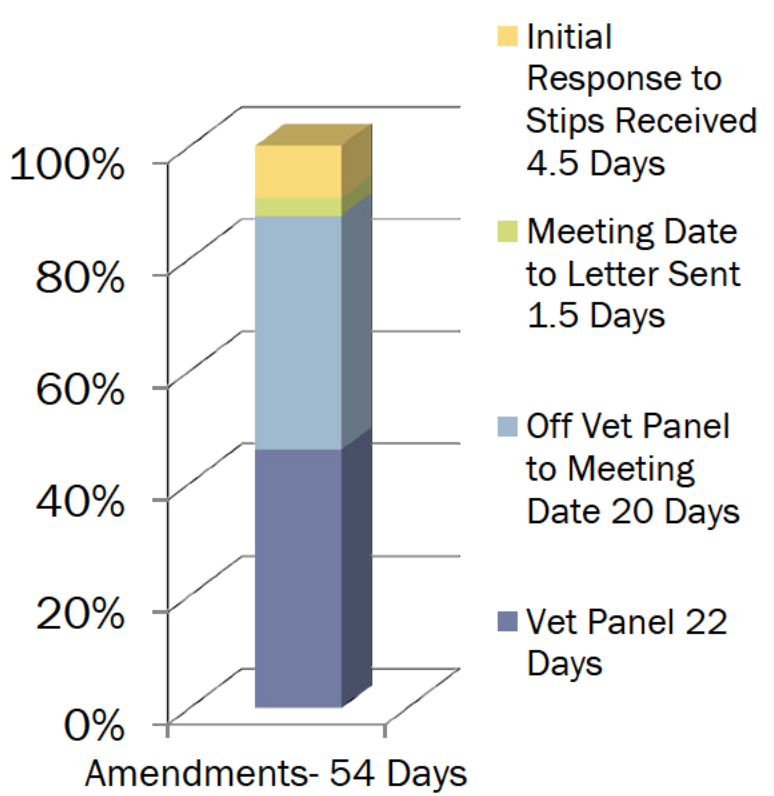


REVIEW OUTCOMES - AMENDMENTS

APRIL 1, 2021– SEPTEMBER 30, 2021



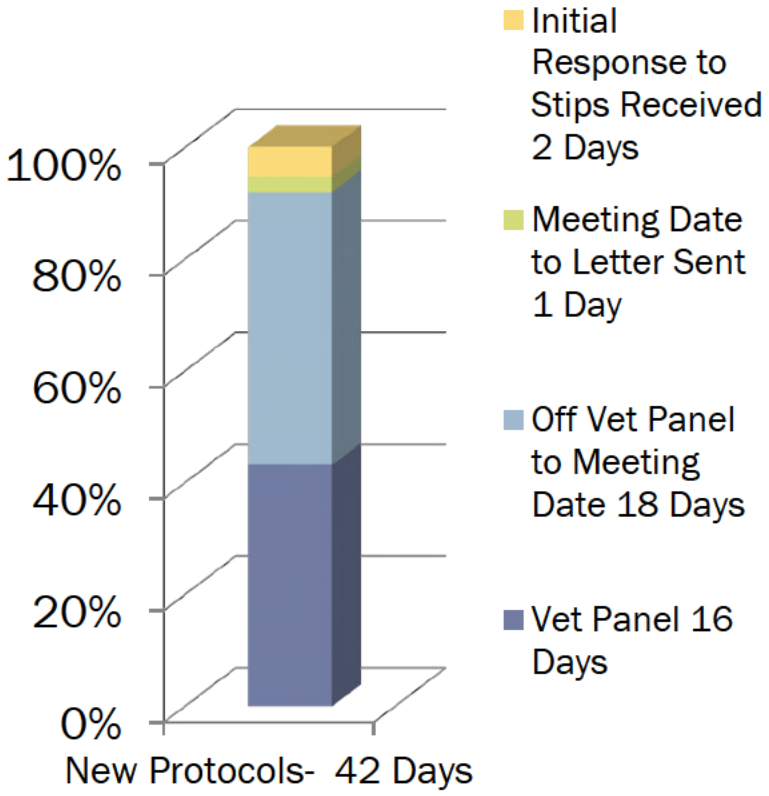


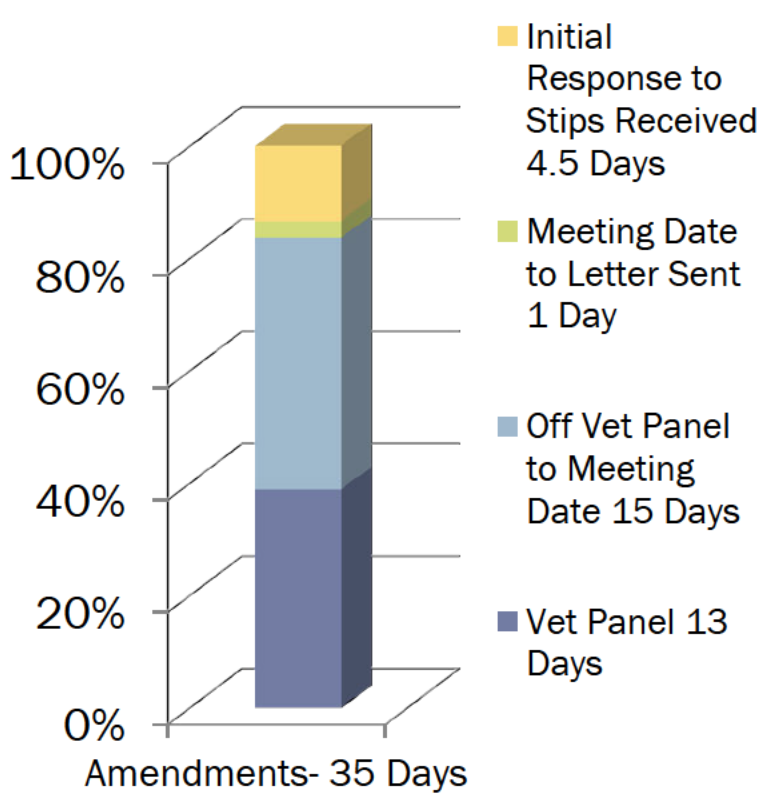
FCR SUBMISSIONS

MEDIAN APPROVAL TIMES

OCTOBER 1, 2020 – MARCH 31, 2021

-INCLUDES TIME ON VET PANEL



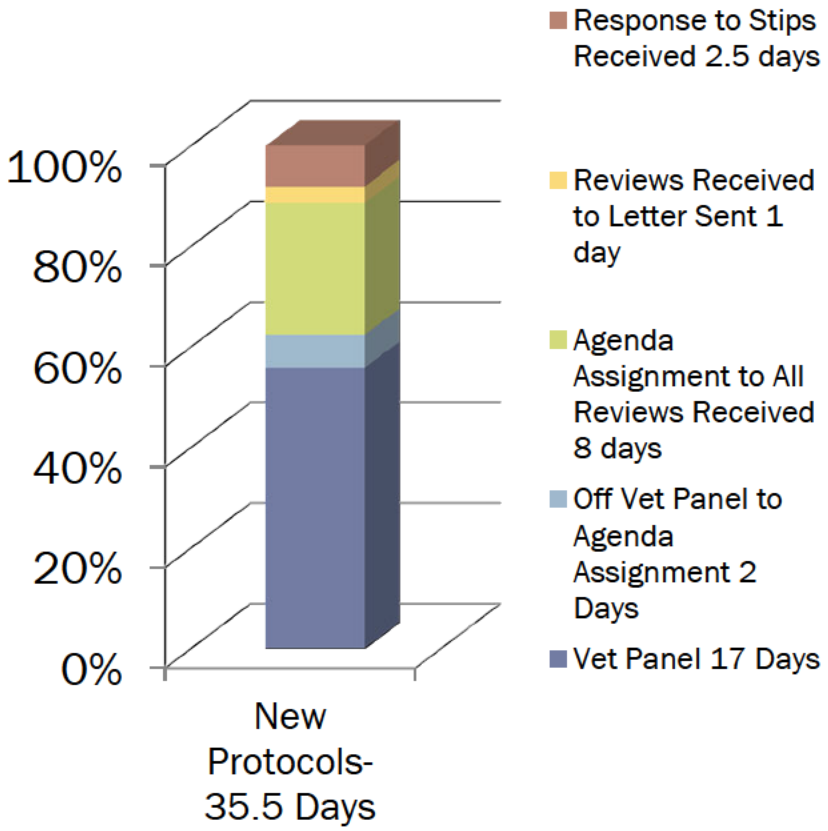


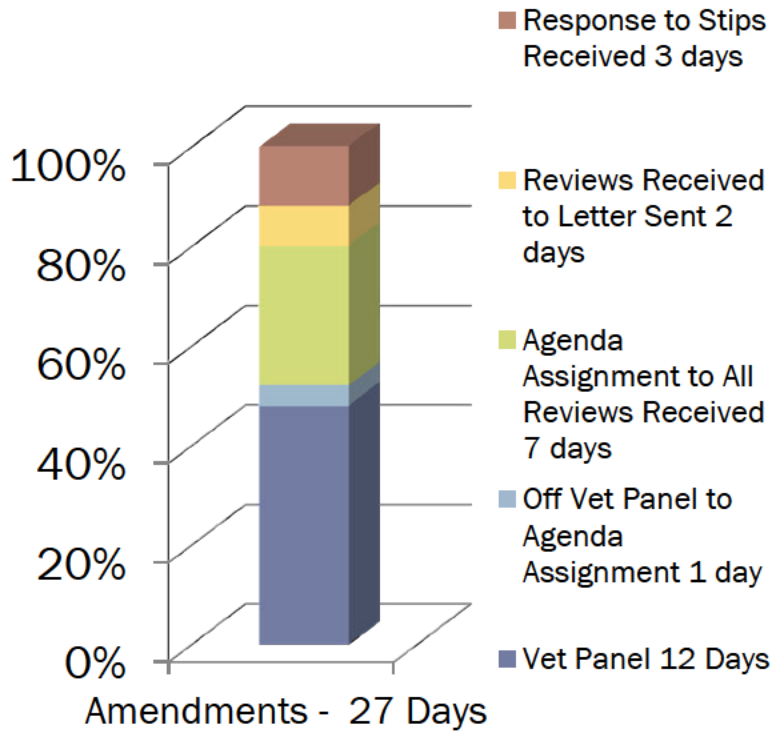
FCR SUBMISSIONS

MEDIAN APPROVAL TIMES

APRIL 1, 2021 – SEPTEMBER 30, 2021

-INCLUDES TIME ON VET PANEL IF RELEVANT



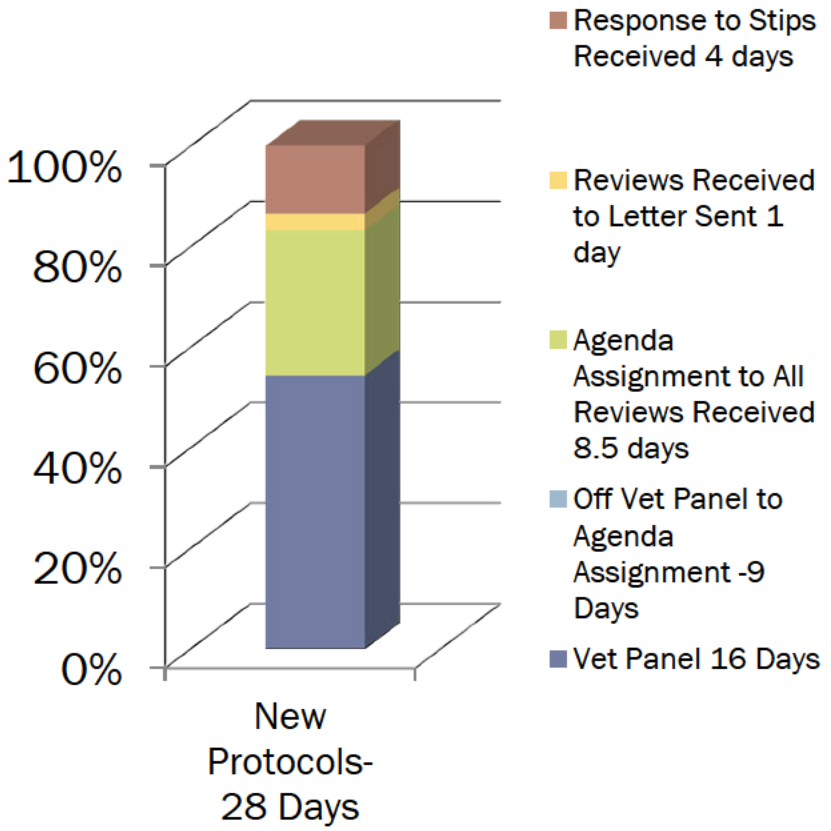


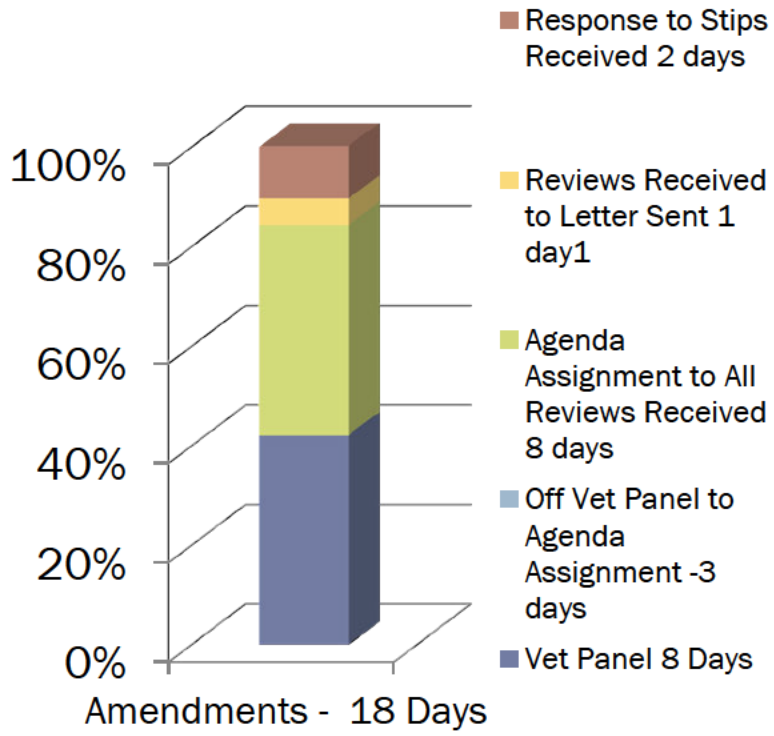
DMR SUBMISSIONS

MEDIAN APPROVAL TIMES

OCTOBER 1, 2020 – MARCH 31, 2021

*INCLUDES TIME ON VET PANEL



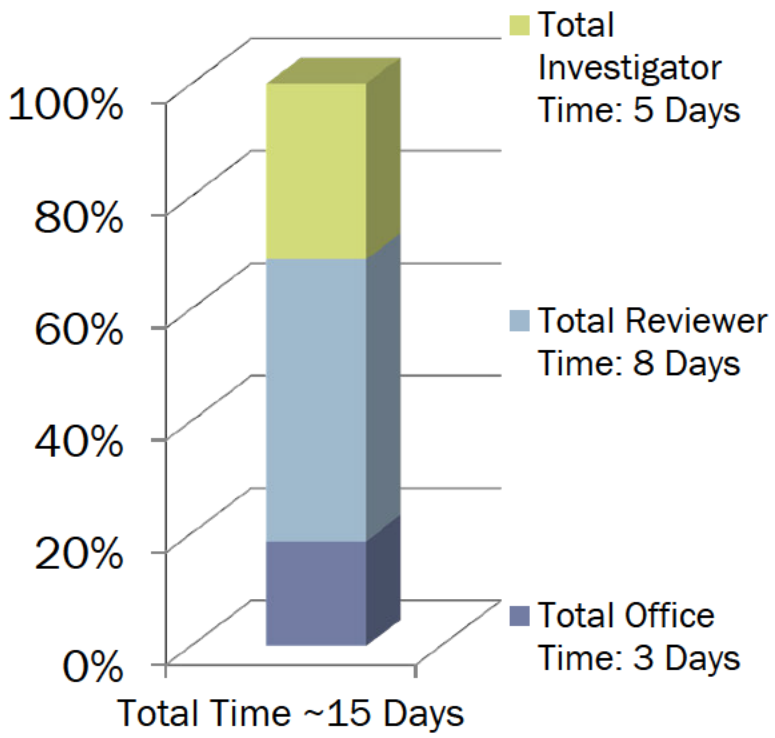


DMR SUBMISSIONS

MEDIAN APPROVAL TIMES

APRIL 1, 2021 – SEPTEMBER 30, 2021

*INCLUDES TIME ON VET PANEL IF RELEVANT

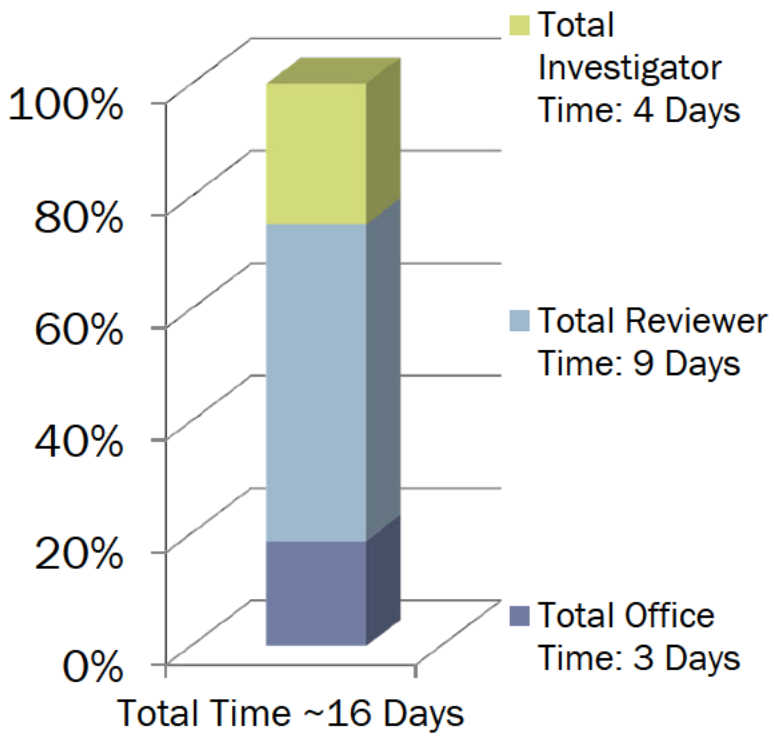


VET PANEL

MEDIAN APPROVAL TIMES

OCTOBER 1, 2020 – MARCH 31, 2021

TOTAL ITEMS: 409

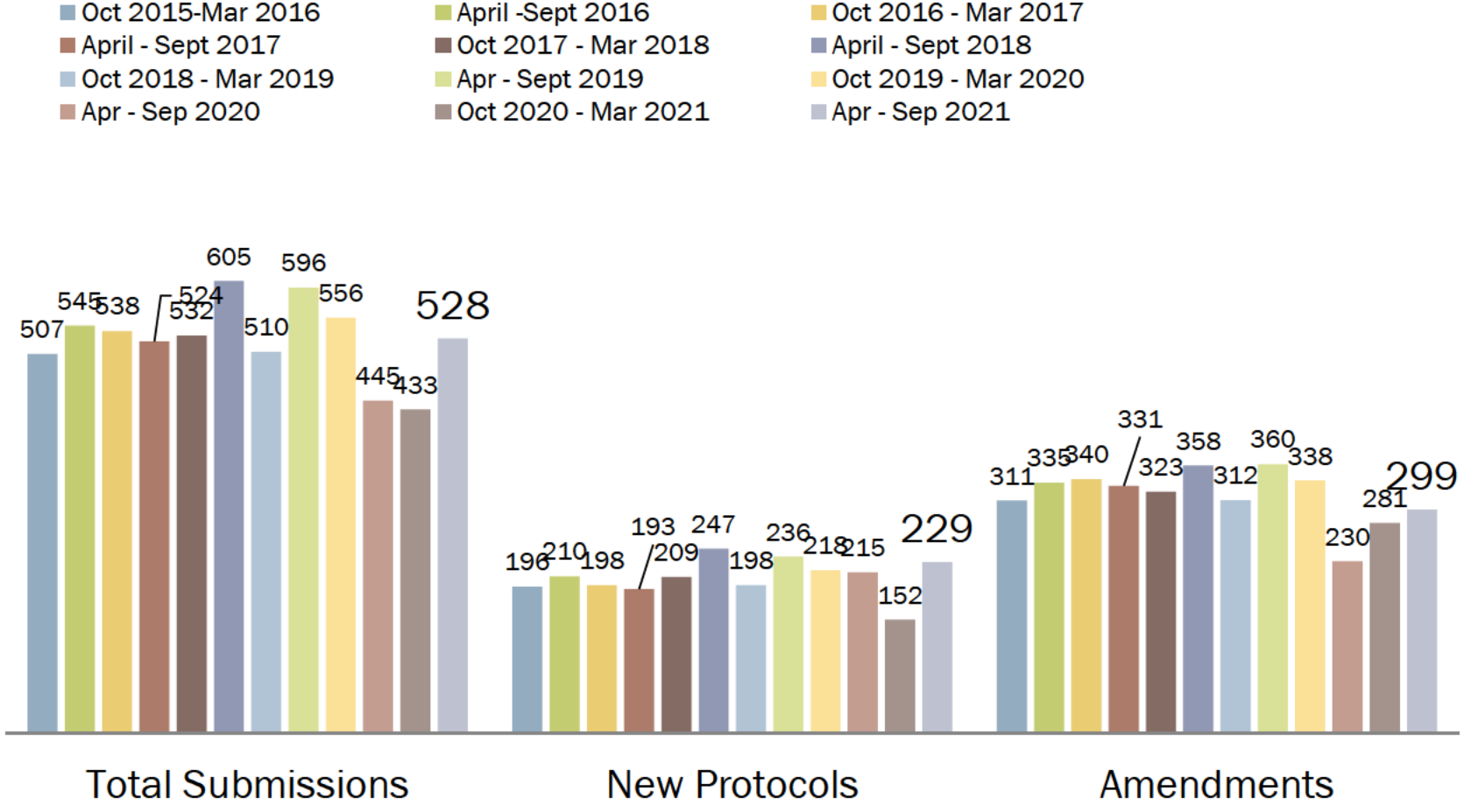


VET PANEL

MEDIAN APPROVAL TIMES

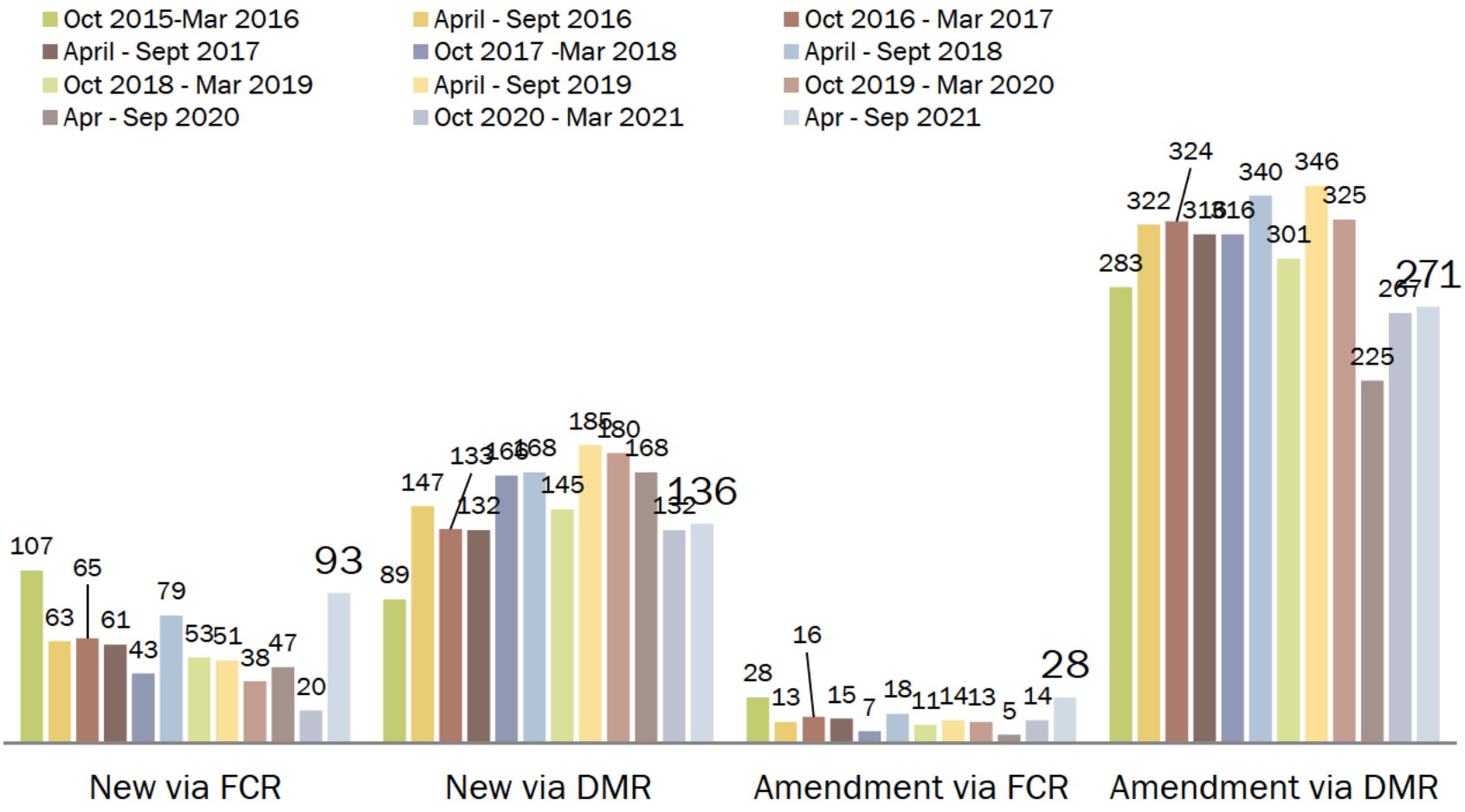
APRIL 1, 2021– SEPTEMBER 30, 2021

TOTAL ITEMS: 242



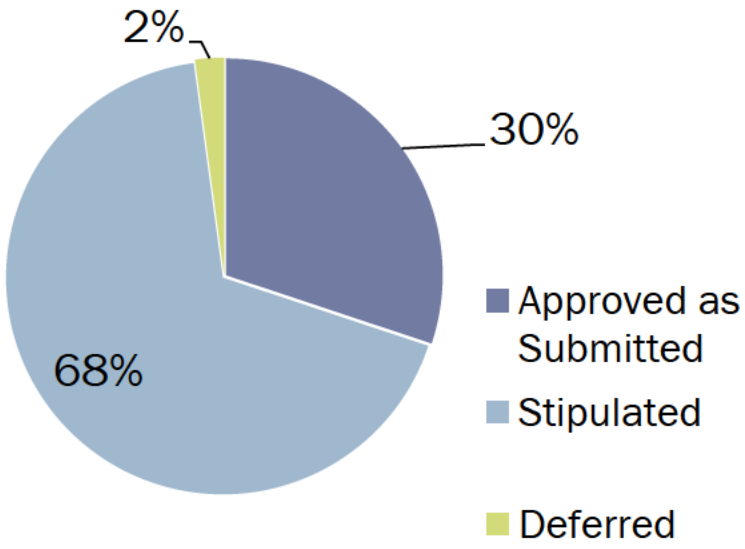
SUBMISSION COMPARISON – TOTALS BY TYPE

OCTOBER 2015– SEPTEMBER 2021

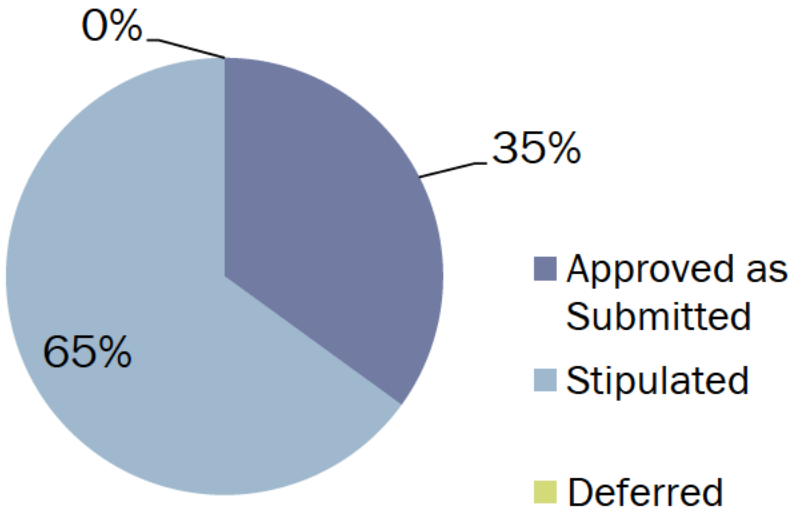


SUBMISSION COMPARISON –
TOTALS BY TYPE AND REVIEW PROCESS
OCTOBER 2015 – SEPTEMBER 2021

APRIL 2021- SEPTEMBER 2021



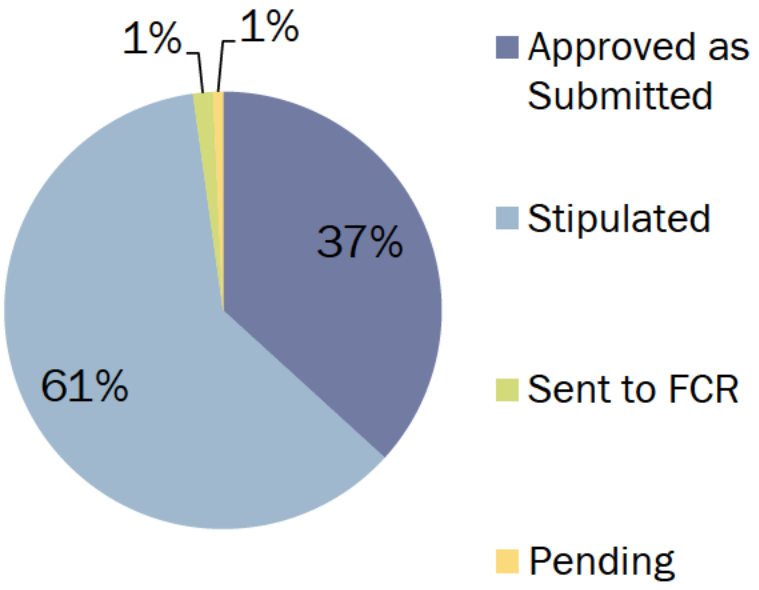
OCTOBER 2020 – MARCH 2021



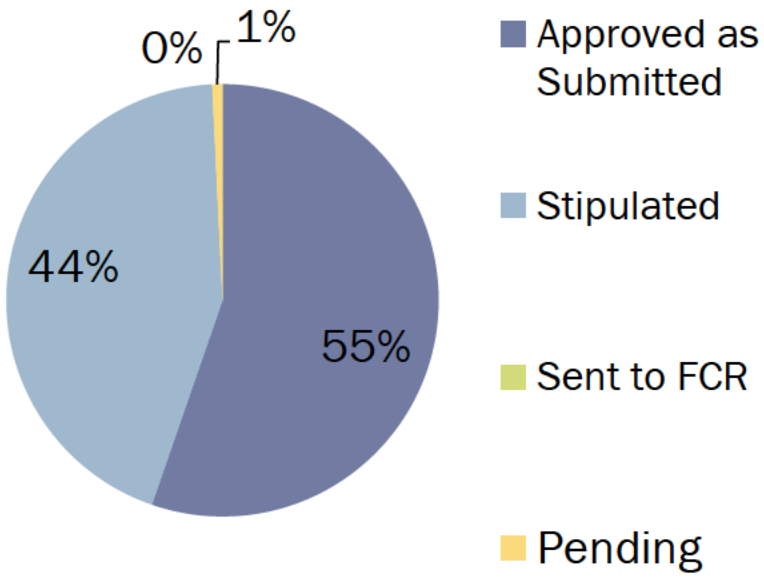
SUBMISSION COMPARISONS

REVIEW OUTCOMES – NEW PROTOCOLS VIA FCR

APRIL 2021- SEPTEMBER 2021



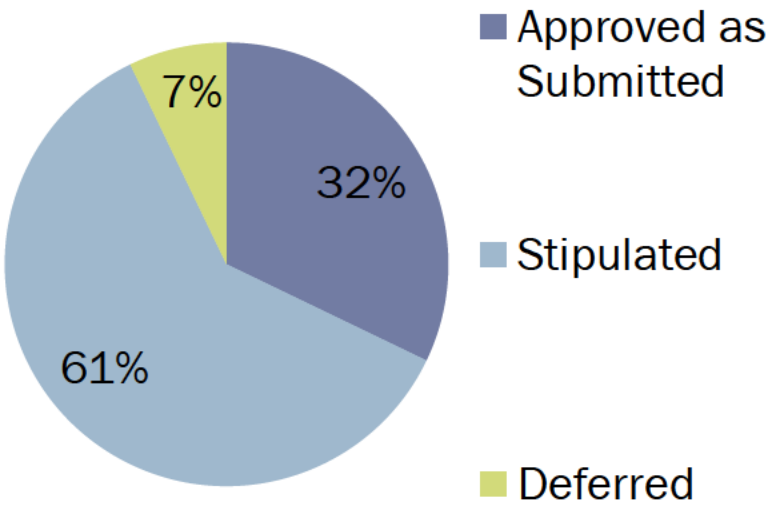
OCTOBER 2020 – MARCH 2021



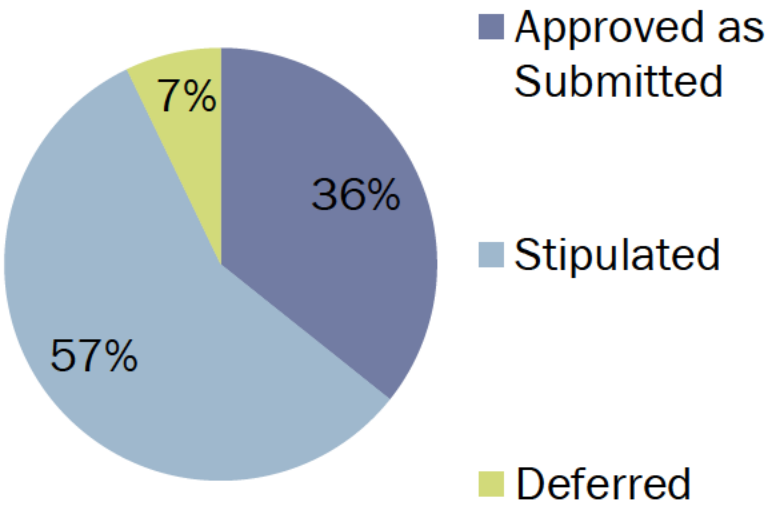
SUBMISSION COMPARISONS

REVIEW OUTCOMES – NEW PROTOCOLS VIA DMR

APRIL 2021 – SEPTEMBER 2021



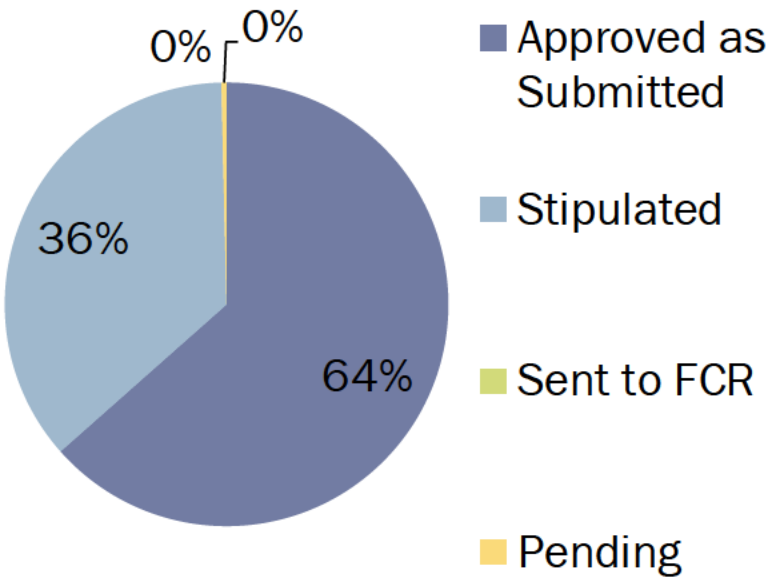
OCTOBER 2020 – MARCH 2021



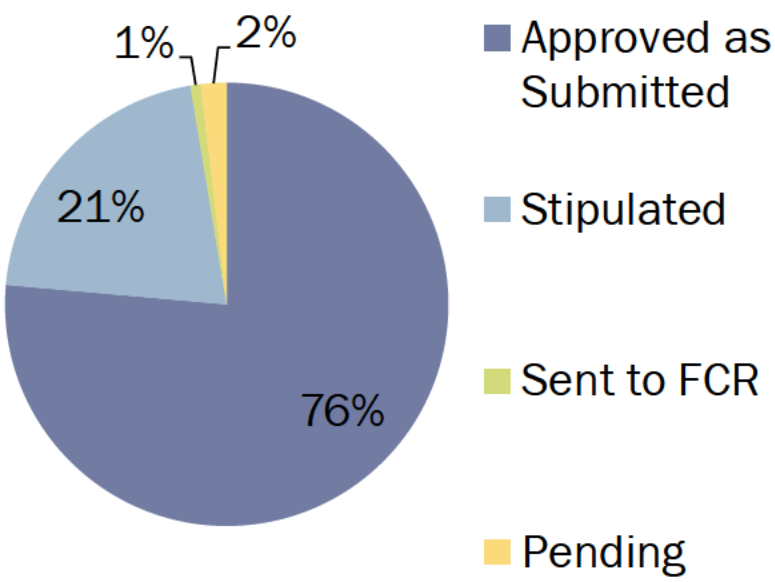
SUBMISSION COMPARISONS

REVIEW OUTCOMES – AMENDMENTS VIA FCR

OCTOBER 2020 – MARCH 2021

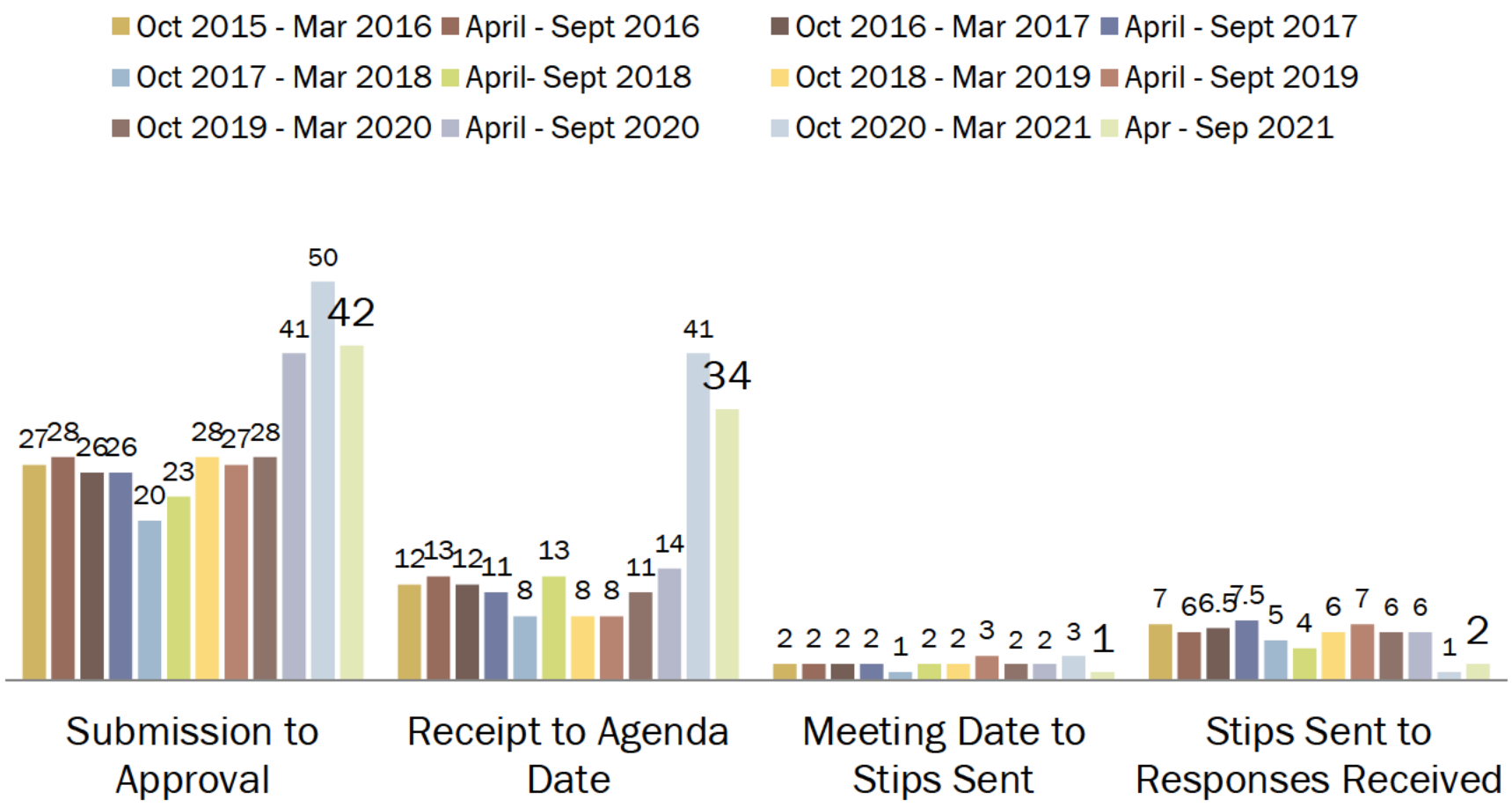


APRIL 2020 – SEPTEMBER 2020



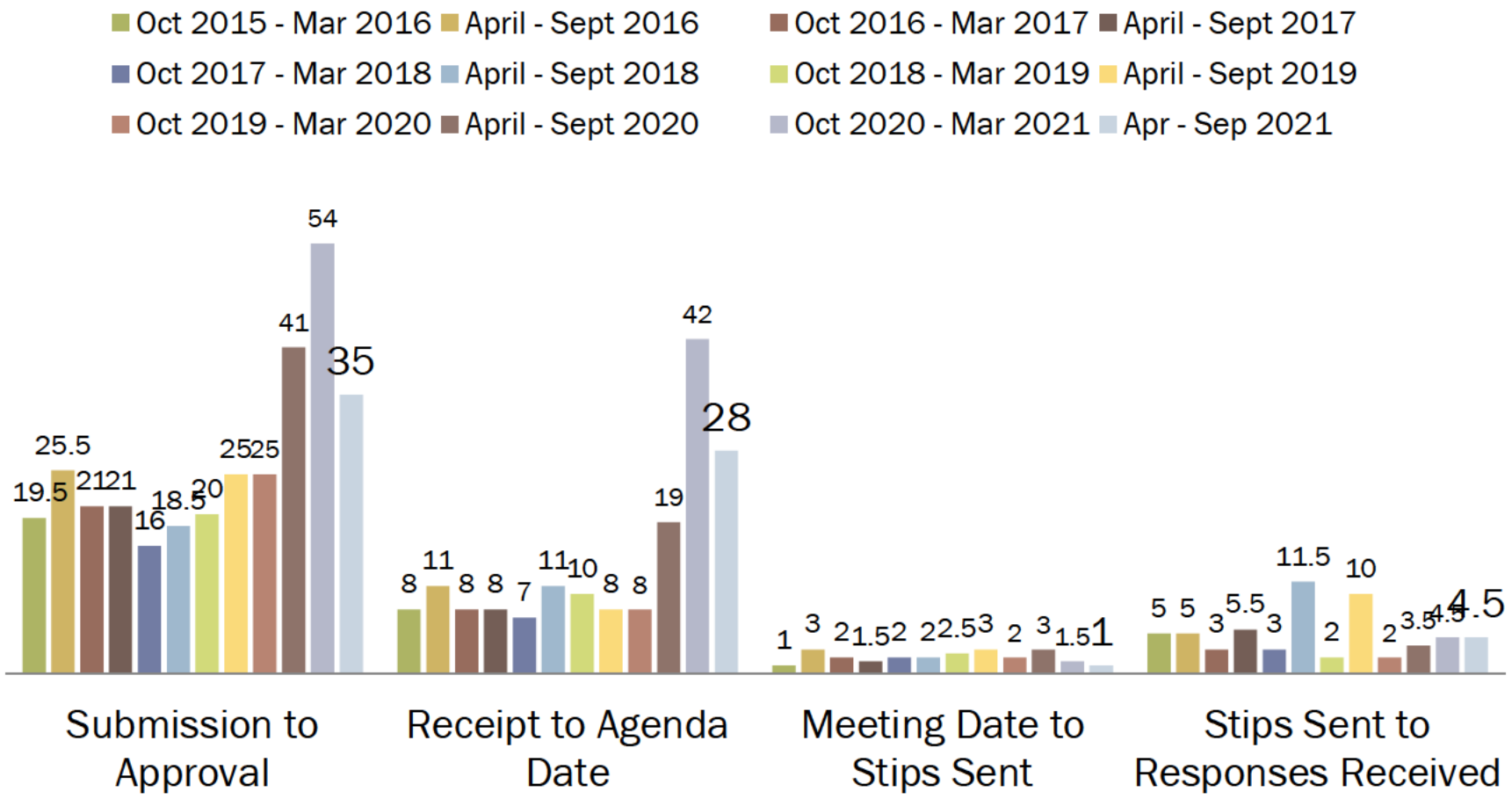
SUBMISSION COMPARISONS

REVIEW OUTCOMES – AMENDMENTS VIA DMR



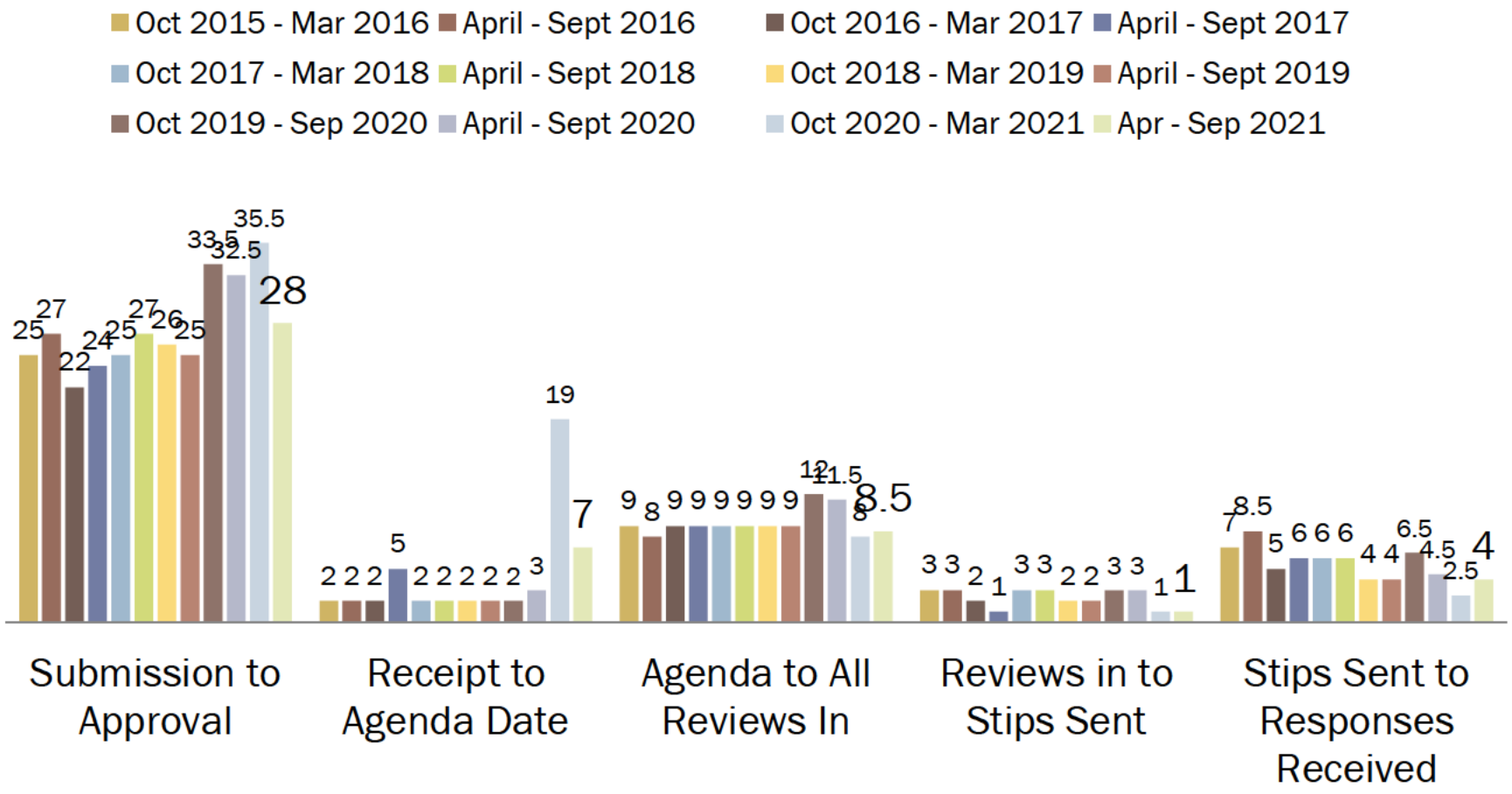
TIME COMPARISON – FCR NEW PROTOCOLS

OCTOBER 2015– SEPTEMBER 2021



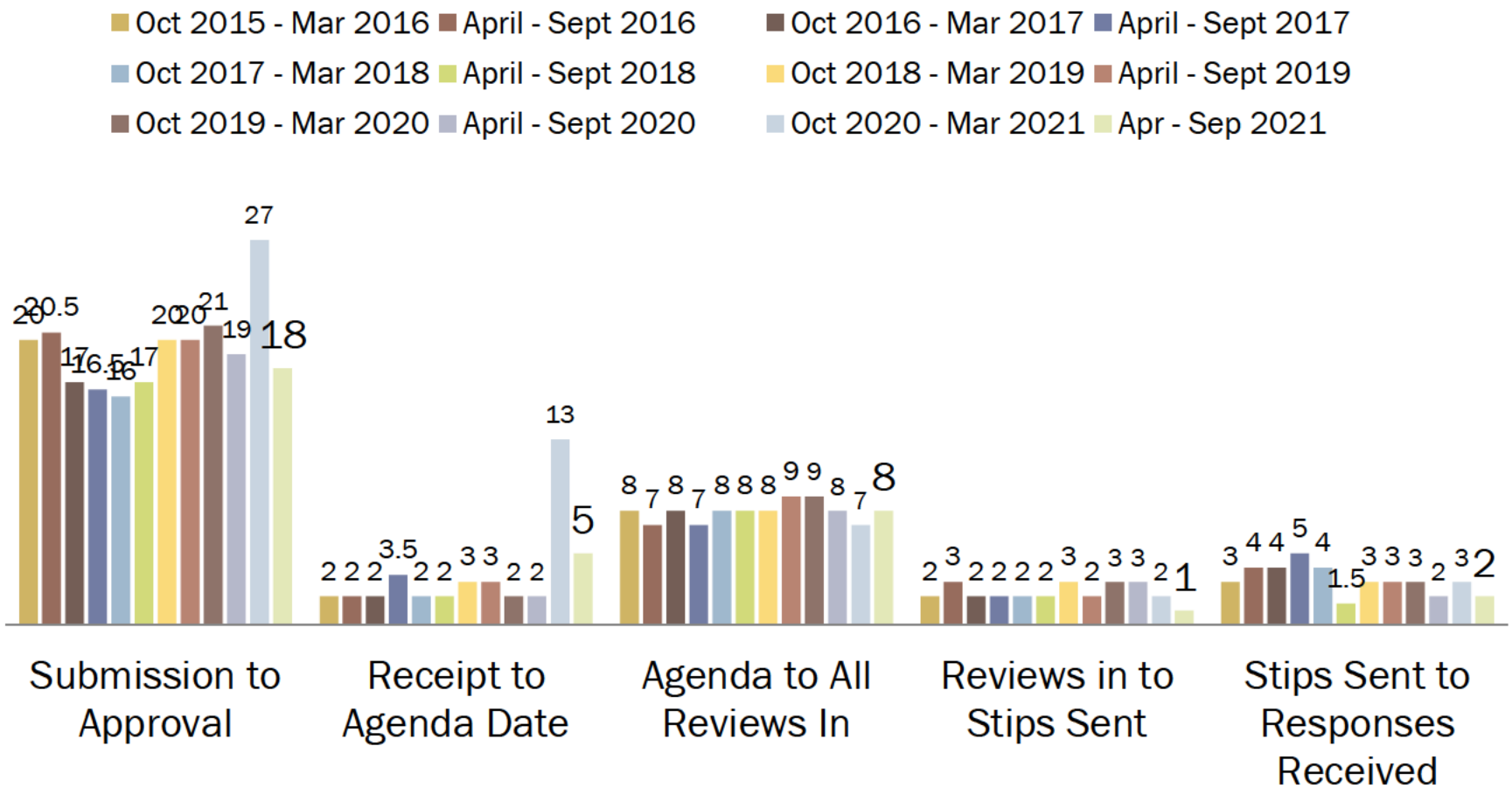
TIME COMPARISON – FCR AMENDMENTS

OCTOBER 2015–SEPTEMBER 2021



TIME COMPARISON – DMR NEW PROTOCOLS

OCTOBER 2015– SEPTEMBER 2021



TIME COMPARISON – DMR AMENDMENTS

OCTOBER 2015– SEPTEMBER 2021)

EXPIRED/SUSPENDED, EXTERNAL ANIMAL HOUSING, AND INCOMING ANIMAL TEMPORARY PROTOCOLS
4/1/2021 – 9/30/2021

Holding Protocol
Lynn Impelluso, 421756
1807-36197A (9/7/2018 – 9/6/2021)
2108-39357A (9/4/2021 – 9/3/2024) (not used on this report)
Report Period: 4/1/2021 – 9/30/2021

PI	Protocol ID	Species	Number of Animals	Expiration Date	New Protocol ID	Transfer Approval Date
Pang, Hongbo	1708-35036A	Mouse	18	2/22/2021	2102-38734A	4/1/2021
Harris, Reuben	1802-35623A	Mouse	17	3/26/2021	2102-38850A	4/13/2021
Potter, Lincoln	1802-35577A	Mouse	80	3/26/2021	None	No mice 7/31/2021
Li, Faqian	1804-35756A	Mouse	50	6/28/2021	2105-39104A	8/20/2021
Potter, Lincoln	1806-35995A	Mouse	47	7/31/2021	NA	No mice 8/15/2021
[redacted]		Mouse	3	8/26/2021	NA	*9/8/2021
		Rat	10	8/26/2021	NA	*9/8/2021
Yee, Douglas	1804-35863A	Mouse	52	8/29/2021	2106-39190A	9/2/2021

*Disciplinary Action:

External Animal Housing Protocol
Lynn Impelluso
1808-36233A
10-1-20 - 3-31-21

PI	Company Name	Protocol ID	Species	Number/Animals
Impelluso, Lynn	Boston Sci	1808-36233A	Dog	0

Incoming Animal Temporary Protocol
Lynn Impelluso
1807-36151A
10-1-20 – 3/31-21

Incoming PI	Date of Arrival	Number of Animals Housed	Specie	New Protocol #
None	9/17/2020	0	None	None