Spring 2021 Semiannual Program Review

April 20, 2021

Voting Member Attendees:

Richard Bianco, Lynn Impelluso, Sam Baidoo, Marilyn Bennett, Geoff Ghose, Jen Hubbard, Beverly Norris, [redacted], Liz Pluhar, Jessica Sieber, Laura Hocum Stone, George Wilcox, Henry Wong

Alternate Member Attendees and Guests:

Frances Lawrenz, Ilana Cohen, Megan McCoy, Paul Lindstrom, Jennifer Borgert, Cynthia Lee, Margaret Luesse, George Aslanidi, [redacted], Giuseppe Dell'Anna, [redacted], Carolyn Fairbanks, Craig Flory, Nathan Koewler, Dezhi Liao, Wensheng Lin, Kristin Pilon, Walt Tollison, Ferenc Toth, Sammy Boyle, Jessica Felgenhauer, Whitney McGee, [redacted] Michelle Reichert, [redacted], Jodi Ogilvie, Christina Larson

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1. Inspection Summary

The Institutional Animal Care and Use Committee Research Compliance Specialist, Jennifer Borgert, presented the Spring 2021 IACUC inspection report.

There were 293 inspections resulting in 205 findings for this six-month cycle. There were 152 Minor Findings and 53 Significant Findings. Thirty-eight percent of the Significant Findings (20) were reported to OLAW.

There was a 13% increase in total findings this six-month cycle from last six- month cycle (172 findings in Fall 2020 versus 205 findings this six-month cycle).

At the time of Program Review, all significant and minor findings had been corrected and the reports closed.

There was a marked increase (56%) in significant findings this past cycle (53 findings found during this six-month period and 34 findings noted during the Fall 2020 six-month reporting period). Of these 53 significant findings noted during this six-month cycle, 29 of them came from either self- reports or outside reports of non-compliance that came into the IACUC whereas 24 findings came from our standard inspection process during the last six months. Additionally, there was one investigator with a repeat significant finding.

There were two areas for which we saw the greatest increase in significant findings this six-month cycle. This included an increase in the self-reported incidents that came into the IACUC office (39 self-reports this six month cycle versus 14 submitted to the office in Fall 2020) as well as a marked increase in personnel working with animals that are not listed on the study (six findings noted this six-month cycle with only one noted in Fall 2020). Of note, we saw three instances in which mice were improperly euthanized.

Additionally, there was no change in the number of findings in the following two categories: Analgesics not given (time/duration) as outlined in protocol (four of this type noted in each cycle) and unapproved surgical procedures performed on mice (two of this type noted in each cycle).

Of these significant findings, 36 of the 53 findings would be considered animal welfare issues (68%).

A slight increase (10%) in the Minor Findings category was noted for this six-month reporting cycle (152 findings this cycle with 138 noted in Fall 2020 cycle). The area with greatest increase in findings included Protocol Not Followed (PNF-standard) (30 findings this six-month cycle versus 20 findings of this type noted in Fall 2020).

Within the program review documents, findings have been defined by type (IACUC [161], OHS [36], DEHS-CS [2], DEHS [1] and Ag [5]) as well as from what inspection/report they were

identified or came from (PAM [73], Second Surgery [21], Initial Surgery [3], Initial surgery/semi-annual [4], Semi-annual [24], PAM/Semi-annual [23], Second Surgery/semi-annual [11], Ag [5], Self-Report [39], Outside Report [2]).

As stated previously, we had 293 inspections during this six-month period. These inspections have been categorized as to type performed with 138 Post Approval Monitoring (PAM) Inspections, 24 combined PAM/semi-annual, 29 Second Surgery inspections, 13 Second Surgery/Semi-annual inspections, 69 semi-annual inspections and 13 Ag inspections conducted over this six-month period. Additionally, as part of our reduced PAM inspections we had 4 initial surgery inspections and 3 initial surgery/semi-annual inspections.

There was an increase of 63% in the number of laboratories that had no findings from the Fall 2020 six-month cycle versus this Spring 2021 cycle (120 to 195 laboratories respectively).

There was one repeat finding found during inspections this last six-month cycle (down from two noted in the Fall 2020 cycle). This repeat finding was noted in the significant finding category.

An overview of the number of Notes to File was given. These fourteen Notes to File (18% decrease from last six-month cycle) were reported monthly during a full committee review meeting to confirm that these changes should not have required a submission from the PI. These Notes were obtained either through a submission to the IACUC office or through an inspection of the laboratory for which additional information was noted but did not change the procedures that were originally reviewed and approved by the IACUC.

There were 14 veterinary recommendations this reporting period (55% increase from last six-month cycle). These recommendations are changes to protocol for which the veterinary team approves while an amendment is submitted by the PI in cases where the change will be for the betterment of the animal. These veterinary recommendations were reviewed during the same time the monthly findings report and notes to file are discussed.

2. Current IMHA Summary

An overview of the IMHA spaces with justifications for housing was presented to the IACUC at this program review. We have 120 PIs that have requested and approved housing of animals outside of Research Animal Resources in our tracking database. These PIs utilize 61 different areas. Areas and justifications are tracked as they come into the office through submissions.

3. PAM Frequency Reduction Implementation Plan (OVPR Risk Recalibration Initiative)

Reduced Post Approval Monitoring frequency was initiated in April 2012, after that Spring Program Review.

There were 162 PIs that did not qualify for reduced post approval monitoring inspections and had their post approval monitoring (PAM) or combined PAM/Semi-annual inspections completed due to not meeting our standard qualifications of reduced frequency. There were 32 PIs/laboratories that were due for post approval monitoring inspections but who did not receive their post approval monitoring inspections as they qualified for reduced frequency (so either did not have an inspection or if surgery was conducted in the laboratory, only had a surgery portion of the visit (labeled initial surgery inspection and the PAM portion was not conducted). Additionally, there were 85 PIs that were due for PAM but either did not receive an inspection as they did not have any active studies, were put on hold (inactivation) due to no response at continuing review or had put their studies on hold due to limited funding or performing solely data analysis.

As background, post approval monitoring inspections are normally conducted yearly for all PI's who are currently performing experimental procedures on animals. The only PI's that do not currently receive yearly PAM inspections include: Fisheries and Wildlife studies except those that house animals on campus, Client Owned animal studies and Agricultural studies. The proposal includes reduction of PAM visit to every other year for those areas that meet the following criteria:

- No significant findings within the last two years
- No concerns or complaints made of the laboratory through RAR, RAR veterinarians, outside entities or through compliance staff concerns
- No repeat findings on most recent inspection
- No minor findings noted from most recent inspection other than ROHP non-compliance
- No additions of a different species to be used in the laboratory (either on original protocol or through a new submission)

If any of the above are noted, the laboratory would go back onto yearly PAM visits until all criteria are again met.

Laboratories that are considered "Euthanasia and Tissue Harvest" would be able to go onto this schedule if above criteria are met. Our office will continue to perform mandatory semi-annual inspections of laboratories that conduct either non-survival or survival surgical procedures for compliance. Those laboratories in good standing would receive twice-yearly inspections of surgical areas and procedures, records, aseptic technique, anesthetics/analgesics used, euthanasia methods, endpoints, ROHP compliance, etc…but would NOT receive a PAM inspection portion during these visits.

4. Administrative Statistics for Spring Program Review 2021

- Total FCR submissions October 1, 2020 – March 31, 2021: 34
- Total DMR submissions October 1, 2020 – March 31, 2021: 399
- Review Outcomes:

FCR
Number of new protocols: 20
Number of new protocols that received stipulations: 13
Number of new protocols that were approved as submitted: 7
Number of new protocols that were deferred: 0

Number of amendments:14
Number of amendments that received stipulations: 8
Number of amendments that were approved as submitted: 5
Number of amendments that were deferred: 1

DMR
Number of new protocols: 132
Number of new protocols that received stipulations: 58
Number of new protocols that were approved as submitted: 73
Number of new protocols that were sent to FCR: 0
Number of new protocols still pending review: 1

Number of amendments: 267
Number of amendments that received stipulations: 56
Number of amendments that were approved as submitted: 204
Number of amendments that were sent to FCR: 2
Number of amendments still pending review: 5

Vet Panel
Total Number of New and Amendments on Vet Panel: 409

- Median Approval Times for submission from October 1, 2020 – March 31, 2021

FCR
New Protocols:
Days on Vet Panel: 20.5
Days from receipt of submission (i.e., from vet panel) to meeting: 20.5
Days from meeting date to initial letter sent: 3
Days from stips sent to responses received: 1*
Days from submission to FCR to approval: 29.5
Total days from initial submission to approval:50

Amendments:
Days on Vet Panel: 22
Days from receipt of submission (i.e., from vet panel) to meeting: 20
Days from meeting date to initial letter sent: 1.5
Days from stips sent to responses received: 4.5*
Days from submission to FCR to approval: 32
Total days from initial submission to approval: 54

DMR:
New Protocols:
Days on Vet Panel: 17
Days from receipt of submission (i.e., from vet panel) to agenda assignment: 2.5
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: 16.5
Total days from initial submission to approval: 33.5

Amendments:
Days on Vet Panel:12
Days from receipt of submission (i.e., from vet panel) to agenda assignment: 2
Days from agenda assignment to all reviews received: 7
Days from reviews received to first letter sent: 2
Days from stips sent to responses received: 3*
Days from submission to DMR to approval: 25
Total days from initial submission to approval: 37

*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: 8
Days protocol spends in control of Investigator: 5
Total days from submission to approval to move on to DMR or FCR: 15

The committee discussed the increase in review times and will work to speed up the review process. Efforts will be made to increase communication with investigators to explain recent changes in the review process, such as the addition of the veterinary review panel, and how this impacts total time from submission to approval.

5. Compilation of IACUC Discussion Notes October 2020—March 2021

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

OCT The committee reviewed an RAR SOP outlining quarantine for incoming NHPs. The committee had no additional comments on the SOP. Information within the SOP is not required to be listed within RAR holding protocols.

OCT The committee reviewed a request to move to quarterly visits on an IMHA which has not had any recent significant findings. The committee approved the request.

OCT The USDA completed its site visit for Minneapolis and Duluth. This was a records evaluation rather than an in person visit due to COVID-19. There were no significant findings identified, however as an opportunity for improvement, the inspector reminded the UMN to make sure that the protocol's animal number requests are clear to the IACUC community members.

OCT Fall Program Review has been scheduled for November 3rd 12:00 -4:00. The program review will be held via Zoom and additional information will be sent to the committee regarding the agenda in upcoming weeks.

OCT The committee discussed the current partnership with Homes for Animal Heroes (HAH) and an acceptable timeline for completion of the adoption process. The committee agreed that if a home is not identified by HAH within 30 days, the IACUC can attempt to use a shelter to adopt the animals. This final decision would be made by the IACUC rather than the PI. Moving forward, an IACUC protocol will be created to account for the spay and neuter of animals up for adoption. For future studies, sponsors will need to account for the per diems during the adoption process (up to 30 days) and cost for 72 hours post-op care following spay and neuter. An SOP for this process will be developed and brought to the IACUC at a future meeting.

OCT The Board of Regents Animal Care and Use Policy is up for its three year review. The committee will discuss potential updates to the policy at program review.

NOV The committee finalized the 2020 Fall Program Review Packet to send to the IO.

NOV The committee was updated on efforts to develop a policy for collecting images of research subjects.

NOV The committee reviewed emergency preparedness SOPs and additional training provided by the area veterinarian and ESS for a surgical lab that had previous difficulty with surgical procedures. The SOPs will be forwarded on to ESS staff for further comments and the committee will be updated on the efforts at future IACUC meetings.

DEC The committee reviewed and approved a new IACUC photography policy and guidelines.

DEC The committee was updated on efforts to train new IACUC members. New IACUC members will be paired with an IACUC office staff member and another IACUC member as mentors to provide help as they begin reviewing protocols.

DEC The committee approved an extension on the request to have IACUC members attend only those facility inspections that are required by federal regulations. The compliance staff will

continue to conduct additional inspections for post approval monitoring and to adhere to PHS Policy requirements. The extension is approved through March of 2021.

DEC The committee approved a request to conduct veterinary visits of Investigator Managed Housing Areas via Zoom rather than in person through March of 2021.

DEC The committee approved a policy and guidelines for co-housing multiple species. This practice is only approved under special circumstances in [redacted] facilities to ensure UMN compliance with the Guide for the Care and Use of Laboratory Animals. These documents are published on the IACUC website.

DEC The New Guide for the Care and Use of Agricultural Animals in Research and Teaching has been published. The new edition has been posted to the IACUC website.

DEC The committee was updated on ongoing efforts to expand training provided for new IACUC members.

JAN The committee reviewed the policy and guidelines for "Use of Neuromuscular Blocking Agents (NMBA) in Animals". The policy and guidelines had gone through the Policy and Guidelines Subcommittee for initial review and updates. The committee updated the documents further and the approved drafts will be posted on the UMN IACUC website.

JAN The committee was updated on efforts to adopt a particular dog that had been on study recently. An internal candidate has been identified and the committee was amenable to managing this adoption through an internal process rather than with the typical foster/adoption agency that is typically used. The committee also discussed options for adopting out cats that may be used on a study. The committee will review the policy and guidelines for IACUC processes surrounding adoption at the next IACUC meeting,

JAN The New Guide for the Care and Use of Agricultural Animals in Research and Teaching has been published. The new edition has been posted to the IACUC website.

FEB The committee reviewed the policy and guidelines for "Adoption of Teaching or Research Animals Owned by the University of Minnesota". The policy and guidelines had gone through the Policy and Guidelines Subcommittee for initial review and updates. The committee updated the documents further and the approved drafts will be posted on the UMN IACUC website.

FEB The committee reviewed the policy and guidelines for "Tumor Endpoint Criteria in Research Rodents". The policy and guidelines had gone through the Policy and Guidelines Subcommittee for initial review and updates. The approved drafts will be posted on the UMN IACUC website.

FEB The committee discussed requests for use of expired surgical gloves due to shortages caused by COVID-19. The committee determined that this could be approved for now on a case by case basis as long as the integrity of the gloves had been maintained when donning them.

FEB The committee discussed the new IACUC Mandated RAR training that is required beginning on January 1, 2021. The initial notice and request for additional required training included:

· “Mouse/Rat Basics” including euthanasia methods for personnel using mouse or rat models
· Species specific basics/handling and anesthesia training for personnel using animal models that include USDA regulated species
· “Husbandry” for personnel with Investigator Managed Housing Areas (IMHAs)
· “Basic surgery training: aseptic technique and suturing” for personnel conducting surgery

Currently Husbandry courses are not finalized, so this required course has been delayed. RAR trainers requested that the IACUC provide feedback on the content, so that expectations are being met for the training modules. As such, the committee determined that it would form a subcommittee to review the content of these modules.

The committee also determined that since there is a limited size for training courses due to COVID-19 restrictions, approval of protocols would not be held up due to completion of these new training requirements. RAR may however, withhold RAR access until all training is completed.

FEB The committee extended the current exception to require members only for inspections with regulatory requirements for IACUC members to be present. The extension is due to COVID-19 and the committee will reevaluate in June.

FEB The committee reviewed the policy and guidelines for “Use of Non-Pharmaceutical Grade Compounds in Research Animals”. The policy and guidelines had gone through the Policy and Guidelines Subcommittee for initial review and updates. The committee updated the documents further to remove the specification for filter sizes and to limit the time that Avertin solutions may be used to 14 days rather than 30 days. Updates will be made to the documents and will then be brought back to the committee for final approval.

MAR The committee reviewed the updates to the policy and guidelines for “Use of Non-Pharmaceutical Grade Compounds in Research Animals”. The committee approved all changes and the new documents will be posted to the IACUC website.

MAR The committee was updated from the training subcommittee on efforts to implement more robust training for researchers. The subcommittee proposed using the CITI training modules for species specific “overview” courses rather than RAR. The subcommittee also suggested deputizing certain labs or cores to assist in the hands-on training modules. Finally the subcommittee reminded the committee that approval of IACUC protocols is not currently held up by completion of the new training modules. The subcommittee will continue to update the IACUC as we continue to work on the implementation of the new training modules.

MAR The committee was updated on the progress of recategorizing the pain classes used at the University to align with the USDA pain classes. It was noted that because there is not a one-to-one correspondence between the current categories and the USDA categories, this will take a substantial amount of time to implement. An option was presented to revert to the software vendor’s stock form in place of the custom form currently in place, however this would require a new format for protocols.

MAR The committee was notified that semi-annual program review will take place at the normally scheduled meeting time on 4/20/21 and attendance was encouraged.

- **SELF-REPORTS and OUTSIDE REPORTS**

OCT The committee reviewed a self-report in which a lab did not complete a formal transfer before updating cage cards with new protocol ID. The lab has submitted the formal transfer request and will make sure that the appropriate steps are taken before updating cage cards. The committee considers the matter closed.

OCT The committee reviewed a self-report in which a lab did not follow the procedure as outlined in the protocol and administered tumor cells subcutaneously without anesthetizing animals first. The committee noted that this was not an animal welfare concern as this procedure should be able to be managed without sedation or anesthetizing animals. The lab will update the protocol to allow for subcutaneous administration of tumor cells without anesthetics. The committee endorsed the action plan and considers the matter closed.

OCT The committee reviewed a self-report in which one animal exhibited a dehisced incision and another appeared hunched and dehydrated following orthotopic pancreatic tumor cell implantation. The committee will require surgeons in the lab to take the RAR aseptic technique and suturing classes to ensure proper technique.

OCT The committee reviewed a self-report in which the vein of an animal undergoing surgery was nicked. Due to blood loss, this animal died. The IACUC has required that the surgeon on this procedure be removed from leading any surgical procedures and receive retraining on appropriate surgical technique and contingency planning for surgical procedures. The committee will discuss the retraining of personnel at future meetings before allowing the lab to continue with this surgeon for surgical procedures.

OCT The committee reviewed a self-report in which an animal appeared to have an adverse response to isoflurane anesthesia. The lab switched from isoflurane to propofol and the animal stabilized. The committee will recommend that the lab update the protocol to include more options for anesthetics in case there is a negative response. The committee considers the matter closed.

OCT The committee received an update on a lab that had conducted an unapproved surgery and received a recent follow-up inspection. The lab has made updates as outlined in their action plan to prevent similar problems. The committee was encouraged by the lab's progress and had no additional comments.

OCT The committee received an update on a lab that had provided a recent self-report where the committee required additional training on use of controlled substances and appropriate surgical records. The committee was encouraged by the lab's progress and had no additional comments.

OCT The committee received an update on a lab that is providing sodium urate injections in the stifle joint. The committee was encouraged by the lab's progress and had no additional comments.

OCT The committee reviewed three SOPs from a lab that had previous issues with anesthetic events. The committee approved the SOPs with minor revisions. Moving forward the IACUC

office compliance supervisor will monitor the first two procedures for each of the SOPs and report back to the IACUC on the lab's progress.

OCT The committee reviewed a self-report in which a lab failed to replace lixits when the animals were switched from treated to regular water. Moving forward, the lab will immediately replace lixits whenever cages that were on water restriction are removed from the room. The committee considers the matter closed.

OCT The committee reviewed a self-report in which a lab reported lapses in aseptic technique during surgery and issues with suturing during closure. To address the incident, all surgeons will take the RAR aseptic technique and suturing course.

OCT The committee was updated on efforts to address recent concerns with the Advanced Preclinical Imaging Center (APIC). The group is having biweekly meetings with the area veterinarian, developing emergency response SOPs, and receiving additional training for the surgeon identified in a previous self-report to improve surgical technique and preparedness. The committee will be updated further on these efforts at upcoming meetings.

OCT The committee reviewed a self-report in which the vein of an animal undergoing surgery was nicked. Due to blood loss, this animal died. The IACUC has required that the surgeon on this procedure be removed from leading any surgical procedures and receive retraining on appropriate surgical technique and contingency planning for surgical procedures. The committee will discuss the retraining of personnel at future meetings before allowing the lab to continue with this surgeon for surgical procedures.

OCT The committee reviewed a self-report in animals were shipped improperly by RAR staff. The staff member had not received the appropriate training to ship animals. To address this problem, RAR has developed a checklist to be followed when preparing animal shipments and the employee in question has received training. The committee considers the matter closed.

NOV The committee reviewed a self-report in which a surgeon did not follow the protocol and guidelines for aseptic technique by failing to shave the surgical site. Surgeons will be required to take aseptic technique training through RAR and unannounced inspections will take place.

NOV The committee reviewed a self-report outlining work that was done on an expired protocol. The lab stopped all work when notified and the protocol renewal has been approved. The committee considers the matter closed.

NOV The committee reviewed a self-report in which a transfer form was not submitted and approved prior to beginning a study. The transfer form has now been processed and the committee considers the matter closed.

NOV The committee reviewed a self-report in which a lab missed a weekly weighing procedures for an animal. The animal had no health concerns and the lab assured that it will be more diligent in the future and ensure all weights are done. The committee considers the matter closed.

NOV The committee reviewed a self-report in which a lab used sutures instead of staples for closure. For all subsequent surgeries only sutures will be used. The committee considers the matter closed.

NOV The committee reviewed two self-reports in which lab members failed to follow proper euthanasia practices. The lab members will take the RAR euthanasia course to ensure that proper procedures are followed in the future. The committee considers the matter closed.

NOV The committee was updated on a self-report in which an animal did not receive sustained release buprenorphine (SR Bup) prior to surgery. The RAR area veterinary technician was contacted before the mouse had recovered from anesthesia and asked whether it would be possible to deliver the SR Bup at that time. To prevent this from happening in the future the lab has updated their surgical record form to prevent initiation of surgery in the absence of SR Bup injection. The lab staff was instructed that the surgeries cannot be initiated if SR Bup was not administered in advance. The committee considers the matter closed.

NOV The committee was updated on a self-report in which a lab returned animals following an anesthetic event without supervising until the animals were *fully* ambulatory. In the future the lab will ensure that animals are not removed from supplemental heat and returned until they are fully ambulatory. The committee considers the matter closed.

DEC The committee reviewed a self-report in which a lab member did not follow appropriate procedure during euthanasia. The lab member will take the RAR euthanasia training course. The committee considers the matter closed.

DEC The committee reviewed a self-report in which an animal presented skin lesions following spinal cord transection surgery. The animal was euthanized and the lab is working with RAR to improve bedding in cages for animals receiving this procedure to reduce likelihood of pressure sores and lesions. The committee considers the matter closed.

DEC The committee reviewed a self-report in which a cage of animals did not receive their special diet and food levels were low. The lab and RAR have developed blue overlay cards and identification methods to make sure that cages are not missed for special diets. The committee considers the matter closed.

DEC The committee reviewed an incident in which a lab was unresponsive to RAR requests to euthanize an animal and had not provided the IACUC with a self-report for the incident. The IACUC will contact the lab and request an update to be reviewed at the next meeting.

DEC The committee was updated on a lab that had not submitted and received approval from IBC on a SARS-COVID rodent study. The committee had no additional comments.

DEC The committee reviewed a self-report in which a lab with multiple approved protocols conducted procedures approved on one of their studies on animals that were listed on a different protocol. The lab will update both protocols to include the procedures to make sure that this does not occur moving forward. The committee considers the matter closed.

DEC The committee reviewed a self-report in which food-restricted cages were not properly checked and fed and pups were weaned prematurely and marked for euthanasia. The lab and RAR will retrain staff of euthanasia procedures and implement additional measures to ensure cages receive the correct amount of food. The committee considers the matter closed.

DEC The committee reviewed a self-report outlining a mouse on a weight loss study that had exceeded the allotted weight loss for euthanasia criteria. The lab will observe mice on this study

more carefully to ensure that the euthanasia criteria are followed in the future. The committee considers the matter closed.

DEC The committee reviewed the training records for a surgeon who had undergone additional training by RAR and ESS to be approved to work as a lead surgeon. The committee approved the request and thanked Matt Lahti for his additional assistance in these efforts.

DEC The committee reviewed ongoing efforts for labs that had compliance issues over the past six months. These labs are showing improvement and have undergone additional training and visits by compliance staff. The IACUC will continue working with these labs and monitoring their performance.

DEC The committee reviewed an RAR self-report in which an animal was given the incorrect dose of ketamine. The animal recovered but the recovery time was prolonged. The investigator was made aware of the incident and was satisfied with the actions taken. The committee considers the matter closed.

JAN The committee discussed ongoing training for a lab that is working with RAR to receive additional anesthetic training. The lab currently is using a ventilator that may need to be updated as there were complications with two recent imaging procedures. RAR and the lab are investigating the equipment and incident further. The lab also made a request to record the heart rate of animals on this study at a 15 minute interval versus an 8 minute interval. The committee has had difficulty with pulse oximeters during high resolution imaging. The committee was amenable to the request to change the recording frequency as long as the lab was still monitoring vital signs continuously to ensure anesthetic depth. The committee also recommended that the lab contact additional researchers with experience in imaging to identify options for a pulse oximeter that would be MRI compatible. The committee will be updated on these discussions at upcoming meetings.

JAN The committee reviewed a self-report in which there was a calculation error on the ketamine/xylazine cocktail used leading to adverse effects. In a second round of experiments the animals received the correct dose, but there were still complications. The lab had recently switched from using Avertin to this anesthetic. The lab is working with RAR to determine if this particular anesthetic could be causing laryngeal or bronchospasms. The lab has since had more success using the ketamine/xylazine anesthetic. The committee considers the matter closed.

JAN The committee reviewed a self-report outlining an adverse event that was encountered during a routine spay. The animal developed a hemoabdomen following the procedure. RAR was contacted and the animal was hospitalized in the ICU. The animal has recovered and is doing well now. The committee considers the matter closed.

JAN The committee reviewed a self-report outlining procedures not followed during euthanasia. The lab will have the staff involved undergo retraining on proper euthanasia methods with RAR. The committee considers the matter closed.

JAN The committee was updated on an RAR self-report in which a deceased mouse was found following cage washing. RAR will update processes and training of LAA/LACTs and cage wash technicians to prevent this event from happening again moving forward. The committee considers the matter closed.

FEB The committee was updated on completion of euthanasia training by lab staff that had recently submitted a self-report regarding euthanasia of mice.

FEB The committee reviewed a self-report in which a lab had requested animals that had been fighting to be euthanized without separating the animals. The lab responded to the concern by stating that it would separate animals immediately in the future if fighting was noticed between animals that were to be euthanized. The area vet will follow up with staff to ensure that everyone is on the same page and that there have not been significant issues with this lab before regarding fighting animals. Barring additional concerns identified, the committee considers the matter closed.

FEB The committee reviewed a self-report in which mice were identified in cages after autoclaving. The lab believes that these mice were euthanized and then missed when returning the cages to be cleaned. The PI has met with the lab staff to discuss the importance of making sure that all animals are removed from cages when returning them to RAR. The committee considers the matter closed.

FEB The committee discussed a request to monitor heart rate at 15 minute intervals for a study where animals are on paralytics and undergoing high resolution imaging. The lab has reported that there are technical difficulties in making these measurements consistently during the imaging. The committee has asked the lab to consult with a veterinarian who has had previous success getting oximeters to work in similar animal models undergoing challenging imaging procedures and to attempt using a mouse oximeter. The veterinarian will work with the group and report back to the committee.

FEB The committee reviewed a revised lab supervision plan. The committee had required a supervision plan in 2017 for this lab due to concerns over animal care practices. The current IACUC chair had requested a revised simplified plan that would also outline any updates or changes that the lab foresees implementing. The committee endorsed the overall plan but requested updates regarding the experience of new lab staff and will also require that an RAR veterinarian shadow work five anesthetic events done by the PI and the lab's new personnel who will be providing anesthesia support. After the five events the veterinarian will report back to the committee for further deliberations.

FEB The committee was updated on the ownership of space currently being used by a PI who had their IMHA privileges revoked. At the time of moving the animals to this space, the IACUC and RAR were under the impression that the new area was owned [redacted], further information has come to light that this space is actually not owned by [redacted] Consequently the animals are still housed in a [redacted] space. [redacted] the committee determined that even though the rooms are not owned [redacted] this is acceptable.

FEB The committee received an update on ongoing efforts to assist a lab in determining a method to monitor anesthetic depth for animals on a study that utilizes high resolution imaging and paralytics. Software for the oximeter was unfortunately not available on the computer in use, so consequently the test of the oximeter was delayed. The committee will be updated at a later meeting when the group is able to test the oximeter.

FEB The committee reviewed a self-report in which complications during surgery ultimately led to the death of an animal. For future procedures on this study surgical access to the carotid

artery will be performed on the right side to avoid violating the esophagus running on the left side of the neck. The committee endorsed this refinement and considers the matter closed.

FEB The committee reviewed a self-report in which mice were lethally irradiated (500 rads) and received T-cell depleted bone marrow transplants two hours following irradiation. The mice underwent tail vein injections and difficulty with this procedure ultimately led to the loss of some animals. Staff has since undergone additional training for tail vein injections and RAR trainers are comfortable with the competency of the lab's staff in conducting these procedures moving forward. The committee considers the matter closed.

FEB The committee reviewed a self-report outlining a group of animals that did not have free access to water for approximately four hours. None of the animals exhibited any signs of distress. The protocol did not list that animals could have limited access to water. The lab reviewed the protocol and will make sure that there is not a reoccurrence of this event. The committee considers the matter closed.

MAR The committee reviewed a self-report in which a pregnant animal on pasture fell on an icy hill. Moving forward husbandry staff will be sure all pregnant cows are on flat ground throughout the winter and if need be, sand will be spread if there are any issues with ice. The committee considers the matter closed.

MAR The committee reviewed a self-report in which a lab used hazardous chemicals without notifying RAR husbandry staff beforehand. Moving forward the lab will be sure to inform RAR. The committee considers the matter closed.

MAR The committee reviewed a self-report in which wound clips were removed four days past the removal date. The lab will conduct formal training on wound clip removal at an upcoming lab meeting and establish a more effective system for tracking of upcoming wound clip removal. The committee considers the matter closed.

MAR The committee reviewed a self-report in which food restriction of animals on study was extended beyond the approved 24 hour period to 26-28 hours. Personnel received additional training on the importance of following the study as approved in the protocol and will implement a system to ensure that the restriction period does not exceed the 24 hours approved within the protocol. The committee considers the matter closed.

MAR The committee received an update on necropsies for animals that had died following imaging. Lung damage and a bacterial infection were identified in the respiratory tract. The area vet will review the necropsy results with the lab and consider ways to prevent damage due to problems with the ventilation of animals. The committee will continue to be updated on these efforts.

MAR The committee reviewed a self-report in which animals were found outside of an isolator. The RAR area veterinarian and the RAR area vet tech also inspected the isolator in question. From the examination of the isolator and reports from the RAR animal care staff, it appears that the cover that is used around a section of plastic pipe that goes down through the tenderfoot deck got somehow dislodged. It seems that sometimes these covers get warped due to the heat, which in turn can cause them to be more easily dislodged by the birds moving around, etc. To prevent a recurrence of this issue, the following corrective actions will be implemented:

· The covers around the pipe will be checked for integrity and proper placement by the RAR staff during the twice a day health checks.
· Weights on or by the covers will be used to decrease the chances of them getting dislodged.
· A sign will be posted on the room door stating to not move the bricks by the covers for the safety of the animals.

The committee considers the matter closed.

MAR The committee reviewed a self-report in which two animals who are typically pair-housed in two cages were confined to one cage together overnight. The area supervisor will provide re-training to the individual employee about the importance of checking locks, latches and dividers at the end of the day (a task that is currently on the daily check sheet). Additionally, the supervisor will double check that this task has been performed each day until the employee and supervisor are confident that the employee can perform this task on her own again. The committee considers the matter closed.

MAR The committee reviewed a self-report in which animals were weaned early due to confusion regarding the weaning cards placed on the cages. Moving forward, the lab will be sure to read the cards carefully to ensure animals are weaned at the correct time. The committee considers the matter closed.

MAR The committee reviewed a self-report in which animals were left in a procedure hood overnight without access to water. The animals were returned to the rack with water by RAR the next morning and no health issues were identified. Moving forward, the lab will institute a checklist to ensure that animals have been returned to the proper area before leaving the room. The committee considers the matter closed.

MAR The committee reviewed a self-report in which a lab failed to notify RAR before administering a chemotherapeutic agent to animals. Moving forward, the lab will be sure to notify RAR beforehand. The committee considers the matter closed.

MAR The committee reviewed a self-report in which more animals than approved were used for a teaching lab to allow for social distancing of students, and the timing and method of animal transport for the teaching lab were not as described in the protocol but did not pose any additional risks to the animals. Moving forward, the lab will update the protocol accordingly. The committee will consider the matter closed once the amendment is received.

MAR The committee reviewed a self-report in which an equipment failure caused animals to be without access to water and animals were subsequently found dead. Moving forward, RAR will remind staff of proper decontamination of the watering system during rack swaps and change out, as any issues are most likely to be found during these processes. The committee requested additional information regarding the timing of the incident and the process for daily observations of animals. The committee will be updated on the responses.

- **SUBCOMMITEE UPDATES**

  Policy and Guidelines Subcommittee: The subcommittee drafted several updates to Policies and Guidelines. These updates are further described in the Policy and Guideline Review section of this document.

  Training Subcommittee: A subcommittee was formed to review the content of new RAR training modules developed to fulfill the IACUC Mandated RAR Training for new animal users. The subcommittee recommended the use of CITI courses to address some of the training requirements. The subcommittee will continue to keep the IACUC updated on the implementation of the new training requirements.

6. Updating Our Policies and Guidelines:

At the previous Program Review in Fall 2020, the committee discussed updating our Policies and Guidelines to be more consistent with other University policies where the policy is a concise statement of the principal commitment of the policy and more generally applicable with the specific associated guidelines in a separate document. This will allow us to keep the overall policies in place while making required changes and updates to the guidelines as necessary. The subcommittee on Polices and Guidelines has presented proposed changes to the committee; the following were presented in this six month period:

- Adoption of Research Animals: approved
- Photography, Video and Audio Recording of Animals Use in Research and Teaching: approved
- Co-Housing Multiple Species: approved (limited to [redacted])
- Neuromuscular Blocking Agents in Animals: approved
- Tumor Endpoint Criteria: approved
- Use of Non-pharmaceutical Grade Compounds in Animals

The updated polices are posted on the IACUC website. Additionally, updated policies will be communicated to labs via email and during the inspection process.

The subcommittee on Policies and Guidelines will continue to update additional policies.

7. Buprenorphine and Rodents

The committee was updated by Drs. Christina Larson and Carolyn Fairbanks on their recent research regarding the effectiveness of Buprenorphine as an analgesic in rodents.

Sustained release buprenorphine (SR-Bup) was found to induce tolerance and to provide only minimal and short duration analgesia in multiple murine and rat pain models, including CFA, incisional pain, and tumor pain. Additionally, SR-Bup was less effective than ketoprofen in cats undergoing spay surgery.

In light of this data, the committee will begin to consider recommending alternative analgesics in the future, particularly for mice. All available formulations of sustained release buprenorphine should be evaluated before making any decisions, as the data presented were generated using one particular commercially available formulation.

8. AAALAC Preparation

Dr. Lynn Impelluso presented the attached slides on “Preparing for an AAALAC International Site Visit”, which included an overview of the site visit process. The University of Minnesota’s site visit has been scheduled for July 20-23 and will be an in person visit. Topics presented include the purpose of the visit, steps that units can take to prepare, components of the site visit, and potential outcomes.

Preparing for an AAALAC International Site Visit




aaalac INTERNATIONAL

Topics Covered

- AAALAC International site visits: Myth vs. Fact
- AAALAC speak
- Purpose of a site visit
- What to expect during a site visit
- Tips on preparing for a site visit

Accreditation = Partnership

For accreditation to work there must be a totally open and honest relationship between the accredited site and the Council on Accreditation. It is a partnership, with both sides working to provide the best animal care and use program possible. Want to know what AAALAC thinks about an issue? Give us a call!

Myth vs. Fact

- Myth: AAALAC International is a regulatory agency.

- Fact: AAALAC International is a private, nonprofit organization.

Myth vs. Fact

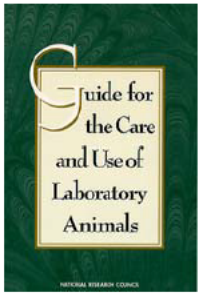
- Myth: AAALAC International conducts *inspections* of laboratory animal care and use programs.

- Fact: AAALAC International evaluates laboratory animal care and use programs through a voluntary, peer-review process.

Myth vs. Fact

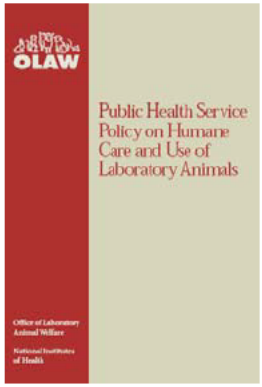
- Myth: AAALAC International establishes policies and regulations.

- Fact: AAALAC International evaluates animal care and use programs based on recommendations in the *Guide for the Care and Use of Laboratory Animals* (*Guide*), NRC 1996 and other widely accepted guidelines.



What Else Might Apply to Us?

- PHS Policy ?
- PHS Assurance?
- PHS Funding?
- Animal Welfare Regulations?
- USDA species?
- Agriculture Guide?



Want a Heads Up on Other References that Site Visitors Use?

aaalac INTERNATIONAL — ASSOCIATION FOR ASSESSMENT AND ACCREDITATION OF LABORATORY ANIMAL CARE INTERNATIONAL

CONTACT | SEARCH: GO

QUICK LINKS: ACCREDITED ORGANIZATIONS | MEMBERS ONLY | REFERENCE RESOURCES | PROGRAM DESCRIPTION | GLOBAL GATEWAY

- ABOUT AAALAC
- ACCREDITATION
- PROGRAM STATUS EVALUATION
- EDUCATION
- RESOURCES
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- PUBLICATIONS
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Accreditation

print version | email a friend

AAALAC's Reference Resources

AAALAC International relies on the *Guide for the Care and Use of Laboratory Animals*, NRC 1996, as its primary standard for evaluating laboratory animal care and use programs. AAALAC International also refers to other specialty publications for supplemental information about procedures or techniques related to the care and use of laboratory animals. Below are select references and information on where to obtain them.

United States

1. **The Animal Welfare Act of 1966** (P.L. 89-544) and subsequent amendments, as promulgated in USDA regulations 9 CFR Chapter 1, Subchapter A, Animal Welfare. Parts 1, 2, and 3. USDA-APHIS-AC Unit 84, 4700 River Rd., Riverdale, MD 20737, 301/734-7833. www.aphis.usda.gov/ac/awa.html

2. **AAALAC International Position Statements.**

3. **Biosafety in microbiological and biomedical laboratories.** DHHS Pub. No. (CDC) 93-8395, May 1999. Division of Safety, NIH, Bldg. 31, Rm. 1C02, Bethesda, MD 20892. 301/496-2801. www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm

Go to: www.aaalac.org

Myth vs. Fact

- Myth: AAALAC International uses the same standards to evaluate animal programs outside the U.S.
- Fact: Because each country has its own set of laws and regulations, AAALAC International site visitors use a customized approach for evaluating the programs.

Myth vs. Fact

- Myth: AAALAC International evaluates animal care and use programs that only use animals regulated under the Animal Welfare Act.
- Fact: AAALAC International accreditation covers all vertebrate animals. Many programs using non- regulated species, such as rats and mice, participate in the accreditation program.

Myth vs. Fact

- Myth: An institution's evaluation and report is available to the general public.

- Fact: AAALAC International's accreditation process is confidential. The evaluation and its results are known solely by the institution and AAALAC International, even if deficiencies are found.

AAALAC - Speak

PD	Program Description
PE	Program Evaluation
PSVC	Post Site Visit Communication
CoA	Council on Accreditation
SV	Site Visit
Must	Really Means Must
Should	Good Idea

Purpose of the Site Visit

- Gain thorough understanding of your program of animal care and use
- Collect evidence of good performance!
- Serve as Council's eyes and ears
- Gather sufficient quantities of information to serve as advocate before Council

Before the Site Visit

- The Council member is assigned
- Setting the date with the institution
- The Co-Visitors are selected
  - Shared information is confidential
  - Same team never returns to same site

What do 'They' Know?

- Have read the current PD
- Have reviewed history of the institution
- Have previous evaluations

Site Visit Coordination

- Make hotel reservations
- Assure they know how to get where
- Local transportation to institution may be needed
- Introductory meeting at the institution commonly at 8:00 a.m. (arrival usually 7:30-7:45 am)
- Be on time!!!!
- Gracious collegial support is always the right thing to do

Entrance Briefing

- Meet with institutional leaders (looking for evidence of institutional support)
- Introduce AAALAC International
- Explanation of the accreditation process
- Explanation of the proposed daily activities
- Explanation of possible final outcomes of SV
- Offer an Exit briefing at conclusion of the SV

Program Review

- Review/clarification of aspects of program
- Clarification of Program Description
- Site visitors may request additional supporting information to gain additional information about the program
- Site Visitors may ask for protocols and other documents for later review during the SV

Program Review

- Pre-Review:
  - Questions (and responses) before hand
  - Supplemental documentation before hand
- On Site Review:
  - Page by page clarification
  - (Abbreviated versus Long)

Meeting with the IACUC

- Set aside some time to meet with IACUC
- Luncheon works well
- Describe accreditation process
- Discuss issues and talk with lay representatives
- Problem cases … IACUC solutions
- VERY important for site visitors to “get a feel” if IACUC is engaged

Meeting the Husbandry Staff

- Can set aside a prescribed time …
- Can have hallway meetings …
- Staff should be ‘familiar’ with the accreditation process
- Discuss their areas of activity
- Don’t let Site Visitors do dumb things …
- Do be around and working

Meeting the Research Staff

- Facility walk-through evaluations
- Health of animals
- Condition of facilities (Sanitation)
- Emergency Contacts and after hours vet support
- Contract and satellite facilities
- PI laboratory visits

Review of Documentation

- USDA Inspection Reports
- Compliance Records
- Selected IACUC Protocols
- PHS Assurance
- IACUC meeting minutes
- Standing Operating Procedures (SOPs)

Executive Session

- Site Visitors time to prepare for Exit Briefing
- Discuss issues and prepare notes
- Commendations for unit
- Mandatory deficiencies and SFI's
- Site Visitors recommendations to Council

Exit Briefing

- Provide unit with preliminary findings and impressions
- Opportunity to correct misinterpretations or errors
- When appropriate encourage PSVC within 10 days
- Verbal, not written

Exit Briefing

- Conducted by Council member
- Summary of program strengths and weaknesses
- Commendations of personnel when appropriate
- Re-emphasize - Independent opinions of site visitors

Exit Briefing

- Discuss issues that are not clear
- Unauthorized research and procedures – Mandatory
- Significant health and safety issues for personnel and animals - Mandatory
- SFI's - Suggestions for improvement - e.g., more intense microbiological monitoring
- May have off line comments too.

Exit Briefing – Potential Outcomes

If already accredited:

CFA

CFA w/ condition

DA

Probation

Revoke Accreditation

If a new application:

AFA

Provisional

Withhold

Post-Site Visit Responses

- Involve the IACUC in response to findings
- Don’t hesitate to contact Council member or AAALAC office if you have questions
- Review potential mandatory findings thoroughly
- If you have an OLAW Assurance, and findings meet their definition of a reportable event, you should report them to OLAW

Post-Site Visit Responses

- Unless you agree with findings, **DO NOT** make changes or spend money on fixes until final letter arrives
- Final letter will include:
  - Commendations
  - Acknowledgement of any items already addressed through PSVC
  - Any mandatory items and/or suggestions for improvement

Post-Site Visit Responses

- Mandatory finding
  - a mandatory item is, in Council's judgment, a serious deviation from the recommendations of the Guide and/or other AAALAC International standards that must be corrected to achieve or continue accreditation

Post-Site Visit Responses

- Suggestion for improvement
  - An element of the peer review process designed to assist accredited programs through the sharing of knowledge and experience
  - There is absolutely no obligation for institutions to make program changes based on suggestions for improvement

Accreditation Verification Letter

- Available on request
  - Mail, phone call
  - Through the accredit mailbox (accredit@aaalac.org)
  - Can only be requested by official unit contacts
- Verifies
  - Currently accredited
  - Date of initial accreditation

Preparing for a Site Visit

- Do
  - Maintain program in “inspection-ready” state
  - Self-identify and resolve deficiencies
  - Keep administration involved and educated
  - Make sure practices and PD match
  - Ensure previous promises to AAALAC have been kept
- Don’t
  - Practice “management by AAALAC”

Preparing the IACUC

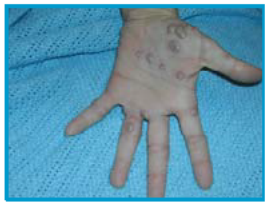
- Train and educate
- Keep informed of national issues and debates that may be applicable to your program
- Discuss and develop policies on relevant issues where clear guidance is lacking
- Document activities
- Follow deficiency reporting requirements

Preparing the OHS Program

- MUST be part of an overall animal care and use program
- Evaluate extent and level of participation
  - Risk assessment performed
    - Job related risks
    - Personal health risks
- Are all at-risk employees offered participation in an OHS program?

Preparing the OHS Program (Cont)

- Are declinations of participation documented?
- Hazard Identification performed routinely
- Waste anesthetic gas exposure
- Allergy awareness and prevention
- Zoonoses awareness and prevention

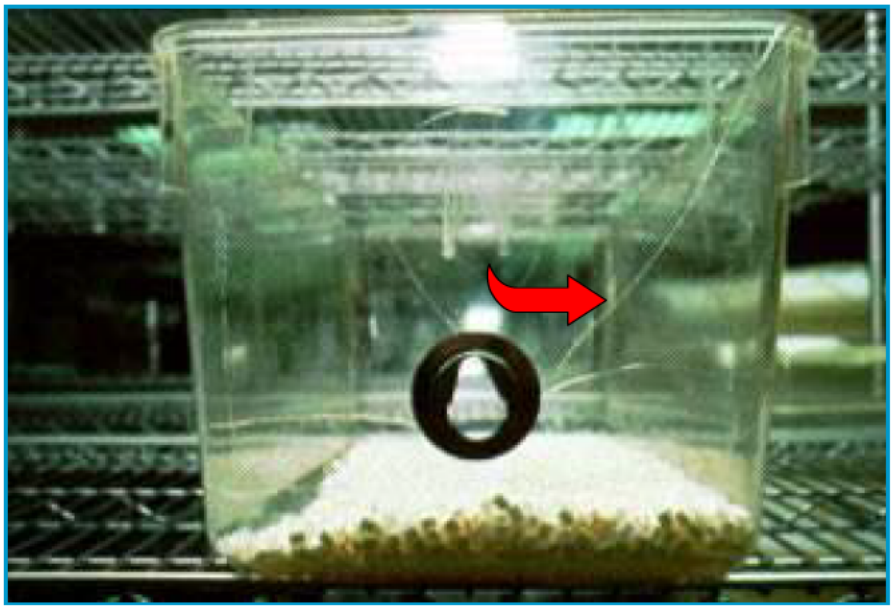


Preparing the Husbandry Program

- Keep areas clean and uncluttered
- Follow sanitation schedules
- Cage sizes adequate
- Monitor effectiveness of sanitation procedures
- Have exemptions documented and approved by IACUC

Preparing the Husbandry Program (cont)

- If SOPs in place, are they followed?
- Condition of caging
- Breeding colonies
- Checklists completed and current
- Does PPE make sense and procedures followed?

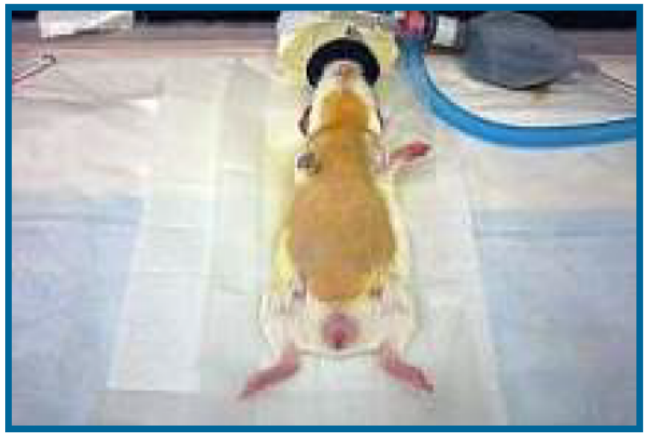


Preparing the Veterinary Care Program

- Have an effective method for identifying, treating, and following up on sick animals
  - ALL sick animals identified
  - Documentation of Tx and resolution
- Part-time veterinarian visits documented
- Frequency of rounds sufficient for facility
- Anesthesia/analgesia: current, documented

Preparing the Veterinary Care Program (cont)

- Is environmental enrichment considered for all species?
- Is aseptic technique followed for rodent survival surgeries?



OR

Preparing the Physical Plant

- Doesn't have to be new
- Does need to be in good repair, clean and sanitizable
- MUST have HVAC performance data, current within 12 months of site visit
- Performance standards and animal room HVAC
- Temperature and humidity monitored
- Contingency plans for power loss
- Rackwash safety!!

Preparing the Staff

- Don’t shut down, we need to see daily operations
- Let PIs, technicians, caregivers know site visitors may ask questions
- Let staff know that a lot of writing is normal

Questions

www.aaalac.org • 301.696.9626 • accredit@aaalac.org




Contact us anytime!

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9. 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, Giuseppe Dell'Anna

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

Acceptable:

- **"Law enforcement and emergency personnel are provided a copy and integration with overall plan is in place"** under Disaster Planning and Emergency Preparedness. It was confirmed that IACUC Leadership met with the UMN Deputy Police Chief approximately one year ago and sent him disaster plans, which he was to share with the relevant units at the satellite campuses.

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)

Paul Lindstrom, Carolyn Fairbanks, Rimantas Kervelevicius, Geoff Ghose, Laura Hocum-Stone, [redacted] Dick Bianco, Sammy Boyle, Nathan Koewler

Paul Lindstrom summarized Group 2's evaluation and identified the following topic for discussion with the rest of the committee:

Acceptable:

- **"Members include a veterinarian, a scientist, a nonscientist, and a nonaffiliated non-lab animal user"** under IACUC Membership and Functions. It was noted that the number of non-affiliated IACUC members has increased from one to two since the last Program Review

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 Tollison, George Wilcox, Sally Noll, [redacted], Henry Wong, Cynthia Lee, [redacted] Jessica Felgenhauer

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

Acceptable:

- **Personnel Qualifications and Training.** It was noted that the additional personnel training discussed at the last Program Review has been implemented. This includes CITI training modules and hands-on training provided by RAR.
- **"Personal Protective Equipment for the work area is appropriate and available"** and **"Respiratory protection is available when performing particulate work"** under Occupational Health and Safety of Personnel. It was noted that although PPE availability remains somewhat constrained by the pandemic, the situation has improved since the last Program Review. The committee is not aware of any situations where personnel safety was compromised by lack of PPE availability.

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

Jennifer Borgert, Jim Perry, Dezhi Liao, Kat Coda, Tim Goldsmith, [redacted], Lynn Impelluso, Whitney McGee, Kristin Pilon

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

Acceptable:

- **"Surgical procedures including laparoscopic procedures are categorized as major or minor"** under Surgery. Although this is currently captured at inspection, this was identified as a potential area for improvement as this information could be included within the protocol as well. A subcommittee was formed to write up a Policy and Guideline to better define major vs minor surgery.

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, Maggie Luesse, Wensheng Lin, Beverly Norris, Ferenc Toth, Anna Stodolka

Frances Lawrenz summarized Group 5's evaluation. All items were found to be Acceptable with no topics for discussion.

I. Semiannual Program Review Checklist [i]

Institutional Policies and Responsibilities Date: 4/20/21

1. Animal Care and Use Program NEW	A*	M	S	C	NA
• Responsibility for animal well-being is assumed by all members of the program (*Guide*, p 1) [must]	A				
• IO has authority to allocate needed resources (*Guide*, p 13)	A				
• Resources necessary to manage program of veterinary care are provided (*Guide*, p 14) [must]	A				
• Sufficient resources are available to manage the program, including training of personnel in accord with regulations and the *Guide* (*Guide*, pp 11, 15)	A				
• Program needs are regularly communicated to IO by AV and/or IACUC (*Guide*, p 13)	A				
• 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]	A				
• Inter-institutional collaborations are described in formal written agreements (*Guide*, p 15)	A				
• Written agreements address responsibilities, animal ownership, and IACUC oversight (*Guide*, p 15)	A				

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

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

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)	A				
• For pilot studies, a system to communicate with the IACUC is in place (*Guide*, p 28)	A				
• For genetically modified animals, enhanced monitoring and reporting is in place (*Guide*, p 28)	A				
• Restraint devices are justified in the animal use protocols (*Guide*, p 29) [must]	A				
• Alternatives to physical restraint are considered (*Guide*, p 29)	A				
• Period of restraint is the minimum to meet scientific objectives (*Guide*, p 29)	A				
• Training of animals to adapt to restraint is provided (*Guide*, p 29)	A				
• Animals that fail to adapt are removed from study (*Guide*, p 29)	A				
• Appropriate observation intervals of restrained animals are provided (*Guide*, p 29)	A				
• Veterinary care is provided if lesions or illness result from restraint (*Guide*, p 30) [must]	A				

• Explanations of purpose and duration of restraint are provided to study personnel (*Guide*, p 30)	A					
• Multiple surgical procedures on a single animal are justified and outcomes evaluated (*Guide*, p 30)	A					
• Major versus minor surgical procedures are evaluated on a case-by-case basis (*Guide*, p 30)	A					
• Multiple survival procedure justifications in non-regulated species conform to regulated species standards (*Guide*, p 30)	A					
• Animals on food/fluid restriction are monitored to ensure nutritional needs are met (*Guide*, p 31)	A					
• Body weights for food/fluid restricted animals are recorded at least weekly (*Guide*, p 31)	A					
• Daily written records are maintained for food/fluid restricted animals (*Guide*, p 31)	A					
• Pharmaceutical grade chemicals are used , when available, for animal-related procedures (*Guide*, p 31)	A					
• Non-pharmaceutical grade chemicals are described, justified, and approved by IACUC (*Guide*, p 31)	A					
• Investigators conducting field studies know zoonotic diseases, safety issues, laws and regulations applicable in study area (*Guide*, p 32)	A					
• Disposition plans are considered for species removed from the wild (*Guide*, p 32)	A					
• Toe-clipping only used when no alternative, performed aseptically and with pain relief (*Guide*, p 75)	A					
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.)	A					
• Members include a veterinarian, a scientist, a nonscientist, and a nonaffiliated non-lab animal user (*Guide*, p 24)[ii]	A					
• IACUC authority and resources for oversight and evaluation of institution's program are provided (*Guide*, p 14)	A					
• IACUC conducts semiannual evaluations of institutional animal care and use program (PHS Policy, IV.B.)	A					
• Conducts semiannual inspections of institutional animal facilities (PHS Policy, IV.B.)	A					
• IACUC organizationally reports to the Institutional Official (PHS Policy, IV.A.1.b.)	A					
• Methods for reporting and investigating animal welfare concerns are in place (*Guide*, p 23) [must]	A					
• Reviews and investigates concerns about animal care and use at institution[iii] (PHS Policy, IV.B.)	A					
• Procedures are in place for review, approval, and suspension of animal activities[iv] (PHS Policy, IV.B.)	A					
• Procedures are in place for review and approval of significant changes to approved activities (PHS Policy, IV.B.)	A					
• 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)	A					
• Requests for exemptions from major survival surgical procedure restrictions are made to USDA/APHIS[v] (*Guide*, p 30) [must]	A					
6. IACUC Training NEW	**A***	**M**	**S**	**C**	**NA**	
• All IACUC members should receive:						
○ Formal orientation to institution's program (*Guide*, p 17)	A					
○ Training on legislation, regulations, guidelines, and policies (*Guide*, p 17)	A					
○ Training on how to inspect facilities and labs where animal use or housing occurs (*Guide*, p 17)	A					
○ Training on how to review protocols as well as evaluate the program (*Guide*, p 17)	A					
○ Ongoing training/education (*Guide*, p 17)	A					
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	A					
○ Compiles program review and facility inspection(s) results (includes all program	A					

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

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]	A				
• Veterinary access to all animals is provided (*Guide*, p 14) [must]	A				
• Direct or delegated authority is given to the veterinarian to oversee all aspects of animal care and use (*Guide*, p 14) [must]	A				
• Veterinarian provides consultation when pain and distress exceeds anticipated level in protocol (*Guide*, p 5) [must]	A				
• Veterinarian provides consultation when interventional control is not possible (*Guide*, p 5) [must]	A				
• If part time /consulting veterinarian, visits meet programmatic needs (*Guide*, p 14)	A				
• Regular communication occurs between veterinarian and IACUC (*Guide*, p 14)	A				
• Veterinarian(s) have experience and training in species used (*Guide*, p 15) [must]	A				
• Veterinarian(s) have experience in facility administration/management (*Guide*, p 15)	A				

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)	A				
○ IACUC members (*Guide*, p 17)	A				
○ Animal care personnel (*Guide*, p 16)	A				
○ Research investigators, instructors, technicians, trainees, and students (*Guide*, pp 16-17)	A				
• Continuing education for program and research staff provided to ensure high quality care and reinforce training (*Guide*, pp 16-17)	A				
• Training is available prior to starting animal activity (*Guide*, p 17)	A				
• Training is documented (*Guide*, p 15)	A				
• Training program content includes: (*Guide*, p 17)					
○ Methods for reporting concerns (*Guide*, p 17)	A				
○ Humane practices of animal care (e.g., housing, husbandry, handling) [xii]	A				
○ 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]	A				
○	Research/testing methods that minimize numbers necessary to obtain valid results (PHS Policy, IV.A.1.g.)	A				
○	Research/testing methods that minimize animal pain or distress (PHS Policy, IV.A.1.g.)	A				
○	Use of hazardous agents, including access to OSHA chemical hazard notices where applicable (*Guide*, p 20)	A				
○	Animal care and use legislation (*Guide*, p 17)	A				
○	IACUC function (*Guide*, p 17)	A				
○	Ethics of animal use and Three R's (*Guide*, p 17)	A				

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

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

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

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

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

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

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

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)	A				
• Selection of analgesics and anesthetics is based on professional veterinary judgment (*Guide*, p 121)	A				
• Painful procedures are monitored to ensure appropriate analgesic management (*Guide*, p 122)	A				
• Nonpharmacologic control of pain is considered as an element of postprocedural care (*Guide*, p 122)	A				
• Procedures are in place to assure antinoception before surgery begins (*Guide*, p 122) [must]	A				
• Guidelines for selection and use of analgesics and anesthetics are in place and regularly reviewed and updated (*Guide*, p 122)	A				
• Special precautions for the use of paralytics are in place to ensure anesthesia[xiv] (*Guide*, p 123)	A				

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

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

* **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:

Spring 2021 IACUC Inspection Report

Inspection Type	Number	Percentage
# of PAM Inspections	138	47%
# Second Surgery Inspections	29	10%
#PAM/Semi-Annual	24	8%
#Second Surgery/Semi-annual	13	4%
#Initial Surgery Inspections	4	1%
#Initial Surgery/Semi-annual	3	1%
# of Semi-Annual Inspections	69	24%
# of Ag Inspections	13	4%
Total # of Inspections	**293**	**100%**
Total # of Findings	**205**	

Inspection Finding Summary	Number	Percentage
Finding Category		
IACUC (% of total findings)	161	79%
IBC (% of total findings)	0	0%
DEHS-CS (% of total findings)	2	1%
DEHS (% of total findings)	1	0%
OHS (% of total findings)	36	18%
Ag (% of total findings)	5	2%
Type of Inspection		
PAM (% of total findings)	73	36%
Second Surgery Inspection (% of total findings)	21	10%
PAM/Semi-annual (% of total findings)	23	11%
Initial Surgery Inspection (% of total findings)	3	1%
Initial Surgery/Semi-annual (% of total findings)	4	2%
Semi-annual (% of total findings)	24	12%
Second Surgery/Semi-annual (% of total findings)	11	5%
Ag (% of total findings)	5	2%
Self Report (% total findings)	39	19%
Surgical Records Review (% of total findings)	0	0%
Committee Request (% of total findings)	0	0%
Unannounced visit (% of total findings)	0	0%
Outside reports of non-compliance (% of total findings)	2	1%

Buildings/Areas	Inspected
[redacted]	

*AAALAC accredited units

Type of Finding		
Minor (% of total findings)--Standard	140	68%
Minor (% of total findings)--Other	12	6%
Significant (% of total findings)--Standard	24	12%
Significant (% of total findings)--Other	29	14%

Repeat Findings		
	Spring 2021	**Fall 2020**
Minor ------> Minor:	0	0
Significant -----> Significant:	1	2
Total # of repeat findings	**1**	**2**

Spring 2021 IACUC Inspection Report

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 RAR 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%
unapproved surgical proedures on mice**	2	4%

SIGNIFICANT Fall 2020		
Findings	**Number**	**Percentage**
Euthanasia methods not followed	1	3%
Analgesics not given after surgical or anesthetic procedures as outlined in protocol	1	3%
Analgesics not given (time/duration) as outlined in protocol	4	12%
Carprofen administered to mice prior to tumor resection surgery but buprenorphine was to be used *	1	3%
dosage of ibuprofen given to mice less than approved in protocol and animals not given this analgesic 12-24 hours prior to surgery to ensure animals will drink the new substance*	1	3%
three fish died as a result of leaving hose running to fill pond thus shocking the fish	1	3%
Animals returned to RAR under anesthesia without staff present unitl fully recovered	1	3%
tail snips taken on animals older than 21 days without anesthetic as required*	1	3%
Anesthesia used but not approved in protocol	1	3%
Lidocaine/bupivacaine not given prior to or after surgery	2	6%
Personnel working with animals but not listed as staff on study	1	3%
Expired anesthetic/ analgesic/euthanasia solution in use	5	15%
weanling mouse found in carcass bag that was still alive*	1	3%
unapproved surgical proedures on mice	2	6%
dehiscence noted and site repaired in USDA animals without veterinary involvement	1	3%

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%
cage of mice did not have food from 8/28--8/31*	1	3%
blood pressure not taken during pig surgeries as outlined which also would help catch early endpoints of study	2	6%
breeding conducted on wrong protocol as animals not properly transferred through RAR business office	1	3%
No protocol in place for animal work	2	6%
too many mice placed in cage for euthanasia	2	6%
cow died without veterinary intervention and caller contacted the IACUC with some concerns of the animal care provided at the site duing the month of March	1	3%
controlled substances not properly stored	1	3%
Total Significant Findings	**34**	100%

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 Spring 2021		
Findings	**Number**	**Percentage**
ROHP	36	24%
IPNF--Expired items	12	8%
IPNF-Surgical Records	4	3%
PNF-Standard	30	20%
PNF-Other	4	3%
IPNF--Standard	26	17%
IPNF-Other	6	4%
IPNF-Anesthetic Records	3	2%
Ag	5	3%

MINOR Fall 2020		
Findings	**Number**	**Percentage**
ROHP	30	22%
IPNF--Expired items	9	7%
IPNF-Surgical Records	6	4%
PNF-Standard	20	14%
PNF-Other	1	1%
IPNF--Standard	27	20%
IPNF-Other	0	0%
IPNF-Anesthetic Records	2	1%
Ag	22	16%

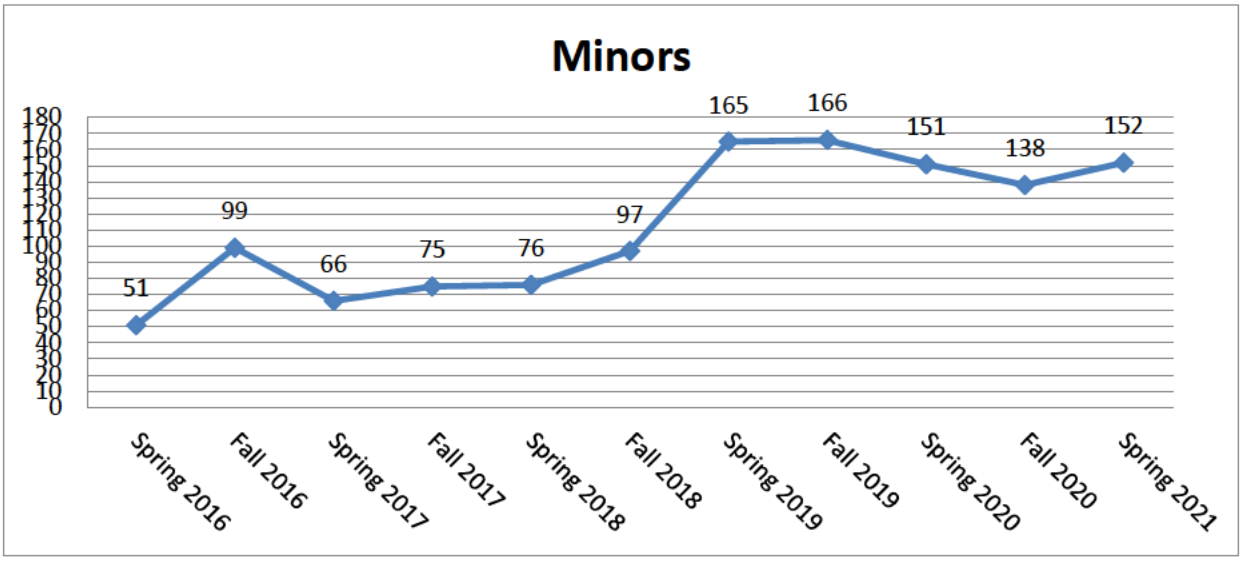
IPNF-Personnel Training Records	8	5%
OHS	0	0%
IPNF-Aseptic Technique	6	4%
IPNF--Aseptic Technique--Other	2	1%
DEHS	1	1%
DEHS-CS	2	1%
Facility Issues	5	3%
Husbandry	2	1%
Total Minor Findings	**152**	**100%**

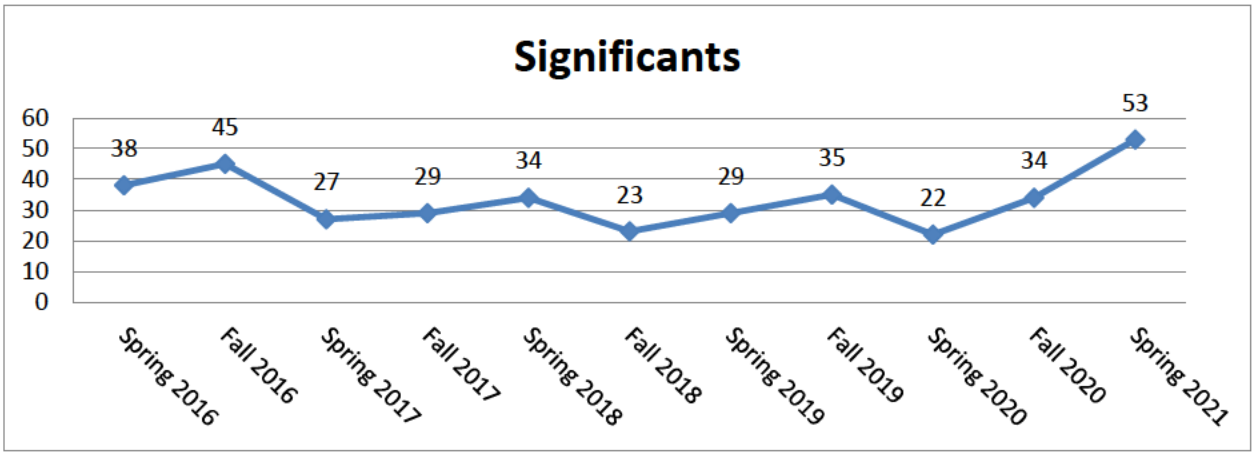
IPNF-Personnel Training Records	1	1%
OHS	2	1%
IPNF-Aseptic Technique	9	7%
Husbandry	9	7%
Total Minor Findings	**138**	**100%**

*IPNF: IACUC Policy Not followed

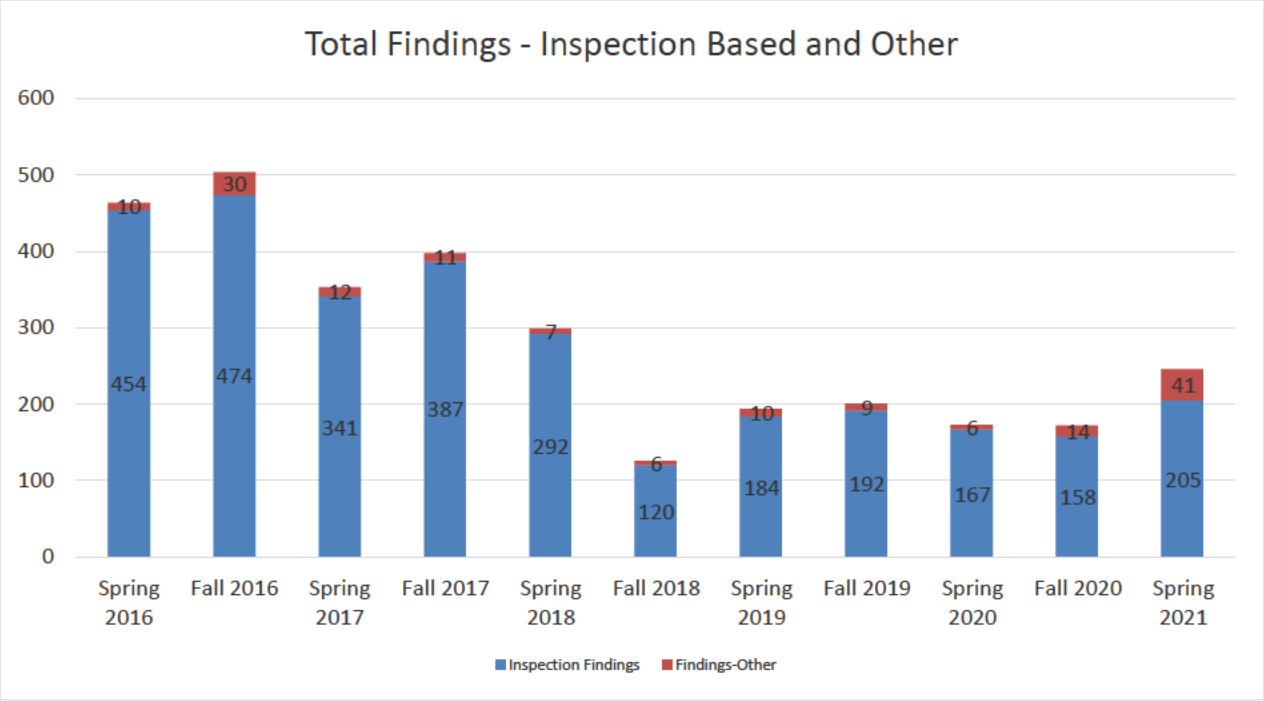
*PNF: Protocol Not Followed

	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
Minors	51	99	66	75	76	97	165	166	151	138	152
Significants	38	45	27	29	34	23	29	35	22	34	53





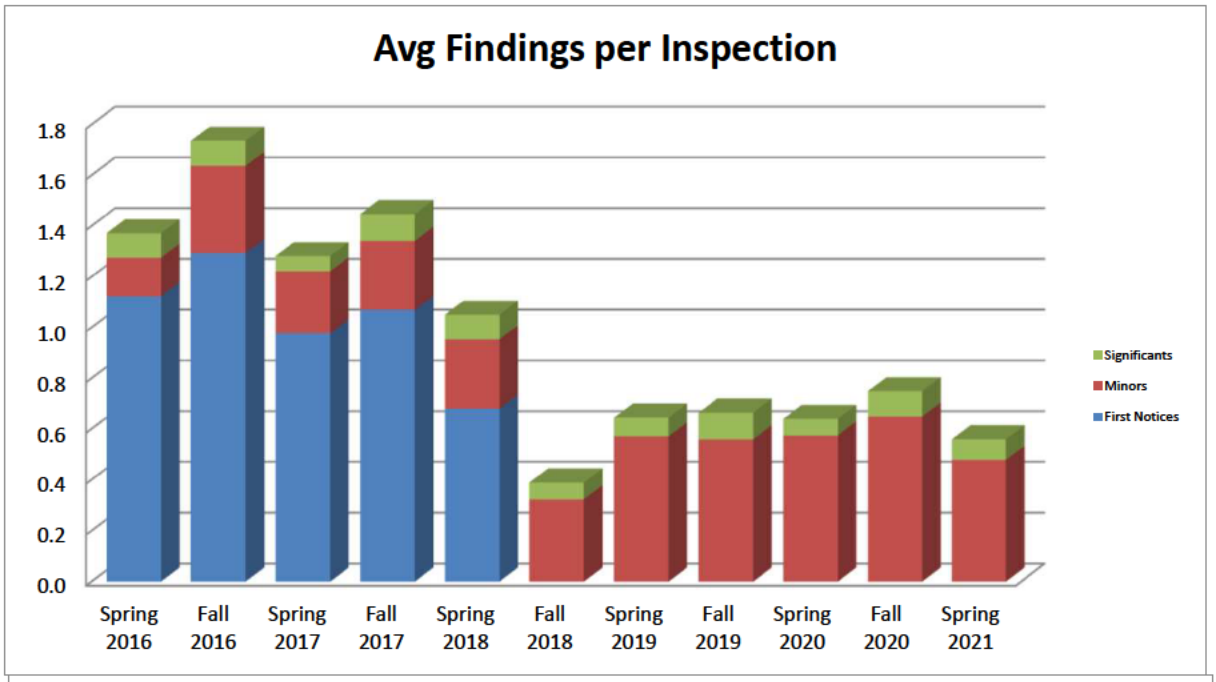
	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
Inspection Findings	454	474	341	387	292	120	184	192	167	158	205
Findings-Other	10	30	12	11	7	6	10	9	6	14	41

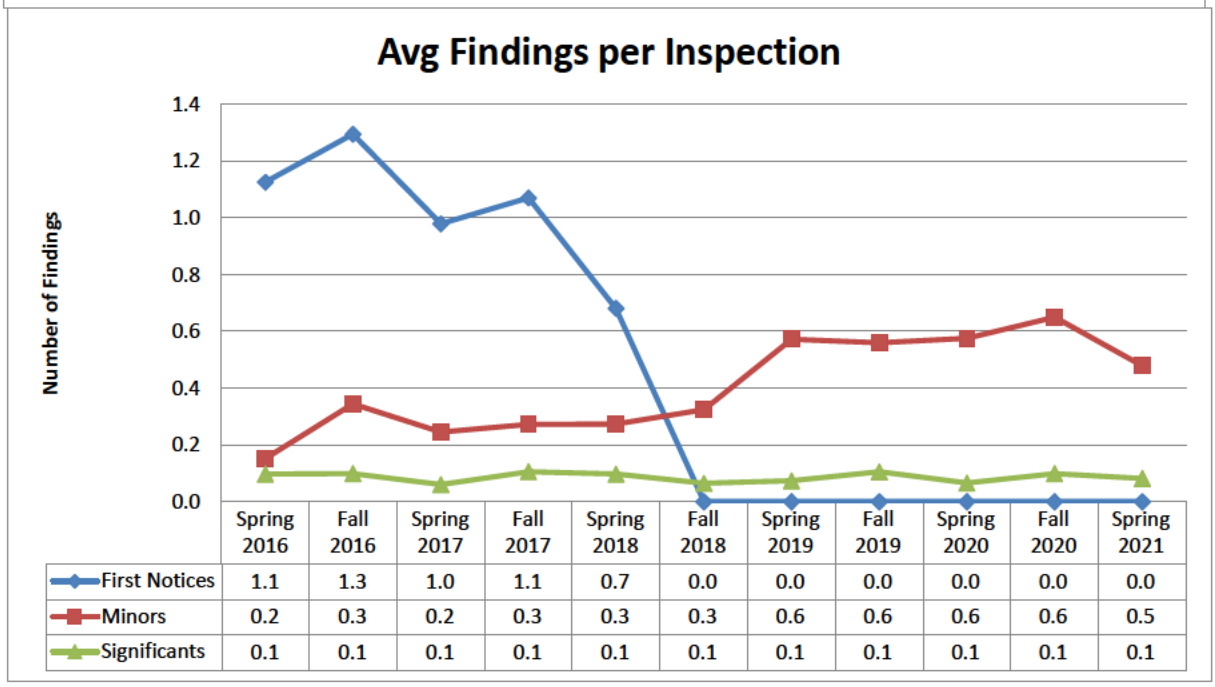


	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
Total Findings-Standard	454	474	341	387	292	114	184	201	167	158	164
Total Inspections	331	273	266	275	278	293	287	286	261	211	293
No Findings	171	100	119	121	143	213	190	192	164	120	195
At least one finding	160	173	147	154	135	80	97	94	97	91	98

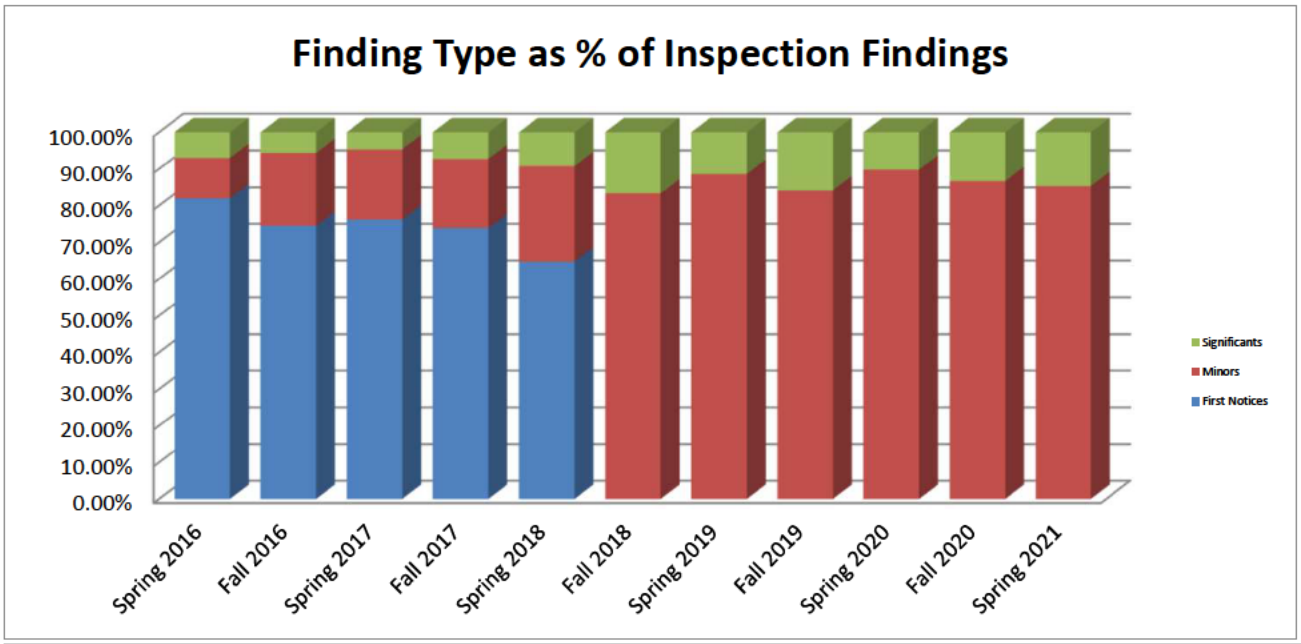
	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
Total Inspections	331	273	266	275	278	293	287	286	261	211	293
First Notices	372	353	260	294	189	0	0	0	0	0	0
Minors	50	94	65	75	76	95	164	160	150	137	140
Significants	32	27	16	29	27	19	21	30	17	21	24

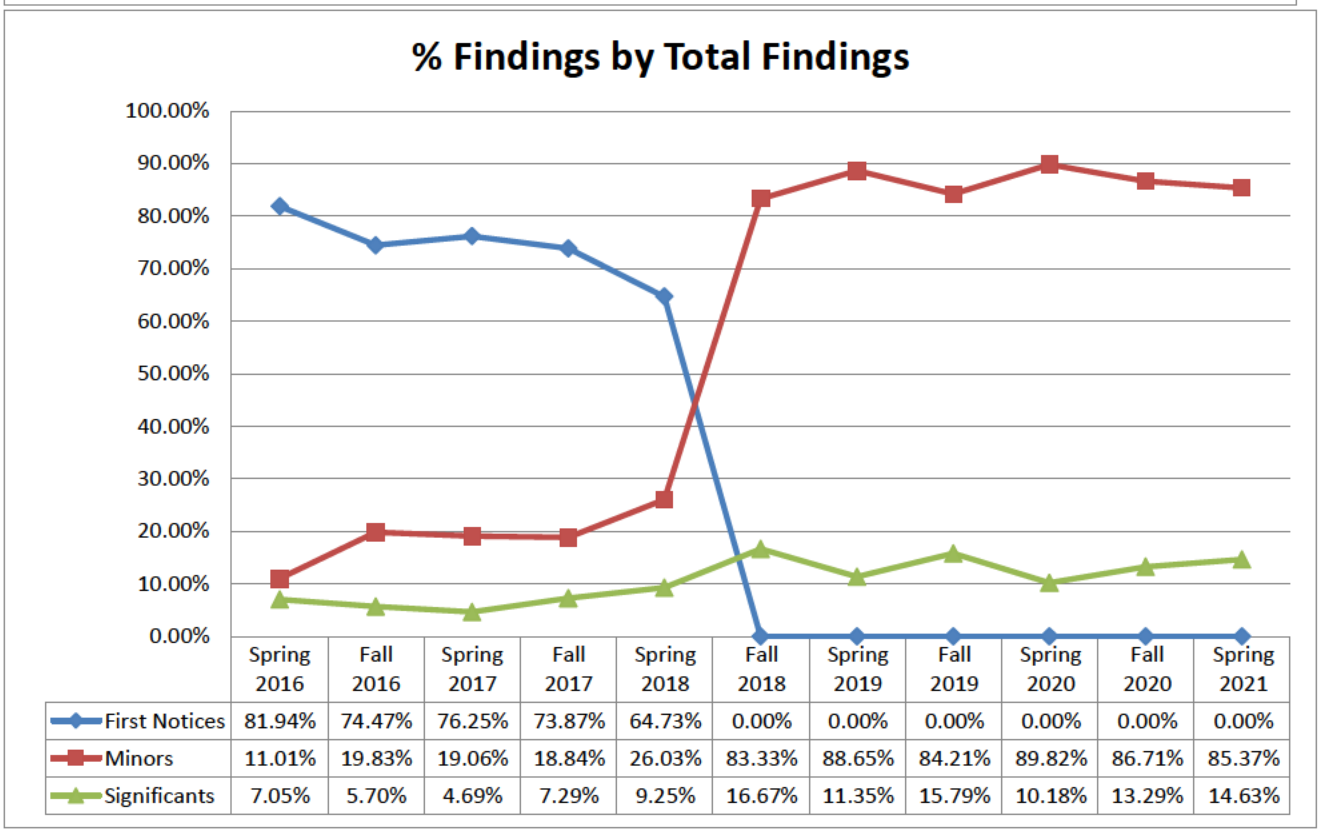
	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
First Notices	1.1	1.3	1.0	1.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Minors	0.2	0.3	0.2	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.5
Significants	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1





	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
First Notices	81.94%	74.47%	76.25%	73.87%	64.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Minors	11.01%	19.83%	19.06%	18.84%	26.03%	83.33%	88.65%	84.21%	89.82%	86.71%	85.37%
Significants	7.05%	5.70%	4.69%	7.29%	9.25%	16.67%	11.35%	15.79%	10.18%	13.29%	14.63%





	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
First Notices	81.94%	74.47%	76.25%	73.87%	64.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Minors	11.01%	19.83%	19.06%	18.84%	26.03%	83.33%	88.65%	84.21%	89.82%	86.71%	85.37%
Significants	7.05%	5.70%	4.69%	7.29%	9.25%	16.67%	11.35%	15.79%	10.18%	13.29%	14.63%

Spring 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
PAM	[redacted]			10/6/2020	IACUC	local anesthesia of tail by immersion in ice cold ethanol is not always performed for tail snips*	going forward, local anesthesia with ice cold ethanol will be used for all pup tail snips	10/7/2020	Ilana Cohen
Self Report				9/30/2020	IACUC	animals shipped without food and some deaths occurred upon arrival to facility*	all staff involved will be retrained	9/30/2020	Self Report
Semi-annual				10/13/2020	IACUC	no protocol in place for animal work	Will only maintain animals until protocol renewed	10/13/2020	Jennifer Borgert
Self Report				9/30/2020	IACUC	row of mice did not have water for four days and two mice died	to prevent this, we will always replace lixits whenever cages that were on water restriction are removed from the room	9/30/2020	Self Report
Outside Report of Non-compliance				10/19/2020	IACUC	conducting work on an expired protocol	proper transfers will happen for some of the mice and all other work under this study will cease until the renewal is approved	10/19/2020	Outside Report of Non-compliance
Self Report				10/19/2020	IACUC	six dogs not properly transferred to another study	dogs have now been transferred to correct study through RAR business office	10/19/2020	Self Report
Self Report				10/27/2020	IACUC	male mice from different cages combined in same cages and severe wounds resulted *	has read guideline for social housing and will not combine male mice going forward*	10/27/2020	Self Report

Spring 2021 Significant Findings Report									
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Self Report	[redacted]			10/27/2020	IACUC	one NHP on fluid restriction not weighed weekly as outlined in protocol due to request to house other animals in their room and scrambling to accommodate request	main concern was to remove other animals undergoing task training as quickly as possible to minimize any further stress on the animals. Thus the protocol deviation was an inadvertent mistake and is not likely to recur*	10/27/2020	Self Report
Self Report				10/28/2020	IACUC	anesthetized animals left unattended[redacted]	mice will recover on supplemental heat and alone e in a cage on paper towels in order to prevent complications with corn cob bedding; mice will be supervised until they are fully ambulatory; mice will be fully ambulatory before they are transferred back to their original cage	10/28/2020	Self Report
Self Report				10/29/2020	IACUC	SR buprenorphine not given prior to intra-spinal surgery as outlined in protocol; animal died during recovery	the surgical record form was modified to prevent initiation of surgery in the absence of SR Buprenorphine and lab staff was instructed that the surgeries cannot be initiated if SR buprenorphine was not administered in advance	10/29/2020	Self Report
PAM				11/5/2020	IACUC	tail snips taken after 21 days of age but no anesthetic used per policy*	local anesthetic will be used for tail snips taken after 21 days	11/11/2020	Paul Lindstrom
Self Report				11/11/2020	IACUC	improper euthanasia of mice*	staff will take refresher training through RAR on proper euthanasia using CO2 and will commit to reduce distractions during work	11/11/2020	Self Report
PAM				11/13/2020	IACUC	tail snips taken for genotyping but procedure not approved in protocol*	amendment submitted adding tail snipping	11/20/2020	Ilana Cohen

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Self Report	[redacted]			11/18/2020	IACUC	improper euthanasia of mice*	staff will take refresher training through RAR on proper euthanasia using CO2	11/19/2020	Self Report
Self Report				11/16/2020	IACUC	procedures performed on mice not listed on approved protocol	protocol will be amendment to include these procedures	11/16/2020	Self Report
Self Report				11/16/2020	IACUC	person performing procedures on protocol not listed as staff	protocol will be amendment to update staff	11/16/2020	Self Report
Self Report				11/23/2020	IACUC	one cage of mice that were on special diets found by RAR to not have food; one female mouse thin*	cages on special diets moved to central location so it is easier to identify what cages need to be checked and he has left the special diet in the RAR cooler so they have access to the food if they would need to add food to a cage	11/29/2020	Self Report
Outside Report of Non-compliance				11/13/2020	IACUC	mouse found very thin; weight records show loss of 50% BW; RAR asked PI to euthanize animal and self report incident	animal euthanized by RAR	11/13/2020	Outside Report of Non-compliance
Second Surgery/Semi-annual				11/30/2020	IACUC	neopredef not administered during closure*	Neopredef will be administered whenever it is available but will also consult their area veterinarian to determine if we should update the protocol to include the alternative drugs	12/1/2020	Kristin Pilon and Richard Bianco
Second Surgery/Semi-annual				11/30/2020	IACUC	non-invasive anesthetic procedure not outlined in protocol	amendment submitted for adding coil procedures (non-invasive) to protocol--just an anesthetic event	3/17/2021	Kristin Pilon and Richard Bianco
PAM				12/4/2020	IACUC	anesthetic expired but in use	in date anesthetic will be obtained before next procedure	12/4/2020	Paul Lindstrom
PAM				12/4/2020	IACUC	personnel working on protocol not listed as staff	personnel added to protocol	12/4/2020	Paul Lindstrom

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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
PAM	[redacted]			12/4/2020	IACUC	COVID research project done on tissue from rats that were perfused under a protocol that does not have this research in the protocol*	amendment added to protocol for this research on tissue	12/16/2020	Paul Lindstrom
PAM				12/10/2020	IACUC	anesthesia used for SC injections but procedure not approved as an anesthetic event*	amendment submitted to add anesthesia for SC injections	12/11/2020	Paul LIndstrom
Self Report				12/10/2020	IACUC	injured pups were weaned prematurely and marked for euthanasia	staff responsible for this incident will be retrained by RAR; weaning will be strictly done at 21 days and properly marked for euthanasia that are healthy, with access to food and water and no pups without the dam	12/10/2020	Self Report
PAM				12/14/2020	IACUC	anesthesia used for irradiation procedures but anesthetic not approved for the procedure	amendment submitted to add anesthesia for irradiation	12/15/2020	Megan McCoy
PAM				12/21/20; 12/23/20; 12/29/20	IACUC	leukemia cells are administered via retro-orbital IV route while under Isoflurane but protocol states that cells given tail vein	amendment for RO administration of cells under anesthesia submitted	1/4/2021	Jennifer Borgert
Self Report				12/28/20 and 12/29/20	IACUC	miscalculation in drug dosages resulted in death of 16 animals	staff member confirmed with PI to adjust calculations and dilutions to ensure right dosage of drug given; no further issue in the lab with mice injected after this time	12/30/2020	Self Report
PAM				1/12/2021	IACUC	personnel working with animals not listed as staff on protocol	is now listed as staff on protocol	1/19/2021	Paul Lindstrom
PAM				1/12/2021	IACUC	anesthetic procedure not listed in protocol (repeat finding)	amendment submitted to add anesthetic procedure	1/19/2021	Paul Lindstrom

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Self Report	[redacted]			1/4/2021	IACUC	mouse found in between a stack of stainless steel wire bar lids that had been run through washer	RAR is in the process to take steps to ensure that no animals remain within equipment sent to dirty cage wash. This includes training of all our LAA?LACTs and cage wash technicians	1/8/2021	Self Report
Self Report				1/19/2021	IACUC	euthanasia procedures of non weaning age mice done incorrectly*	will require staff member to take euthanasia training through RAR	1/19/2021	Self Report
PAM				1/21/2021	IACUC	personnel working with animals not listed as staff on protocol*	amendment submitted to add personnel to protocol	1/22/2021	Ilana Cohen
PAM				1/26/2021	IACUC	expired Isoflurane in use	expired isoflurane disposed, new will be procured	1/28/2021	Jennifer Borgert
Second Surgery Inspection				1/26/2021	IACUC	regular buprenorphine administered once daily in combination with Carprofen but not approved for regular buprenorphine and given at the wrong frequency	amendment submitted for regular buprenorphine and will give it at proper duration	1/27/2021	Paul Lindstrom
PAM/Semi-annual				1/27/2021	IACUC	noted that NHP had undergone a craniotomy for the grey matter implant surgery but Meloxicam given after surgery instead of pre-surgery as outlined in protocol	PI confirmed meloxicam will be given prior to surgery until such time the amendment is approved by the IACUC	2/2/2021	Kristin Pilon and Jen Hubbard
Self Report				1/22/2021	IACUC	RAR found two carcasses in cages from [redacted] after they were being dissembled after autoclaving*	staff will be re-trained on looking throughout bedding prior to bagging cages for autoclaved procedures	1/28/2021	Self Report
Second Surgery Inspection				1/29/2021	IACUC	heart was transplanted (vascularized heart transplant) into the abdominal cavity of a rat but this surgical procedure was not described in protocol*	vascularized heart transplant will not be conducted until an amendment has been submitted and approved for this surgical procedure	4/9/2021	Paul Lindstrom

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Second Surgery Inspection	[redacted]			1/29/2021	IACUC	personnel performing surgery not listed as staff on protocol*	personnel added as staff and surgeon	2/23/2021	Paul Lindstrom
Second Surgery Inspection				1/29/2021	IACUC	SR buprenorphine not two hours prior to surgery as outlined in protocol*	SR buprenorphine will be administered 2 hours pre-surgery	2/23/2021	Paul Lindstrom
Self Report				2/4/2021	IACUC	put fighting male mice of the same litter in a euthanasia cage/severe wounding	mice will either be separated or euthanized immediately	2/4/2021	Self Report
Second Surgery				2/26/2021	IACUC	paralytic used during procedure for sheep but paralytic not approved in protocol	amendment submitted for paralytic (will not be used until approved)	3/3/2021	Jennifer Borgert
Self Report				3/8/2021	IACUC	Housing of animals [redacted] without approval	Increase hours allowed for transfer to four days to allow for teaching needs and to reduce the stress that would be required to move them back each day after 12 hours	3/8/2021	Self Report
Self Report				3/5/2021	IACUC	animal care staff found some of the young chicks had fallen under the tender food deck into the partially water filled waste reservoir. 12 chicks were found dead and 8 were still alive, dried and recovered under a heat lamp	the covers around the pipe will be checked for integrity and proper placement by the RAR staff during the twice a day checks; weights on or by the covers will be used to decrease the chances of them getting dislodged; a sign will be posted on the room door stating to not move the bricks by the covers for the safety of the animals	3/5/2021	Self Report

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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]			3/5/2021	IACUC	on 2/26/21 an animal care staff member forgot to pull a cage divider after moving monkeys to new banks. Two animals were locked into one cage together overnight thus animals did not have the required amount of space*	the area supervisor will provide re-training to the individual employee about the importance of checking locks, latches and dividers at the end of the day. Additionally, the supervisor will double check that this task has been performed each day until the employee and supervisor are confident that the employee can perform this task on their own	3/5/2021	Self Report
PAM/Semi-annual				3/10/2021	IACUC	expired euthanasia solution used	expired solution disposed and new obtained. Personnel reminded to follow SOP	3/12/2021	Jennifer Borgert and Henry Wong
Self Report				3/11/2021	IACUC	animals weaned too early and were too small to take care of themselves; animals euthanized	will be providing more careful oversight in the future that animals are weaned at appropriate times	3/11/2021	Self Report
Second Surgery Inspection				3/15/2021	IACUC	expired analgesic in use	use of expired analgesic discontinued and discarded	3/22/2021	Kristin Pilon
Self Report				3/18/2021	IACUC	lixits fell off of the rack and into an animal cage leaving the animals without access to water for an unknown amount of time; animals suspected to have died from dehydration	lixits falling off of the rack and into an animal cage is a very rate occurrence. LAA team in [redacted] will be reminded on proper decontamination of the lixits during rack swaps and change out as loose lixits are most likely to be found during these processes	3/18/2021	Self Report
Self Report				3/18/2021	IACUC	Conducted surgeries on a protocol that does not have surgeries approved*	mice were transferred to another investigator who has the surgeries present on the protocol; no further treatments, surgeries will be conducted until the renewal is fully approved	3/23/2021	Self Report

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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]			3/18/2021	IACUC	person performing surgery was not listed as staff on protocol*	mice were transferred to another investigator who has the surgeries present on the protocol; no further treatments, surgeries will be conducted until the renewal is fully approved	3/23/2021	Self Report
Self Report				3/29/2021	IACUC	suspected burns from electro-cautery unit; minimal surface area and gel not used on metal paddle	gel will be used going forward and new paddle will be purchased for smaller animals	3/29/2021	Self Report
Self Report				3/31/2021	IACUC	Three cages were found in [redacted] without any food on the morning of 3/29/2021. One mouse was found dead and three others required medical attention for dehydration, weight loss, and lethargy. RAR is responsible for checking all 3 of these cages daily and providing additional food if none is present in the hopper. It is unknown how long these cages were without food. food and one died	The [redacted] care staff will be reminded of the following at their morning team meetings: •Feed levels must be checked on all cages, every day during daily health checks. •Verify all water sources are in working order when placing cages on the rack.	3/31/2021	Self Report

Spring 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
Ag	[redacted]			10/21/2020	Ag	several feed storage containers in the upper level of the barn that are not labeled with an expiration or mill date.	feed containers will be labeled with fill date and used within 6 months	10/29/2020	Jennifer Borger	Ag
Ag				12/17/2020	Ag	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	1/6/2021	Jennifer Borgert	Ag
Ag				3/17/2021	Ag	gooseneck trailer had two areas on the right side by the door when the wall mats need to be replaced to avoid possible injury to smaller animals	trailer will be sold or repaired prior to transporting animals	4/5/2021	Kristin Pilon	Ag
Ag				3/17/2021	Ag	in [redacted] the feed is stored against the wall and should be pulled back to allow air circulation	feed has been pulled back from the wall	4/5/2021	Kristin Pilon	Ag
Ag				3/17/2021	Ag	in [redacted] there was an open bag of mineral not in rodent proof container and stored near chemicals on a shelf. Additional there was a bag of feed stored on sweeping compound	mineral bag placed in rodent proof container, food has been segregated from chemicals and sweeping compound	3/25/2021	Kristin Pilon	Ag

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Semi-annual	[redacted]			2/11/2021	IACUC	fire extinguisher in [redacted] blocked by other equipment	path to fire extinguisher cleared	2/23/2021	Kristin Pilon	DEHS
PAM/Semi-annual				1/27/2021	DEHS-CS	has begun using controlled substances but did not inform DEHS	controlled substance protocol approved	2/9/2021	Kristin Pilon and Jen Hubbard	DEHS-CS
Second Surgery/Semi-annual				11/30/2020	DEHS-CS	needs to confirm that they will fill out proper CS disposal paperwork and have the multiple bottles of expired morphine picked up	CS paperwork has been filled out and submitted and the expired controlled substance were surrendered	12/1/2020	Kristin Pilon and Richard Bianco	DEHS-CS
PAM/Semi-annual				12/11/2020	IACUC	surgical room floors in [redacted] have cracks and gouges that need repair	repairs scheduled for 1/28-2/8/2021	1/27/2021	Kristin Pilon and Lynn Impelluso	Facility Issue
Semi-annual				12/8/2020	IACUC	chipping paint noted on ceiling in [redacted]	room no longer belongs to RAR, new PI will be responsible if animals are housed	3/2/2021	Megan McCoy	Facility Issue

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Semi-annual	[redacted]			3/26/2021	IACUC	large crack in surgical floor that needs to be repaired	will be repaired on 4/19/2021	3/31/2021	Kristin Pilon and Walt Tollison	Facility Issue
Semi-annual				3/26/2021	IACUC	chipping paint on electrical/duct toward back of surgical suite	paint repaired	3/31/2021	Kristin Pilon and Walt Tollison	Facility Issue
PAM				12/8/2020	IACUC	high fat diet stored in freezer is expired	expired HFD discarded, new product ordered	12/15/2020	Jennifer Borgert	Husbandry
Semi-annual				11/16/2020	IACUC	needs to add min/max readings for temperature and humidity to daily check lists when animals are housed in [redacted]	min/max temperature and humidity will be recorded daily	12/3/2020	Jennifer Borgert	Husbandry

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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/Semi-annual	[redacted]			3/24/2021	IACUC	needs to replace the anesthetic machine bag as there are a few holes in it	anesthetic bag replaced	4//7/2021	Kristin Pilon and Jessica Sieber	IPNF
Initial Surgery/Semi-annual				2/9/2021	IACUC	needs to touch up "Dot's NHP chair as there is chipping paint; chair located in [redacted]	chair switched out with one in good condition	2/23/2021	Kristin Pilon and Walt Tollison	IPNF
PAM				11/5/2020	IACUC	non-pharmaceutical grade glucose used for GTT but no justification in protocol	glucose tolerance testing will not be done until protocol is amended	1/6/2021	Paul Lindstrom	IPNF
PAM				12/8/2020	IACUC	log not currently kept for scissors used for decapitation	appropriate decapitation log will be kept	12/15/2020	Jennifer Borgert	IPNF
PAM				1/21/2021	IACUC	needs to have an SOP for the cleaning and disinfection of behavioral equipment	cleaning SOP created	1/29/2021	Jennifer Borgert	IPNF

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PAM	[redacted]			1/21/21 and 1/26/21	IACUC	vaporizer overdue for calibration	vaporizer scheduled for calibration	2/15/2021	Jenifer Borgert	IPNF
PAM				1/27/21 and 2/3/21	IACUC	anesthetic vaporizer overdue for inspection	vaporizer scheduled for calibration	2/18/2021	Ilana Cohen	IPNF
PAM				2/1/2021	IACUC	anesthetic vaporizer overdue for inspection	vaporizer scheduled for service	2/25/2021	Jennifer Borgert	IPNF
PAM				3/25/2021	IACUC	log not kept for decapitation of mice	decapitation log will be kept	3/29/2021	Megan McCoy	IPNF
PAM/Semi-annual				12/11/2020	IACUC	needs to remind staff that open dates required on bacteriostatic water and good for 30 days	staff reminded to date opened bacteriostatic water	12/18/2020	Kristin Pilon and Lynn Impelluso	IPNF
PAM/Semi-annual				1/27/2021	IACUC	in room [redacted] there are items that need to be resterilized mixed in with in date supplies; need to segregate	expired packs labeled and segregated	2/9/2021	Kristin Pilon and Jen Hubbard	IPNF

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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/Semi-annual	[redacted]	[redacted]	[redacted]	1/27/2021	IACUC	in room [redacted] there are two electric heating pads used on animals that work in the same manner as human heating pads; must discontinue use immediately	electric heating pads removed, approved heating pads ordered (will rent from RAR until new ones arrive)	2/9/2021	Kristin Pilon and Jen Hubbard	IPNF
PAM/Semi-annual				1/27/2021	IACUC	cloth chair present in [redacted]	cloth chair removed	2/9/2021	Kristin Pilon and Jen Hubbard	IPNF
PAM/Semi-annual				1/27/2021	IACUC	exposure kit in [redacted] was not easily accessible	exposure kit is now accessible	2/9/2021	Kristin Pilon and Jen Hubbard	IPNF
PAM/Semi-annual				1/27/2021	IACUC	open saline bottles used longer than 30 days	saline bottles will be disposed within 30 days of opening	2/9/2021	Kristin Pilon and Jen Hubbard	IPNF

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Second Surgery Inspection	[redacted]			3/15/2021	IACUC	animals recovered from surgery in cardboard box	plastic container will be used for recovery	3/22/2021	Kristin Pilon	IPNF
Second Surgery/Semi-annual				12/15/2020	IACUC	decapitation equipment has not been sharpened in the past year	guillotine will be sharpened prior to next decapitations	1/5/2021	Jennifer Borgert and Henry Wong	IPNF
Self Report				11/5/2020	IACUC	using inappropriate staples for skin closure; protocol is approved for suture	for all subsequent surgeries on this protocol, the only skin closure used will be suture as outlined and approved in protocol	11/5/2020	Self Report	IPNF
Self Report				12/10/2020	IACUC	mice on restricted diet without food and daily logs were not signed off and the labeling of cages indicating that these are food restricted mice were unclear	the lab will ensure that food will be weighed and provided daily including weekends based on the preceding day's consumption and food restricted cages will be clearly labeled	12/10/2020	Self Report	IPNF
Self Report				3/2/2021	IACUC	Wound clips not removed post operatively as required	formal training will be done at a lab meeting and this training documented in personnel training records on the importance of removing wound clips from animals	3/2/2021	Self Report	IPNF

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Self Report	[redacted]			3/2/2021	IACUC	RAR not informed of chemical hazard used in animals prior to use	going forward RAR will be informed of chemical hazards	3/2/2021	Self Report	IPNF
Self Report				3/5/2021	IACUC	RAR not informed of chemical hazard used in animals prior to use	during lab meeting will remind staff of chemical hazards present; will have more than one member check the cages for appropriate identification of hazards	3/5/2021	Self Report	IPNF
Self Report				3/11/2021	IACUC	five mice left in [redacted] hood without water overnight	Cages were returned to the racks with a water bottle by RAR personnel; to prevent situation again, laboratory has put together a checklist of things to do for all individuals to bring them to the mouse	3/11/2021	Self Report	IPNF
Semi-annual				11/5/2020	IACUC	cart with six cages marked for euthanasia week of November 1 but animals not yet euthanized and cages overly soiled	animals were euthanized the next day	11/6/2020	Kristin Pilon	IPNF
Semi-annual				11/5/2020	IACUC	two cages of mice that have newly born pups with adult animals used for harem breeding. Needs to separate animals as there are too many per cage dimension guidelines	animals separated into new cages	11/6/2020	Kristin Pilon	IPNF

Spring 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
Semi-annual	[redacted]			11/12/2020	IACUC	cage wash area signage outlining cage wash methods of egress and machine de-energizing was not visible	signage has ben reposted	11/16/2020	Megan McCoy and [redacted]	IPNF
Semi-annual				11/16/2020	IACUC	emergency/disaster plan not available for review	disaster plan updated	12/3/2020	Jennifer Borgert	IPNF
Semi-annual				12/15/2020	IACUC	some of the information required to be posted in the IMHA was not posted (disaster plan, contact information, protocol number	updated information has been posted	1/4/2021	Paul Lindstrom	IPNF
Semi-annual				2/11/2021	IACUC	staff housing animals in space not trained on the emergency plan	staff trained on emergency plan	2/23/2021	Kristin Pilon	IPNF
Semi-annual				2/17/2021	IACUC	two small plastic bags of rodent diet in refrigerator in the hallway of the core doe not have fill or expiration dates on them	items disposed	2/19/2021	Jennifer Borgert	IPNF

Spring 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
Semi-annual	[redacted]			3/23/2021	IACUC	emergency plan overdue for inspection	disaster plan updated	3/30/2021	Jennifer Borgert	IPNF
PAM				10/27/2020	IACUC	acclimation procedures not documented	acclimation procedures will be documented	11/4/2020	Kristin Pilon	IPNF
PAM				11/2/2020	IACUC	anesthetic record not kept for retro-orbital eye injections	records will be kept for all anesthetic procedures	11/10/2020	Ilana Cohen	IPNF-Anesthetic Records
PAM				1/21/2021	IACUC	anesthetic record not kept for intra-tibial injections	anesthetic records will be kept	1/29/2021	Ilana Cohen	IPNF-Anesthetic Records
PAM				3/17/2021	IACUC	anesthetic records were not available for tail vein injection and optical imaging procedures	anesthetic records will be kept	3/23/2021	Megan McCoy	IPNF-Anesthetic Records

Spring 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 Inspection	[redacted]			12/17/2020	IACUC	expired glutaraldehyde for cold sterilization in use	new glutaraldehyde and betadine obtained	1/6/2021	Megan McCoy	IPNF-Aseptic Technique
Second Surgery Inspection				12/17/2020	IACUC	expired surgical drapes in use	expired drapes replaced	1/7/2021	Kristin Pilon	IPNF-Aseptic Technique
Second Surgery Inspection				1/20/2021	IACUC	hair covering not worn during surgical procedures	hair covering will be worn for survival surgery	1/21/2021	Paul Lindstrom	IPNF-Aseptic Technique
Second Surgery/Semi-annual				12/15/2020	IACUC	hair covering not worn during surgical procedures	hair covering will be worn for surgical procedures	1/5/2021	Jennifer Borgert and Henry Wong	IPNF-Aseptic Technique

Spring 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]			10/12/2020	IACUC	aseptic technique not practiced	going forward, they will follow the protocol and IACUC policy on aseptic technique	10/12/2020	Self Report	IPNF-Aseptic Technique
Self Report				11/3/2020	IACUC	animals not shaved prior to surgery	surgeon involved made aware that shaving is required prior to surgery; surgeon will have retraining with RAR by taking Aseptic technique course	11/3/2020	Self Report	IPNF-Aseptic Technique
Semi-annual				3/29/2021	IACUC	IV stand base rusted and should be repaired	will be repaired by 4/9/2021	4/1/2021	Kristin Pilon and Walt Tollison	IPNF-Aseptic Technique
Semi-annual				3/29/2021	IACUC	mayo stand base needs repair as paint is chipping	will be repaired by 4/9/2021	4/1/2021	Kristin Pilon and Walt Tollison	IPNF-Aseptic Technique
PAM/Semi-annual				3/24/2021	IACUC	[redacted] has expired DMQ in use	expired DMQ disposed, new obtained	3/29/2021	Kristin Pilon and Jessica Sieber	IPNF-Expired Items

Spring 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/Semi-annual	[redacted]			3/24/2021	IACUC	[redacted] had two bags of expired rodent food	expired food disposed	4//7/2021	Kristin Pilon and Jessica Sieber	IPNF-Expired Items
Initial Surgery/Semi-annual				2/9/2021	IACUC	in [redacted] is expired that is used in all rooms for cleaning/disinfection	new DMQ obtained	12/14/2021	Kristin Pilon and Walt Tollison	IPNF-Expired Items
PAM				12/8/2020	IACUC	expiration date not listed on aliquot of insulin	expired insulin discarded, new product ordered	12/15/2020	Jennifer Borgert	IPNF-Expired Items
PAM				1/21/2021	IACUC	expired surgical gloves in use	in date gloves will be obtained	1/25/2021	Kristin Pilon	IPNF-Expired Items
PAM/Semi-annual				1/22/2021	IACUC	expired betadine scrub in NHP exposure kit [redacted]	expired scrubs replaced	2/16/2021	Paul Lindstrom and Whitey McGee	IPNF-Expired Items

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Second Surgery/Semi-annual	[redacted]			1/13/2021	IACUC	expired surgical gloves in use	gloves marked as expired and will only be used for non-animal use. A new box will be ordered	1/13/2021	Kristin Pilon	IPNF-Expired Items
Second Surgery/Semi-annual				1/27/2021	IACUC	betadine scrub in NHP exposure kit in room [redacted] was expired	betadine scrubs replaced	2/2/2021	Paul Lindstrom and Nathan Koewler	IPNF-Expired Items
Semi-annual				1/14/2021	IACUC	multiple expired items in crash box	expired items removed from space and will be disposed or re-sterilized	1/14/2021	Kristin Pilon and Walt Tollison	IPNF-Expired Items
Semi-annual				1/14/2021	IACUC	expired surgeon's gloves, transducer covers	expired items removed from space and will be disposed	1/14/2021	Kristin Pilon and Walt Tollison	IPNF-Expired Items
Semi-annual				1/20/2021	IACUC	scrubs in NHP exposure kit expired	betadine scrubs ordered	2/1/2021	Jennifer Borgert and Keith Barker	IPNF-Expired Items

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Semi-annual	[redacted]			2/11/2021	IACUC	expired surgical supplies	removed during inspection	2/11/2021	Kristin Pilon	IPNF-Expired Items
Semi-annual				1/28/2021	IACUC	paint on the inside of the entry door [redacted] was scraped and the exposed metal appeared to be rusty	door will be repaired prior to housing animals	2/1/2021	Paul Lindstrom and Sally Noll	Facility Issue
Initial Surgery Inspection				2/25/2021	IACUC	training records not present for newest staff member	training records updated	3/9/2021	Megan McCoy	IPNF-Personnel Training Records
PAM				11/5/2020	IACUC	no personnel training records present	training record updated	11/11/2020	Paul Lindstrom	IPNF-Personnel Training Records
PAM				11/4/2020	IACUC	personnel training records do not document animal procedures in one staff member's documents	training record updated	11/10/2020	Kristin Pilon	IPNF-Personnel Training Records

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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]			11/24/2020	IACUC	personnel training records not present in the laboratory	training record updated	12/4/2020	Paul Lindstrom	IPNF-Personnel Training Records
PAM				1/21/2021	IACUC	no personnel training records available for one staff member	training record completed	2/9/2021	Megan McCoy	IPNF-Personnel Training Records
PAM				3/15/2021	IACUC	no personnel training records in lab	training records filled out and placed in the lab	3/31/2021	Kristin Pilon	IPNF-Personnel Training Records
PAM				3/25/2021	IACUC	no training records for PI	training records completed	3/31/2021	Megan McCoy	IPNF-Personnel Training Records
Second Surgery Inspection				12/16/2020	IACUC	training records not present for one staff member performing work with animals	training record updated	12/17/2020	Ilana Cohen	IPNF-Personnel Training Records

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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
Initial Surgery/Semi-annual	[redacted]			2/9/2021	IACUC	analgesic administration (cetacaine, EMLA cream in ear bars, local blocks of bupivacaine/lidocaine) not documented in surgical records	all analgesic administrations will be documented	2/23/2021	Kristin Pilon and Walt Tollison	IPNF-Surgical Records
PAM				11/24/2020	IACUC	no post operative records for ligation surgery conducted on 11/18/20	post operative records will be kept	12/4/2020	Paul Lindstrom	IPNF-Surgical Records
PAM/Semi-annual				3/26/2021	IACUC	items missing in surgical and post operative records	training will be done to ensure records are complete	3/28/2021	Kristin Pilon and Walt Tollison	IPNF-Surgical Records
Second Surgery Inspection				1/29/2021	IACUC	needs to add some items to surgical records	items added to surgical records	2/23/2021	Paul Lindstrom	IPNF-Surgical Records
Initial Surgery Inspection				11/23/2020	IACUC	person conducting surgeries listed as staff but not listed as a surgeon on the protocol	amendment to add surgeon submitted	12/10/2020	Jennifer Borgert	PNF

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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]			10/21/2020	IACUC	surgeon listed on perfusion procedure not staff any longer; needs to update section during renewal	procedure and personnel removed from protocol administratively	11/4/2020	Kristin Pilon	PNF
PAM				10/27/2020	IACUC	sling used as restraint but protocol indicates that animals will be lightly cross tied in their pen or confined to a smaller area in the pen	amendment submitted	11/4/2020	Kristin Pilon	PNF
PAM				10/27/2020	IACUC	ethanol used to disinfect entrance to the urethra prior to catheter placement but protocol indicates that betadine will be used or equivalent	chlorhexidine or betadine will be used	11/4/2020	Kristin Pilon	PNF
PAM				10/27/2020	IACUC	anesthetic procedure could be done at termination of study but protocol does not have procedure for this anesthetic event	amendment submitted to remove procedure	11/4/2020	Kristin Pilon	PNF
PAM				10/27/2020	IACUC	animals not monitored 5-7 days for cystitis	post procedure monitoring records for cystitis will be kept	11/4/2020	Kristin Pilon	PNF

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PAM	[redacted]			10/26/2020	IACUC	dosage of propofol for induction is greater than approved	protocol amendment submitted	11/12/2020	Kristin Pilon	PNF
PAM				10/23/2020	IACUC	BLI anesthetic procedure not described in protocol	amendment submitted	11/16/2020	Jennifer Borger	PNF
PAM				10/28/2020	IACUC	anesthetic used not approved in protocol	amendment submitted	12/21/2020	Jennifer Borger	PNF
PAM				11/4/2020	IACUC	endpoints of study not followed	amendment submitted	11/12/2020	Paul Lindstrom	PNF
PAM				1/11/2021	IACUC	animals receive two injections of calcein four days apart but only approved for one injection and then an injection of tetracycline five days apart	amendment submitted for 2 injections of calcein	1/28/2021	Kristin Pilon	PNF

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PAM	[redacted]			1/12/2021	IACUC	needs to add dilute clove oil anesthesia as an alternative anesthetic for carp	amendment submitted to add clove oil anesthesia	1/19/2021	Paul Lindstrom	PNF
PAM				1/21/2021	IACUC	person performing surgery not listed as a surgeon on protocols	amendment submitted to add surgeons to protocol	1/22/2021	Ilana Cohen	PNF
PAM				2/1/2021	IACUC	fructose/sucrose added to drinking water when animals are on diets; not currently approved in protocol	changes added to protocol renewal	3/25/2021	Kristin Pilon	PNF
PAM				2/1/2021	IACUC	animals can be on diets for up to 25 weeks but approved for up to 20 weeks	changes added to protocol renewal	3/25/2021	Kristin Pilon	PNF
PAM				2/1/2021	IACUC	staff administers 1.5g/kg of glucose to animals but approved for 1g/kg	changes added to protocol renewal	3/25/2021	Kristin Pilon	PNF

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PAM	[redacted]			2/1/2021	IACUC	anti-CD 20 is given IP every two weeks (up to three injections) but protocol states weekly IV injections	changes added to protocol renewal	3/25/2021	Kristin Pilon	PNF
PAM				2/1/2021	IACUC	person doing surgeries not listed as surgeon on protocol	amendment submitted to add surgeon	2/25/2021	Jennifer Borgert	PNF
PAM				2/25/2021	IACUC	Endpoints of study not followed	endpoints are followed per protocol	3/4/2021	Megan McCoy	PNF
PAM				3/15/2021	IACUC	person listed as staff on protocol but conducting surgeries--not listed as a surgeon	surgeon added to protocol	3/31/2021	Ilana Cohen	PNF
PAM/Semi-annual				12/4/2020	IACUC	staff performing surgery on mice but not listed as surgeons on protocol (listed only as staff)	amendment to add surgeons submitted	12/7/2020	Kristin Pilon and Craig Flory	PNF

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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/Semi-annual	[redacted]			12/11/2020	IACUC	blood collection more than approved during bypass	amendment submitted to change frequency of blood collection	12/18/2020	Kristin Pilon and Lynn Impelluso	PNF
Second Surgery Inspection				10/23/2020	IACUC	noted that gloves are not worn by lab staff during tagging surgery in the field	amendment submitted, gloves worn for handling but not for surgery	11/2/2020	Megan McCoy	PNF
Second Surgery Inspection				12/16/2020	IACUC	person performing surgeries not listed as a surgeon on protocol	amendment submitted to add surgeon	12/17/2020	Ilana Cohen	PNF
Second Surgery Inspection				12/16/2020	IACUC	protocol needs to be adjusted to increase occlusion time from 60 minutes to up to 120 minutes	amendment submitted to increase occlusion time to 120 minutes	12/17/2020	Paul Lindstrom	PNF
Second Surgery Inspection				2/25/2021	IACUC	SpO2 not currently monitored during the intravital imaging as outlined in protocol	SpO2 will be monitored or amendment submitted to omit this monitoring parameter	3/3/2021	Jennifer Borgert	PNF

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Second Surgery Inspection	[redacted]			3/3/2021	IACUC	person performing surgeries not approved as a surgeon on the protocol	protocol renewal with changes submitted administratively (due to glitch in eProtocol)	3/29/2021	Ilana Cohen	PNF
Second Surgery/Semi-annual				11/30/2020	IACUC	training of staff on experimental procedures conducted at beginning of November but amendment not yet approved until 11/30/20	amendment was submitted as soon as the other one was approved but did not receive any comments from IACUC in over a month. Amendment has now been approved	12/1/2020	Kristin Pilon and Richard Bianco	PNF
Second Surgery/Semi-annual				12/15/2020	IACUC	hamsters sedated with Isoflurane prior to decapitation but protocol is approved for no anesthesia	an amendment will be submitted to add the option of isoflurane sedation prior to decapitation if sedation is warranted	1/5/2021	Jennifer Borgert and Henry Wong	PNF
Second Surgery/Semi-annual				12/15/2020	IACUC	person performing surgery not listed as a surgeon on the protocol	surgeon and qualifications will be added to protocol prior to conducting next surgeries	1/5/2021	Jennifer Borgert and Henry Wong	PNF
Self Report				12/4/2020	IACUC	during animal health exams, cat given wrong dose (increased) of anesthetic	veterinary technician has met with both the area veterinarian and their direct supervisor to undergo retraining and to discuss proactive ways to prevent recurrence	12/4/2020	Self Report	PNF

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Self Report	[redacted]			2/9/2021	IACUC	mice fasted and without water for experiment but these items were not approved in protocol	A reminder that only procedures that are approved in our protocols can be performed with our research animals will be addressed at lab meeting and in our upcoming annual lab h. h	2/9/2021	Self Report	PNF
Self Report				3/1/2021	IACUC	fasting of animals sometimes longer than 24 hours	staff have been reminded that animals involved with behavioral training/food restriction must be fed no later than 24 hours	3/1/2021	Self Report	PNF
Self Report				3/8/2021	IACUC	only 1-2 horses are listed in the protocol for movement between [redacted]	increase number of horses moving to four in next submission cycle and the PI will remind all investigators to review the IACUC to become more familiar with the details	3/8/2021	Self Report	PNF
PAM				1/19/2021	OHS	ROHP requirements not met by all staff listed on protocol			Jennifer Borgert	ROHP
PAM				1/27/21 and 2/3/21	OHS	ROHP requirements not met by all staff listed on protocol			Ilana Cohen	ROHP

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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
Semi-annual	[redacted]			3/29/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	4/6/2021	Kristin Pilon and Walt Tollison	ROHP
Initial Surgery Inspection				2/25/2021	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	3/22/2021	Megan McCoy	ROHP
Initial Surgery/Semi-annual				2/9/2021	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	2/23/2021	Kristin Pilon and Walt Tollison	ROHP
PAM				10/21/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	10/23/2020	Kristin Pilon	ROHP
PAM				10/28/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	11/10/2020	Ilana Cohen	ROHP

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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]			10/26/2020	OHS	ROHP requirements not met by all staff listed on protocol	staff member removed from protocol	11/12/2020	Kristin Pilon	ROHP
PAM				10/29/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	11/3/2020	Jennifer Borger	ROHP
PAM				11/5/2020	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	11/17/2020	Paul Lindstrom	ROHP

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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]			11/20/2020	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	12/22/2020	Paul Lindstrom	ROHP
PAM				11/30/2020	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirement completed	12/10/2020	Ilana Cohen	ROHP
PAM				12/7/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/2/2021	Jennifer Borgert	ROHP

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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]			12/30/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	1/10/2021	Kristin Pilon	ROHP
PAM				12/21/20; 12/23/20; 12/29/20	OHS	ROHP requirements not met by all staff listed on protocol	staff member removed from protocol	1/5/2021	Jennifer Borgert	ROHP
PAM				1/21/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	1/28/2021	Ilana Cohen	ROHP
PAM				1/18/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/1/2021	Ilana Cohen	ROHP
PAM				1/21/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	1/25/2021	Kristin Pilon	ROHP

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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]			1/25/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/12/2021	Jenifer Borgert	ROHP
PAM				1/22/21 and 2/3/21	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/8/2021	Jennifer Borgert	ROHP
PAM				2/24/2021	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	3/3/2021	Paul Lindstrom	ROHP
PAM				3/5/2021	OHS	ROHP requirements not met by all staff listed on protocol	staff member removed from protocol	3/8/2021	Paul Lindstrom	ROHP
PAM				3/25/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	3/29/2021	Megan McCoy	ROHP

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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/Semi-annual	[redacted]			12/11/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/1/2021	Kristin Pilon and Lynn Impelluso	ROHP
PAM/Semi-annual				12/22/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	1/11/2021	Kristin Pilon	ROHP
PAM/Semi-annual				1/22/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/3/2021	Paul Lindstrom and Whitey McGee	ROHP
PAM/Semi-annual				1/27/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/9/2021	Kristin Pilon and Jen Hubbard	ROHP
PAM/Semi-annual				3/24/2022	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	4/1/2021	Kristin Pilon	ROHP

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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/Semi-annual	[redacted]			3/26/2021	OHS	ROHP requirements not met by all staff listed on protocol	protocol treated as a clinical protocol; new staff will be changed out depending on availability	3/28/2021	Kristin Pilon and Walt Tollison	ROHP
Second Surgery Inspection				12/10/2020	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	12/18/2020	Ilana Cohen	ROHP
Second Surgery Inspection				1/20/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/26/2021	Paul Lindstrom	ROHP
Second Surgery Inspection				1/29/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	2/4/2021	Paul Lindstrom	ROHP
Second Surgery Inspection				2/25/2021	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	3/8/2021	Jennifer Borgert	ROHP

Spring 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]			11/30/2020	OHS	ROHP requirements not met for all staff listed on protocol	ROHP requirements met	12/29/2020	Kristin Pilon and Richard Bianco	ROHP
Semi-annual				3/24/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	4/1/2021	Kristin Pilon	ROHP
Semi-annual				3/24/2021	OHS	ROHP requirements not met by all staff listed on protocol	ROHP requirements met	4/6/2021	Kristin Pilon	ROHP

Spring 2021 No Findings Report					
Type of Inspection	**Building**	**Room #**	**Responsible Party**	**Date of Inspection**	**Inspectors**
Semi-annual	[redacted]		Karry Bazille	10/8/2020	Paul Lindstrom
PAM/Semi-annual			Philip Portoghese	10/13/2020	Jennifer Borgert
PAM			Karam Aboudehen	10/21/2020	Kristin Pilon
PAM			Tim Johnson	10/22/2020	Ilana Cohen
PAM/Semi-annual			Heather Waye	10/21/2020	Paul Lindstrom
PAM/Semi-annual			Heather Waye	10/21/2020	Paul Lindstrom
PAM/Semi-annual			Heather Waye	10/21/2020	Paul Lindstrom
PAM/Semi-annual			Rob Denton	10/21/2020	Paul Lindstrom
Semi-annual			Terresa Xiong	10/21/2020	Ilana Cohen and [redacted]
Semi-annual			Jeramy Kulesa	10/21/2020	Ilana Cohen and [redacted]
Semi-annual			Terresa Xiong	10/21/2020	Ilana Cohen and [redacted]
Semi-annual			Terresa Xiong	10/21/2020	Ilana Cohen and [redacted]
PAM			Fekadu Kassie	10/23/2020	Paul Lindstrom
Second Surgery Inspection			A. David Redish	10/21/2020	Megan McCoy
PAM			Daniel Salzman	10/19/2020	Ilana Cohen
PAM			Craig Bierle	10/20/2020	Jennifer Borgert
PAM			Rocio Gomez-Pastor	10/26/2020	Paul Lindstrom
PAM			Jen Hubbard	10/26/2020	Paul Lindstrom

Second Surgery Inspection	[redacted]	Markus Meyer	10/26/2020	Kristin Pilon
PAM		Robert Wilson	10/26/2020	Kristin Pilon
PAM/Semi-annual		Samuel Dudley	10/26/2020	Kristin Pilon and Beverly Norris
Ag		Bradley Heins	10/21/2020	Jennifer Borgert
Ag		Lee Johnston	10/21/2020	Jennifer Borgert
Semi-annual		Karry Bazille	10/29/2020	Megan McCoy
Semi-annual		Patrice Banks	10/29/2020	Megan McCoy
PAM		Mark Herzberg	10/28/2020	Megan McCoy
PAM		Jessica Felgenhauer	10/26/2020	Jennifer Borgert
PAM		Samuel Cramer	11/2/2020	Kristin Pilon
PAM/Semi-annual		Kimberly Klukas	11/5/2020	Kristin Pilon
PAM		Sergio Gradilone	11/5/2020	Kristin Pilon
Second Surgery/Semi-		Gordon Smith	11/9/2020	Kristin Pilon and Craig Flory
PAM		Marco Pravetoni	11/6/2020	Ilana Cohen
PAM		William Elmquist	11/3/2020	Jennifer Borgert
Semi-annual		Maxim Cheeran	11/9/2020	Paul Lindstrom
PAM		Emily Barrell	11/10/2020	Kristin Pilon
PAM		Shujun Liu	11/11/2020	Ilana Cohen
PAM		Geoffrey Hart	11/10/2020	Paul Lindstrom
PAM		Li-Na Wei	11/10/2020	Paul Lindstrom

Semi-annual	[redacted]	Sivaraj Sivaramakrishnan	11/10/2020	Jennifer Borgert
Semi-annual		Ned Patterson	11/12/2020	Megan McCoy and [redacted]
Semi-annual		Brooke Hart	11/13/2020	Megan McCoy and Ferenc Toth
Semi-annual		Dallas Domink	11/13/2020	Megan McCoy and Ferenc Toth
Semi-annual		Brooke Hart	11/12/2020	Megan McCoy and [redacted]
PAM		Eric Jensen	11/16/2020	Ilana Cohen
PAM		Montserrat Torremorell	11/11/2020	Jennifer Borgert
Ag		Alfredo DiCostanzo	11/16/2020	Paul Lindstrom
PAM		Ningling Kang	11/16/2020	Megan McCoy
PAM/Semi-annual		Carrie Haskell-Luevano	11/17/2020	Paul Lindstrom
PAM		Tianshun Zhang	11/18/2020	Paul Lindstrom
Semi-annual		Mark Sanders	11/16/2020	Jennifer Borgert
PAM		David Zarkower	11/19/2020	Ilana Cohen
PAM		Vivian Bardwell	11/19/2020	Ilana Cohen
Initial Surgery Inspection		Dawn Lowe	11/19/2020	Megan McCoy
PAM		Samuel Dudley	11/18/2020	Megan McCoy
PAM		Mary Garry	11/24/2020	Paul Lindstrom
PAM		Jonathan Gewirtz	11/18/2020	Jennifer Borgert
Semi-annual		Danielle Hyde	11/20/2020	Jennifer Borgert
PAM		James Ervasti	11/20/2020	Megan McCoy

PAM	[redacted]	Brian Fife	11/23/2020	Megan McCoy
PAM		Douglas Mashek	11/24/2020	Jennifer Borgert
PAM		Kurt Prins	11/30/2020	Ilana Cohen
PAM		Luke Hoeppner	11/24/2020	Jennifer Borgert
PAM		Maxim Cheeran	11/25/2020	Jennifer Borgert
PAM		James Robinson	12/1/2020	Ilana Cohen
Ag		Dan Braaten	12/2/2020	Kristin Pilon
PAM		Martin Wessendorf	12/4/2020	Paul Lindstrom
PAM		Megan Paulsen	12/3/2020	Paul Lindstrom
Semi-annual		Brooke Hart	12/7/2020	Paul Lindstrom
PAM		Yasuhiko Kawakami	12/4/2020	Megan McCoy
PAM		Yasuhiko Kawakami	12/4/2020	Megan McCoy
PAM		Lorene Lanier	12/10/2020	Megan McCoy
PAM/Semi-annual		Jennifer Menken	12/10/2020	Megan McCoy
PAM		Sarah Greising	12/14/2020	Kristin Pilon
PAM		Ryan Hunter	12/14/2020	Megan McCoy
PAM		Stephen Huddleston	12/11/2020	Kristin Pilon
Second Surgery Inspection		Rosemary Kelly	12/11/2020	Kristin Pilon
PAM		Julia Lemos	12/10/2020	Jennifer Borgert
PAM		Thomas Griffith	12/11/2020	Jennifer Borgert

Second Surgery Inspection	[redacted]	James Lokensgard	12/15/2020	Ilana Cohen
Semi-annual		John Bischof	12/15/2020	Paul Lindstrom
PAM		Peggy Norris	12/11/2020	Kristin Pilon
Second Surgery Inspection		Sayeed Ikramuddin	12/11/2020	Kristin Pilon
Ag		Sally Noll	12/14/2020	Jennifer Borgert
Second Surgery Inspection		Steven Graves	12/16/2020	Ilana Cohen
PAM		Eric Wise	12/11/2020	Kristin Pilon
PAM		Jakub Tolar	12/16/2020	Jennifer Borgert
Second Surgery Inspection		Cyrus Jahansouz	12/11/2020	Kristin Pilon
PAM		Andrew Grande	12/16/2020	Paul Lindstrom
PAM		Andrew Grande	12/16/2020	Paul Lindstrom
PAM		Ling Li	12/17/2020	Jennifer Borgert
PAM		Ling Li	12/17/2020	Jennifer Borgert
Semi-annual		Scott Madill	12/17/2020	Ben Clark and [redacted]
Semi-annual		Scott Madill	12/17/2020	Ben Clark and [redacted]
Semi-annual		Max Meyers and Danielle Hyde	12/14/2020	Ben Clark
Second Surgery Inspection		Sergey Khasabov	12/17/2020	Megan McCoy
Second Surgery/Semi-		Brendan Dougherty	12/17/2020	Kristin Pilon
PAM/Semi-annual		Michael Lee	12/22/2020	Kristin Pilon
Ag		Kyle Rozeboom	12/18/2020	Jennifer Borgert

Second Surgery Inspection	[redacted]	Ann Parr	12/22/2020	Jennifer Borgert
PAM		Timothy O'Connell	12/22/2020	Jennifer Borgert
PAM		Xiaoli Chen	12/22/2020	Paul Lindstrom
Second Surgery/Semi-		Melanie Graham	12/22/2020	Paul Lindstrom and Jan Zimmerman
Second Surgery/Semi-		Melanie Graham	12/22/2020	Paul Lindstrom and Jan Zimmerman
PAM		Michael Koob	1/6/2021	Megan McCoy
Semi-annual		Richard Bianco	1/7/2021	Kristin Pilon and Nathan Koewler
PAM		Davis Seeling	1/8/2021	Ilana Cohen
PAM		David Potter	1/11/2021	Ilana Cohen
Semi-annual		Nicholas Phelps	1/12/2021	Paul Lindstrom
Semi-annual		Eric Schoen	1/13/2021	Ilana Cohen
Semi-annual		Eric Schoen	1/13/2021	Ilana Cohen
Ag		Samuel Baidoo/Hayford Manu	1/13/2021	Paul Lindstrom
Ag		David Ziegler	1/13/2021	Paul Lindstrom
PAM		Scott Dehm	1/15/2021	Ilana Cohen
Semi-annual		Scott Madill	1/14/2021	Kristin Pilon and Walt Tollison
Semi-annual		Brenda Mielke	1/14/2021	Kristin Pilon and Walt Tollison
Semi-annual		Karry Bazille	1/15/2021	Ben Clark and [redacted]
Semi-annual		Karry Bazille	1/15/2021	Ben Clark and [redacted]
PAM		Julia Davydova	1/11/2021	Paul Lindstrom

PAM	[redacted]	Julia Davydova	1/15/2021	Paul Lindstrom
PAM		Masato Yamamoto	1/15/2021	Paul Lindstrom
Initial Surgery/Semi-		Paul Iaizzo	1/21/2021	Paul Lindstrom and Carolyn Fairbanks
PAM		Erin Dickerson	1/21/2021	Ilana Cohen
Semi-annual		Scott Madill	1/25/2021	Kristin Pilon and Walt Tollison
Semi-annual		Dan Busian	1/20/2021	Ben Clark and Beverly Norris
Semi-annual		Christina Clarkson	1/25/2021	Kristin Pilon and Walt Tollison
PAM		Nicolas Ernst Castro	1/14/21 and 1/21/21	Jennifer Borgert
Semi-annual		Karry Bazille	1/25/2021	Megan McCoy and Craig Flory
Semi-annual		Karry Bazille	1/25/2021	Megan McCoy and Craig Flory
PAM/Semi-annual		Christina Camell	1/28/2021	Kristin Pilon
PAM		Yoji Shimizu	1/28/2021	Ilana Cohen
PAM		Alon Herschhorn	1/28/2021	Jennifer Borgert
PAM		Marc Jenkins	1/26/2021	Ilana Cohen
PAM/Semi-annual		Ann Fallon	1/22/2021	Paul Lindstrom and Jorge Polanco
PAM		Ricardo Battaglino	1/29/2021	Kristin Pilon
PAM		Michael Georgieff	1/29/21 and 2/2/21	Megan McCoy
PAM		Brenda Ogle	1/27/21 and 2/3/21	Ilana Cohen
PAM		Sagar Goyal	2/3/2021	Paul Lindstrom
PAM		Robert Schumacher	2/2/2021	Ilana Cohen

Semi-annual	Katie Tuininga	2/4/2021	Ilana Cohen
Second Surgery Inspection	John Belcher	2/4/2021	Megan McCoy
PAM	Jan Czyzyk	2/5/2021	Paul Lindstrom
PAM	Harald Junge	2/5/2021	Jennifer Borgert
PAM	Sunil Mor	2/10/2021	Paul Lindstrom
Second Surgery Inspection	Kaylee Schwertfer	2/11/2021	Ilana Cohen
PAM	Curtis Hughey	2/12/2021	Paul Lindstrom
Semi-annual	Mark Masino	2/9/2021	Jennifer Borgert
Semi-annual	Mark Masino	2/9/2021	Jennifer Borgert
Second Surgery/Semi-	Tay Netoff	2/16/2021	Paul Lindstrom
PAM/Semi-annual	Sandy Mand	2/15/2021	Jennifer Borgert
Semi-annual	Maxim Cheeran	2/19/2021	Paul Lindstrom
PAM	Kevin Wickman	2/24/2021	Paul Lindstrom
PAM	R. Scott McIvor	2/17/2021	Ilana Cohen
PAM/Semi-annual	Julia Ponder	2/19/21 and 2/22/21	Ilana Cohen and [redacted]
PAM	Vaiva Vezys	2/23/2021	Megan McCoy
Second Surgery Inspection	Sunny Chan	2/22/2021	Megan McCoy
Second Surgery/Semi-	Esther Krook-Magnuson	2/25/2021	Kristin Pilon
PAM	John Collister	2/25/2021	Kristin Pilon
PAM	Rita Perlingeiro	2/26/2021	Paul Lindstrom

Initial Surgery Inspection	[redacted]	Benjamin Saunders	2/26/2021	Jennifer Borgert
PAM		Sarah Heilbronner	2/28/2021	Kristin Pilon
Semi-annual		Mak Bee	3/5/2021	Paul Lindstrom
Semi-annual		Mark Bee	3/5/2021	Paul Lindstrom
PAM		Lester Drewes	3/4/2021	Kristin Pilon
PAM		Robert Cormier	3/3/2021	Kristin Pilon
Semi-annual		Eric Schoen	3/9/2021	Megan McCoy and Beverly Norris
Semi-annual		Mark Thomas/Julia Lemos	3/4/2021	Jennifer Borgert
PAM		Tate Gisslen	3/9/2021	Paul Lindstrom
Second Surgery/Semi-		Mark Thomas	3/4/2021	Jennifer Borgert
Semi-annual		Rachael Hoemke and Bridget Nieto	3/10/2021	Ilana Cohen ad Geoff Ghose
PAM		Chester Whitley	3/10/2021	Paul Lindstrom
Semi-annual		Frank Ondrey	3/11/2021	Paul Lindstrom
Semi-annual		Mark Hove	3/12/2021	Paul Lindstrom
PAM		Deepali Sachdev	3/15/2021	Ilana Cohen
Second Surgery/Semi-		Anna Lee	3/10/2021	Jennifer Borgert
PAM		Luke Johnson	3/16/2021	Jennifer Borgert
Ag		Nicky Overgaard	3/17/2021	Kristin Pilon
Semi-annual		Erin Larson	3/22/2021	Megan McCoy
Semi-annual		Eric Schoen	3/23/2021	Ilana Cohen

PAM	[redacted]	Daniel Schmidt	3/23/2021	Paul Lindstrom
Second Surgery Inspection		Patrick Rothwell	3/22/2021	Kristin Pilon
Second Surgery Inspection		Carolyn Fairbanks	3/17/2021	Jennifer Borgert
PAM		Emilyn Alejandro	3/25/2021	Ilana Cohen
Second Surgery Inspection		Lucy Vulchanova	3/25/2021	Paul Lindstrom
PAM		Ruifeng Cao	3/25/2021	Kristin Pilon
PAM		Jean Regal	3/25/2021	Kristin Pilon
PAM		Paul Mermelstein	3/25/2021	Paul Lindstrom
PAM		Molly McCue	3/29/2021	Jennifer Borgert
Second Surgery Inspection		Linda McLoon	3/29/2021	Jennifer Borgert
PAM/Semi-annual		Casey Johnson	3/29/2021	Kristin Pilon and Walt Tollison
PAM/Semi-annual		Alonso Guedes	3/29/2021	Kristin Pilon and Walt Tollison
Second Surgery/Semi-		Ferenc Toth	3/29/2021	Kristin Pilon and Walt Tollison
Semi-annual		Timothy Kurtti/Ulrike Munderloh	3/31/2021	Paul Lindstrom and Keith Barker
Semi-annual		Erin Malone	3/26/2021	Jennifer Borgert and Keith Barker
Semi-annual		Scott Madill	3/26/2021	Jennifer Borgert and Keith Barker
Semi-annual		Brooke Hart	3/26/2021	Jennifer Borgert and Keith Barker

NOTES WRITTEN TO FILE

Investigator Name	Date of Inspection/submission	Protocol number (s)	Notes written to file
James Michelson	10/14/2020	1903-3865A	PI requests to begin screening for Dermatomyositis in the samples that he is acquiring from veterinarian blood draws and cheek swabs to this protocol and in so doing, broaden the scope to other genetic diseases
Robert Schumacher	11/4/2020	2007-38269A	PI requests to add several products which may be used as an alternative to Matrigel. All are growth factor matrices designed for in vitro and in vivo use to support cell growth/tumor induction. This change is updated in the procedures for cell administration and tumor induction, and an attachment was added to list the products we propose to use. The attachment contains descriptions and literature references for the products.
Mark Herzberg	11/6/2020	2006-38215A	Following an IACUC inspection on 10/28/20, where we asked if we could begin using electronic records for anesthesia we were advised that to do so would require an amendment to the protocol; Rationale: ease of use. A fillable google form allows for entering data from any location and not requiring notebooks and pens to be transported. No double
Natalia Tretyakova	11/6/2020	2004-38077A	We would like to change animal housing location of our mice from [redacted]. We would also like to request 10 more mice to repeat the three week LPS treatment with male mice because we did not get enough high quality RNA for our downstream applications.

NOTES WRITTEN TO FILE

Stephanie Goldschmidt	11/13/2020	2003-37962A	On a recent amendment approved on 11/5 we asked for extension to continue motion sensor data collection only. However, we would like to continue both motion sensor data collection as well as saliva collection (both previously approved by IACUC). Both events would continue until the end of the study. The previously reviewed amendment also extended the study to a total of 78 days.
Ferenc Toth	11/16/2020	1901-36656A	PI requests adding other embolic agents to statements regarding injection of microspheres. The PI has also removed a sentence in the procedure describing using larger microspheres for
Kimberly VanderWaal	12/4/2020	1911-37577A	PI requests that every four days, when collecting fecal samples from the tray located under each of the isolator cages, the researcher will also collect air samples using the Andersen Cascade Impactor and the SKC Bio sampler impinger over 30 minutes from the isolator vents built into the cages separately from the air supply and exhaust, without opening the isolator, so there will be no direct contact with the animals during this air sample collection
John Collister	12/21/2020	1810-36452A	As recommended we are including two outcomes for rats with lesion of the OVLT. All rats will recover as described with post operative monitoring and analgesia. Some of these rats approximately one week later will be euthanized as described and undergo perfusion in order to verify the area of the brain that was lesioned. Others will move on as described in the protocol to undergo further surgeries as currently described.

NOTES WRITTEN TO FILE

Sarah Greising	1/12/2021	1902-36812A, 1811 36513A	PI request to clarify in the procedure description that GFP donor rats will be used only as tissue donors and not undergo any experiments. Also that tissue harvest and euthanasia procedures for GFP donor rats will follow the same procedures as experimental rats (VML, injured).
Scott Mc Pherson	1/14/2021	2002-37909A	PI requests to update source and number of animals in transfer column to account for a recently approved DMR request to add mice from a collaborator's protocol.
R. Scott McIvor	2/19/2021	1911-37603A	PI requests to make a modification to the Experimental Design (section 4, in italics), explaining additional use of tissues for studies of cardiac manifestations exhibited by MPS I mice. Some of the cardiac and aortic tissues of experimental animals and controls will be extracted at euthanasia
Patrick Rothwell	3/2/2021	1810-36447A	PI requests removal of [redacted] and associated behavioral procedures from the protocol
David Largaespada	3/29/2021	1808-36277A	Addition of reference for departure from RAR recommendations for maximum IV volume in mice for Procedure Hydrodynamic Injection. The volume and method were already approved. The lab is only adding the reference. "The Hydrodynamic Tail Vein Assay as a Tool for the Study of Liver Promoters and Enhancers" Methods Mol Biol. 2013; 1015: 279--289. doi: 10.1007/978-1-62703-435-7_18 PMCID: PMC4096022; NIHMSID: NIHMS593518

NOTES WRITTEN TO FILE

Robert Wilson	3/29/2021	2012-38723A	Request the option to record the procedure to present data to overseas collaborators. Video recording is necessary because travel is limited due to COVID 19 and the collaborators need to see the stent in situ. The animal will be completely covered at all times and no University of Minnesota staff will be filmed.

Date of Recommendation	Investigator	Species	Protocol Number	Recommendation
10/13/2020	Ferenc Toth	pig	1901-36656A	This veterinary recommendation is to provide post operative multi-modal analgesia. In the Surgical induction of ischemic osteonecrosis of the femoral head" procedure, the post operative plan only includes a non-steroidal anti-inflammatory medication (i.e. Carprofen or flunixin). The addition of an opioid (i.e. SR buprenorphine) which has a different mechanism of action from NSAIDs will allow for more complete pain management post surgery; (Buprenorphine SR 0.18 mg/kg SC once at the end of surgery)
10/22/2020	Markus Meyer	pig	1908-37334A	This veterinary recommendation is being written to provide veterinary approval to stop an approved surgical procedure due to out of range activated clotting time (ACT) and to additionally prescribe protamine (a heparin neutralizer). As part of the approved protocol, heparin is given as the approved dose for a surgical procedures and testing for ACT commenced as planned. Due to an inappropriately increased ACT, the RAR vet was paged to provide guidance. The risk of uncontrolled bleeding at the extended ACT was too great to allow the surgery to continue. As part of ending the surgery, protamine was prescribed (starting with 20 mg but allowing for up to 10mg protamine/1000IU of heparin to neutralize the heparin and return ACT to normal. Once ACT was normal, the percutaneous catheters were to be removed and the animal recovered from anesthesia.
10/26/2020	Paul Iaizzo	sheep	2006-38201A	For the surgical procedures "Prototype Transcatheter Device Testing--Sheep" the catheter location sites of the jugular vein and saphenous vein can be used included for catheter placement

10/26/2020	Markus Meyer	pig	1908-37334A	This veterinary recommendation is being written to provide veterinary approvals for two different aspects of this protocol: First this veterinary recommendation is to approve a rescheduled surgery for the procedure that was cancelled 10/22/20 due to out of range surgical parameters (longer than expected ACT). The procedure is approved for 10/27/20. Second due to the extended ACT time for this animal after the one protocol approved dose of heparin, a range of heparin will be added to allow stepwise administration as well as adding the neutralizing agent, protamine to the protocol: Heparin: change the approved dose from 5000IU bolus, 0.5-1.0 ml/hr. IV) to a range of 500-5000IU, 0.25--1.0ml/hr. Increases in dose would typically be in 500 IU increments to achieve the appropriate ACT and rate of administration would be 0.25--1.0ml/hr. IV. ACT would be monitored for effect of heparin as stated in protocol; Protamine is approved to add to the protocol to be administered for either reversal in the case of out of range ACT or as an optional treatment to neutralize the effects of heparin after the surgery is complete to limit post operative bleeding. Protamine dosing should start with 20 mg but is allowed for up to 10mg protamine/1000IU of heparin, IV. If using as a reversal, effects should be monitored by ACT, results should be recorded when ACT returns to normal prior to recovering animal to post operative care.
11/2/2020	Cyrus Jahansouz	mouse	2008-38354	Additional analgesic regimen is being approved via vet rec to promote better pain control. To prevent breakthrough pain and increase pain control in this model during the po period, Carprofen should be given prior to the procedure on the day of surgery and three days after at 2.5--5 mg/kg every 12-24 hours, SC or IP. Carprofen is approved per the current protocol to be given if recommended by the veterinarian, but adding this to the pre and post-operative treatment regimen for every animal will promote animal welfare. To further improve pain control, standard buprenorphine can be swapped for SR and should be given on the day of surgery (every 4-6 hours for first 12 hours) and three days after at 0.05--0.1 mg/kg every 8-12 hours SC or IP
11/3/2020	Robert Wilson	pigs	1903-36910A	For anesthetic of pigs for surgical procedures, the following anesthetic regimens can be used: 1. Isoflurane with buprenorphine +/- midazolam CRI or propofol CRI + buprenorphine once

11/3/2020	Demetri Yannopoulos	pigs	1806-36020A	For anesthetic of pigs for surgical procedures, the following anesthetic regimens can be used: 1. Isoflurane with buprenorphine +/- midazolam CRI or propofol CRI + buprenorphine once
11/3/2020	Jason Bartos	pigs	1804-35824A	For anesthetic of pigs for surgical procedures, the following anesthetic regimens can be used: 1. Isoflurane with buprenorphine +/- midazolam CRI or propofol CRI + buprenorphine once
11/12/2020	Markus Meyer	pigs	1908-37334A	Due to clinical concerns of the pacemaker implant on the right shoulder of pig 20IS19 dehiscing, the scheduled three week post surgery check up can be performed up to one week early in the event a repair of the surgical site or re-implantation/movement of the implant is needed to minimize the number of anesthetic events. The rest of the experimental timeline will then be moved up accordingly. Prevention of the pacemaker being removed by pig and minimizing the number of anesthetic events will improve the animal welfare of the pig
12/10/2020	Wei Chen	cat	1905-37090A	For anesthesia for training sessions the following drugs/dosages will be used: Ketamine: 3-11 mg/kg IM; Xylazine 0.2-1mg/kg IM; Atipamezole 25-50ug/kg IM; fluid maintenance: 3-10 mL/kg/hr. IV LRS or 0.9% NaCl

12/23/2020	Eric Newman	mouse	1908-37348A	Per the protocol, Sulfatrim antibiotic has been given in the drinking water at a 1:32 ratio starting at the day of surgery and for the following week. There have been concerns that these mice are not drinking the water and might be dehydrated following surgery. Parenteral antibiotics are also given prior to surgery and aseptic technique is used in the lab, so the concern for infection is low. The neophobic nature of mice is likely causing them to avoid the antibiotic water and providing them with normal water following surgery should prevent any avoidance and subsequent dehydration. It is recommended that Sufatrim antibiotic water be discontinued and removed from the protocol, and mice are provided with normal drinking water throughout the study.
3/15/2021	Andrew Grande	dog	1911-37613A	For the survival surgery canine stroke procedure the following recommendations are noted: Acepromazine can be given IM or SC; Carprofen will be administered in the post-operative period for at minimum 3 days following surgery. Carprofen will be given for a total of 4 mg/kg per day at either a dose of 2 mg/kg BID PO or SC for 4 mg/kg SID PO or SC; Catheter will remain in for up to 1 week for either BrdU administration (if performed) or for MRI; catheter will be flushed at minimum twice daily with 0.9% NaCl while in use; Can include the option of diazepam 0.2-0.2 mg/kg IV or IM as premedication; Can include the option of butorphanol 0.1-0.4 mg/kg IV/IM can be used as premedication; SR-buprenorphine for analgesia to be given at 0.06-0.2 mg/kg once SC, recommended dose of 0.2 mg/kg SC; Phenobarbital will be given at a dose of up to 3mg/kg twice daily, approximately 12 hours apart. this dose may be adjusted based on case by case basis and can be given at a maximum dose of 24 mg/kg; Ceftiofur 2.2 mg/kg SC can be used as an additional option for prophylactic antibiotic for the day of surgery

3/15/2021	Andrew Grande	dog	1911-37613A	For the "survival surgery--administration of reprogramming virus the following recommendations are noted: Acepromazine can be given IM or SC; Carprofen will be administered in the post operative period for at minimum three days following surgery. Carprofen will be given for a total of 4 mg/kg per day at either a dose of 2 mg/kg BID PO or SC or 4 mg/kg SID PO or SC; Can include the option of diazepam 0.2-0.3 mg/kg IV or IM as premedication; Can include the option of butorphanol 0.1-0.4mg/kg IV/IM can be used as premedication; SR-buprenorphine for analgesia to be given at 0.06-0.2 mg/kg once SC; recommended dose of 0.2 mg/kg SC; Ceftiofur 2.2 mg/kg SC can be used as an additional option for prophylactic antibiotic for the day of surgery
3/15/2021	Andrew Grande	dog	1911-37613A	For Procedure "other--MRI Imaging" the following recommendations are noted: Acepromazine can be given IM or SC; Can include the option of diazepam 0.2-0.3 mg/kg IV or IM as premedication; Can include the option of butorphanol 0.1-0.4 mg/kg IV or IM can be used as premedication; If catheter from surgery remains in place for use in only MRI, the catheter will be removed at recovery from anesthesia for MRI; In additional option for anesthesia for the MRI can include induction using propofol at 2-4 mg/kg IV and the use of a propofol CRI IV given at 0.2 mg/kg/min used for anesthetic maintenance for both transport and during the MRI. Respirations will be monitored and if dog not breathing on own, respirations will be provided either through mechanical ventilation as described or manual breaths by anesthetists/group

Repeat Significant Findings

[redacted]

1/12/21:
Significant Findings:

- It was noted that [redacted] is conducting animal procedures on your protocol but is not yet approved as staff. Please confirm that personnel will be added to your protocol and approved by the IACUC prior to working with animals in the lab.
- It was noted that carp are anesthetized with clove oil solution prior to injection with Ovaprim but this anesthetic procedure is not described in your protocol. Please confirm that Ovaprim injection under clove oil solution anesthesia will not be conducted until an appropriate eProtocol amendment has been approved. (This is a repeat finding also noted on your July 18, 2019 inspection report. You responded that an amendment would be submitted but I could not find this submission).

7/18/19:
Significant Finding:

- It was noted that carp are anesthetized with clove oil solution prior to injection with Ovaprim but this anesthetic procedure is not described in your protocol. Please confirm that Ovaprim injection under clove oil solution anesthesia will not be conducted until an appropriate eProtocol amendment has been approved. Also, if clove oil solution will be used for any other anesthetic procedures, please add it as an alternative anesthetic.

Investigator	Species	Building	Room number	Protocol Number	Justification
Alejandro, Emilyn	mouse	[redacted]		1806-36072A	We need special housing for this mice that is only available in [redacted] in [redacted]
Aliota, Matthew	mouse			1804-35828A, 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 off-hours. 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 housed at [redacted] prior to first surgical procedure or for the duration of the study.

Bartolomucci, Alessandro	mouse	[redacted]	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 [redacted] presently as there is no [redacted] available; they will continue to be housed in this [redacted] for the duration of the study.

Baughn, Anthony	mouse	[redacted]	1810-36444A	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 the [redacted]. Standard operating procedures for work [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 outside of RAR managed facilities 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	[redacted]	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 outside of RAR managed facilities 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.
Bianco, Richard	sheep, pigs		1802-35610A, 1804-35772A, 1804-35780A, 1806-36011A, 1807-36201A, 1808-36237A, 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	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 off hours. 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	[redacted]	1804-35844A, 2007-38259A	Fish embryos will be considered vertebrates after they reach Day 3. They will be housed [redacted] from Day 3 to Day 5 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 [redacted] whereas the housing & care of fish post day 5 can be taken care [redacted] The [redacted] has experts and an approved protocol for this procedure (#1506-32642A)
Bischof, John	zebrafish embryos		1804-35844A (zebrafish)	Fish embryos will be considered vertebrates after they reach Day 3. They will be housed [redacted] from Day 3 to Day 5 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 [redacted] whereas the housing & care of fish post day 5 can be taken care [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] to contain the highly infectious organisms. Standard operating procedures for work [redacted] and caging equipment used for housing the infected animals are designed to reduce the risk of personnel exposure to infectious organisms during husbandry.

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 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]
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, Clark	mouse		1802-35597A	Also, for [redacted] for up to 72 hours postop housing of animals undergoing survival surgeries. As described in the text, following a survival surgery the animal is placed in a clean cage in [redacted]. The purpose of this is to facilitate the post-operative evaluation and special care of the mice with implants.
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 investigator managed housing.

Cvetanovic, Marija	guinea pigs, frog, rat, mouse	[redacted]	2002-37875A	the proposed animals will be used for a teaching lab taught at [redacted] at [redacted] This is sufficiently far from the Twin Cities that central [redacted] housing would not be possible
Denton, Robert	salamanders		1901-36686A	This secured cold room provides controlled conditions necessary to keep the salamanders at a cool temperature.
Desrosiers, Mark	turtle		1810-36465A	There are no turtle housing facilities in [redacted] and this [redacted] animal in [redacted]
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		1803-35638A, 1808-36330A	We request [redacted] for up to 72 hours postop housing of animals undergoing survival surgeries. As described in the text, following a survival surgery the animal is placed in a clean cage and the cage placed in the fume hood in [redacted]. The purpose of this is to facilitate the post-operative evaluation and special care of the mice with implants.
Ernst Castro, Nicolas	horse, camelids		2101-38776A	Horses and camelids that are free of infectious disease and are not intended for advanced imaging will be housed at [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	[redacted]	2101-38776A	Horses and camelids that are free of infectious disease and are not intended for advanced imaging will be housed at [redacted]. Horses/camelids with potentially infectious disease and/or intended for practice with the advanced imaging modalities will be housed in [redacted]
Ervasti, James	mouse		1806-36018A	Our studies involve continuous monitoring of mouse metabolic functions including 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 monitor the animals at all times.
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 normal RAR facility where a 12/12 cycle of light and dark is maintained.
Firshman, Anna	Horse		2008-38349A	RAR 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	[redacted]	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 small ruminant ward 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.
[redacted]	NHP, mouse, rat		1805-35937A, 1806-35989A, 1806-36065A, 1808-36291A, 1810-36463A, 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	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.
Griffith, Thomas	mouse		1906-37113A	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]
Guedes, Alonso	mouse		2004-38045A	For some of the addiction studies, we will use specialized testing apparatus (conditioned place preference test apparatus) at [redacted] where mice will be housed for up to 3 weeks.

Harmon, James	sheep	[redacted]	1908-37287A	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."

Hart, Geoffrey	mouse	[redacted]	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 [redacted] co-housed with pet store mice in [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 [redacted] animals in [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] looking at NK cells. We will do similar for [redacted] animals that have been cohoused with pet store mice for at least 45 days in the facility.
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	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	The AeroCore is a University ESO/ISO (external/internal service organization). AeroCore provides animal testing services, as such, the animals are housed in the [redacted] and all services are performed in the [redacted]

Heimpel, George	birds	[redacted]	1804-35830A	The zebra finches will be used to rear a quarantined insect. A certified quarantine facility is therefore needed to do the research
Henke, Craig	mouse		1909-37429A	Hypoxia chamber studies
Hogquist, Kristin	mouse		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		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		2103-38889A	Facility was built to specifically house aquatic animals
Ikramuddin, Sayeed	mouse		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 at [redacted]
[redacted]	NHP		1901-36714A	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

Kawakami, Yasuhiko	zebra fish	[redacted]	1908-37300A, 2004-38018A	No RAR housing is available for zebrafish. The zebra fish facility in [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		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: Dr. Alessandro Bartolomucci). 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
Knauer, Whitney	camelid		1912-37659A	Protocol has not yet been approved
Kotz, Catherine	mouse		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] facility we need to use [redacted]
Kozak, Ken	salamanders		2010-38540A	Salamanders cannot be housed in any of the RAR facilities 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	[redacted]	1904-36955A	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
Langlios, 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 [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 [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).

Lemos, Julia	mouse	[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 the [redacted] (in a room to be shared with [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.
Liang, Jennifer	zebra fish		1804-35821A, 2002-37859A	The provided housing is a state of the art aquatic system for housing zebrafish. This is not available anywhere else [redacted] has a state of the art aquatic zebrafish facility that has been running since 2009. There are no other appropriate facilities for zebrafish [redacted]. 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	The immunized mice will be challenged with infectious SARS-CoV-2, which is BSL3 agent. 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 BSL3 agent. As such, infection and monitoring of the infected mice needs to be conducted in [redacted]

Liu, Julia	mouse	[redacted]	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
Lokensgard, James	mouse		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		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		1906-37111A	[redacted]
Madill, Scott	horses		1906-37132A, 1906-37140A, 1906-37178A, 1907-37280A	RAR does not have the space to house horses
Madill, Scott	horses		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		1805-35927A	Animals will be housed at [redacted] as this is also the location of [redacted]. By housing the animals [redacted] 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]	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		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		2003-37976A	Fish and reptile species (i.e. turtles) are used in [redacted] to display animals discussed in [redacted]. It is necessary to house them [redacted] for students to observe during course instruction and discussion.
Martin, Cindy	pigs		1803-35699A	Animals will be undergoing a surgical procedure (arterial switch and atrial septectomy). It is anticipated that animals may need to stay anesthetized and supported by a ventilator for 12-48 hours in [redacted] to have time to recover from the surgical procedure.
Martinson, Krishona	Horse		1808-36231A	RAR does not house horses
Mashek, Doug	mouse		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.

Mashek, Doug	mouse	[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		1806-36051A, 1904-36944A, 1905-37035A	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. [redacted] 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 1-7dpf for experiments, so we house them in the lab.
Masopust, David	mouse		1902-36825A, 1910-37451A	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]
Masopust, David	hamster		1910-37451A	Hamsters will be infected with SARS-CoV2 and this needs to be done [redacted]

McGaugh, Suzanne	fish	[redacted]	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. The [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.
McGaugh, Suzanne	fish		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	[redacted]	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		1807-36111A	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, 2103-38930A	Facility was built to specifically house aquatic animals
Mermelstein, Paul	rat		1809-36379A, 1811-36486A	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.

Metzger, Joseph	mouse	[redacted]	2004-38031A	Our lab recently moved to [redacted] from [redacted] and the [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 the husbandary SOP for the [redacted] The animal will be housed for upto 3 months in this area based on the experimental design described below.
Munderloh, Ulrike	mice, hamster		1804-35774A, 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.
Nelson, Dwight	sheep		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 off-hours. 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 housed at [redacted] prior to first surgical procedure or for the duration of the study.

Netoff, Tay	rat	[redacted]	2004-38001A	We need to video record the rats 24/7 for 15 days to find whether or not they have behavioral seizures
Niedernhofer, Laura	mouse		1808-36256A, 2003-37982A	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].
Norris, Peggy	sheep		2004-37997A	"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, is GLP competent and maintains the facility under AAALAC and GLP compliancy. Transportation is provided on short notice and during off-hours. The facility provides 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."
O-Uchi, Jin	mouse		1806-36049A	Use of telemetry system
Olson, Erin	fish		1904-37007A	The fish under this protocol are housed for display in an office

Ondrey, Frank	mouse	[redacted]	1806-36059A, 1902-36832A, 1905-37092A, 1912-37696A, 1909-37376A, 2002-37849A, 2004-38081A, 2102-38881A	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.
Ondrey, Frank	mouse		1806-36059A	Mice will be imaged five times each, when radioisotope copper 64 is injected, at Time Zero, and 12, 24, 36 and 48 hours, post injection. During this time the mice will be housed in [redacted] is intended to hold radioactive research animals, and is only accessible from [redacted]. Once imaging is complete, these mice will be euthanized via cervical dislocation, under Isoflurane anesthesia. Carcasses will be disposed of in house, allowing the radioactivity to dissipate before disposal. 64Cu has a half life of 12.7 hours. Caging will be collected from [redacted] once radioactivity has dissipated.
Osborn, John	rat		1805-35904A, 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		2002-37873A, 2006-38203A, 2008-38392A, 2008-38393A, 2011-38597A	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.

Patterson, Ned	dog	[redacted]	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 ICUS 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 [redacted] for up to three days if there are life threatening seizures (>5 minutes of two or more without recovery in between) that do not respond to the first drug administered in an attempt to stop the seizures with monitoring as in #1 above.
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] 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	[redacted]	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		1901-36695A	The [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
Portoghese, Phillip	mouse		1809-36366A	In a number of our experiments we test the mice for acute tolerance. This requires the animals to be brought up the night before LPS injection wait another 24 hours for testing of the compound and another 48 hours to test the ED80 dose of the drug to see if there is tolerance. for the sickle cell mice, these animals are quite fair and at this time we are unsure how they will respond to the treatment. There will not be a large number being used at one time and we would like to keep them upstairs for 72 hours for observation
Potter, Lincoln	mouse		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
Primus, Alexander	fish		1808-36276A, 2012-38701A	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.

Revelo, Xavier	mice	[redacted]	2103-38896A	Mice will be housed in [redacted] for running wheel and calorimetry procedures that require specialized equipment in the [redacted]
Rothwell, Patrick	mice		1810-36447A	Our lab studies the effects of behavioral experience on brain function and behavior. My previous studies have shown that even mild stress (handling, injections, and/or exposure to a novel environment) 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.
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.
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	[redacted]	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.
Sivaramakrishnan, Sivaraj	cichlids		1805-35886	RAR does not maintain Cichlid facilities
Smanski, Michael	fish		1904-36985A	There is no [redacted] housing for zebrafish [redacted]
Sorensen, Peter	fish		1904-36985A, 2011-38629A	RAR does not possess fish holding facilities that are either large enough or have well water for our carps
Sorensen, Peter	fish		2011-38629A	RAR does not possess fish holding facilities that are either large enough or have well water for our carps.

Spencer, Sade	mouse	[redacted]	1804-35790A, 1804-35806A	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 the [redacted] (in a room to be shared with [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.
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]
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 in [redacted] These animals will be housed in the [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] during testing. 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

Thomas, Mark	rat	[redacted]	2011-38592A	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
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
Tischler, Anna	mice		1804-35785A, 1912-37660A, 2004-38090A, 2005-38161A, 2102-38860A	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] to contain the highly infectious organisms. Standard operating procedures for work in the [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	[redacted]	1906-37145A	cats and dogs are only hospitalized within [redacted], until they are adopted or fostered as part of the blood donor program
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. [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	[redacted]	1902-36738A	RAR does not house horses
Trumble, Troy	horse		1902-36738A	No other housing option [redacted] for housing horses
[redacted]	NHP		1904-36959A	Animals must be quarantined after MPTP injection (either IM or intracarotid) and are held in a room adjacent to the [redacted] During this 72 hour period in which the animal is present, the room will be designated as an [redacted] otherwise it is managed by RAR
Wagner, Carston	mouse		1807-36095A	Currently we are approved for [redacted] and have passed all required inspections for the animals we keep in [redacted] The animals we keep in [redacted] have some type of neuropathy or tumor that requires constant supervision to make sure they are eating, clean bedding and to watch tumor growth. They also require testing more frequently and the stress of moving them back and forth [redacted] would provide an additional stress.
Ward, John	frogs		1902-36788A	Housing allows daily post operative monitoring by [redacted] to ensure that the frog does not have negative consequences to surgery
Weaver, Cyprian	newts		2001-37822A	We will be performing the resection surgery on the animals. After surgery they need to be continuously monitored for at least three days of surgery for any kind of discomfort or distress

Waye, Heather	snakes, amphibians	[redacted]	1901-36655A, 1907-37208A, 2002-37863A, 2010-38529A, 2010-38559A	These animals are [redacted] where they are used for display purposes or experimental subjects in a variety of classroom situations/laboratory research
Waye, Heather	bird, fish, Pterygoplichthys		1806-36052A	For display [redacted]
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 [redacted] facilities rather than needing to be transported back and forth on a frequent basis.

Wong, Henry	mouse	[redacted]	1803-35719A	In brief, animals for screening are transported to [redacted] and allowed to acclimate for 24 hours prior to the start of any study. The mice are housed for all experimental manipulations for the duration of that particular study since they are tested or administered with compound daily. Animals would experience undue stress being transferred back and forth to the holding room everyday. In addition, the investigator will be more easily able to observe for any adverse effects. The longest duration study is the chronic tolerance test where mice will be housed in [redacted] for a maximum of 9 days. The animals are injected twice a day and are observed for any adverse effects due to the concentration of the compound being administered.
Wong, Henry	mouse		1803-35719A	In brief, animals for screening are transported to [redacted] and allowed to acclimate for 24 hours prior to the start of any study. The mice are housed for all experimental manipulations for the duration of that particular study since they are tested or administered with compound daily. Animals would experience undue stress being transferred back and forth to the holding room everyday. In addition, the investigator will be more easily able to observe for any adverse effects. The longest duration study is the chronic tolerance test where mice will be housed in [redacted] for a maximum of 9 days. The animals are injected twice a day and are observed for any adverse effects due to the concentration of the compound being administered.
Zordoky, Beshay	mouse		1807-36187A	The mice for the stress studies will be housed in [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.

[redacted]	[redacted]
10/20	Quarterly Inspections
11/20	Quarterly Inspections
12/18/20	Veterinary Consult
1/21	Quarterly Inspections
2/21	Quarterly Inspections
3/23/21--Semi-annual	Minor: emergency plan overdue for inspection

Deborah Ferrington/Scott McPhearson	[redacted]
10/20	No animals housed in IMHA, no consult
11/20	Quarterly Inspections
12/20	Quarterly Inspections
1/21/2021--IACUC Semi-annual	No animals housed in IMHA, no semi-annual
2/21	Quarterly Inspections
3/21	Quarterly Inspections

Anthony Baughn	[redacted]
10/20	Quarterly Inspections
11/9/20--Semi-annual	No Deficiencies
12/20	Quarterly Inspections
1/21	Quarterly Inspections
2/15/21	Veterinary Consult
3/21	Quarterly Inspections

David Masopust	[redacted]
10/20	Quarterly Inspections
11/9/20--Semi-annual	No Deficiencies
12/20	Quarterly Inspections
1/21	Quarterly Inspections
2/15/21	Veterinary Consult
3/21	Quarterly Inspections

Frank Ondrey	[redacted]
10/20	Quarterly inspections
11/20	Quarterly inspections
12/21/20	Veterinary Consult
1/21	Quarterly inspections
2/21	Quarterly inspections
3/11/2021--Semi-annual	No Deficiencies

Mark Masino	[redacted]
10/20	Quarterly Inspections
11/17/20	Veterinary Consult
12/20	Quarterly Inspections
1/21	Quarerly Inspections
2/9/21--Semi-annual	No Deficiencies
3/21	Quarterly Inspections

Anna Tischler	[redacted]
10/20	Quarterly Inspections
11/9/20--Semi-annual	No Deficiencies
12/20	Quarterly Inspections
1/21	Quarterly Inspections
2/15/21	Veterinary Consult
3/21	Quarterly Inspections

Philip Portoghese	[redacted]
10/13/20--Semi-annual	No Deficiencies
11/20	Quarterly Inspections
12/20	Quarterly Inspections
1/3/21	Veterinary Consult
2/21	Quarterly Inspections
3/21	Quarterly Inspections

[redacted]	[redacted]
10/26/20	Veterinary Consult
11/4/20	Veterinary Consult (Mermelstein/Thomas); No animals housed for Clark Chen this month
12/20	No animals housed in IMHA for month of December
1/21	No animals housed in IMHA for month of January
2/11/21--Semi-annual	Minor: staff have not been trained on the emergency plan
	Minor: fire extinguisher was blocked by some equipment in room [redacted]
3/21	No animals housed in [redacted] for month of March so no consult conducted

Mark Thomas	[redacted]
10/20	No Consult--Reduced Frequency
11/23/2020	Veterinary Consult
12/20	No Consult--Reduced Frequency
1/11/2021	Veterinary Consult
2/21	No Consult--Reduced Frequency
3/4/21--Semi-annual	No Deficiencies

Melanie Graham	[redacted]
10/27/20	Veterinary Consult
11/20	No Inspection--Reduced Frequency
12/22/20--Second Surgery/Semi-annual	No Deficiencies
1/21	No Inspection--Reduced Frequency
2/3/21	Veterinary Consult
3/21	No Inspection--Reduced Frequency

Esther Krook-Magnuson	[redacted]
10/15/20	Veterinary Consultation
11/20	No Inspection--Reduced Frequency
12/20	No animals housed for month of December so no consult done
1/21	No Inspection-Reduced Frequency
2/25/21--Second Surgery/Semi-annual	No Deficiencies
3/21/21	No Inspection--Reduced Frequency

Richard Bianco	[redacted]
10/20	No Inspection--Reduced Frequency
11/9/20	Veterinary Consult
12/20	No Inspection--Reduced Frequency
1/7/21--Semi-annual	No Deficiencies
2/21	No Inspection--Reduced Frequency
3/9/21	Veterinary Consult

Sivaraj Sivamakrishnan	[redacted]
10/20	Quarterly inspections
11/10/20--Semi-annual	No Deficiencies
12/20	Quarterly inspections
1/21	Quarterly inspections
2/21	consult not conducted
3/21	Quarterly inspections

John Bischof	[redacted]
10/20	No animals housed for month of October so no vet consult conducted
11/20	No animals housed so no vet consult conducted
12/15/20--Semi-annual	No Deficiencies
1/21	No animals housed for month of January, no consult
2/10/2021	Veterinary Consult
3/21	No animals housed so no vet consult conducted

Tim Kurtti	[redacted]
10/20	No Inspection--Reduced Frequency
11/19/20	Veterinary consult
12/20	No Inspection--Reduced Frequency
1/25/21	Veterinary consult
2/21	No Inspection--Reduced Frequency
3/31/21--Semi-annual	No Deficiencies

[redacted]	[redacted]
10/9/2020	Veterinary Consult
11/24/2020	Veterinary Consult
12/17/2020	Veterinary Consult
1/27/2021	Veterinary Consult
2/17/21--Semi-annual	Minor: two plastic bas of rodent diet without expiration dates
3/29	Veterinary Consult

Tay Netoff	[redacted]
10/20	No animals housed in IMHA, no veterinary consult conducted
11/20	No animals housed in IMHA, no veterinary consult conducted
12/20	No animals housed in IMHA, no veterinary consult conducted
1/21	No animals housed in IMHA, no veterinary consult conducted
2/16/21--Second Surgery/Semi-annual	No Deficiencies
3/21	No animals housed in IMHA, no veterinary consult conducted

Brendan Dougherty	[redacted]
10/20	No aniamls housed for month of October so no veterinary consult conducted
11/20	No animals housed for month of November so no veterinary consult conducted
12/17/20--Semi-annual/Second Surgery	No Deficiencies
1/21	No animals housed for month of January so no veterinary consult conducted
2/21	No animals housed for month of February so no veterinary consult conducted
3/21	No animals housed for month of March so no veterinary consult conducted

[redacted]	[redacted]
10/20	No animals in IMHA so no veterinary consult completed
11/20	No animals in IMHA so no veterinary consult completed
12/20	No animals in IMHA so no veterinary consult completed
1/27/21--Second Surgery/Semiannual	Minor: betadine scrub in NHP kit [redacted] was expired
2/21	No animals in IMHA so no veterinary consult completed
3/21	No animals housed in IMHA so no veterinary consult conducted

Matthew Aliota	[redacted]
10/20	No animals in IMHA so no veterinary consult done
11/20	No animals in IMHA so no veterinary consult done
12/20	No animals in IMHA so no veterinary consult done
1/21	No animals in IMHA so no veterinary consult done
2/19/21--Semi-annual	No Deficiencies
3/21	No animals in IMHA so no veterinary consult done

[redacted]	[redacted]
10/20	No frogs in IMHA so no veterinary consult
11/19/20	Veterinary Consult
12/20	No frogs in IMHA so no veterinary consult
1/13/21--Second Surgery/Semi-annual	Minor: surgical gloves expired but in use
2/21	Reduced Frequency--No consult
3/1/21	Veterinary Consult

Christina Camell	[redacted]
10/20	No animals housed in [redacted] so no veterinary consult conducted
11/20	No animals housed in [redacted] so no veterinary consult conducted
12/20	No animals housed in [redacted] so no veterinary consult conducted
1/28/21--PAM/Semi-annual	No Deficiencies
2/21	No animals housed in [redacted] so no veterinary consult conducted
3/21	No animals housed in [redacted] so no veterinary consult conducted

[redacted]	[redacted]
10/20	No animals housed so no veterinary consult
11/20	No animals housed so no veterinary consult
12/14/20--PAM	Significant: mice anesthetized with Isoflurane for irradiation but anesthetic not approved
1/21	No animals housed so no veterinary consult
2/21	No animals housed so no veterinary consult
3/21	No animals housed in month of March so no consult conducted

Mark Bee	[redacted]
10/20	No animals in IMHA so no consult conducted
11/13/2020	Veterinary Consult
12/20	No animals in IMHA so no consult conducted
1/21	No animals in IMHA so no consult conducted
2/21	No animals in IMHA so no consult conducted
3/5/21--Semi-annual	No Deficiencies

Sandy Mand	[redacted]
10/20	Quarterly Inspections
11/19/2020	Veterinary Consult
12/20	Quarterly Inspections
1/21	Quarterly Inspections
2/15/21--PAM/Semi-annual	No Deficiencies
3/21	Quarterly Inspections

Jennifer Menken	[redacted]
12/10/20--PAM/Semi-annual	No Deficiencies
1/21	Quarterly Inspection
2/21	Quarterly Inspection
3/30/2021	Veterinary Consult

[redacted]	[redacted]
10/13/2020--Semi-annual	Significant: No protocol in place for animal work
11/20	Quarterly Inspections
11/20	Quarterly Inspections
12/15/2020	Veterinary consult
1/21	Quarterly Inspections
2/21	No animals housed, no veterinary consult
3/21	No animals housed, no veterinary consult

Reduced Post Approval Monitoring:

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

Fall 2018 REDUCED POST APPROVAL MONITORING INSPECTION RESULTS FROM LAST SIX MONTHS (April 2018—September 2018)
#DID NOT QUALIFY OR COMPLETED: 133
#QUALIFIED FOR REDUCED PAM: 53
#QUALIFIED BUT STAGGERED: 0
NO ACTIVE ANIMAL WORK, INACTIVE PROTOCOL, ETC…: 62

Facility Name	Facility Code	Fall 2020	Spring 2021
[redacted]	1	7/24/2020	1/13/2021
	1	7/27/2020	1/15/2021
	1	8/10/2020	10/8/2020
	1	7/24/2020	1/13/2021
	2	7/27/2020	1/15/2021
	2	7/27/2020	1/15/2021
	3	7/24/2020	3/23/2021
	4	7/27/2020	1/25/2021
	5	9/23/2020	3/9/2021
	6	9/29/2020	12/14/2020
	7	7/27/2020	1/25/2021
	8	9/29/2020	12/8/2020
	10	8/26/2020	10/28/2020
	10	8/25/2020	10/28/2020
	10	8/18/2020	10/21/2020
	10	8/18/2020	10/21/2020
	10	8/18/2020	10/21/2020
	10	9/24/2020	11/20/2020
	10	9/23/2020	3/10/2021
	12	9/18/2020	11/12/2020
	12	9/28/2020	12/7/2020
		9/18/2020	11/12/2020
	12	7/20/2020	1/14/2021
	12	8/31/2020	3/26/2021
	12	9/25/2020	3/26/2021
	13	8/28/2020	11/13/2020
	14	8/7/2020	2/19/21 and 2/22/21
	15	7/16/2020 and 9/2/20	3/24/2021
	16	8/26/2020	11/5/2020
	17	7/8/2020	1/7/2021
	18	9/30/2020	12/17/2020
	19	8/10/2020	10/21/2020
	20	Due to the pandemic, classes cancelled, no live animal work conducted	Not applicable
[redacted]	21	7/23/2020	1/12/2021
	22	7/20/2020	1/28/2021

[redacted]	22	7/29/2020	2/19/2021
[redacted]		8/5/2020	2/17/2021
		9/17/2020	3/22/2021
		Not applicable	1/13/2021
		9/23/2020	3/11/2021
		7/21/2020	1/27/2021
		9/3/2020	3/31/2021
		8/5/2020	2/9/2021
		9/30/2020	12/17/2020
		9/25/2020	3/23/2021
		9/25/2020	3/23/2021
		Not applicable	2/11/2021
		8/5/2020	2/11/2021
[redacted]		No animals housed; not applicable	imals housed; Not applicable
		9/16/2020	11/9/2020
		9/8/2020	11/17/2020
		9/29/2020	3/12/2021
		9/28/2020	12/22/2020
		Not applicable	Not applicable
		9/4/2020	12/15/2020
[redacted]		Inspection not completed during six month cycle	10/13/2020
		7/30/2020	10/13/2020
		9/23/2020	3/10/2021
		10/9/2020	11/10/2020
		8/4/2020	2/25/2021
		Not applicable	2/9/2021
		9/17/2020	12/17/2020
		9/30/2020	11/9/2020
		7/27/2020	2/9/2021
[redacted]		7/9/20 and 9/18/20	3/5/2021
[redacted]		7/9/20 and 9/18/20	3/5/2021
		9/9/2020	12/10/2020

[redacted]

8/14/2020	2/15/2021
Not applicable	Not applicable
9/14/2020	3/4/2021
Not Applicable	Not applicable
8/18/2020	2/16/2021
Not applicable	Not applicable
Not applicable; no fish at this time	Not applicable/ no fish at this time
7/23/2020	1/28/2021

[redacted]

9/23/2020	3/17/2021
8/20/2020	10/21/2020
8/20/2020	10/21/2020
9/24/2020	1/13/2021
9/24/2020	1/13/2021
9/3/2020	12/2/2020
9/14/2020	11/16/2020
9/14/2020	Not applicable
9/29/2020	12/17/2020
9/15/2020	12/14/2020
9/30/2020	12/18/2020
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. (Non-survival Surgery - Imaging)
1712-35414A	Kim, Do-Hyung	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.
1712-35414A	Kim, Do-Hyung	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	non pharmaceutical-grade urethane is used as an anesthesia in our non-survival surgeries. Urethane comes in crystal form stored in secondary containment at room temperature. To prepare urethane from solid crystal, in a chemical fume hood, 0 9g urethane is diluted in 5mL of saline and filtered using 0 22 micron Millex GP filter. Urethane in liquid form is stored at room temperature. Urethane is the best and only option for this procedure because results will be comparable to previous research. (DOI:10.1523/JNEUROSCI.4801-06.2007 , DOI: 10.1073/pnas.1520759113)) (Terminal Epilepsy Analysis/electrophysiology)
1801-35497A	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 fiber). 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). Please note that this is not a survival surgery. The justification for multiple survival surgeries is provided with the survival surgeries. (Cardiac Perfusion)

1801-35497A	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 inhibitors 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.
1801-35497A	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.
1801-35497A	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. (Cardiac Perfusion)
1801-35497A	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.
1801-35505A	Ashe, Karen	Mice, Rabbit	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.
1802-35610A	Bianco, Richard	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.

1803-35638A	Ebner, Timothy	Mice	MULTIPLE SURGERY	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. 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 fiber 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.
1803-35638A	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 [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. (Acute Experimental Optical/Electrophysiology Surgery (Nonsurvival))
1803-35638A	Ebner, Timothy	Mice	SOCIAL HOUSING	We are requesting an exemption of social housing. See question 19.
1803-35638A	Ebner, Timothy	Mice	ENVIRONMENTAL ENRICHMENT	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.

1803-35667A	Davydova, Julia	Mice, Hamster	TUMOR ENDPO NT 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 antibiotics. 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. (Subcutaneous OR Intraperitoneal Tumor Establishment in Mice) In hamster, the maximum allowed tumor size is 6^3 mm. (Subcutaneous OR Intraperitoneal Tumor Establishment in Hamsters)
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)
1803-35725A	Richard, Jocelyn	Rat	SOCIAL HOUSING	Rats that are pre-exposed to ethanol in their home cage need to by singly housed to allowed accurate measurement of alcohol consumption. Rats that are food restricted for some experiments will need to be singly housed to ensure that each individual receives adequate amounts of food. Finally, rats with surgical implants will need to be singly housed after implantation to avoid damage to the implants by the other subjects (who may attempt to chew on the implants).
1804-35785A	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 moribund (defined as immobility and hunched posture) or lose >20% of their body weight, according to the IACUC euthansia criteria.
1804-35814A	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.
1804-35814A	Blazar, Bruce	Mice	EUTHANASIA METHOD	See protocol
1804-35815A	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.
1804-35815A	Blazar, Bruce	Mice	EUTHANASIA METHOD	See protocol

1804-35815A	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.
1804-35819A	Wong, Henry	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Animals will only be sedated momentarily in order to allow for a single injection. A single entry at the time of anesthesia and one during recovery will be sufficient.
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 likelihood 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 described above would be performed at a later date (at least one month after the chamber implant surgery).
1804-35861A	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. (Intravenous catheter surgery) Multiple surgical procedures are usually performed in immediate succession (i.e. catheter surgery be followed by viral injection). (Intracranial surgery: virus, cannula implant, optrode implant) Not applicable to non-survival surgical procedure. (Perfusion)
1804-35861A	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. (Rat Breeding)
1804-35861A	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.

1804-35861A	Spencer, Sade	Rat	SOCIAL HOUSING	Individuals 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.
1804-35863A	Yee, Douglas	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Avertin does not come as a certified pharmaceutical grade compound. We have historically had problems with other anesthetics killing the mice and have found this one to be quite reliable. Avertin is stored as a powder until right before surgery. Then it is weighed and brought up in solution. As soon as it is no longer needed for the surgery it will be properly disposed of. There is an SOP for Avertin attached to this to explain it more in-depth. (Tumor Resection)
1805-35872A	Beilman, Gregory	Pig (Biomedical)	BLOOD COLLECTION L MIT	t 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)
1805-35891A	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.
1805-35891A	Blazar, Bruce	Mice	EUTHANASIA METHOD	See protocol
1805-35904A	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.
1805-35904A	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. (Uninephrectomy) Prior 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 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 and the uninephrectomy its position would be displaced by the compensatory hypertrophy. (Implantation of renal interstitial catheter) 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. (Implantation of intra-venous catheter)
1805-35904A	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. (Acute RBF/GFR)
1805-35904A	Osborn Jr, John	Rat	ENVIRONMENTAL ENRICHMENT	Rats will be single housed in metabolic cages. In these studies it is essential that 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.

1805-35904A	Osborn Jr, John	Rat	SOCIAL HOUSING	Rats in study will need to be single housed, additional enrichment will be provided.
1805-35905A	Saunders, Benjamin	Rat, Mice	MULTIPLE SURGERY	For experiments involving intravenous 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 region, and relevant intracranial implants (optical fibers and/or lenses) will be interested into the target region (s). Because adequate expression of opsins for optogenetic control of neural firing can take up to 8 weeks, jugular catheters (See procedures) will be implanted in a separate survival surgery, 4-8 weeks after the initial virus infusion and implant surgery. It is not possible to maintain the integrity of jugular catheters for more than ~6weeks, and given the required time for adequate viral expression that is necessary for our optogenetics, fiber photometry, and calcium imaging studies, we must implant the jugular catheters near the time when optimal viral expression occurs, necessitating a second survival surgery. Conducting all components in one surgery would result in a large attrition among the experimental subjects due to loss of catheter integrity, and ultimately a waste of resources and requirement of larger groups of experimental subjects. For rats receiving wound clips, after 1 week of recovery they will be briefly anesthetized with isofluorane and the clips removed. For each surgery, great care will be taken to minimize the pain and discomfort to animals, as described below.
1805-35905A	Saunders, Benjamin	Rat, Mice	SOCIAL HOUSING	Animals that are food restricted for some experiments will need to be singly housed to ensure that each individual receives adequate amounts of food. Animals with surgical implants will need to be singly housed after implantation to avoid damage to the implants by the other subjects (who may attempt to chew on the implants).
1805-35907A	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). (Breeding)
1805-35907A	Garry, Daniel	Mice	EUTHANASIA METHOD	Cervical dislocation will be performed by technically competent staff to ensure quick and complete euthanasia
1805-35922A	Iaizzo, Paul	Pig (Biomedical)	NON-PHARMACAUTICAL GRADE COMPOUNDS	We make our own version of a St. Thomas cardioplegia solution that optimizing the function of the heart after reanimation.
1805-35962A	Zhang, Tianshun	Mice	TUMOR ENDPO NT CRITERIA	Due to the superficial nature of these melanoma tumors, the skin has a tendency to tighten and ulcerate at a very small size. In order to get sufficient data from our study and reduce the need to repeat, we would like to treat the ulceration with collasate ointment, instead of euthanizing the mouse before we can get sufficient data. We will treat any ulceration 1cm3 or smaller with collasate ointment 3 times a week. Any tumors larger than 1cm3 with an ulcer will be euthanized immediately.
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	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 WEIGH NG EXCEPTION (FOOD/FLU D)	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	See protocol
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.
1806-36017A	Taylor, Raye	Cat, Dog	72 HOUR POST-OP ANALGESIA POLICY	See protocol

1806-36017A	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 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. (Spay and Neuter Dogs)
1806-36018A	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. Albee 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.
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	The animal will be housed individually after implantation of the optrode. The animal will have a headstage on the top of their skull and therefore group housing will increase the chance of headstage damage and therefore the animals will be housed individually.
1806-36033A	Garry, Daniel	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	DMD knockout model animals will have an end point of animal death without intervention in both the treated and untreated study groups. The aim of the study is to determine the length of increase in disease model animals with the treatment and thus the treated and untreated animals will be allowed to survive as long as possible to determine survival times.

1806-36033A	Garry, Daniel	Mice	EUTHANASIA METHOD	Cervical dislocation will be performed by technically competent staff to ensure quick and complete euthanasia. Decapitation will be used for euthanasia of mouse embryos and neonates up to day 10.□ □ Mouse neonates up to 10 days of age will be euthanized by methods according to NIH publication Guidelines for Euthanasia of Rodent Fetuses and Neonates (revisid 6/22/16, Website: https //oacu.oir.nih.gov/animal-research-advisory-committee-guidelines). Decapitation will be performed by new disposable razorblades, which will be disposed of at the end of the procedure, or replaced more frequently as needed. □ □ Excerpt from the N H guideline:□ Mouse, Rat, and Hamster Neonates up to 10 days of age: Acceptable methods for euthanasia include: injection of chemical anesthetics (e g., pentobarbital), decapitation or cervical dislocation. Additionally, these animals are sensitive to inhalant anesthetics; e.g., CO2, or isoflurane from a vaporizer (used with appropriate safety considerations) although prolonged exposure, up to 50 minutes may be necessary. 2,15-17 A secondary physical method of euthanasia is recommended to ensure death (e.g. cervical dislocation, decapitation, bilateral pneumothorax). Death must be verified prior to disposal. “Fetuses that are believed to be unconscious and altricial neonates
1806-36039A	Fairbanks, Carolyn	Mice, Rat	72 HOUR POST-OP ANALGESIA POLICY	Post-operative analgesic therapy is contraindicated since provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied. (Spared Nerve Injury Surgery)
1806-36048A	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 N H/OLAW Webinar]’
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% Tribromoethanol (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.
1807-36119A	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 30% 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 30%. 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.

1807-36119A	Pennell, Christopher	Mice	EUTHANASIA METHOD	Cervical dislocation is rapid and apparently painless. I have over 30 years experience using this method of euthanasia. We propose to develop a new model for 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 request that we are allowed to use 30% weight loss as one criterion for euthanasia (please note this exemption was granted in previously approved protocols). 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 30%. 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 30% body weight. Therefore, mice will be euthanized when one or more of the following criteria are met:□ 1) they have lost 30% of their body weight□ 2) they score 8 in our clinical scoring system (see below; the weight criterion in this scoring system requires 25% weight loss for the maximum [worst] score)□ 3) for tumor-bearing mice, when the bioluminescence signal >8E+07 photons/sq cm/sec/steridian (value based on preliminary data)□ □ 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.□ Activity: "0" if normal; "1" mild to moderately decreased; "2" stationary unless stimulated.□ Fur texture: "0" if normal; "1" mild to moderate ruffling; "2" severe ruffling/poor grooming□ Posture: "0" if normal; "1" hunching noted only at rest; "2" severe hunching impairs movement□ Weight loss relative to initial weight: "0" if <10%; "1" if >10% and <25%; "2" if >25%.The other criterion for euthanasia is a clinical score of 8. The scoring system has 4 components, each of which is given a score of 0-2.
1807-36137A	Georgieff, Michael	Mice	EUTHANASIA METHOD	Decapitation without anesthesia or sedation will only be performed on postnatal day (P)0-P3 mice, for generation of our glia cultures.
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 possible. Often, this state co-occurs as moribundity. In our MDS mouse strains, we expect the same disease state to occur.
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.
1807-36197A	[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.

1807-36214A	Patterson, Ned	Dog	MULTIPLE SURGERY	As these are clinical patients, and live at home with their owners if the device does not help or the owners do not want to keep it in at study endpoint the device will be explanted. Or if the owner chooses to withdraw the dog from the study before the 2 year endpoint or there is device infection or other adverse effect of the the device it will be explanted anytime within the 2 years study frame. (Intracranial Surgical Implantation of EEG seizure device via 4 Burr holes.) Justified in the implantation surgery procedure. (Explantation of the device.)
1807-36214A	Patterson, Ned	Dog	EUTHANASIA METHOD	Will be done by the attending VMC DVM or regular DVM, and in clinical practice is often done with and IV placed and no sedation.
1807-36224A	Elmquist, William	Mice	BLOOD COLLECTION L MIT	Blood collection will be performed post euthanasia. (Distributional Pharmacokinetics of anti-cancer agents)
1807-36224A	Elmquist, William	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	In efficacy studies, the improvement in survival upon treatment with novel anti-cancer agents will be evaluated. In these studies, tumor-bearing mice with deviations from normal health will be euthanized at moribund.
1808-36242A	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. (Spinal Nerve Ligation)
1808-36248A	Michaeli, Shalom	Rat	MULTIPLE SURGERY	A chronic pain state needs to develop prior to electrode implantation (Spared nerve injury) We need to wait for the chronic pain state to develop following SNI. (Implantation of DBS electrodes--survival) We need to wait for the chronic pain state to develop following SNI. (Implantation of SCS electrodes--survival)
1808-36248A	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. (Spared nerve injury)
1808-36248A	Michaeli, Shalom	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	See protocol
1808-36248A	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.
1808-36261A	Pang, Hongbo	Mice, Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have used avertin routinely in our previous studies (Pang HB et al, 2014). t 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
1808-36277A	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	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)
1808-36286A	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.
1808-36291A	[redacted]	Nonhuman Primate (Macaques)	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: Renal transplant (and bilateral nephrectomy of native kidneys))
1808-36294A	Gorr, Sven-Ulrik	Mice	SOCIAL HOUSING	Mice will be group housed unless they damage each others wound. They will then be housed individually for up to 96 hours. We will use female mice, which tend to be less aggressive than males, to minimize risk of damage to the wounds.
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 fiber 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. (Implantation of Optical/Electrophysiology Chamber Surgery (Survival))

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	Mice with implants are that will be housed [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.
1808-36334A	Gordon-Evans, Wanda	Dog, Cat	SOCIAL HOUSING	Postoperatively, the dogs or cats may damage the others incision and so should be housed separately.
1809-36335A	Herschhorn, Alon	Mice, Rabbit	BLOOD COLLECTION L MIT	For the first three months the amount of blood needed for weekly antibody titer tests may exceed blood collection limits. Fluid replacement will be performed as needed; after each blood draw that exceeds the maximum recommended collection volume the removed volume will be replaced with warm 0.9% saline solution. (RO Antibody titer test mice)
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.
1809-36366A	Portoghese, Philip	Mice	72 HOUR POST-OP ANALGESIA POLICY	Additionally, post-operative analgesic therapy is contraindicated since provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied. (Spared nerve injury)
1809-36374A	Larsen, Peter	Wild Rodents	EUTHANASIA DEATH/MORIBUND ENDPOINT	We are collecting museum voucher samples and tissues from wild rodents. These samples will allow for metagenomic sequencing to identify zoonoses associated with each species.
1809-36386A	Deng, Yibin	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Our animal studies are trying to determine whether and how the genetic alterations or chemoprevention/chemotherapy will provide any survival benefit for the mouse cohorts. In order to generate a credible mouse survival curve, we need to observe the mouse cohorts up to "natural death". However, these mice are valuable and needed for pathological and biochemical analyses, we cannot allow them to die spontaneously and risk organ deterioration. Rather, we will harvest mice when they are determined to be moribund-"close to death endpoint". One Criterion from UMN IACUC guideline will potentially affect our studies to observe survival benefits. Based on "UMN IACUC Euthanasia Guideline", we have provided a very strict criteria to determine the moribund state, and these must include at least one of the first two criteria and at least one of the three remaining criteria: (1) progressive weight reductions up to 10% of body weight measured on two separate occasions over a period of one week; (2) sudden, unexplained weight loss of at least 10% of body weight over a period of one week; (3) failure to gain weight appropriately over a 3 week period; (4) persistent, hunched posture with rapid breathing over a 1 hr observation period; and (5) excessive tumor burden (palpable abdominal mass, size ~2 cm in maximum dimension). These criteria are based on over 12 years of personal experience monitoring 10 independently derived genetically engineered mouse cancer models (over 9,000 mice analyzed by the PI). We have documented on 254 independent occasions mice that fit the moribund criteria will die within ~2 days (1.55 days ± 0.8). Therefore, we are confident that performing this censorship, although not ideal, is a necessary compromise to obtain mice for pathological/biochemical studies as well as to generate a credible survival curve.

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.
1810-36394A	Harris, Reuben	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	If RAR veterinary staff require euthanasia of moribund mice, we will follow through in the allowed time.
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. (Breeding)
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.
1810-36403A	Bierle, Craig	Guinea Pig	SOCIAL HOUSING	Guinea pigs will generally be housed in same-sex or breeding pairs. However, animals may be housed individually for 3 reasons: 1) Sexually mature males may be housed individually once the animal has been bred. Young males can be safely housed together if paired at or shortly after weaning, but mature male guinea pigs can become aggressive towards each other if introduced for the first time. 2) GPCMV can be shed in many bodily fluids, including saliva and urine. To avoid unintended infections, we request to isolate animals that are known to be seropositive or that have been experimentally infected. Seropositive or experimentally challenged may housed in pairs if appropriate for an individual experiment or for long-term housing as deemed appropriate by the research staff. 3) Uninfected/mock infected guinea pigs may be housed individually if the animal is a control for an experiment where infected guinea pigs are also housed individually.
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. (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)

1810-36426A	Hoeppner, Luke	Fish (Zebra fish)	NON-PHARMACAUTICAL GRADE COMPOUNDS	Scientific Justification for the use of non-pharmaceutical grade MS-222. Non-pharmaceutical grade MS-222 is widely used for anesthesia of zebrafish embryos and adults throughout the zebrafish research community. Zfin org, a commonly used online resource for zebrafish investigators, lists the Sigma-sourced, non-pharmaceutical grade MS-222 in the protocol for making MS-222 (https://zfin org/zf_info/zfbook/chapt10.html#wptohtml63). A variety of recent zebrafish publications also state in their methods sections that they utilize non-pharmaceutical grade MS-222 obtained from Sigma, which is >98% pure, for anesthesia of zebrafish. 1. Ruparelia et al. Zebrafish models of BAG3 myofibrillar myopathy suggest a toxic gain of function leading to BAG3 insufficiency. Acta Neuropathol. 2014. 128:821-33. 2. Miesfeld et al. Yap and Taz regulate retinal pigment epithelial cell fate. Development. 2015. 142:3021-32. 3. Shahid et al. Zebrafish biosensor for toxicant induced muscle hyperactivity. Sci Rep. 2016. 6:23768 (Breeding zebrafish)
1810-36427A	Hoeppner, Luke	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Protocol XIX, #5: A survival analysis will be carried out separately each cohort. Death or moribundity will be used as an endpoint because all mice (regardless of vehicle or STAT3 inhibitor treatment group) will experience respiratory difficulty and using death/moribundity as an endpoint is the only way to distinguish when the STAT3 inhibitor treatment is having an effect. Best efforts will be made to avoid death and euthanize when moribundity is observed. Mice will be checked daily for signs of moribundity.□ □ We expect to see LPS-induced moribundity or death within 7 days post-LPS injection based on the survival analysis conducted in our prior publication (Vohra, Hoeppner, et al, Am J Physiol Lung Cell Mol Physiol 2012, PM D: 22003095). If moribundity or death isn't observed within 7 days post-LPS injection, we will euthanize the mice after 7 days post-LPS.
1810-36427A	Hoeppner, Luke	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.
1810-36429A	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 (including phosphorylation) that require precise timing of sacrifice, sedatives or anesthesia would interfere with the scientific goals of the experiment.□ □ Only individuals trained in decapitation will sacrifice the animals. In addition the guillotine used for decapitation will be maintained by professional sharpening at least once per year and with manual sharpening when needed in the interim.
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.
1810-36435A	Cvetanovic, Marija	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Further monitoring of a given mouse is not necessary as the procedure is terminal before 15 minutes pass.
1810-36435A	Cvetanovic, Marija	Mice	SOCIAL HOUSING	When group housed, mice with implanted canula ad pump tend to open the wound and scratch the area around the canula and pump for each other. This can lead to injury and infection. For these reasons mice are single housed after the surgery.
1810-36442A	Aldrich, Courtney	Rat	SOCIAL HOUSING	Rats will be individually housed. Individual housing is preferred because it prevents the animals from chewing each others catheter and quickly damaging them. Rats will not be tethered, but allowed to move freely in their cages.

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.
1810-36452A	Collister, John	Rat	MULTIPLE SURGERY	The multiple surgeries required in this study cannot be combined into one due to the severity and length of the individual procedures and recovery time required for the health of the animals. Specifically, the first surgery in the study requires a stereotaxic device, which would impede the success of the other surgeries and requires a different anesthetic regimen. The second procedure requires an extended recovery to allow for compensatory renal adaption. The third surgery requires that the first two surgeries, plus the collection of data over the control period, are already completed.
1810-36452A	Collister, John	Rat	ENVIRONMENTAL ENRICHMENT	Since food and water intake will be strictly monitored, any environmental enrichment (e g. gnawing, chewing) could adversely affect the data, and due to the nature of the continual recording of blood pressure and heart rate in each animal individually, social housing will be unacceptable due to cross-talk of the radiotelemetric data transmission.
1810-36452A	Collister, John	Rat	SOCIAL HOUSING	Due to the nature of the continual recording of blood pressure and heart rate in each animal individually, social housing will be unacceptable due to cross-talk of the radiotelemetric data transmission specific from each transmitter to its matched receiver.
1810-36452A	Collister, John	Rat	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	Food is not being restricted, and we strive to avoid any unnecessary handling of the rats. Food and fluid intake are measured and recorded daily, as well as urine output. However, upon noticing any unusual hydration status or behavioral changes, rats will be weighed, and if the status persists or the weight of the animal is outside of what is expected, the area veterinarian will be called. (NaCl/KCl drinking water and specialized NaCl food)
1810-36460A	Townsend, DeWayne	Mice	MULTIPLE SURGERY	Ovariectomy 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. (Ovariectomy) 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. (Orchiectomy)
1810-36460A	Townsend, DeWayne	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 moribundity 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 moribund 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 recover to model a chronic spinal cord injury so that we can test our scar ablation techniques and cell transplantation. Pain and distress will be controlled through analgesics and antibiotics. (Spinal Cord Injury) 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. (Injection of Rose Bengal/sNPCs)

1810-36479A	Mensinger, Allen	Fish (Other)	Three-Days Post-Op Analgesia	The PI is interested in the effects of multimodal sensory input on freely swimming, naturally behaving fish. Any use of post op analgesia would depress the level of sensitivity in the mechanosensory lateral line and render the experiments much less effective. The toadfish tolerate the procedure extremely well with only a small incision (2 cm) needed to access the cranium and implant the electrodes. They will resume swimming without 2 hrs of being removed from anesthesia and will actively attack prey and eat within 12 hrs of surgery. We do not use post surgery antibiotics as we have never observed a post op infection manifest itself in less than 7 days. It is believed the toadfish mucous contains antibiotic properties as captured fish often bear severe head scars from intraspecfic fighting but do not show infection. Post op examination of fish after three to 5 days shows clear CSF and no sign of external infection. Many antibiotics also damage hair cells and would interfere with our experiments
1810-36480A	El-Ashry, Dorraya	Mice	TUMOR ENDPO NT 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)
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
1811-36486A	Mermelstein, Paul	Rat, Mice	MULTIPLE SURGERY	For self-administration experiments in which animals receive intracranial injections, two survival procedures will be performed on the same animal: stereotaxic injections and jugular catheterization. Stereotaxic injection allows direct manipulations of the brain that result in changes in drug self-administration behavior. The inhaled anesthetics used for both of these surgeries are well tolerated. Any animals showing signs of distress or lack of wound healing will not be subjected to additional procedures until fully healed.
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. (Atrial Septectomy and Pulmonary Banding)
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 L MIT	Animal will be euthanized by this method and will not survive this blood collection. (Trunk blood collection following pharmacokinetic studies)
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.
1812-36575A	Modiano, Jaime	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
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.
1812-36595A	Chen, Clark	Mice	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.
1812-36606A	Kells, Stephen	Comensal Mice, Comensal Rats	EUTHANASIA DEATH/MORIBUND ENDPOINT	The animals are structural pests and alternative methods of handling/ release are not advisable.
1812-36606A	Kells, Stephen	Comensal Mice, Comensal Rats	EUTHANASIA METHOD	The investigator has been performing cervical dislocation for many years and is proficient in this euthanize method. The investigator will also teach the Minneapolis Public Housing Authority personnel how to cervically dislocate mice after they are caught during dis-infestation. Sticky and snap traps are standard practice in vermin control. These practices will be implemented throughout Minneapolis. The investigator's role is provide better vermin control and management practices. Due to this standard practice, there is a possibility that animals will die within the traps (48 hours). Preventative measures are in place to try and prevent this. Traps are also checked as often as possible by the housing authority. Study of these methods and reduction of the mouse population, reduces the use of current practices which can be more invasive to the rodents, or riskier for bystanders.
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. (2 Photon Microscopy/Calcium Imaging)
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 rats will be administered analgesics, the additional pain and distress experienced should be minimal. (Controlled Cortical Impact (CCI)) Prior to this procedure, rats undergo controlled cortical impact, as described previously. The cutdown procedure is minimally invasive and since rats will be given analgesics, additional pain and discomfort should be minimal. (Femoral Vein Cutdown)

1901-36656A	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. (Surgical induction of ischemic osteonecrosis of the femoral head)
1901-36657A	Lesne, Sylvain	Mice	SOCIAL HOUSING	Mice that are returned to cages after maze trials can often start fighting, which can make behavioral data not usable. We therefore need to singly house all animals that will be behaviorally characterized. Animals will be acclimated to single housing the week before behavioral tests begin. Thus, animals may be singly housed for up to two weeks and no longer.
1901-36672A	Gallaher, Dan	Rat	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	We have been informed that once a day recording is sufficient. Since this is non-survival surgery, we have been asked to record anesthesia use only daily.
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.
1901-36686A	Denton, Robert	Amphibian (Other)	ENVIRONMENTAL ENRICHMENT	Salamanders are not social animals and are housed individually in the case of cross-contamination of skin microbiota.
1901-36686A	Denton, Robert	Amphibian (Other)	SOCIAL HOUSING	Salamanders are not social animals. Individual housing reduces cross-contamination and allows for more consistent observations
1901-36695A	Ponder, Julia	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 (observation of surface conditions).
1901-36695A	Ponder, Julia	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	Ponder, Julia	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	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)
1901-36714A	[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 MHA 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. (Chamber Surgery) Please see above for the microdrive and repair procedures. 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. (Microdrive Placement / Headcap Repair)
1901-36714A	[redacted]	Nonhuman Primate (Macaques)	SOCIAL HOUSING	Conspecific interaction will be limited during quarantine period. In the case of a single treated animal, no visual interaction with conspecifics will be possible if [redacted]; however, given the layout of the quarantine room relative to the standard vivarium, it is likely that the affected animal will be able to hear and be heard by the primary colony.

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)
1901-36717A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Multiple survival surgeries are required to record the needed number of neurons. The first recording chamber does not produce any deficits and placing additional chambers maximizes the use of these valuable animals. The additional surgery is done only if the animal is in excellent health. Having the ability to reposition the chamber greatly increases the efficiency and productivity of the experimental protocol. These animals require extensive training periods (6-18 months) to master the voluntary movement paradigm. The usefulness of a single recording site is limited because the ability to record single units in the same area decreases over time. Moving the recording chamber increases the yield of single neurons in any one animal and minimizes the number of animals required for a particular study. In addition, posts and chambers may loosen over time and require tightening or reattachment. (Post/Chamber Implant)
1901-36717A	[redacted]	Nonhuman Primate (Macaques)	FOOD/FLUID RESTRICTION RECORDKEEPING	Food and water are provided by both RAR and the [redacted] as detailed in the attachment: Primate SOP Food and Water. (Water Restriction)
1901-36717A	[redacted]	Nonhuman Primate (Macaques)	SOCIAL HOUSING	Pair housing of these animals could potentially cause injury to the hands or fingers during altercations. Any injury to the arm/hand would put our research at risk. A single injury to a hand or arm could nullify years of training, data collection, and future funding because data must be duplicated across both limbs before the research can be considered for publication. Also, pair housing could result in damage to the recording chambers, which could be catastrophic to the animal's health. Therefore, pair house is challenging in these animals. Two of these animals are already pair-housed and it is expected that they will remain as a pair, unless there are concerns about the behaviors listed above. The third animal is not likely to be suited to pair-housing, however if a suitable cage mate was available, pair-housing would be attempted.
1901-36722A	Lowe, Dawn	Mice	MULTIPLE SURGERY	Simultaneous with (0 time point) or 1,3,5, or 7 days after barium chloride injury we will measure physiological function of the muscle in the anesthetized mouse (in vivo contractile analysis). This is an extremely minimally invasive procedure in which only two small electrodes are place subcutaneously around the peroneal nerve of the leg. Immediately after this measurement, while the mouse is still anesthetized the skin will be open and barium chloride delivered. The barium chloride delivery will take less than 5 minutes beyond the physiological measurements. (Barium Chloride Muscle Injury)
1901-36722A	Lowe, Dawn	Mice	72 HOUR POST-OP ANALGESIA POLICY	Because we will be examining the role of macrophages in skeletal muscle autophagy/damage/regeneration, such as that which is induced by barium chloride injury, it is necessary to restrict the use of analgesia unless serious negative consequences result. 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. □ □ If an analgesic is prescribed by RAR, analgesics that have fewer anti-inflammatory effects could be used in these cases, such as sustained release buprenorphine will be used first. Local anesthetics such as lidocaine or bupivicaine (sodium channel blockers) may also be used as regional analgesia if an analgesic is deemed necessary or if sustained release buprenorphine is not suitable/working. The most commonly used local anesthetic agents are Lidocaine and Bupivacaine. Lidocaine acts faster (within 2-5 minutes of injection) but its effects only last up to 2 hours. Bupivacaine, has a slower onset of action (about 5-10 minutes after injection) but its effects last much longer, for about 4-8 hours. We'll also continually work with the vet staff in order to be sure an adequate attention has been paid to post-surgical pain. If prescribed by RAR, the doses are typically 5-20 ul of 0 5% Bupivacaine or 15-20 ul of 1% Lidocaine will be given by subcutaneous injection. (Barium Chloride Muscle Injury)
1901-36724A	Gorr, Sven-Ulrik	Mice	SOCIAL HOUSING	If mice damage each others burn wounds they will be housed individually for the duration of the study. We will use female mice, which tend to be less aggressive than males, to minimize risk of damage to the wounds.
1902-36750A	Goldschmidt, Stephanie	Dog	MULTIPLE SURGERY	This is not a research procedure, but a procedure for treatment of the primary tumor that will be performed in tandem to the lymph node removal. The additional procedure that is part of the project is the removal of the lymph nodes at the time of oncologic surgery. For oncologic principles the lymph nodes will be removed prior to the primary oncologic surgery. (Lymphadenectomy)
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)

1902-36774A	Lee, Michael	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Once the animal is under deep anesthesia, they are euthanized within 10 minutes. (Intracardial Purfusion)
1902-36774A	Lee, Michael	Mice	EUTHANASIA METHOD	1. Decapitation of pregnant female mice is performed secondary to CO2-based euthanasia to ensure complete euthanasia.□ 2. Direct decapitation of mouse embryo is accepted procedure.□ 3. Direct decapitation of mouse pups (P0-1) is acceptable procedure. □ **Based on the AVMA guidelines, decapitation is an acceptable form of euthanasia, particularly when harvesting uncontaminated tissue.
1902-36774A	Lee, Michael	Mice	SOCIAL HOUSING	Females that are pregnant will be separated to minimize cannibalism by other adults.
1902-36776A	Bardwell, Vivian	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	There is no restriction so no weight loss is expected (Tamoxifen in chow)
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 cannibalism by other adults.
1902-36831A	Newman, Eric	Mice, Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	Urethane is used alone or in combination with other drugs to produce anesthesia in laboratory animals. One of the key advantages in utilizing urethane is that it provides an extended period of anesthesia with minimal physiological changes. The long lasting and stable anesthesia induced by intravenous administration of urethane produces minimal related cardiovascular and respiratory depression. Another positive characteristic of urethane is that is produces a much deeper degree of analgesia than many other anesthetics. (Non-survival retina extracellular space imaging-mice)
1902-36831A	Newman, Eric	Mice, Rat	EUTHANASIA METHOD	Staff are well-trained on the cervical dislocation procedure.Training records are maintained and updated to ensured staff are qualified to perform the procedure. Cervical dislocation in conscious condition provides a means to recover tissues and body fluids that are uncontaminated by anesthesia. t also provides a means of obtaining anatomically undamaged brain tissue for study. Handling and restraint required to perform this technique may be stressful to animals.The equipment used to perform cervical dislocation will be maintained in good working condition. Staffs are well-trained on decapitation procedure.Training record is maintained and updated to ensured staff are qualified to perform the procedure. Decapitation provides a means to recover tissues and body fluids that are chemically uncontaminated when performed without anesthesia. t also provides a means of obtaining anatomically undamaged brain tissue for study. Handling and restraint required to perform this technique may be distressful to animals.The equipment used to perform decapitation will be maintained in good working condition to ensure sharpness of blades and proper alignment and contact between blades.Between decapitation sessions, and once gross contaminants have been removed, the equipment should be thoroughly cleaned. Rinse a final time with 70% alcohol to ensure evaporation and reduce the need to hand dry the equipment. Replace new scissors every year.
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. (Transplantation of muscle stem cells)
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) (Hepatic portal vascular access port placement)
1903-36845A	[redacted]	Nonhuman Primate (Macaques)	BLOOD COLLECTION L MIT	Multiple blood draws are planned to mimic the safety studies required to support a regulatory submission, please see attachment TABLE 1 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. (Standard screening or blood/blood component banking)
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. (ES or iPS cell transplantation into muscle) 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. (Teratoma biopsy)
1903-36866A	Kyba, Michael	Mice	TUMOR ENDPO NT 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. (Induction of colon cancer)
1903-36866A	Kyba, Michael	Mice	EUTHANASIA METHOD	Embryos 15 days of gestation or greater will be decapitated.
1903-36867A	Hughey, Curtis	Mice	BLOOD COLLECTION L MIT	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 N H 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)
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.
1903-36867A	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.
1903-36900A	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	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.
1903-36904A	Farrar, Michael	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (treatment with antibiotics)

1903-36906A	Asakura, Atsushi	Mice	MULTIPLE SURGERY	24 hours after muscle injury, cell transplantation will be performed. After surgery is completed, animals will be cared and examined on a day bases by member of our research staff, PI (Atsushi Asakura), Dr. Shuichi Watanabe (Research Associate), Mayank Verma (Junior Scientist), or [redacted] (Undergraduate Student). They will also monitor those animals everyday. Animal Facility staff is also monitoring regularly. The information will be transmitted by phone to PI's office and PI's laboratory. During weekend the information will be transmitted by phone to PI's cell phone and by E-mail. Within 24 hours, the animals develop evidence(s) of distress will be performed for a terminal study. To alleviate pain during operation, we will frequently check the level of anesthesia after intraperitoneal injection of Avertin. We are going to put some soft bedding in the cages. For post-surgical analgesia, we will use a subq. injection of 5 mg/kg ketoprofen every day for 3 days. Assessment of pain or distress will be determined by following symptoms: decreased activity, abnormal postures, hunched back, muscle flaccidity or rigidity, poor grooming, decreased food or water consumption, weight loss (generally 20-25% of baseline), failure to grow, or loss of body condition (cachexia), dehydration, decrease or increase in pulse or respiratory rate, physical response to touch (withdrawal, lameness, abnormal aggression, vocalizing, abdominal splinting, increase in pulse or respiration), self-aggression, inflammation, vomiting or diarrhea. If a mouse shows two or more symptoms described above, analgesia will be given. If an animal is experiencing unrelieved pain or distress, it must be euthanized. If the unexpected event that an animal meets these criteria prior to the designated study endpoints, animals will be euthanized by appropriate means (CO2/O2 inhalation or KCL injection after anesthetized with IP injection of Avertin, 225-240 mg/kg. This method is consistent with the recommendations of the Panel of Euthanasia of the American Veterinary medical Association. (Skeletal muscle injury)
1903-36906A	Asakura, Atsushi	Mice	SOCIAL HOUSING	If multiple adult males are in the same cages, they start fighting. Therefore, Single adult male mouse will be housed in a cage. Other way o reduce fighting in males is to keep litter mates together and avoid introducing unrelated males.
1903-36906A	Asakura, Atsushi	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Scientific justification for use of non-pharmaceutical grade Avertin: Avertin has been widely used as one of the anesthetic agents for mice. Accordingly, RAR site mentioned that "Avertin® is a non-pharmaceutical grade compound. Currently, there is no equivalent veterinary or human drug is available for experimental use of Avertin®. The highest grade equivalent chemical reagent will be used and formulated aseptically, with a nontoxic vehicle, as appropriate for the route of administration. Use of Avertin has been already reviewed and approved by IACUC
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.
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. (Aqueduct Blockage as part of Acute Electrode Implantation)

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. (Acute Stereotaxic Delivery of Viral Vectors to Specific Brain Nuclei)
1904-36936A	Fairbanks, Carolyn	Rat, Dog	BLOOD COLLECTION L MIT	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. (Blood Collection in Rat for Oral Bioavailability Studies)
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.
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 MHA will not be given.
1904-36959A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	See protocol

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- /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 fibrosis (Fig 6 and 7) and the increased arrhythmias in Fig 11. t 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. This is a minimally invasive procedure that we sometimes add to other more invasive procedures, such as cardiac pressure overload 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. (Osmotic minipump implantation)
1904-36978A	van Berlo, Jop	Mice, Rat	EUTHANASIA METHOD	We will only perform decapitation using sharp scissors in neonatal pups younger than post-natal day 7 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.
1905-37011A	Faulk, Christopher	Mice	ENVIRONMENTAL ENRICHMENT	nesting material must be withheld while animals are in metabolic cages to collect urine for iAs metabolic analysis. Enrichment paper may absorb urine and alter metabolic end points.
1905-37011A	Faulk, Christopher	Mice	SOCIAL HOUSING	Mice will be temporarily individually housed for no greater than 48 hours in standard metabolic cages. Metabolic cages will be used to collect uncontaminated urine and fecal matter from each animal, and individual housing is needed to prevent mixing of samples between animals. Urine iAs metabolite levels will be needed for each animal separately rather than pooling samples in order to accurately correlate levels with molecular measurements seen in each female's pups, which have been exposed to iAs in utero and during lactation. The time period in the metabolic cage is expected to be approximately 24 hours with a maximum of 48 hours; the duration has been decreased as much as possible to reduce stress due to single housing. The females will also be subjected to the metabolic cage procedure after all pups have been weaned in order to avoid any additional maternal stress or pup health issues associated with extended separation.
1905-37029A	Finger, Erik	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.
1905-37039A	Garry, Mary	Pig (Biomedical)	ENVIRONMENTAL ENRICHMENT	t 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)	SOCIAL HOUSING	t is possible that we will need an exception to social housing for the reasons stated in 17B. If possible, however, we will house socially.
1905-37059A	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	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.
1905-37059A	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.
1905-37062A	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. (Biopsy of tissue)
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. (Lying time restriction with access to feed and water)
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. (Fin Clip)
1906-37113A	Griffith, Thomas	Mice	EUTHANASIA METHOD	All staff have been trained in and are competent at cervical dislocation.
1906-37114A	Malone, Erin	Cow (Biomedical)	72 HOUR POST-OP ANALGESIA POLICY	The standard of care for bovine standing surgery is preoperative flunixin meglumine and no postoperative analgesics unless indicated by clinical signs. Most drugs are not approved for use in cattle and most cattle do not need postoperative analgesics. We propose following this standard (this is the same as we would use in clinical cases). (Right flank exploratory, typhlotomy, omentopexy lab + ultrasound (Cows)) Part of veterinary student training is to detect and administer pain relief. This is difficult to teach without the ability to show the difference. Students will be expected to monitor their calves for any signs of discomfort and treat appropriately; however, we would like to avoid mandating a protocol or timing. The PI will also be monitoring the calves for signs of discomfort and can alert the students as needed. Students will be evaluated on their pain management plans as part of their grade. Generally, calves will be undergoing their terminal procedure the following day, as well. (Calf anesthesia and minor surgery lab (Male calves))
1906-37114A	Malone, Erin	Cow (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Cows are undergoing standing surgery so no anesthetic monitoring is indicated (eg Heart rate, respiratory rate monitoring).
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. (VML Injury to the Peroneus Tertius (PT) Muscle)
1906-37132A	Madill, Scott	Horse, Cow (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	standing sedation and sampling only, entire procedure less than 5 minutes (Standing CSF tap)
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 likely 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. (Equine Caslick Vulvoplasty)
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. (Equine Caslick Vulvoplasty)

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. (Equine Caslick Vulvoplasty)
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.
1906-37149A	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	ENVIRONMENTAL ENRICHMENT	Animals will be implanted with electrodes and must be housed singly to avoid harming each other or damaging the implants.
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.
1906-37162A	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. (Controlled Cortical Impact (CCI) - Mice) 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. (Jugular Catheterization Procedure 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. (Jugular Cannulization after TBI)

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, ibuprofen, 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 (Bovine superovulation and embryo flush)
1906-37184A	Ning, Jianfang	Mice	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. (Intracranial injection 1) Intratumoral injection is the only approach for oHSV effectively getting to GBM in orthotopic tumor model. 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. (Intratumoral injection of oHSV or peptide)
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.
1907-37213A	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_nfCKPkafnlIPqn5KJ0/edit) (Breeding)
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 (Euthanasia)
1907-37213A	Junge, Harald	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	sulfo-NHS biotin is not available USP grade, it will be ordered from Sigma. t 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. (transcardial perfusion)

1907-37234A	Garry, Mary	Mice	SOCIAL HOUSING	Following LAD ligation or femoral artery ligation, animals must be housed singly to prevent removal of closures
1907-37234A	Garry, Mary	Mice	EUTHANASIA METHOD	Cervical dislocation is rapid and humane and sedation is not required.
1907-37242A	Alford, Patrick	Mice	EUTHANASIA METHOD	The neonates are decapitated with scissors at P2
1907-37248A	Lowe, Dawn	Mice	MULTIPLE SURGERY	See protocol
1907-37248A	Lowe, Dawn	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. (Nerve cuff implantation) 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. We need to avoid anti-inflammatory reagents following BaCl injury because we are studying the effects of hormones on inflammation and subsequent regeneration of the muscle. Thus, if analgesics are determined necessary, in consultation with a veterinarian as we routinely do, the mouse will be sacrificed. (Barium Chloride Injury) We will not give injections of Buprenorphine after the 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. (Transplantation)
1907-37248A	Lowe, Dawn	Mice	SOCIAL HOUSING	To monitor physical activities (wheel running capacity or cage activities), mice will be housed individually.
1907-37248A	Lowe, Dawn	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.
1907-37280A	Madill, Scott	Horse, Cow (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	we are perfoming laocal anesthetic blocks for the purpose of diagnosis. We will record doses used and sites of administration bu tthe animal remains conscious and unsedated throughout - we will not be recording vital signs (Equine Lameness Exam - with local anesthetic blocks) sedation only; animals remain conscious and upright (Use of Sedation for Equine Procedures) sedation only, animals remain conscious throughout (Use of Sedation for Bovine Procedures) local anesthetic bleb only for placement of jugular catheter (Blood Collection during Treadmill Exercise) sedation only - animal remains standing and conscious throughout (Shock wave therapy)
1907-37280A	Madill, Scott	Horse, Cow (Biomedical)	SOCIAL HOUSING	While not in [redacted] 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.
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. (Hernia Creation Surgery)
1908-37303A	Geller, Melissa	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (Hyperchlorinated Water)
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. (Parabiotic pairing) 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.
1908-37315A	Yuan, Shauna	Mice	EUTHANASIA METHOD	For E18 pup cultures, pups will be decapitated using scissors immediate after they are taken out of the sac

1908-37330A	Geller, Melissa	Mice	MULTIPLE SURGERY	The manufacturer of these osmotic pumps explains why removal is necessary (found here: http://www.alzet com/products/guide_to_use/implantation_and_explantation.html): Explanting ALZET Pumps Surgical removal of the ALZET pumps is accomplished in the anesthetized animal via a simple skin incision. If the pump has been in place longer than a couple of weeks, or the infusate is an irritant, it may be necessary to free the pump from surrounding connective tissue in order to remove it. The pump should be removed in the following circumstances: To verify delivery by measuring residual volume To verify stability & bioactivity of the test agent in solution No later than the recommended “explant by” date (see below) Note that an explanted pump cannot be reused. Schedule for Removing Spent ALZET Osmotic Pumps After its pumping lifetime has ended, an ALZET osmotic pump becomes an inert object for a period of time lasting about half again as long as the pump’s specified pumping duration. After that time, because of the continued osmotic attraction of water into the pump, it may swell and begin to leak a concentrated salt solution, resulting in local irritation of tissues around the pump. Therefore, DURECT advises explanting spent ALZET osmotic pumps according to the following schedule: ALZET Pump Model No. Explant Pump By* 1002 Day 21 (Implantation of Alzet pump into peritoneal cavity)
1908-37333A	Anderson, Lisa	Rabbit, Rat, Frog (Other)	SOCIAL HOUSING	Animals may be housed individually to prevent chewing and removal of catheter cap if RAR deems this is necessary. They would be housed individually until they are euthanized for the lab.
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. (Induction and surgical prep for all procedures) After initial surgery animals will be placed under anesthesia at week 1, week 2 and 3 for visualization of the stenosis with fluroscopy. If the (Renal Artery Stenosis with a Stent and Coil) After initial surgery at weeks 3 and 5 animals will be placed under anesthesia for an Echocardiogram and endocardial heart biopsy. At week 5 the animal will be euthanized after procedure. (Renal Artery Stenosis With a Vascular Occluding Device)
1908-37346A	Robinson, James	Mice	TUMOR ENDPO NT 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. (RCAS viral gene delivery)
1908-37350A	Fairbanks, Carolyn	Cat, Rat	72 HOUR POST-OP ANALGESIA POLICY	The intention of the incision is to induce a state simulating the hyperalgesia experienced in the immediate post-operative period. Administration of analgesics would be likely to alter the course of hyperalgesia development, defeating the goal of the experiment.□ (Induction of post-incisional hyperalgesia)
1909-37362A	Bastian, Thomas	Mice, Rat	EUTHANASIA METHOD	Decapitation without anesthesia or sedation will only be performed on embryonic and early postnatal day (P)0-P5 mice. Decapitation without sedation will only be performed on embryonic or newborn rats when skeletal tissues are weak and decapitation is rapid.

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. (Allograft Prostate Cancer Mouse Models)
1909-37381A	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. We will need to clear endogenous epithelium from the mammary gland and allow the inflammation to resolve prior to performing the macrophage depletion and subsequent injection of cells into the mammary gland. (Mammary fat pad clearing and transplantation)
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 describing 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 possible. bi 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 on Brain Development, Conditioned Behavior, and Neurotransmission. Neuroscience and Behavioral Physiology, Vol. 33, No. 1, 2003
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.
1909-37385A	Lund, Troy	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	If animals reach a moribund state before the projected 4 week experiment endpoint, they will be euthanized immediately. This is a possibility with this experiment.
1909-37389A	Camell, Christina	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	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. t 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 contribute to protection against bacteria challenge in the elderly/
1909-37389A	Camell, Christina	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)
1909-37392A	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)
1909-37406A	Yamamoto, Masato	Mice, Hamster	MULTIPLE SURGERY	In the animals the therapeutic viruses are injected into the orthotopic pancreatic tumor, both the initial cell inoculation and the injection of the virus will be performed after surgically opening abdomen. There is no method to inoculate the cell into the pancreatic bed precisely with minimal leakage into peritoneal cavity without opening abdomen. There is no way to inject the therapeutics accurately into the pancreatic tumor without opening abdomen. Therefore, two operations are inevitable for such experiments
1909-37406A	Yamamoto, Masato	Mice, Hamster	TUMOR ENDPO NT CRITERIA	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.
1909-37416A	Vallera, Daniel	Mice	TUMOR ENDPO NT CRITERIA	Tumors are not expected to ulcerate, but there are times when this happens and is outside our control. If the tumor is small and ulcerates, the animal will be monitored for signs of discomfort and infection, and steps will be taken to make it comfortable. t will be euthanized if the problem cannot be resolved in three days. If the tumor is large, approaching 2cm3, the animal will be euthanized. (P/Flank Tumor induction)
1909-37416A	Vallera, Daniel	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	For pilot studies ONLY, this is necessary to analyze maximum tolerated dose of the drugs administered. In order to collect data on maximum tolerated dose, mice will reach a moribound state when administered the highest dose. If animals are discovered moribound, or hunched/shaking, they will be euthanized. Animals sometimes die over night, but death is not an endpoint we are using.
1909-37416A	Vallera, Daniel	Mice	EUTHANASIA METHOD	Barbiturate overdose will be delivered by injection Euthanasia solution ≥86 mg/kg IP or IV, contains sodium pentobarbital 390 mg/ml + sodium phenytoin 50 mg/ml (dosing based on barbiturate concentration).
1909-37418A	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 every day 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)

1909-37418A	Widge, Alik	Rat	SOCIAL HOUSING	The animals will be singly housed during and after 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.
1909-37418A	Widge, Alik	Rat	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	We need to weigh animals every day 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)
1909-37430A	Ogle, Brenda	Mice	MULTIPLE SURGERY	The time between surgeries is intended to more accurately model the disease state of a myocardial infarction. Delaying treatment after inducing an infarction allows for an inflammatory response that simulates the onset-to-door time, common in myocardial infarction cases. The first surgery induces the MI and the second surgery is necessary to administer the experimental treatment. Additional analgesics will be provided if the animal appears in pain or distress (assessed by monitoring eating habits and mobility) or a veterinarian may be consulted on further actions. (Myocardial Infarction)
1909-37430A	Ogle, Brenda	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Avertin is only available as non-pharmaceutical grade. It is filter sterilized before use. It is made up and stored according to RAR guidelines to avoid formation of toxic breakdown products (Isolation of Pancreatic Islets)
1909-37444A	Kratzke, Robert	Mice	TUMOR ENDPO NT CRITERIA	For ulcerated tumors, we are requesting an exception to IACUC guidelines for euthanasia as sometimes, tumor ulcers can form and might be related to the treatment given. Therefore, for tumors that develop ulcers, we will treat the ulcers with collasate. So long as the ulcers are less than 0 8cm in diameter and 3mm deep or less, the mice will be treated approximately 3x/week with collasate (more or less frequently as needed to ensure that ulcers are covered). Should ulcers exceed these parameters or should they demonstrate painful behavior associated with the ulcers, the mice will be euthanized. (Tumor Induction II)
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 moribundity 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. COV D-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	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.
1910-37459A	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.
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. (Replacement of Neural or LED implantation (Hyperdrive, silicon probes, miniscopes, etc))
1910-37469A	Redish, David	Rat	SOCIAL HOUSING	The implantation of hyperdrive devices preclude dual housing due to safety concerns. Similarly DREADD and optogenetic surgeries preclude dual housing due to safety concerns. Because the behavioral experiments must be directly compared to our hyperdrive, DREADD, and optogenetic experiments, all of our rats must receive the same treatment (i.e. single housing).

1910-37473A	Peterson, Lisa	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.
1910-37482A	Kawakami, Yasu	Mice	72 HOUR POST-OP ANALGESIA POLICY	We will characterize natural regeneration process after digit amputation. Pharmacological treatments likely affect the regeneration process through systemic modulation of cellular activities, and therefore, we should not treat neonates with analgesics. □ We will also not use a topical anesthetic, such as lidocaine cream. t is known that digit regeneration involves cells around the injury site, including the nerve. Therefore, topical anesthetic might affect cells that would participate in regeneration. □ If animals show signs of pain or distress, we will euthanize them rather than treating with analgesics. (Digit tip amputation)
1910-37482A	Kawakami, Yasu	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	See protocol
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. t 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. (Primary tumor resection)
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.

1910-37491A	Low, Walter	Rat, Mice	MULTIPLE SURGERY	This experiment requires additional surgery or surgeries to administer Zika virus or glioma cells infected with Zika virus. Mice/ratswill be anesthetized during each surgical procedure. There are no sensory fibers within the brain to cause pain to the animal. Only the small incision will be noticed, and any minor pain or distress will be minimized with anesthetics and analgesics. (Induction of brain tumor cell line) This experiment requires additional surgery or surgeries to administer Zika virus or glioma cells infected with Zika virus. For the groups in Experiment 1B, these inoculations will be given on days 3, 7, and 14 following intracranial tumor implantation. For the groups in Phase 3 experiments, these inoculations will be given on days 3, 7, and 21 following intracranial tumor implantation. Mice/rats will be anesthetized during each surgical procedure. There are no sensory fibers within the brain to cause pain to the animal. Only the small incision will be noticed, and any minor pain or distress will be minimized with anesthetics and analgesics. (Administration of Zika virus-infected glial tumor cells) We are rechallanging long-term survivors to investigate the immune system response in order to understand the mechanisms by which our treatment enhanced survival in long-term survivors. (Induction of brain tumor cell line to rechallenge long-term survivor)
1910-37491A	Low, Walter	Rat, Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	A state of moribundity may be reached to determine if treated animals experience tumor reduction and/or ablation, and whether they live longer than their untreated counterparts. Each animal will be euthanized as quickly as possible once this state is achieved. Animals which respond to treatment and show signs of tumor ablation will be allowed to live up to 12 weeks after gliosarcoma cell injection as long as they remain healthy.
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.
1910-37507A	Hallstrom, Timothy	Mice	MULTIPLE SURGERY	This procedure depends upon two surgeries. The first is the actual optic nerve crush assay. This damage can promote axon regeneration, depending on the underlying genotype tested. To detect the regenerated axons, a second surgery is required. During the second surgery, axons are labelled with cholera toxin B subunit (CTB). This minor surgery involves injection into the vitreous of the anesthetized mouse. We are skilled with intravitreal injections and expect errors to be minimal. (Optic Nerve Crush Assay)
1910-37507A	Hallstrom, Timothy	Mice	72 HOUR POST-OP ANALGESIA POLICY	We propose not using analgesia on the neonatal models based on the following criteria: 1. This is a minor procedure, involving a small incision across the developing neonate eyelid. This tissue is partially lost within days following the procedure during normal neonate development. 2. In our experience, the pups recover quickly from this procedure and do not display evidence of pain following the procedure. Observations on evidence of pain have looked for A) lethargy or reluctance to move; in contrast all the pups are active and nursing. B) Labored or increased respiration has not been observed. C) No decrease in appetite has been observed, as all pups continue nursing and do not lose body weight. 3. It is unclear how certain analgesics might affect cellular changes in the retina that we are observing. (In vivo electroporation)
1910-37507A	Hallstrom, Timothy	Mice	EUTHANASIA METHOD	used only on day 0 neonates, or if older mice appear to have survived C02 treatment.
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.
1911-37568A	Yamamoto, Masato	Mice	MULTIPLE SURGERY	In the animals the therapeutic viruses are injected into the orthotopic pancreatic tumor, both the initial cell inoculation and the injection of the virus will be performed after surgically opening abdomen. There is no method to inoculate the cell into the pancreatic bed precisely with minimal leakage into peritoneal cavity without opening abdomen. There is no way to inject the therapeutics accurately into the pancreatic tumor without opening abdomen. Therefore, two operations are inevitable for such experiments

1911-37568A	Yamamoto, Masato	Mice	TUMOR ENDPO NT CRITERIA	Remarkably functional treatment 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. (1. Subcutaneous tumor induction)
1911-37597A	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- /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 fibrosis (Fig 6 and 7) and the increased arrhythmias in Fig 11. t is these confounding factors we need to avoid in our study.
1911-37602A	Jenkins, Marc	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	The food consumption of the mice should not change with this addition of 2W peptide 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.□ (2W chow) The food consumption of the mice should not change with this amino acid diet 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. (amino acid and casein diets) 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. (Drinking water with bromodeoxyuridine) The water consumption of the mice should not change with the addition of OVA 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. (OVA-treatment in water) 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. (antibiotic in drinking water)
1911-37610A	Thayer, Stanley	Rat, Mice	EUTHANASIA METHOD	E17 fetuses will be removed from the euthanized dam and euthanized via decapitation with sharp scissors
1911-37610A	Thayer, Stanley	Rat, Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Halothane is no longer used clinically. However its use for overdose euthanasia is currently used in our laboratory and has been for many years. Thus, to be consistent with past and ongoing studies we wish to continue with this procedure. Because pharmaceutical grade halothane is no longer available in the US, we use non-pharmaceutical grade halothane of high purity (>99%). t should be noted that we check for reflexive or any higher order (e.g. struggling, vocalization) response by pinching the toes forcefully prior to rapid decapitation with sharp scissors. Halothane is stored in a cool, dark location prior to use. Within a fume hood, approximately 1 mL of halothane solution is deposited in a Nalgene induction chamber to anesthetize a mouse.

1911-37610A	Thayer, Stanley	Rat, Mice	SOCIAL HOUSING	Group housing appears to damage surgical implants. Single housing is standard procedure for surgical implants that can be perturbed by cage mates. While single housing is more stressful to mice than group housing, single housing is critical to the health of the animals in cases where cage mates could damage surgical implants, such as intra-cranial implantations. In our lab, pilot studies have shown that having cage mates decreases the long-term stability of EEG electrodes. Thus, to control for the potential for damage to surgical implants, decrease risk of complications post-surgery, and decrease total number of subjects necessary to conduct these studies, we propose to single house animals that receive intra-cranial implantations. This procedure results in an overall decrease in our animal usage.
1911-37613A	Grande, Andrew	Dog	MULTIPLE SURGERY	See protocol
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.
1911-37621A	Olson, Julie	Mice	EUTHANASIA METHOD	Neonates younger than 7 days, do not require additional justification for not anesthetizing prior to decapitation. The demyelinating disease which the mice develop following TMEV infection or EAE induction leads to hind limb paralysis and loss of weight. The mice are monitored daily and receive food supplements until the experimental end point, unless the mice have reached a moribund state at which point they would be euthanized. Some mice with EAE will completely recover from the hind paralysis.
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)
1911-37634A	Pravetoni, Marco	Rat	BLOOD COLLECTION L MIT	Animal will be euthanized by this method and will not survive this blood collection (Trunk blood collection following pharmacokinetic studies)
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. (Controlled Cortical Impact (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. (Controlled Cortical Impact (CCI) - rat)
1911-37638A	Grande, Andrew	Mice, Rat	EUTHANASIA METHOD	Euthanasia occurs instantly.
1912-37649A	Whitley, Chester	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	NA (AAV vector administration)
1912-37651A	Lesne, Sylvain	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	Recording body weights weekly would introduce considerable pre-handling of the mice that could affect our Barnes Circular Maze test. (Tamoxifen or corn oil dietary feed.)
1912-37651A	Lesne, Sylvain	Mice	SOCIAL HOUSING	Mice that are returned to cages after maze trials can often start fighting, which can make behavioral data not usable or unreliable. We therefore need to singly house all animals that will be behaviorally characterized. Animals will be acclimated to single housing the week before behavioral tests begin. Thus, animals may be singly housed for up to two weeks and no longer.
1912-37651A	Lesne, Sylvain	Mice	FOOD/FLUID RESTRICTION RECORDKEEPING	Recording body weights weekly would introduce considerable pre-handling of the mice that could affect our Barnes Circular Maze test. (Tamoxifen or corn oil dietary feed.)

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 moribund 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.
1912-37696A	Ondrey, Frank	Rat, Mice	BLOOD COLLECTION L MIT	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.
1912-37727A	Bischof, John	Mice	EUTHANASIA METHOD	The lab staffs are well trained and proficient enough to perform the procedure quickly and effectively.
2001-37740A	Lokensgard, James	Mice	EUTHANASIA METHOD	Decapitation is used on one-day old pups to collect brain tissue for cell cultures.
2001-37741A	Lokensgard, James	Mice	MULTIPLE SURGERY	The scientific justification for multiple surgeries is that repeated antigen exposure mimics the HIV patients on optimal therapy that show CSF viral escape (i e., HIV blips). Thus, multiple surgeries in our model will boost recall immune responses to kill the encountered peptide-loaded glial cells to control CNS inflammation. After at least 30 days these animals will undergo CFSE dye- and viral peptide-loaded glial cell injection. (Intracerebroventricular stereotaxic injection of MCMV) The scientific justification for multiple surgeries is that by injecting the Luciferase-expressing LV-CMV-p24-luc, we can monitored longitudinally over time using bioluminescent imaging for luciferase reporter gene expression. Later on we will inject anti-PD-1 or anti-PD-L1 Abs into the right lateral ventricle to monitor and assess increased viral clearance in the presence of PD-1: PD-L1 pathway blockade using bioluminescent imaging. (Injection of luciferase-expressing LV-CMV-p24-luc to brain striatum region)
2001-37741A	Lokensgard, James	Mice	72 HOUR POST-OP ANALGESIA POLICY	NSAIDs or other anti-inflammatory 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. Recent articles that refer to the potential use of other drugs (e.g., Gabapentin, Memantin and Mexiletin) for analgesia were considered as alternate analgesic agents. However, these compounds have significant effects on neural/brain function and would interfere with our ability to study the oxidative stress response in the brain during viral encephalitis and hence will not be used.
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 L MIT	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. (Cardiac Puncture)
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 amphibian 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. (Immobilization) Paralytics must be prepared in amphibian 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. (Immobilization)
2001-37757A	Araque, Alfonso	Mice	MULTIPLE SURGERY	We would like to request an exception to IACUC's Policy on Multiple Surgical Procedures. In our procedure we state that following viral injections some of our mice will be given a cannulae or an optic fiber implant. We would like the alternative of performing this surgery separately to shorten the amount of time the mice wear these implants. Expression of the injected virus takes 2-4 weeks. This means that the mice will have the cannula and the optic fiber implant at least that long before commencing the experiment. These implants extend from the surface of the brain a couple of centimeters and some mice either by grooming or scratching can remove or alter this implants. This can result in open wounds, infection and increased death rates. Further, after implantation of the cannulas, each mouse needs to be single housed to lower the risk of losing the implants by action of their cage mates. Therefore, by decreasing the amount of time the mice wear the cannula, it can increase their survival rates and decrease the amount of time the mice needs to be single housed.
2001-37757A	Araque, Alfonso	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We would like to use Tribromoethanol as an anesthetic for the transcardial perfusion procedure which is a terminal procedure. When used appropriately Tribromoethanol, can be a very effective non harmful anesthetic. To ensure appropriate use the following guidelines will be used: 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. Urethane is purchased from Sigma-Aldrich (U2500), and this non pharmaceutical-grade urethane is used as an anesthesia in non-survival surgeries. Urethane comes in crystal form stored in secondary containment at room temperature. To prepare urethane from solid crystal, in a chemical fume hood, 0.9g urethane is diluted in 5mL of saline and filtered using 0 22 micron Millex GP filter. Urethane in liquid form is stored at room temperature. Urethane is the best and only option for this procedure because results will be comparable to previous research. (DOI:10.1523/JNEUROSCI.4801-06.2007 , DOI: 10.1073/pnas.1520759113)
2001-37757A	Araque, Alfonso	Mice	SOCIAL HOUSING	Mice with optic fibre head implants, will be singly housed to reduce injury to head. Double-housed mice have been observed to pull on each other's implants, ripping them out of the head, and causing severe damage requiring euthanasia.

2001-37768A	Haynes, Christy	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Following injection of Plasmodium chabaudi or saline (control), mice would be monitored every 24 to 48 hours by personnel on the protocol for weight, activity level, hematuria, and general appearance. Observance would be recorded and the mice can only be euthanized when the parasite level are at the appropriate level (5% to 50%). The exception would be if the mice were very sick with major weight loss. In this case, the mice will be monitored closely for 24 hrs, and they will be euthanized if no improvement was seen.
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. t 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 described 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.□ (CNS virus delivery and icv peptide delivery with osmotic minipumps)
2001-37780A	Bartolomucci, Alessandro	Mice	SOCIAL HOUSING	Animals may be singly housed at times to prevent stress, injury and death due to same-sex incompatibility 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).
2001-37795A	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
2001-37795A	Pang, Hongbo	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	We have used avertin routinely in our previous studies (Pang HB et al, 2014). t 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
2001-37798A	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 NAD: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. (Tagging)
2001-37801A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	See protocol

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. (#4. Islet Transplantation)
2001-37804A	Fife, Brian	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (Drinking water with bromodeoxyuridine) 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. (antibiotic in drinking water)
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 L MIT	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.) (Phlebotomy to induce anemia)
2001-37808A	Lokensgard, James	Mice	MULTIPLE SURGERY	See protocol
2001-37808A	Lokensgard, James	Mice	72 HOUR POST-OP ANALGESIA POLICY	NSAIDs or other anti-inflammatory 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. Recent articles that refer to the potential use of other drugs (e.g., Gabapentin, Memantin and Mexiletin) for analgesia were considered as alternate analgesic agents. However, these compounds have significant effects on neural/brain function and would interfere with our ability to study the oxidative stress response in the brain during viral encephalitis and hence will not be used.
2001-37812A	Ruan, Hai-Bin	Rabbit, Mice	SOCIAL HOUSING	In order to measure food intake, locomoter activity, and energy expenditure in CLAMS metabolic cages, mice need to singly housed in these cages for up to a week.

2001-37812A	Ruan, Hai-Bin	Rabbit, Mice	EUTHANASIA METHOD	Barbiturate will anesthetize animals. Barbiturate will be administered IV or IP.
2001-37812A	Ruan, Hai-Bin	Rabbit, Mice	ENVIRONMENTAL ENRICHMENT	Due to technical limitations of metabolic cages, mice have to be singly housed to determine food intake, locomotor activity, and energy expenditure.
2002-37829A	Johnson, Tim	Turkey, Turkey	EUTHANASIA METHOD	Euthanasia up to time of transfer to RAR is covered under the unit SOP which was approved for the use of cervical dislocation of newly hatch poults up to one week of age.Per unit SOP "Cervical dislocation of young poultry is requested because of the extremely long time needed to euthanize poultry with CO2 especially up to one week of age after hatch. They are resistant to CO2 having hatched under high CO2 conditions in the egg. Anyone conducting euthanasia is trained in using CO2 or cervical dislocation. Senior staff will do cervical dislocation." The earlier IACUC guideline-based euthanasia criteria cannot be used because we are testing the pathogenicity of different ORT strains, which requires assessment of clinical signs. However, if clinical signs beyond that of a typical ORT respiratory infection are demonstrated (including lameness or immobilization, indicative of a systemic infection), birds may be euthanized prior to the study endpoint.
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 described elsewhere. (Cardiotoxin Injection)
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 buprofen 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. (Intra-Diaphragm Cell Injection)
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)

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.
2002-37862A	Haskell-Luevano, Carrie	Mice	EUTHANASIA METHOD	Any use of anesthetic will inhibit or block certain blood chemistry that we are studying.
2002-37875A	Cvetanovic, Marija	Frog (Other), Rat, Guinea Pig, 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.
2002-37878A	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	See protocol
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 talkings 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	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 1 or 2 viral vector injections (brain and/or spinal cord) 1-10 weeks prior to the non-survival surgery. (Exposure for mouse spinal cord for in vivo calcium imaging) Two viral vector injections (one in brain and one in spinal cord) are needed for monosynaptic gene transfer. (Injection of viral vectors in spinal cord)
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. (Spared nerve injury

2002-37888A	Vulchanova, Lucy	Mice	SOCIAL HOUSING	Mice with in-dwelling canullae will be single-housed for approximately 3 weeks.
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.
2002-37893A	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))
2002-37897A	Sachdev, Deepali	Mice	TUMOR ENDPO NT 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 moribund. 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). (Intracardiac injection of cells)
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 moribund. 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. 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)
2002-37901A	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.
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. (Acute Stereotaxic Delivery of Viral Vectors to Specific Brain Nuclei: Rats)
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 L MIT	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	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	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.
2003-37921A	Mashek, Douglas	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.
2003-37929A	Starr, Tim	Mice	TUMOR ENDPO NT 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. (Tumor Induction)
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 concentration of the drug, date prepared and filtered, and name of person who prepared the solution. Mice are given a dose of 225-250 mg/kg i.p. Mice get no more than one dose a week. This is typically ~0.5 ml per mouse.

2003-37936A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Animals will arrive on the protocol with implanted vascular access ports (VAPs). The placement of a central VAP 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. The placement of the portal vascular access port allows cell products to be delivered intraportally using a non-invasive technique, that improves agreement with the clinical situation and moves surgical manipulation of the portal vein outside of the diabetic immunosuppressed phase. 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. The utility of the prevascularized site has been evaluated in small animal models and in the clinic, small animal models have been poorly predictive of clinical success with prevascularized sites. This will be done during the diabetic phase using the intended timing that will be used in the clinical situation to accurately estimate efficacy and safety. (Mini-sentinel site prep (prevascularization)) A prevascularized site was previously created to accommodate the graft. The surgical procedures and timing mimic the intended plan for use of hESCs in clinical patients.(Conventional intraportal transplant (non-surgical) together with mini-sentinel site cell transplant (surgical))
2003-37950A	Pravetoni, Marco	Mice, Rat	EUTHANASIA DEATH/MORIBUND ENDPOINT	Only animals in AIM3b will use death as an experimental endpoint. The animals will be continuously monitored following administration of a potentially lethal opioid challenge, until death occurs or until animals recover from the challenge. The purpose of this experiment is to determine whether the mAb treatment is capable of rescuing animals from opioid poisoning. Therefore, animals receiving the saline control are likely to experience opioid lethality. Since opioids are analgesics, these studies will not cause pain and distress in rats. For all other experiments, the IACUC guidelines will be followed.
2003-37959A	Lee, Michael	Mice	EUTHANASIA METHOD	E18-21 mouse embryos and neonatal mouse pups P0-1 days will be euthanized by rapid decapitation using a large surgical-grade scissors 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. The use, cleaning,and sharpness inspection of decapitation scissors will be recorded in a log. Scissors will be sharpened or replaced at least annually or as needed based upon inspection.
2003-37959A	Lee, Michael	Mice	NON-PHARMACAUTICAL GRADE COMPOUNDS	Avertin is not available as a pharmaceutical grade agent. We have used Avertin as an anesthetic for many years and find that it very quick and effective relative to the other anesthetics. t is a reliable agent for inducing anesthesia with low risk of respiratory suppression or occupational exposure, in comparison with using inhaled anesthetics for inducing anesthesia. Avertin stock solution has an assigned expiration date of 6 months and is stored at 4 degrees Celsius protected from light. Working solutions of Avertin will be made in a biosafety cabinet and will be sterile filtered. The pH of the working solution will checked before each use, and the solution will only used when when the pH is >5. The working solution has an expiration date of 30 days and is stored in a 4 degree refrigerator. If any precipitate forms, the solutions are discarded.
2003-37967A	Garry, Mary	Mice	TAIL BIOPSY	the lidocaine cream will be "applied once 5 minutes prior to the tail biopsy procedure. (breeding)
2003-37970A	Garry, Daniel	Mice	EUTHANASIA METHOD	Cervical dislocation will be performed by technically competent staff to ensure quick and complete euthanasia

2003-37989A	Dougherty, Brendan	Rat	MULTIPLE SURGERY	Our studies relate to the effects of circulating sex steroids on respiratory motor control and neuroplasticity. As most sex steroids are produced in the gonads, removal of the gonads is vital to answer fundamental experimental questions. Removing the gonads and allowing for a week of recovery creates a "new baseline" of reduced sex steroid production and circulation for which to conduct our studies. These procedures are have significant scientific merit and are considered standard procedures in the study of sex steroids. Rats receiving gonadectomies (or sham surgeries) receive pain medication at the time of surgery to minimize discomfort. The procedures are very fast (5-10 minutes per rat) allowing rats to recover from anesthesia quickly and no functional deficits are anticipated. (Gonadectomy) As described with gonadectomy, our studies center on the effect of sex steroids in respiratory motor control and neuroplasticity. following removal gonads, our capacity to reintroduce steroids in a controlled manner is critical to interpretation of our results. Similarly, to discern how inflammation impedes the expression of plasticity and potential sexually dimorphic responses to inflammation, carefully controlled administration of LPS is warranted for clear data interpretation. (Implantable pumps or pellets for steroids, LPS or other drug administration) Our studies relate to the effects of circulating sex steroids on respiratory motor control and neuroplasticity. As most sex steroids are produced in the gonads, removal of the gonads is vital to answer fundamental experimental questions. Removing the gonads and allowing for a week of recovery creates a "new baseline" of reduced sex steroid production and circulation for which to conduct our studies. Some rats may be injured following removal of gonads to determine a role for sex steroids in recovery of function. (Spinal Cord Injury) Our studies relate to the effects of circulating sex steroids on respiratory motor control and neuroplasticity. Our ability to accurately define the motor neurons involved in these effects is vital to data interpretation. This straight forward and simple procedure has been validated in multiple previous studies, causes minimal distress and no observable side-effects. (Intrapleural injections of retrograde anatomical tracers and siRNA.)
2003-37989A	Dougherty, Brendan	Rat	72 HOUR POST-OP ANALGESIA POLICY	Adequate analgesic effects for these routine and very brief procedures are accomplished in a single pre-operative administration.
2003-37989A	Dougherty, Brendan	Rat	NON-PHARMACAUTICAL GRADE COMPOUNDS	We may utilize non-pharmaceutical-grade urethane as all acute neurophysiological experiments are terminal. Transition from inhaled isoflurane to Urethane is necessary for studies of respiratory neurophysiology because isoflurane is a profound respiratory depressant, while urethane maintains long-lasting anesthesia with minimal effect on cardio-respiratory function. We may utilize non-pharmaceutical-grade Pancuronium Bromide if/when pharmaceutical grade is unavailable. The pharmaceutical grade version of this compound is currently available through only one vendor (Pfizer) and is frequently back ordered for weeks to months at a time. Also, this compound is stable for up to 36 months in solution as specified by the manufacturer (they recommend retesting at 36 months). We will maintain our stores of Pan B for up to 12 months. For best practice, Pan B will be made using USP Saline and filter sterilized into sterile vials using 0.45uM filters.
2003-37989A	Dougherty, Brendan	Rat	SOCIAL HOUSING	Paired rats receiving modifications to fluid and/or diet to study the effects of obesity may gain sufficient body mass to surpass allowable weight restrictions within standard Rat containers. If this should occur, all attempts would be made to provide larger housing containers to allow for continued paired housing and adequate environmental enrichment for these rats as there is no specific scientific need to separate them. However, in the event that suitable accommodations for lager rodents could not be attained, rats would be housed individually until the completion of the study. Enrichment would continue to be provided. This exception would permit adequate freedom of movement, access to food and water and access to environmental enrichment.
2003-37991A	Guedes, Alonso	Pig (Biomedical)	MULTIPLE SURGERY	The study endpoint will be two weeks post-fentanyl challenge. If necessary, the fentanyl challenge with PK samples will be repeated in the same animals (once) no sooner than 7 days after the first challenge, at which point the minipigs will be humanely euthanized. Animals undergoing a repeat challenge will be humanely euthanized while under anesthesia for that challenge. (Cut down venous and/or arterial access)

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. (Spinal Cord injury and Scaffold Transplantation) 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. (Axonal Tracing) The rat must first be injured and recover to model a spinal cord injury so that we can test functional alterations after transplantation of scaffolds. Pain and distress will be controlled through analgesics and antibiotics. (Motor Evoked Potential (MEP) Recording)
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	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 WEIGH NG EXCEPTION (FOOD/FLU D)	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). (Antibiotic water)
2004-38031A	Metzger, Joseph	Mice, Rat	TUMOR ENDPO NT CRITERIA	See protocol
2004-38031A	Metzger, Joseph	Mice, Rat	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.
2004-38031A	Metzger, Joseph	Mice, Rat	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
2004-38033A	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.

2004-38045A	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 crosstalk 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. (Spare Nerve Injury)
2004-38045A	Guedes, Alonso	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (High-fat Diet)
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	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. (Intracardiac Perfusion)
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. (Liver cancer induction in mice)
2004-38049A	Harris, Reuben	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (NTBC in drinking water)
2004-38055A	Gewirtz, Jonathan	Rat	MULTIPLE SURGERY	In the event of catheter malfunction, a new catheter will be implanted in the ipsilateral femoral vein in order to keep a rat on protocol and avoid using additional new rats. Such catheter "reimplants" are well tolerated by the rats (they are indistinguishable in terms of general health and performance in behavioral protocols) and significantly reduces the number of animals needed for a given protocol. Catheter reimplants typically occur several weeks or months after the first surgery (Indwelling catheter implantation) All animals in this protocol will be tested for drug self-administration. Hence they will undergo in-dwelling IV catheter implantation prior to the start of behavioral procedures. (Brain microinjection)
2004-38055A	Gewirtz, Jonathan	Rat	SOCIAL HOUSING	Rats will be housed individually after catheterization surgery. If they are housed together they may damage another's catheter harness, which may then harm the rat if his/her catheter is pulled out.

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. (Electrode Implantation Surgery)
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.
2004-38075A	Widge, Alik	Rat	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	We need to weigh the animals every day to monitor 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)
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.
2005-38115A	Stromnes, Ingunn	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. (Parabiosis)
2005-38135A	[redacted]	Nonhuman Primate (Macaques)	MULTIPLE SURGERY	Viral tract-tracers and traditional neural-tract tracers must be compared, within subjects, in order to establish the relative efficacy of the new viruses for transport and uptake. They unfortunately can't be injected during the same procedure, because the transport time for viral tracers is >4 weeks, while the traditional tracers need 2 weeks (greater wait times until perfusion and the traditional tracers will not be visible in the cell). We will adjust time between surgeries according to veterinarian recommendations for each individual animal based on recovery. Additional painkillers may be given between surgeries if recommended, as well. (Neural tract tracer injection surgery) NOTE: these animals may have had previous survival surgeries, but this procedure is a NON-SURVIVAL surgery. We will adjust time between surgeries according to veterinarian recommendations for each individual animal based on recovery. Additional painkillers may be given between surgeries if recommended, as well. (Optical imaging non-recovery surgery)
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))
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 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.

2006-38175A	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.
2006-38182A	Garry, Daniel	Pig (Biomedical)	SOCIAL HOUSING	Animals will only be housed at [redacted] 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.
2006-38185A	Schumacher, Robert	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	Mice in toxicity studies are classified as Pain class C, because we need to see whether clinical signs of drug toxicity are reversible, i.e., whether the animals recover or continue to decline after a dose that causes symptoms of toxicity. See Health and Monitoring section for description of practices and procedures to assure that humane euthanasia is administered in a timely way.
2006-38190A	Clarkson, Christina	Horse, Cow (Biomedical), Pig (Biomedical), Goat, Sheep (Biomedical)	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	A sedative is administered prior to IV injection of pentobarbitol for euthanasia.
2006-38199A	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 every day 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)
2006-38199A	Widge, Alik	Rat	SOCIAL HOUSING	Because the animals will need to be singly housed during and after 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, we will singly house the rats before the behavioral training but after at least a week of habituation period following arrival. Changing pair-housing to single housing during the middle of behavioral training will not be ideal.
2006-38201A	Iaizzo, Paul	Pig (Biomedical), Other* (USDA), Sheep (Biomedical), Dog	NON-PHARMACAUTICAL GRADE COMPOUNDS	We prepare a modified St. Thomas solution that is typically used for heart transplantation. Our solution has demonstrated improved function after re-animation to make the most of the research prep from each study and we also aim to improve/modify solutions in order to improve outcomes in cardiothoracic transplantation.
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. t 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. (Viral Vector Infusion and LED device implantation)

2006-38206A	Bartolomucci, Alessandro	Mice	SOCIAL HOUSING	Animals may be singly housed at times to prevent stress, injury and death due to same-sex incompatibility 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).
2006-38215A	Herzberg, Mark	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	No adverse affects are expected with the addition of antibiotics which are known to be well tolerated. (Antibiotic 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	See protocol
2006-38231A	Mc Pherson, Scott	Mice	72 HOUR POST-OP ANALGESIA POLICY	See protocol
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. (Spared Nerve Injury (SNI))
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.
2007-38243A	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 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
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.
2007-38259A	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.

2007-38274A	Mashek, Douglas	Mice	BLOOD COLLECTION L MIT	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. (Jugular Vein and Carotid Artery Catheter Placement)
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. (Spinal Nerve Ligation)
2007-38296A	Paulsen, Megan	Mice	BLOOD COLLECTION L MIT	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. (Fetal blood collection)
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.

2007-38316A	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.
2007-38318A	Cardona, Carol	Chicken	BLOOD COLLECTION L MIT	We need to have enough blood to collect peripheral blood monocytes (PBMCs) or the white cell fraction from whole blood. I'm uncertain how much I will need but plan to start with 2 ml. In the first blood draw, I will evaluate if I can extract sufficient numbers of PBMCs and get accurate interferon measures with 1 ml. If I can, I will reduce the amount of blood that I collect at each timepoint. I anticipate that we will not need an exception and that our blood draws (total of 8 ml) will be under 1% of the birds body weight (850-950g) over 2 weeks. (Blood collection in isolators, chickens) I plan to measure IFN levels in PBMCs and need enough whole blood to extract that fraction. I will evaluate if I can do the measure with less blood and if that is the case, I will collect 2 ml or 1 ml per time, whatever works. I anticipate that we will not need an exception and that our blood draws (total of 8 ml) will be under 1% of the birds body weight (850-950g) over 2 weeks. (Blood collection in isolators, chickens)
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))
2008-38343A	[redacted]	Nonhuman Primate (Macaques)	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. (Kidney transplant)
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. (Jugular Vein Catheter Placement)

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 responsible 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 Implant) Transmitter replacement or repair is necessary if the original transmitter fails, since blood pressure is the primary measurement in this study. (Transmitter reimplant (if needed))
2008-38393A	Osborn Jr, John	Sheep (Biomedical)	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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)
2009-38417A	Heins, Bradley	Cow (Agricultural)	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	Standard protocol for calf studies are biweekly body weights which is adequate to detect response differences. (Performance of Calves Pre- and Post-Weaning fed complete pelleted starters formulated with or without BP and with our without added sugar.) Because of no restriction to intake weekly weighing is not necessary, normal 2 week weighing will be adequate. (Performance of calves Pre- and Post-Weaning fed complete pelleted starters formulated with or without BP and with or without added sugar.)
2009-38418A	Osborn Jr, John	Sheep (Biomedical)	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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)
2009-38420A	Haskell-Luevano, Carrie	Mice	72 HOUR POST-OP ANALGESIA POLICY	Additionally, post-operative analgesic therapy is contraindicated since provision of analgesics would inhibit the neurochemical changes required to develop the hypersensitive states to be studied. (Spared nerve injury)
2009-38423A	Johnston, Lee	Pig (Agricultural)	FOOD/FLUID RESTRICTION RECORDKEEPING	This study will be conducted on a commercial farm. Farm staff are responsible for feeding and care of the sows and piglets. Farm staff will monitor feed intake and dietary treatment allocations daily but will only record sows that do not consume their feed. Dietary treatment allocations will be marked on each sow's gestation stall. (Feeding sows gestation diets at different time points in gestation supplemented with 3 levels of zinc as zinc sulfate monohydrate: 125 ppm, 290 ppm, or 3,885 ppm additional zinc.)
2009-38426A	LeBeau, Aaron	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	t 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 described below.

2009-38447A	Groman, Stephanie	Rat	SOCIAL HOUSING	Rats with surgical implants may need to be singly housed after implantation to avoid damage to th
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. (Spare Nerve Injury)
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.
2009-38450A	Guedes, Alonso	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (High-fat Diet)
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 moribund 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.).
2009-38457A	Orr, Harry	Mice	MULTIPLE SURGERY	8 Weeks in between Bolus injection of antisense nucleuotides has been shown to result in more uniform delivery to all regions of the mouse brain than slower release pump delivery, however antisense nucleuotides degrade over time so multiple bolus injections may be necessary to achieve full therapeutic potential. Our mice recover quickly from this short survival surgery and any additional surgeries will take place an absolute minimum of 4 weeks apart. In a currently ongoing clinical trial for antisense nucleuotides therapy in HD, patients receive intrathecal injection every 3 months. Antisense nucleuotides used in that trial are similar in chemical composition and mechanism of action to the antisense nucleuotides used in our translational studies. (Direct Intracerebroventricular injection) Since this procedure is linked to other procedures in our protocol, it would follow after them at the same occurrence rate. (Stitch Removal)
2009-38457A	Orr, Harry	Mice	72 HOUR POST-OP ANALGESIA POLICY	This is a follow up procedure for the removal of stitches, and is noninvasive. (Stitch Removal)
2009-38457A	Orr, Harry	Mice	EUTHANASIA DEATH/MORIBUND ENDPOINT	The 154KI mice have a premature death phenotype, as mentioned in other sections. We are working on several treatments as well as new mutations, and mice that may or may not have a similar phenotype. To assess if they do we need to allow the mice progress to a moribund state. The new treatments will prolong the life span of the 154 ki mice. The new mutations may stop or delay the premature death of these animals.
2009-38457A	Orr, Harry	Mice	ANESTHESIA, SURGERY, AND POST-PROCEDURAL RECORDKEEPING	Further monitoring of a given mouse is not necessary as the procedure is terminal before 15 minutes pass. (Non-survival perfusion) This is a follow up procedure for the removal of stitches, and is noninvasive. (Stitch Removal)
2009-38457A	Orr, Harry	Mice	EUTHANASIA METHOD	Neonates up to P8 are euthanized by decapitation with surgical scissors as they do not have mature nociceptors and are resistant to hypoxia. P10 through P17 are anesthetized with C02 until they no longer move and decapitated.

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. (Orthotopic Tumor cell implantation. tumor resection)
2009-38488A	Kyba, Michael	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 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 such as cryo-injury, we cannot use analgesics for this procedure. (Transplantation of muscle stem cells)
2009-38488A	Kyba, Michael	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. (Muscle injury by injection)
2009-38488A	Kyba, Michael	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	SOCIAL HOUSING	Necessary for housing mice in environmental chambers to study metabolism.
2009-38488A	Kyba, Michael	Mice	EUTHANASIA METHOD	Embryos 15 days of gestation or greater will be decapitated.
2009-38491A	Smith, Gordon	Other* (USDA)	MULTIPLE SURGERY	See protocol

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. t 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 intracranial microinjections, in which postoperative analgesics are routinely administered. In animals >P8, we will apply the same postoperative analgesia protocols which we have used successfully in many animals: As noted above, 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 in animals >P8 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.
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.
2009-38492A	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. Multiple surgical procedures are necessary to model and monitor the clinical course of human prostrate cancer. One surgery is necessary to implant tumors at subcutaneous sites in the mouse. The second surgery, castration, is used to mimic androgen depletion therapy. Biopsies of tumors are taken at 2 week to 1 month intervals during tumor growth to track clonal dynamics of cancer cells. Biopsies allow us to reduce animal numbers by enabling collection of an intermediate time-point before endpont.
2009-38503A	Bartolomucci, Alessandro	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. Mice are also singly housed during the first 3 post surgical days, to allow wound healing and more accurate monitoring of each individual subject recovery. As per RAR practice, male mice can be occasionally isolated due to spontaneous escalation of fighting behavior leading to wounds/injury.

2009-38503A	Bartolomucci, Alessandro	Mice	SOCIAL HOUSING	Animals may be singly housed at times to prevent stress, injury and death due to same-sex incompatibility 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. Animals may be singly housed as required for the assessment of indirect calorimetry, food intake and locomotor activity during the duration of the recording (up to 8 weeks)
2010-38524A	Chen, Chi	Mice	SOCIAL HOUSING	For experiment 1, mice of all treatment groups will be housed individually in metabolic cage on days 1 though 4. For experiment 2 (including 2.1, 2 2, and 2.3), mice will be placed in metabolic cages only in last day of AIN93G acclimation, day 4 and 7 of the experiment.When not housed in metabolic cage, mice will be group housed.
2010-38529A	Waye, Heather	Reptile (Other)	ENVIRONMENTAL ENRICHMENT	Snakes do not require social housing. The cage does have environmental enrichment, in the form
2010-38531A	Patel, Manish	Mice	TUMOR ENDPO NT CRITERIA	For most ulcerated tumors, the mice will be euthanized. However, if the tumor is ulcerated and is decreased in size as a result of treatment, we will treat those animals using topical treatment on the ulcer itself. In each case, we will consult with veterinary staff about the most appropriate way to treat these mice. If there is no resolution of the ulcer within 5 days of palliative management, the mice will be euthanized. (Tumor Induction II)
2010-38534A	Mand, Sandy	Fish (Other), Amphibian (Other), Reptile (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. We change the bedding material/sand every month or two depending on the condition of the sand. Feces are regularly removed to maintain cleanliness.
2010-38534A	Mand, Sandy	Fish (Other), Amphibian (Other), Reptile (Other)	SOCIAL HOUSING	We have a male leopard gecko. Male geckos fight when housed together and we would prefer not to breed geckos. □ We also have a ball python that is housed individually. t is only recommended to house ball pythons together for breeding and we are not intending to breed our snake.
2010-38544A	Robinson, James	Mice	TUMOR ENDPO NT 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. (RCAS Tumor Induction)
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. (Bacterial Inoculation)
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. (Parabiosis)
2010-38559A	Waye, Heather	Reptile (Other), Amphibian (Other)	ENVIRONMENTAL ENRICHMENT	Snakes do not require social housing. The cage does have environmental enrichment
2011-38591A	Thomas, Mark	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 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.
2011-38598A	Lee, Anna	Mice	EUTHANASIA METHOD	Decapitation will be used for P0 or E15 mice using sharp scissors. The addition of sedation to these animals can interfere with the success of neuronal culturing experiments
2011-38598A	Lee, Anna	Mice	SOCIAL HOUSING	During the oral drug consumption tests and taste preference tests, mice will be individually housed to be able to measure the amount of consumption for each mouse. The mice will either be group housed again after the tests are over, or euthanized if the experiment is completed.
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)
2011-38613A	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 NSA Ds 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). (Spinal Nerve Ligation)
2011-38614A	Georgieff, Michael	Mice	BLOOD COLLECTION L MIT	The 18% severe anemia group requires the greatest volume of blood to be drawn from the animal. The animals reaches a hematocrit of 18 at roughly P9-P10 which equates to a maximum of 84ul at a rate of 5.25 ul/g twice daily. After threshold is reached they are bled at 3 25 up/g once daily to maintain hematocrit followed by imaging/ tissue collection occurs at P14 (no phlebotomy at P14). This totals to a total blood volume loss of 97.5ul. At p14 our animals weigh between 8-10g which brings the average very close to the permitted weight.□ □ In the NICU, severely anemic babies have a hematocrit of 50% the normal value.The average hematocrit of a healthy mouse is approximately 36% , the half of which is 18%. Thus a hematocrit of 18% simulates conditions closer to those experienced by the severely anemic group in the NICU. (Phlebotomized mouse model)
2011-38628A	Lesne, Sylvain	Mice	SOCIAL HOUSING	Mice that are returned to cages after maze trials can often start fighting, which can make behavioral data not usable. We therefore need to singly house all animals that will be behaviorally characterized. Animals will be acclimated to single housing the week before behavioral tests begin. Thus, animals may be singly housed for up to 12 weeks to accommodate the length of the Restaurant Row Task.
2011-38649A	Shimizu, Yoji	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. (Parabiosis surgery)

2011-38649A	Shimizu, Yoji	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. (Resection of ear pinna)
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 moribund at day 7. Death may be delayed in vaccine-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.
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 fiber). 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 inhibitors 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	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. (Cardiac Perfusion)
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.
2012-38672A	Kim, Do-Hyung	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. (Mouse colony)
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.
2012-38674A	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.
2012-38678A	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. (Intracranial injections)
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 fiber 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)
2012-38686A	Garry, Mary	Mice	EUTHANASIA METHOD	Cervical dislocation will be performed by technically competent staff to ensure quick and complete euthanasia. Decapitation will be used for euthanasia of mouse embryos and neonates up to day 10.

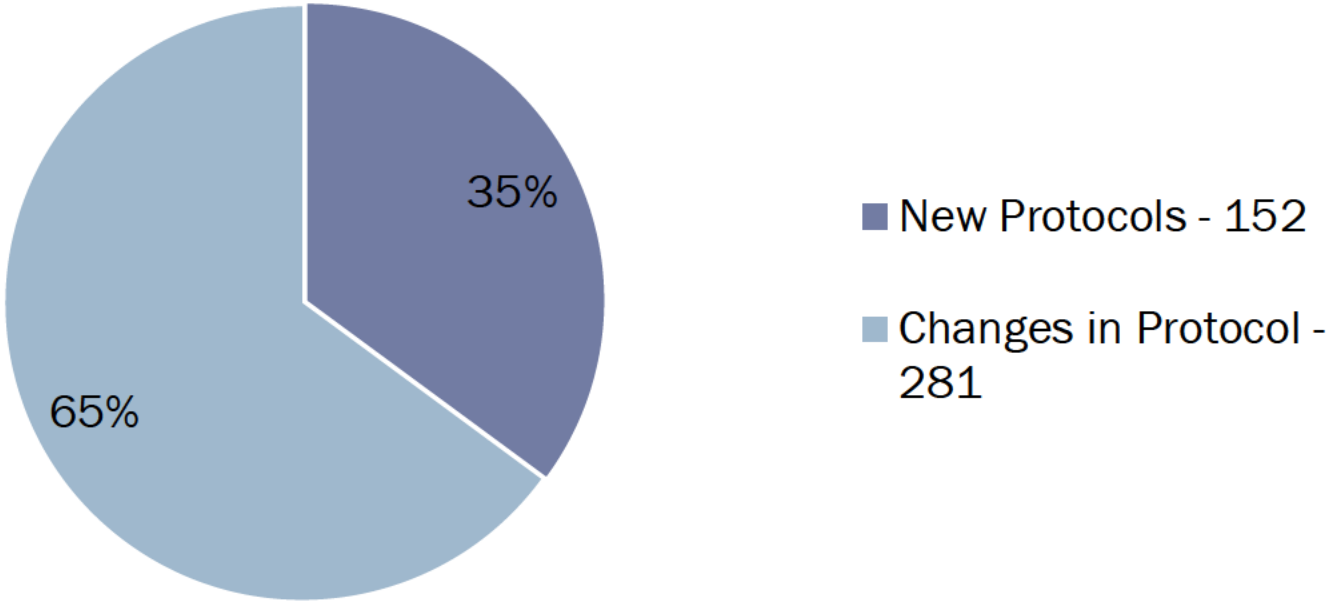
2012-38703A	Bianco, Richard	Rat	72 HOUR POST-OP ANALGESIA POLICY	We are implanting subdermal implants which is a simple skin incision and pocket creation. We are not incising into muscle or a body cavity. Based on observations of rat behavior (including but not limited to, decreased activity, hunched 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. □ (Subdermal Patch implant)
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.
2012-38712A	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. t 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 WEIGH NG EXCEPTION (FOOD/FLU D)	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. (Dox diet)
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. (Induction and surgical prep for all procedures) t is essential that the stents are checked weekly to ensure the placement is still correct and to monitor the performance of the stent. (Stent implant and weekly check)
2101-38746A	Richard, Jocelyn	Rat	SOCIAL HOUSING	Rats that are pre-exposed to ethanol in their home cage need to by singly housed to allowed accurate measurement of alcohol consumption. Rats that are food restricted for some experiments will need to be singly housed to ensure that each individual receives adequate amounts of food. Finally, rats with surgical implants will need to be singly housed after implantation to avoid damage to the implants by the other subjects (who may attempt to chew on the implants).
2101-38762A	Czyzyk, Jan	Mice	BLOOD COLLECTION L MIT	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.

2101-38768A	Belcher, John	Mice	72 HOUR POST-OP ANALGESIA POLICY	The major endpoint for our research on sickle cell disease (SCD) is microvascular stasis. We have published numerous papers demonstrating that pro-inflammatory compounds increase stasis and anti-inflammatory compounds inhibit 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. (Dorsal skin fold chamber (DSFC) implantation)
2101-38768A	Belcher, John	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. (Terminal Blood Collection from the inferior vena cava or heart)
2101-38800A	Pacak, Christina	Mice	WEEKLY WEIGH NG EXCEPTION (FOOD/FLU D)	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. (Dox diet)
2102-38870A	Larson, Erin	Mice	SOCIAL HOUSING	Animals with IV catheters typically must be singly housing to prevent damage being done to the back ports by cagemates. However, we will pilot test group housing with the new magnetic VAB caps to determine feasibility and impacts on catheter patency duration.

IACUC RESEARCH SUBMISSIONS

OCTOBER 1, 2020 – MARCH 31, 2021

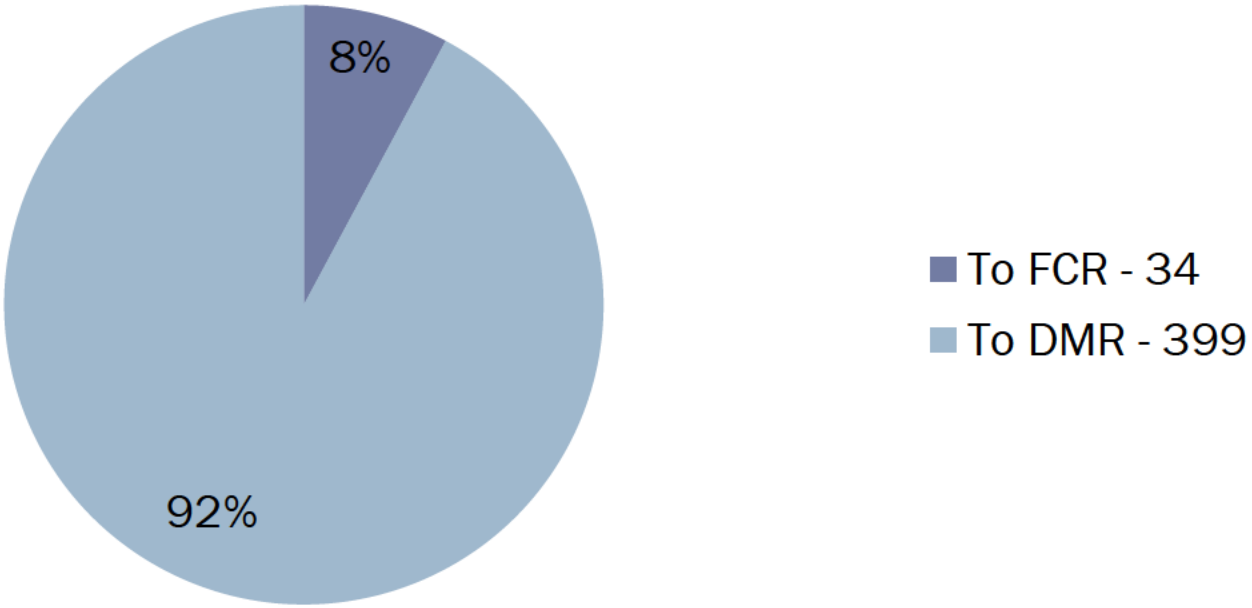
TOTAL SUBMISSIONS: 433



TOTAL SUBMISSIONS – 433

BY SUBMISSION TYPE

OCTOBER 1, 2020 – MARCH 31, 2021

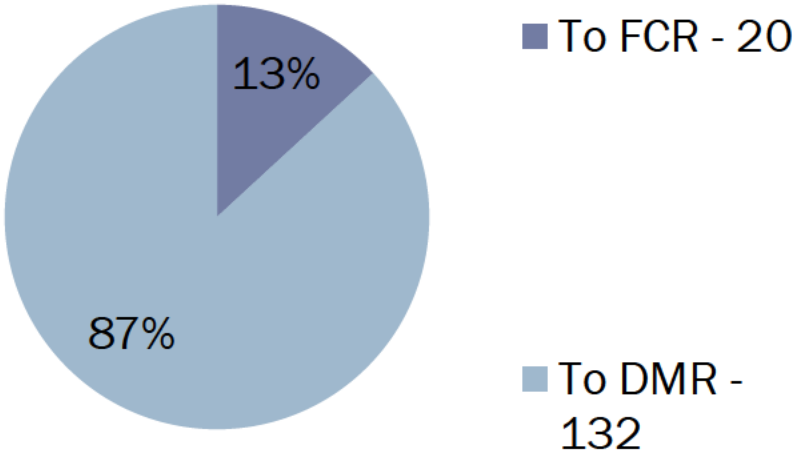


TOTAL SUBMISSIONS – 433

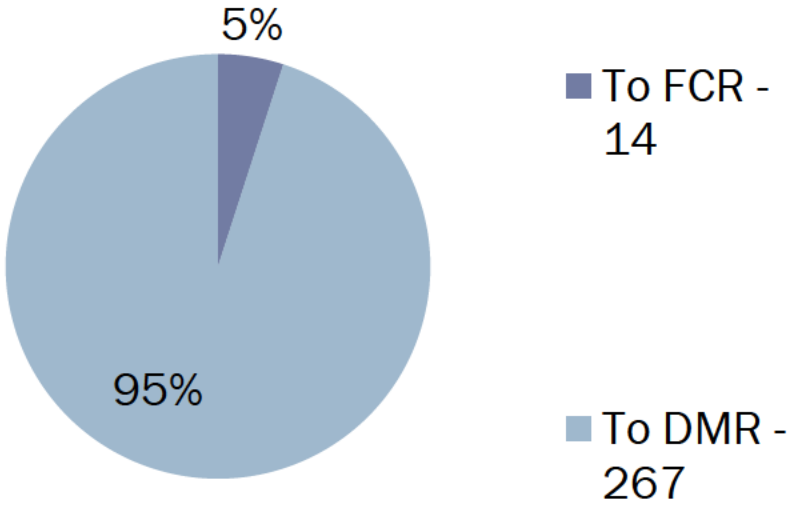
BY SUBMISSION TYPE

OCTOBER 1, 2020 – MARCH 31, 2021

NEW PROTOCOLS – 152



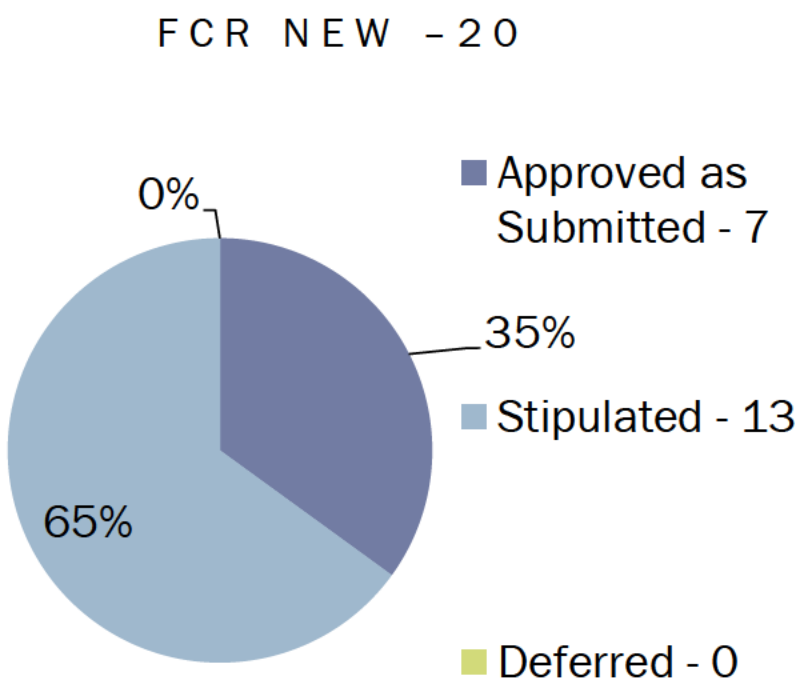
AMENDMENTS – 281

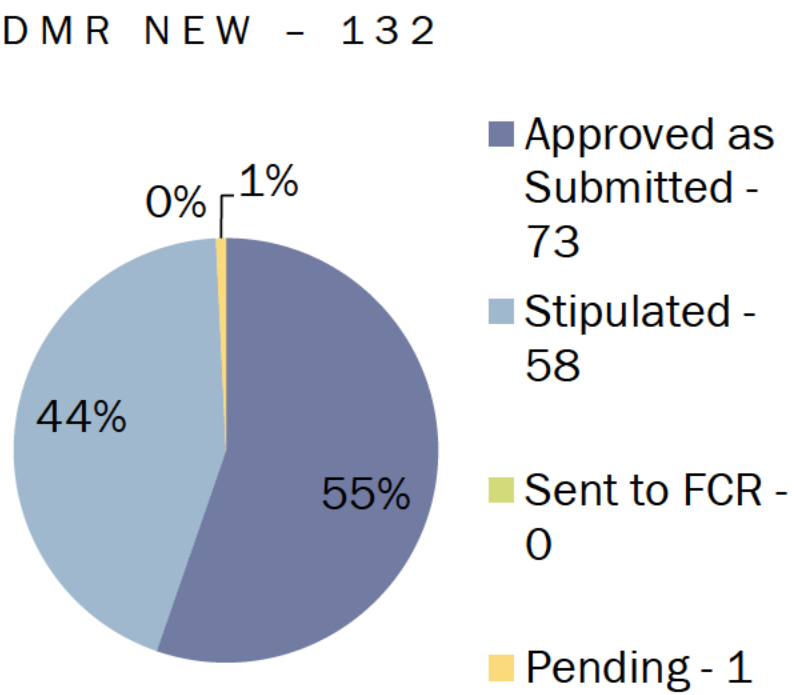


TOTAL SUBMISSIONS – 433

BY SUBMISSION TYPE

OCTOBER 1, 2020 – MARCH 31, 2021

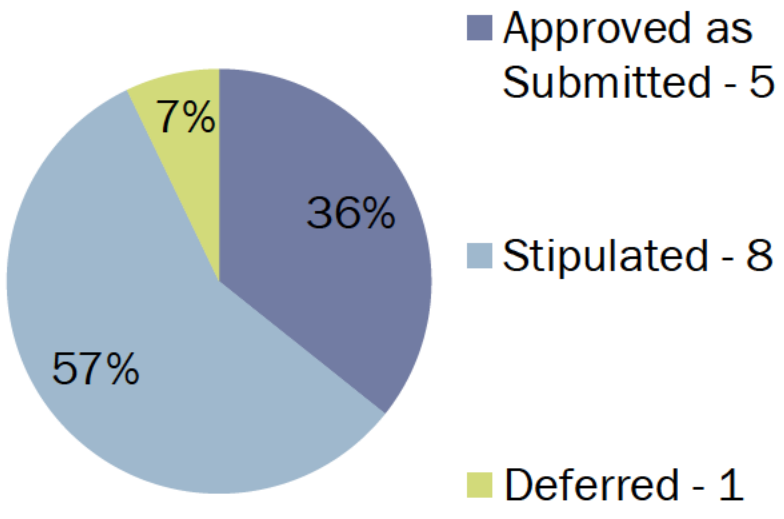




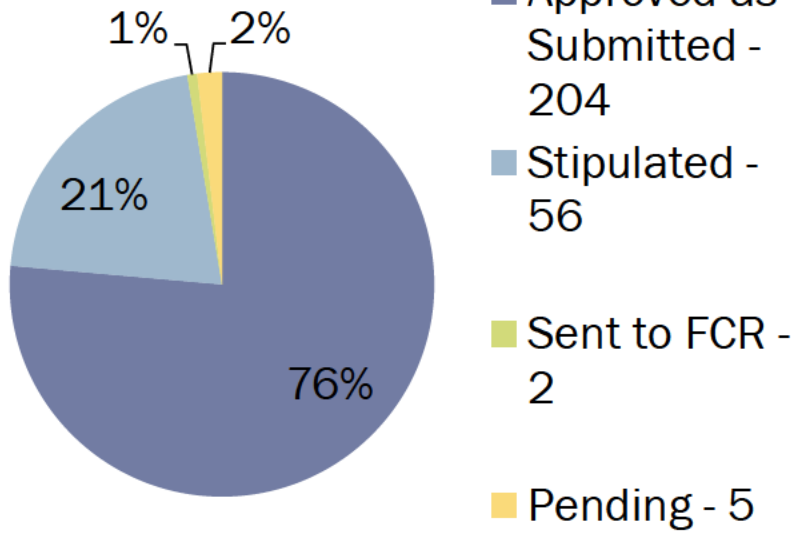
REVIEW OUTCOMES- NEW STUDIES

OCTOBER 1, 2020 – MARCH 31, 2021

FCR AMENDMENTS – 14

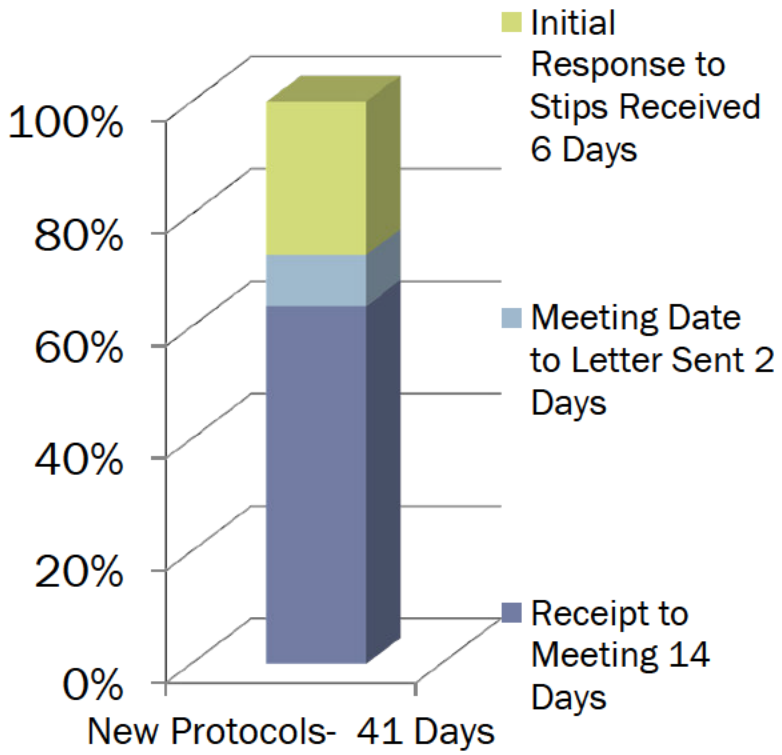


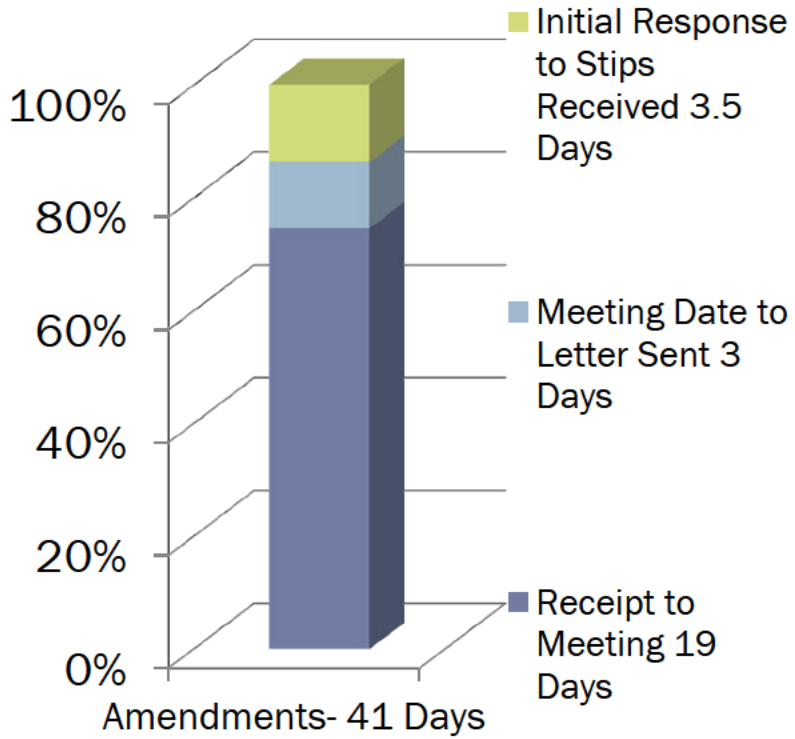
DMR AMENDMENTS -267



REVIEW OUTCOMES - AMENDMENTS

OCTOBER 1, 2020 – MARCH 31, 2021



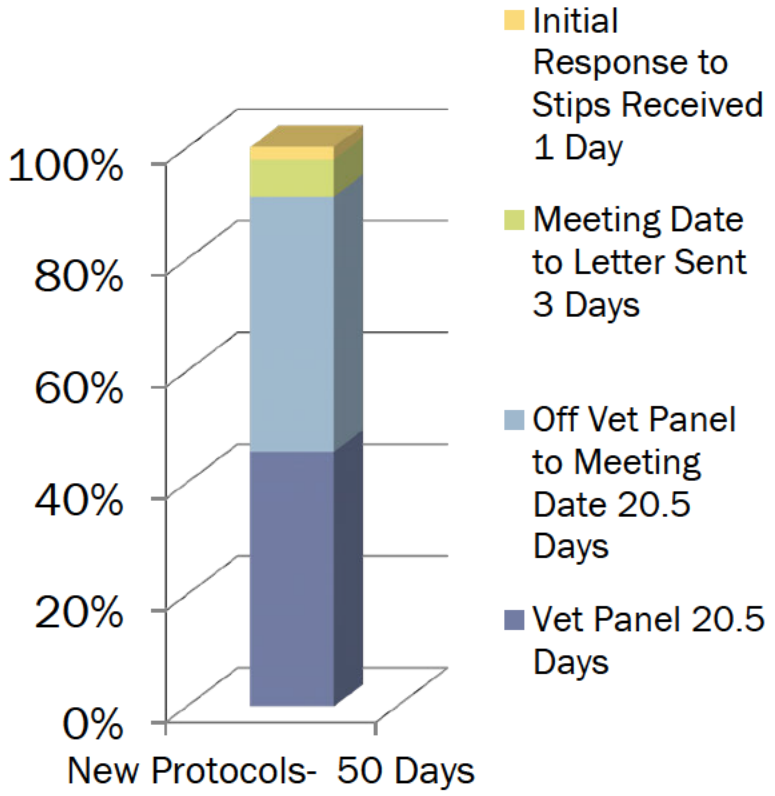


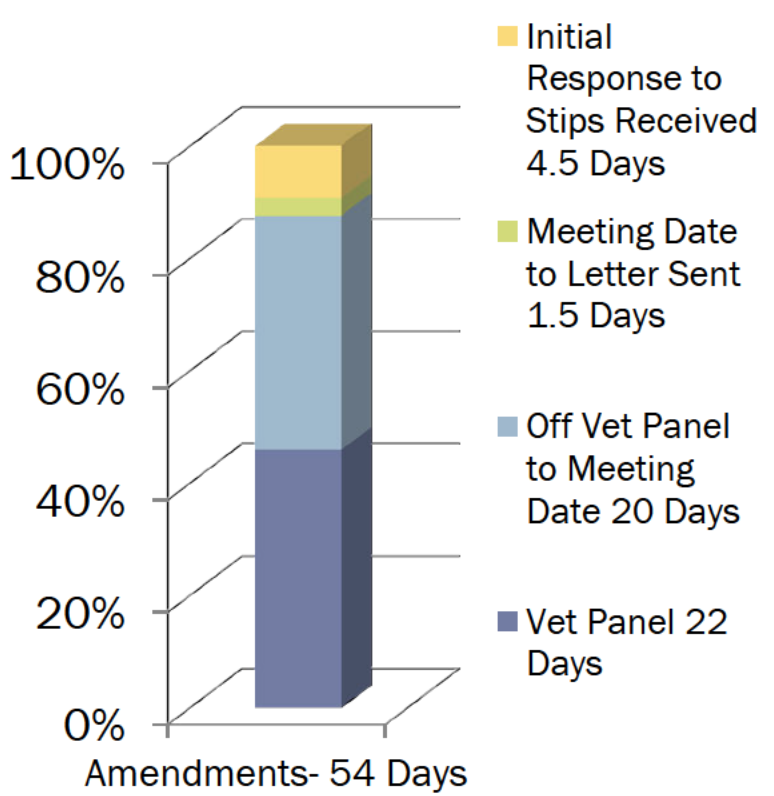
FCR SUBMISSIONS

MEDIAN APPROVAL TIMES

APRIL 1, 2020 – SEPTEMBER 30, 2020

-NO VET PANEL FOR MAJORITY OF THIS TIME FRAME



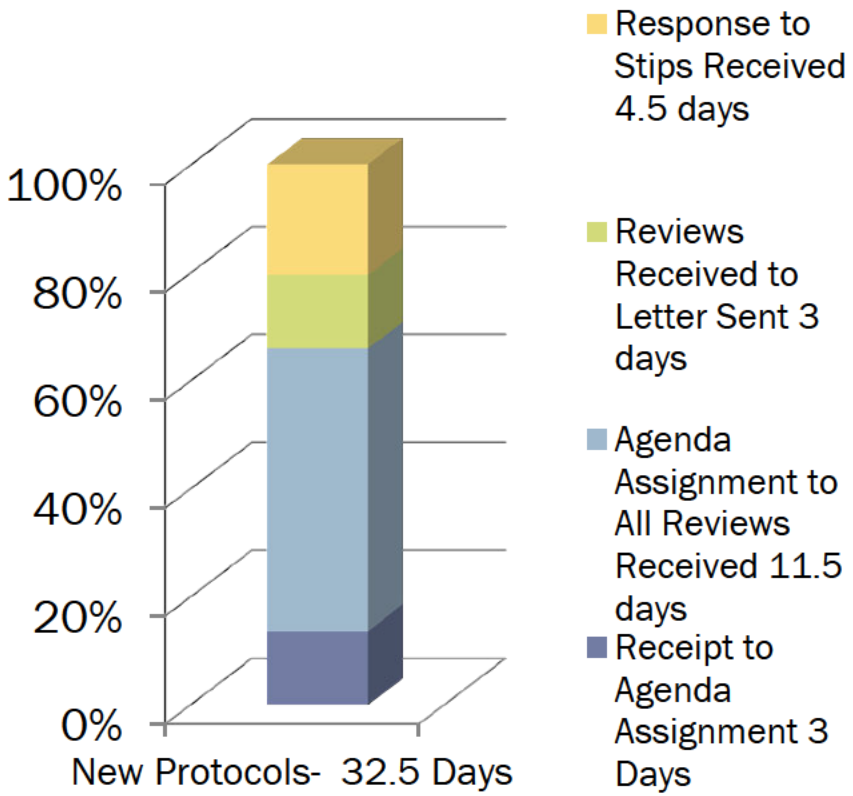


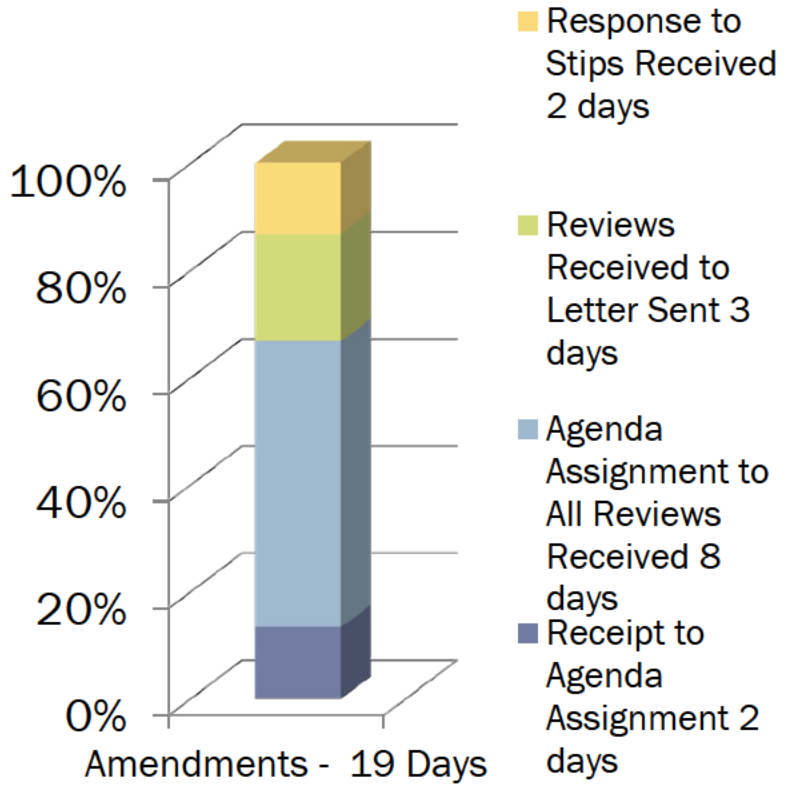
FCR SUBMISSIONS

MEDIAN APPROVAL TIMES

OCTOBER 1, 2020 – MARCH 31, 2021

-INCLUDES TIME ON VET PANEL



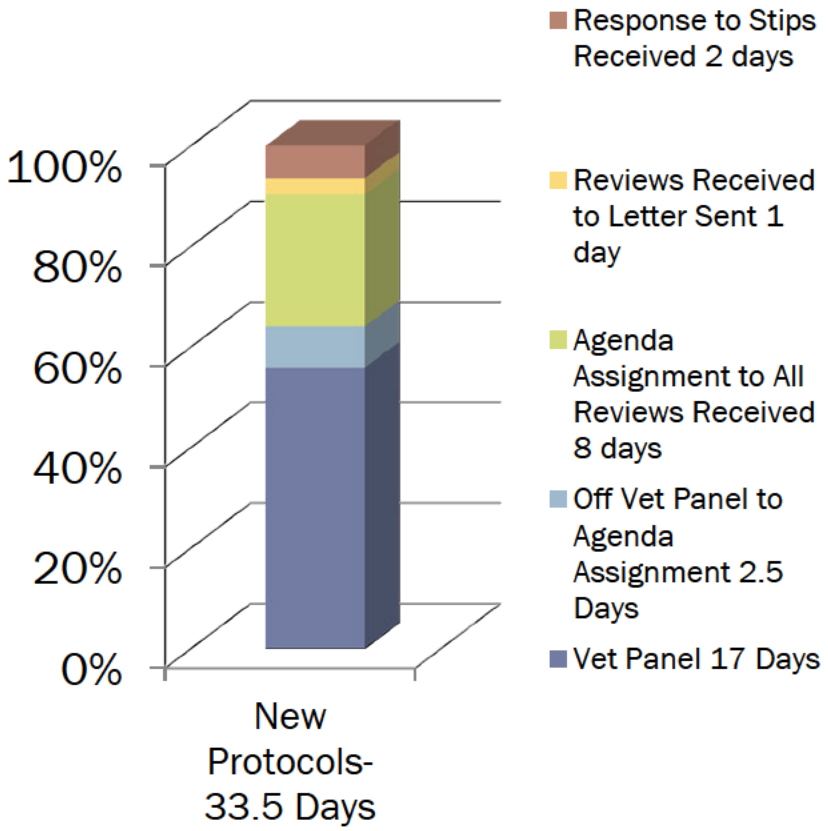


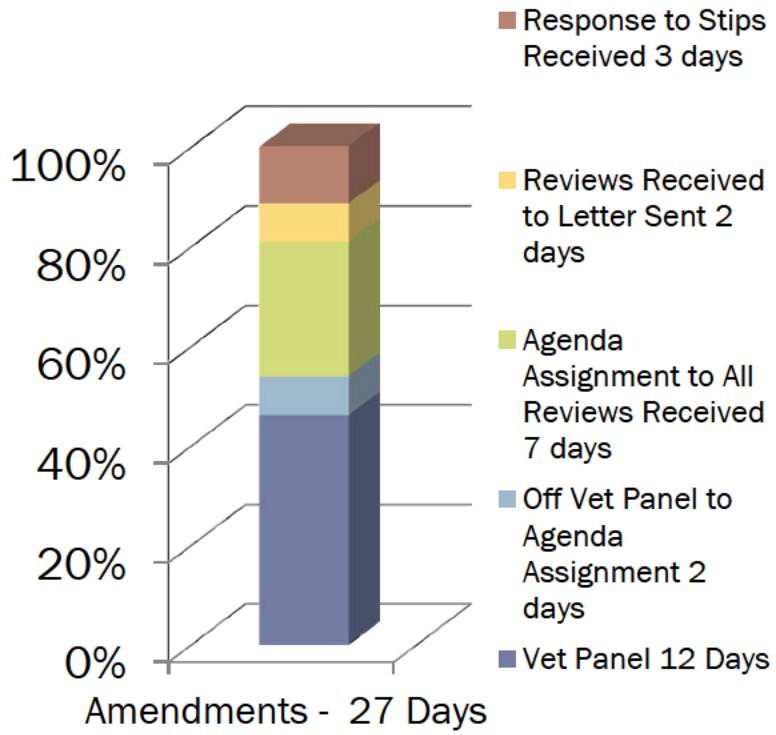
DMR SUBMISSIONS

MEDIAN APPROVAL TIMES

APRIL 1, 2020 – SEPTEMBER 30, 2020

-NO VET PANEL FOR MAJORITY OF THIS TIME FRAME



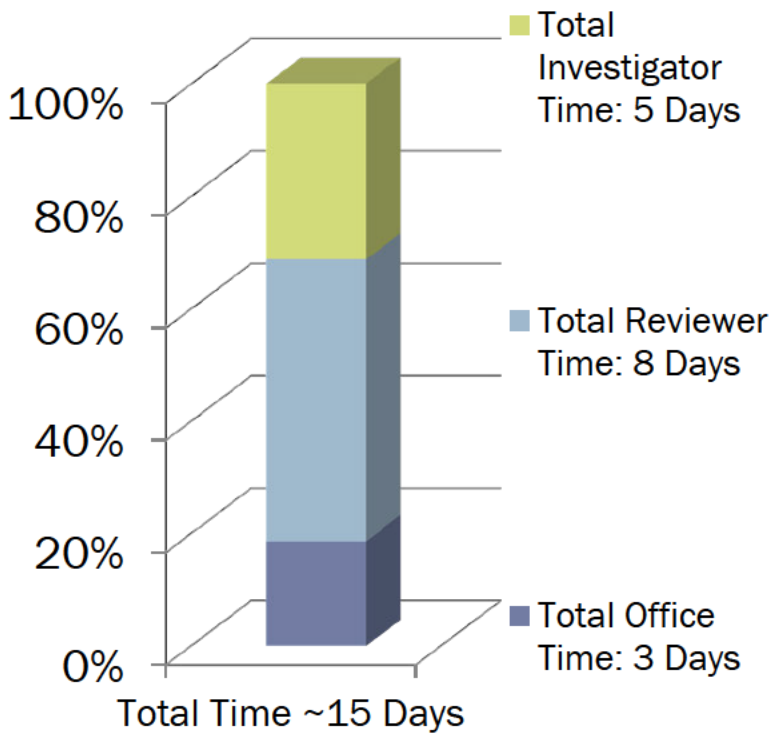


DMR SUBMISSIONS

MEDIAN APPROVAL TIMES

OCTOBER 1, 2020 – MARCH 31, 2021 (SOME ITEMS STILL PENDING)

*INCLUDES TIME ON VET PANEL

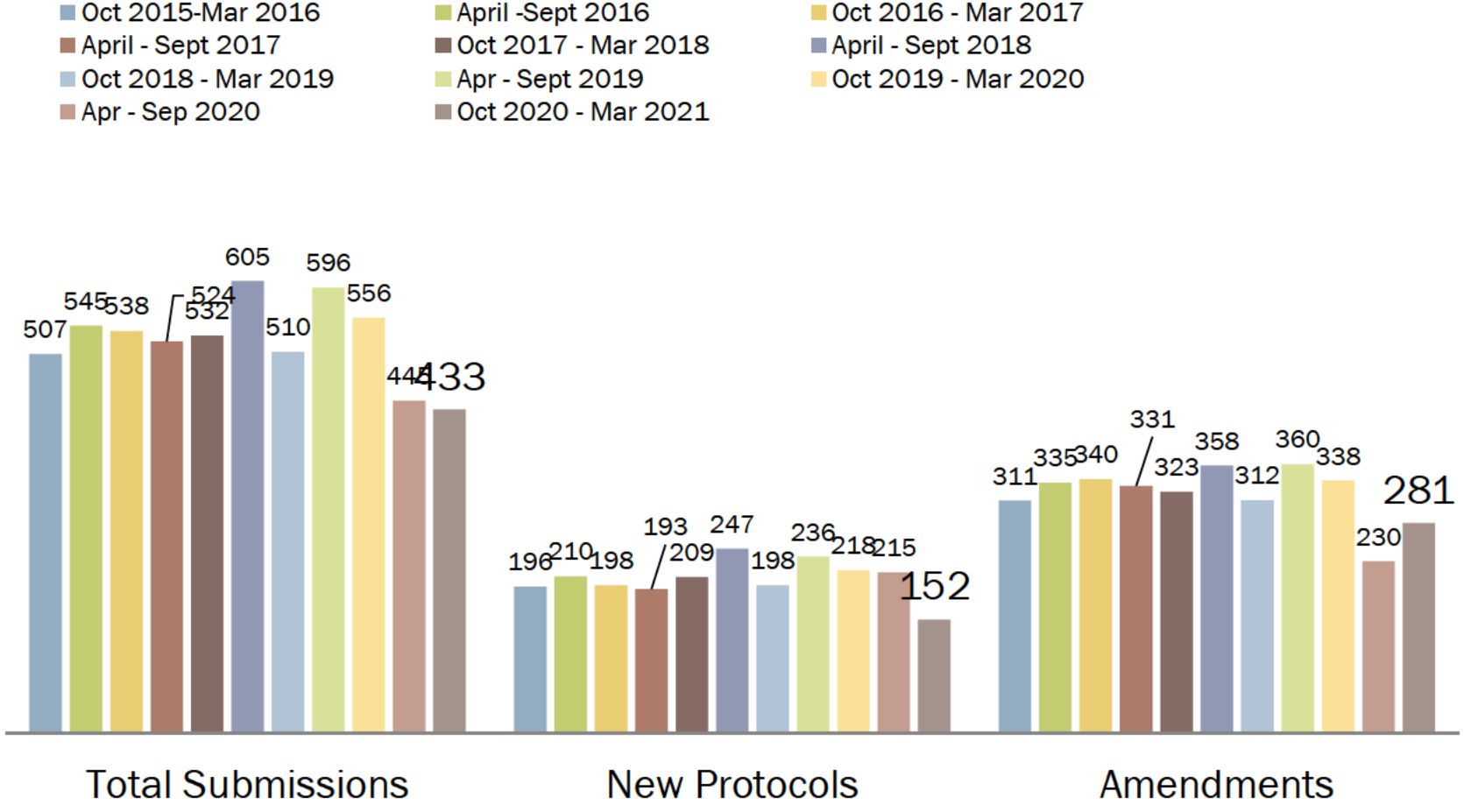


VET PANEL

MEDIAN APPROVAL TIMES

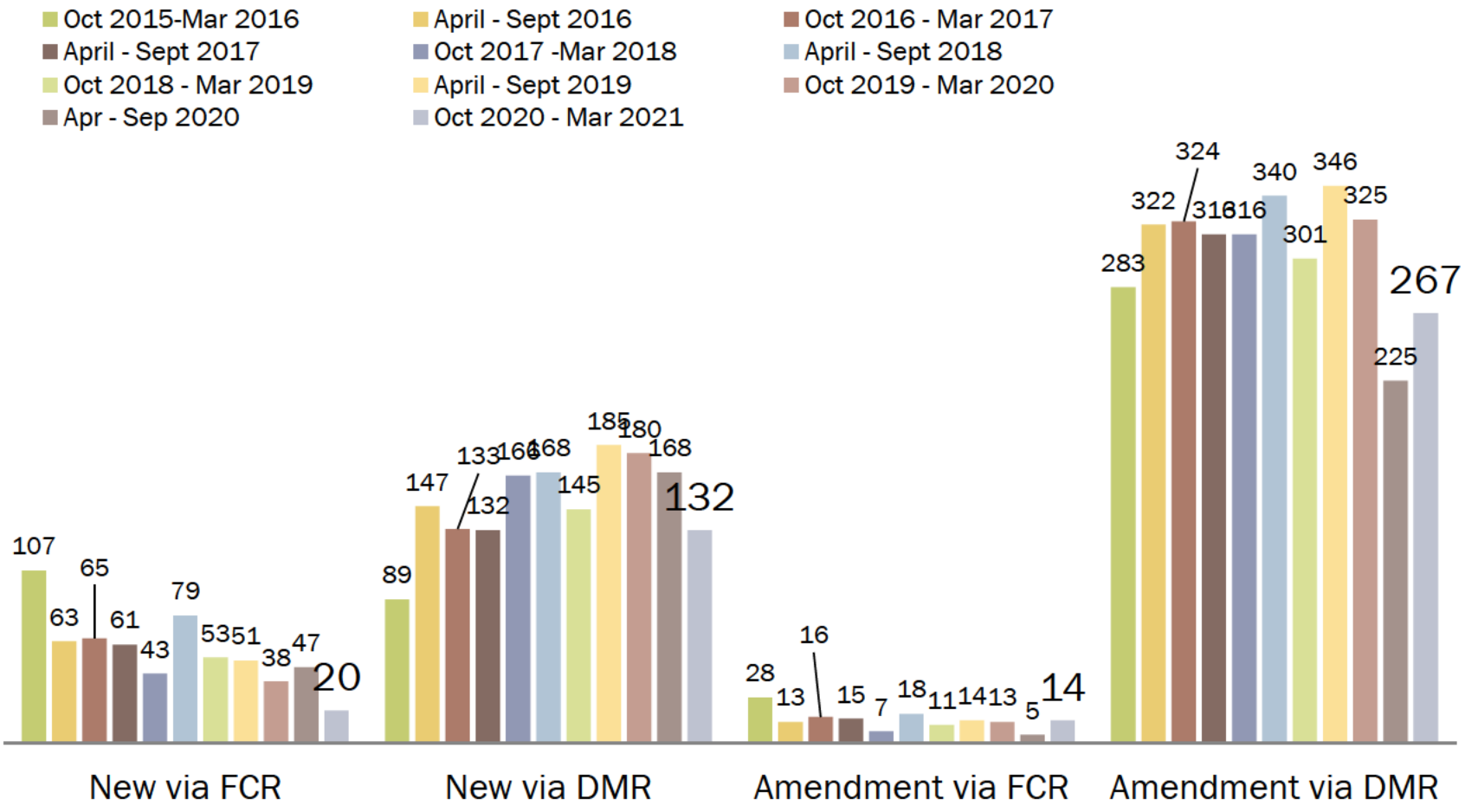
OCTOBER 1, 2020 – MARCH 31, 2021

TOTAL ITEMS: 409



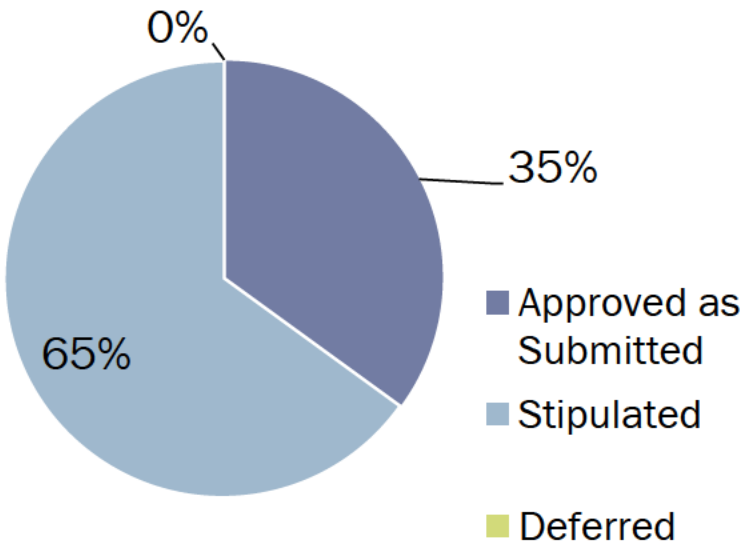
SUBMISSION COMPARISON – TOTALS BY TYPE

OCTOBER 2015– MARCH 2021

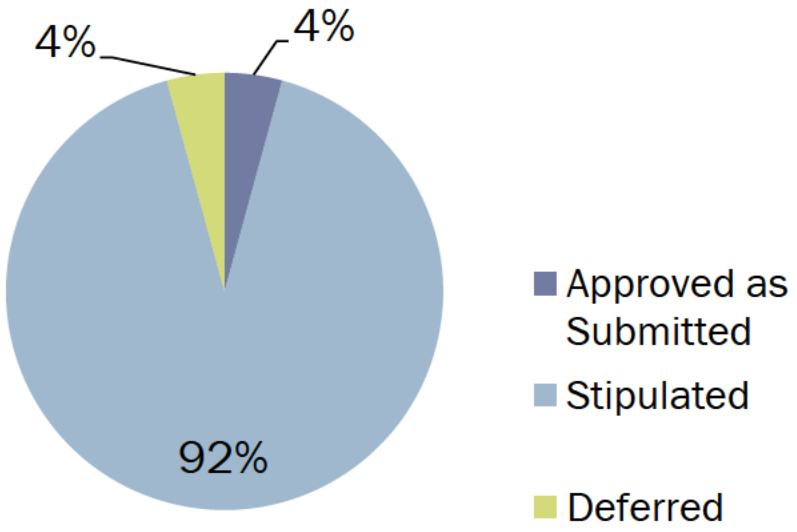


SUBMISSION COMPARISON –
TOTALS BY TYPE AND REVIEW PROCESS
OCTOBER 2015 – MARCH 2021

OCTOBER 2020 – MARCH 2021



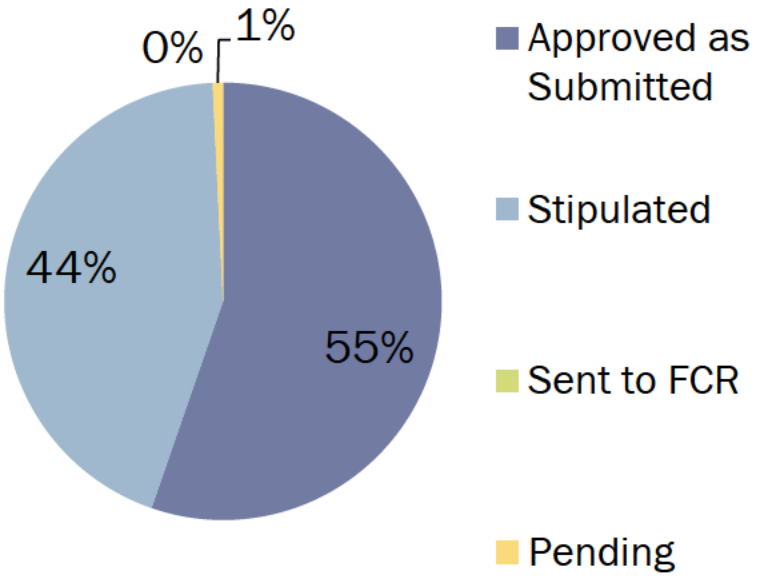
APRIL 2020 – SEPTEMBER 2020



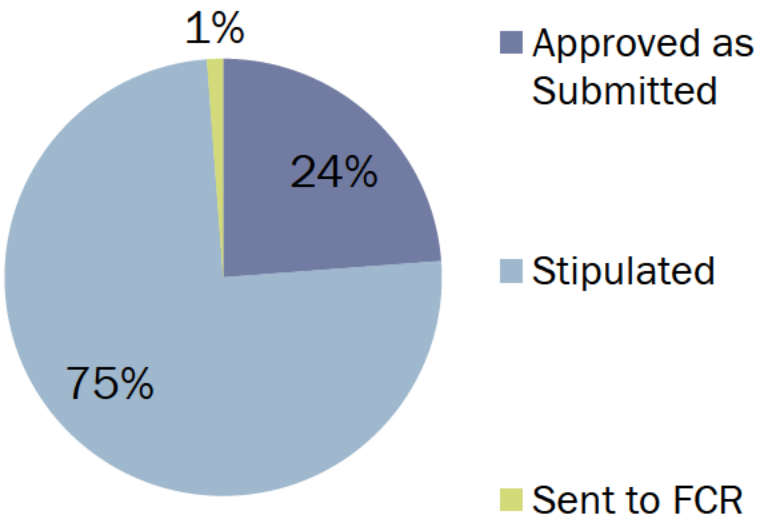
SUBMISSION COMPARISONS

REVIEW OUTCOMES – NEW PROTOCOLS VIA FCR

OCTOBER 2020 – MARCH 2021



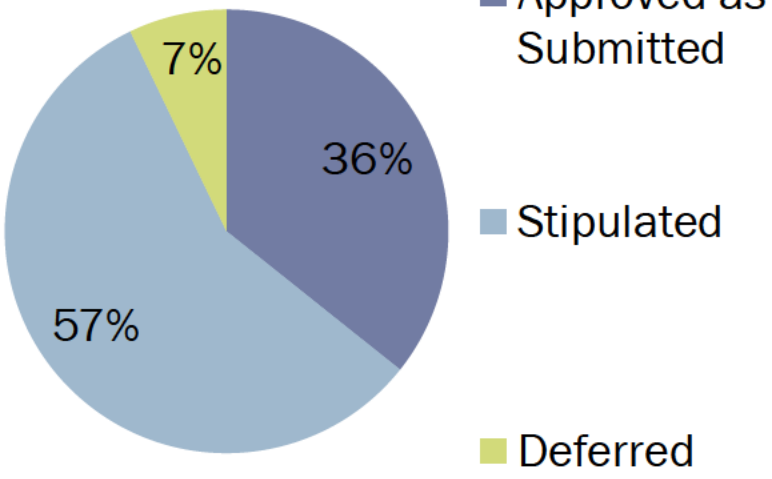
APRIL 2020 – SEPTEMBER 2020



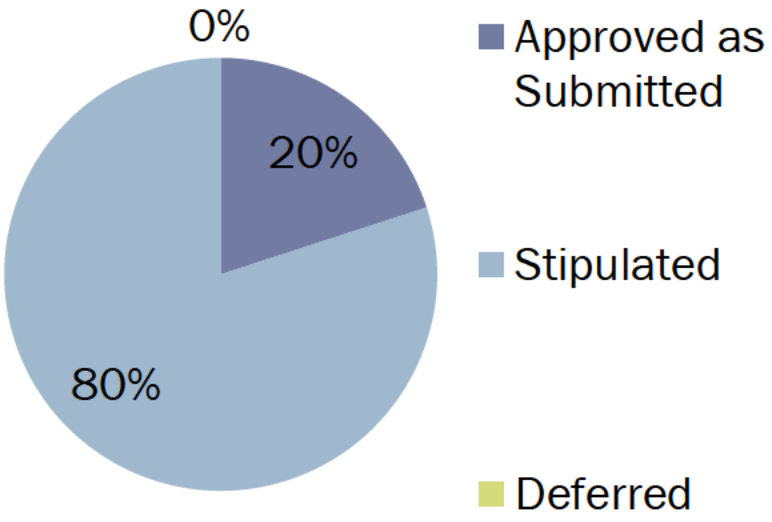
SUBMISSION COMPARISONS

REVIEW OUTCOMES – NEW PROTOCOLS VIA DMR

OCTOBER 2020 – MARCH 2021



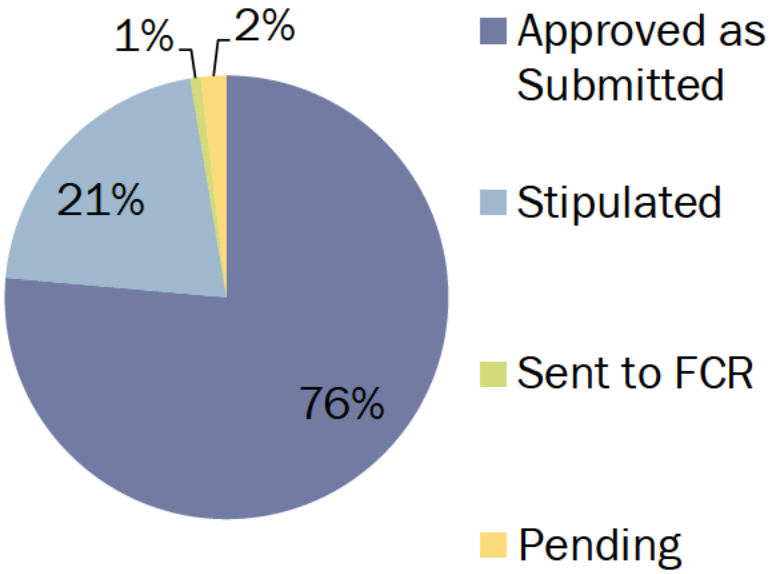
APRIL 2020 – SEPTEMBER 2020



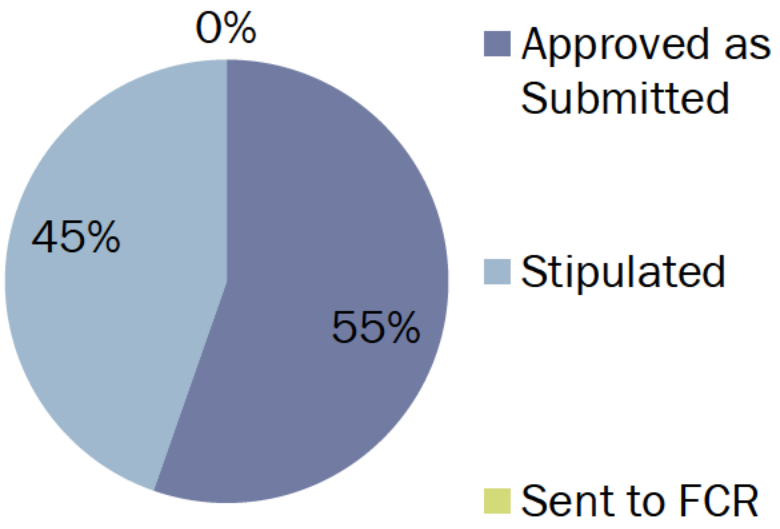
SUBMISSION COMPARISONS

REVIEW OUTCOMES – AMENDMENTS VIA FCR

OCTOBER 2020 – MARCH 2021

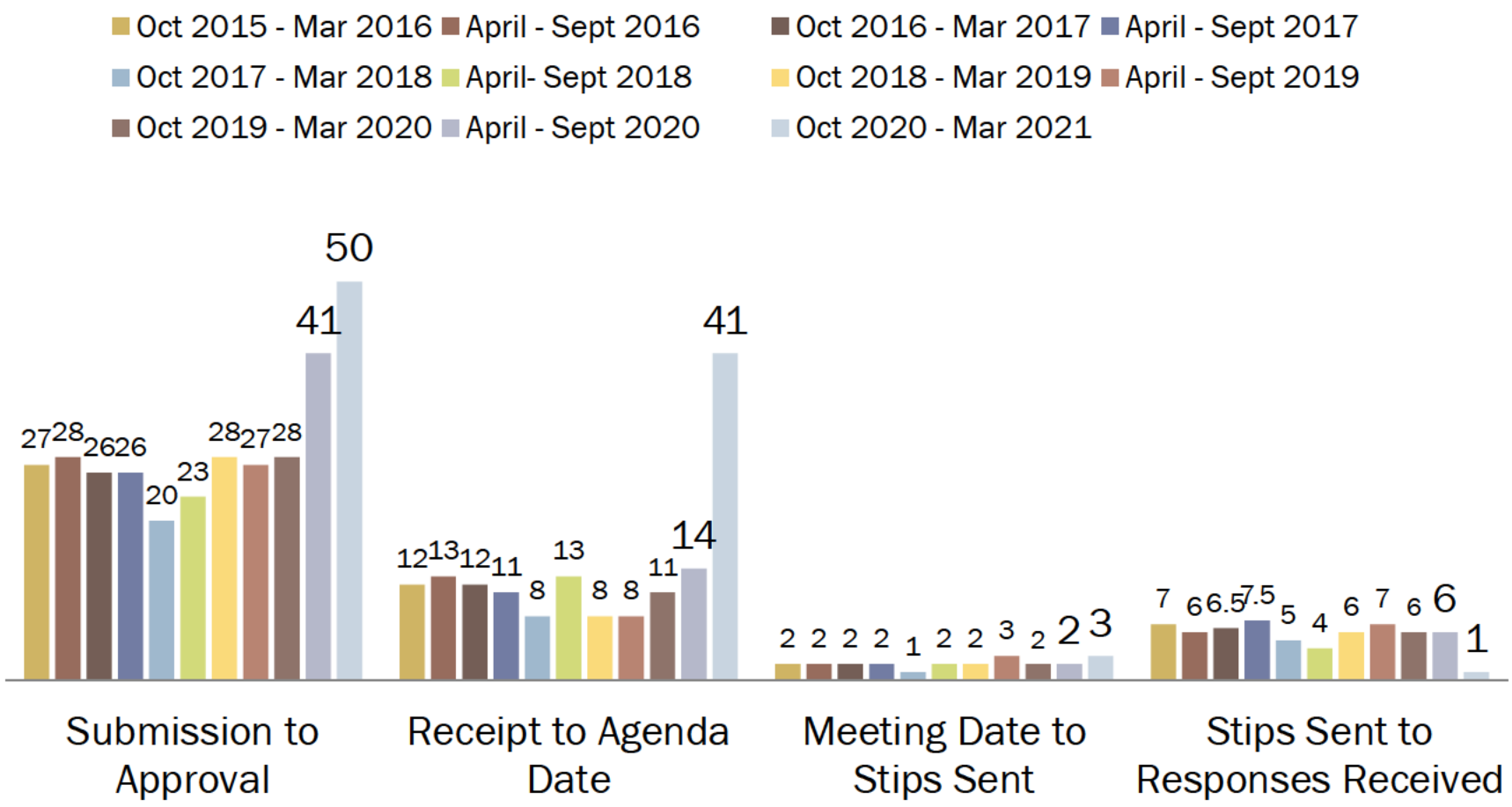


APRIL 2020 – SEPTEMBER 2020



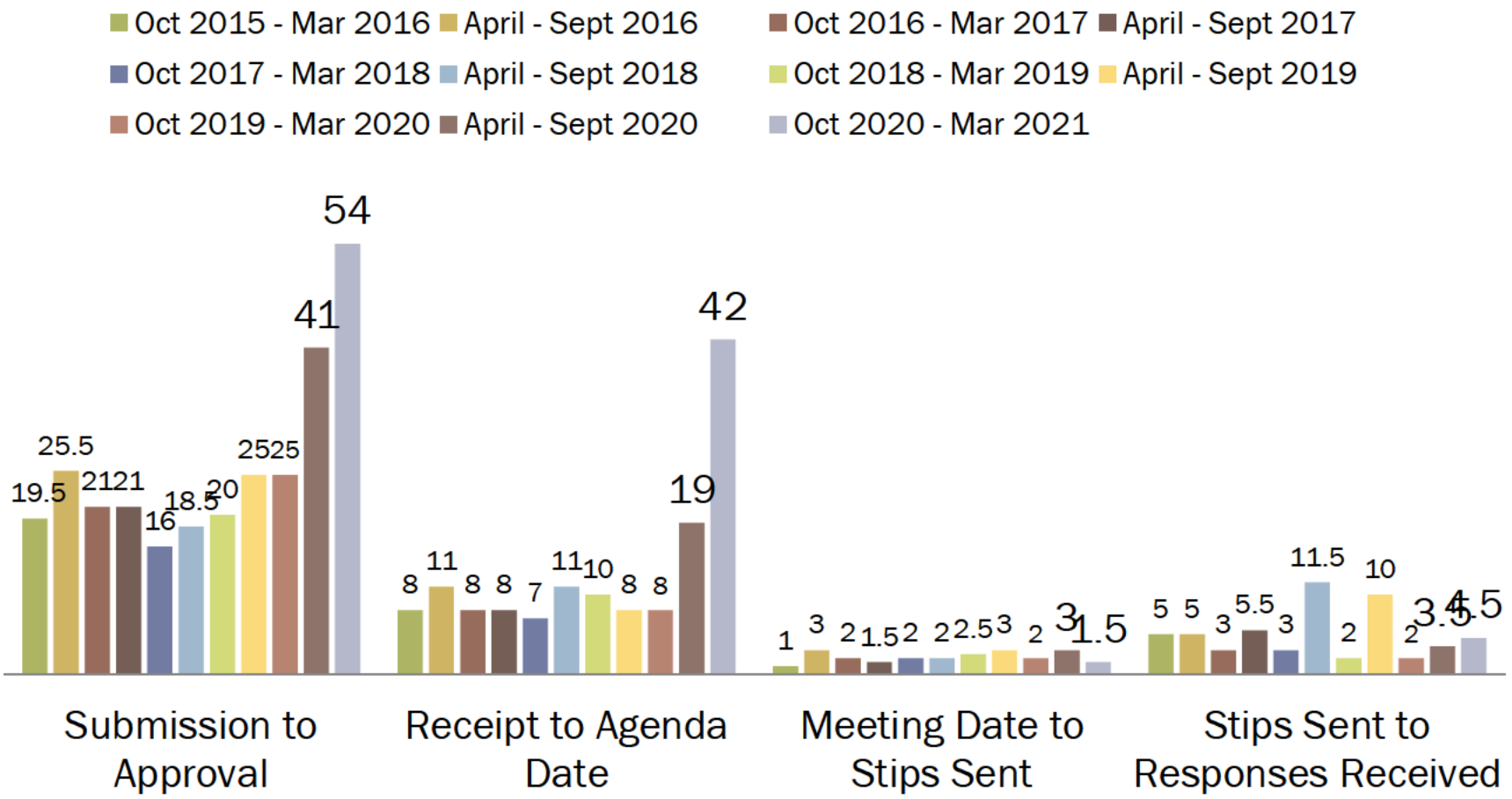
SUBMISSION COMPARISONS

REVIEW OUTCOMES – AMENDMENTS VIA DMR



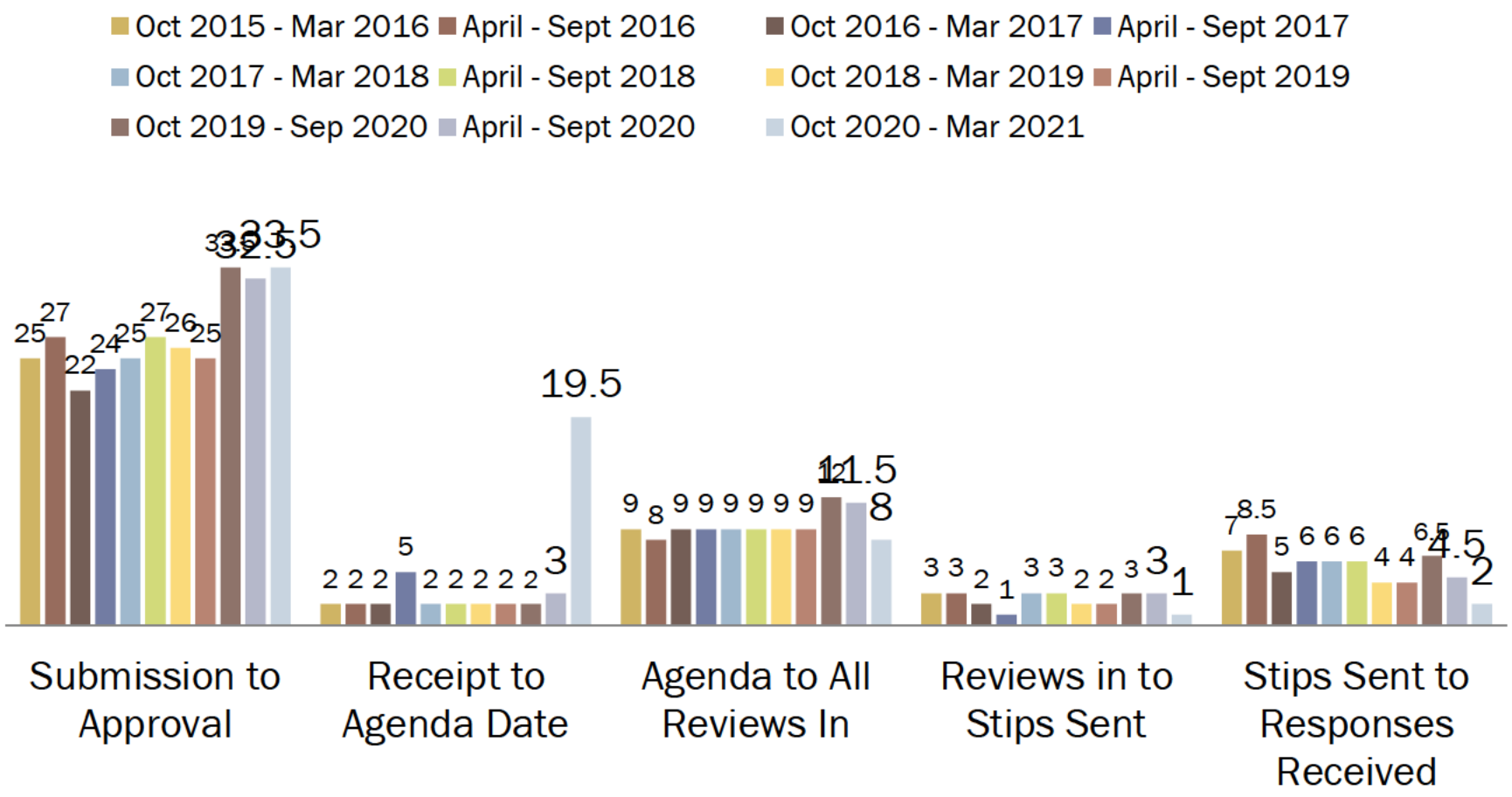
TIME COMPARISON – FCR NEW PROTOCOLS

OCTOBER 2015– MARCH 2021



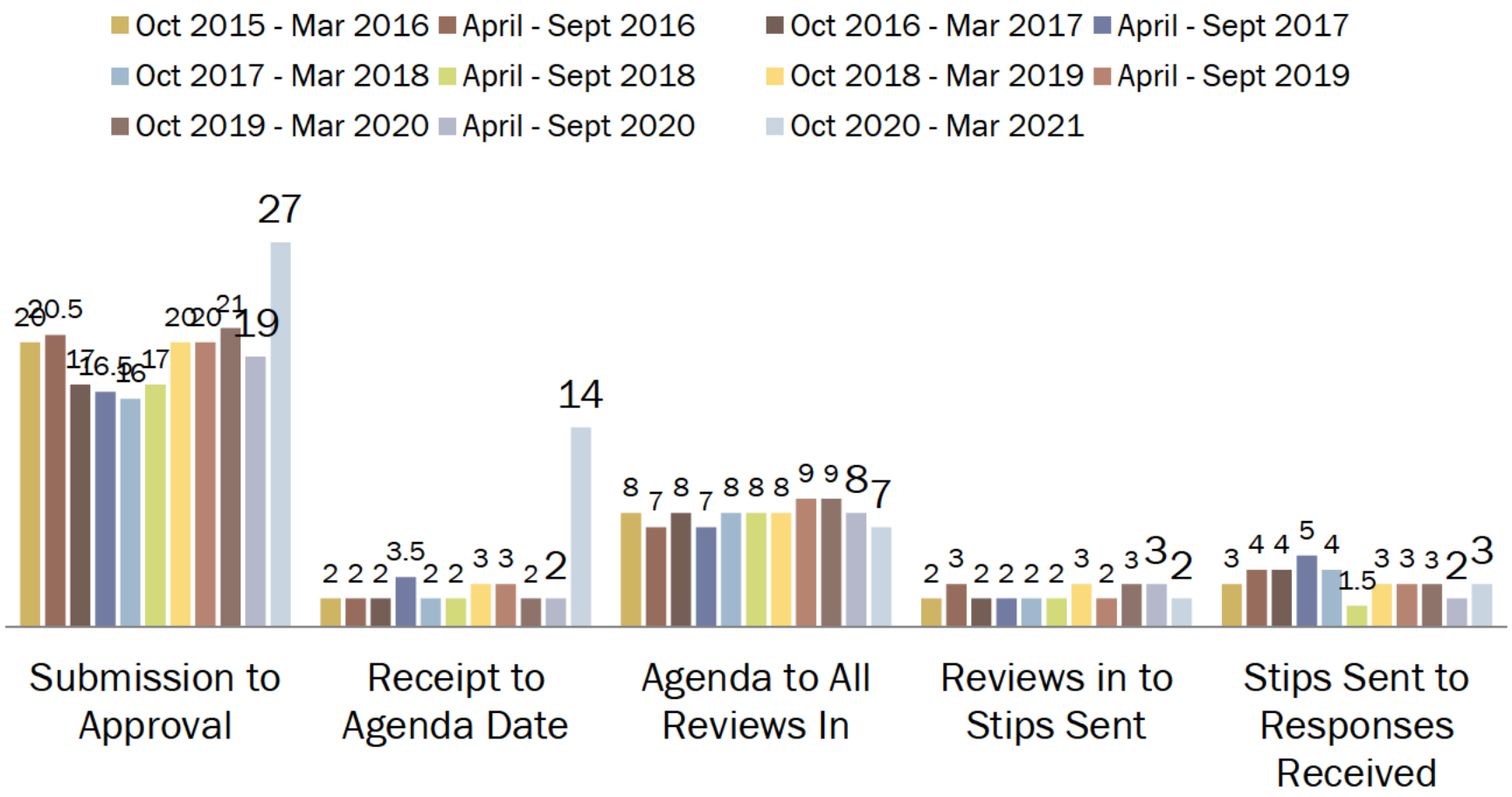
TIME COMPARISON – FCR AMENDMENTS

OCTOBER 2015–MARCH 2021



TIME COMPARISON – DMR NEW PROTOCOLS

OCTOBER 2015– OCTOBER 2020 (PLUS PRELIMINARY THROUGH MARCH 2021)



TIME COMPARISON – DMR AMENDMENTS

OCTOBER 2015– OCTOBER 2020 (PLUS PRELIMINARY THROUGH MARCH 2021)

EXPIRED/SUSPENDED, EXTERNAL ANIMAL HOUSING, AND INCOMING ANIMAL TEMPORARY PROTOCOLS
10/1/2020 – 3/31/2021

Holding Protocol
Lynn Impelluso, 421756
1807-36197A
10-1-2020 - 3-31-2021

PI	Protocol ID	Species	Number of Animals	Expiration Date	New Protocol ID	Transfer Approval Date
LeBeau, Aaron	1708-35052A	Mouse	22	9/30/2020	2009-38426A	10/30/2020
Kyba, Michael	1708-35046A	Mouse	1302	10/3/2020	2009-38488A	10/28/2020
Chen, Clark	1707-34937A	Mouse	50	10/4/2020	2008-38320A	10/20/2020
Koewler, Nathan	1709-35117A	Mouse	120	10/26/2020	2009-38452A	10/28/2020
Thomas, Mark	1711-35337A	Mouse	160	12/28/2020	2011-38231A	1/15/2021
Bernlohr, David	1712-35406A	Mouse	250	1/22/2021	2012-38713A	2/1/2021
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	1802-35594A	Mouse	80	3/26/2021		***None

*Approved on 4/1/2021
**Approved on 4/13/2021.
***Remains on holding protocol.

External Animal Housing Protocol – No activity this period
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 #
Orr, Harry	9/17/2020	5	Mouse	0

***These mice were scheduled to ship to France. Mid-transit, a veterinarian identified a problem with the shipment, and the mice were re-routed back to the UofM and [redacted]. As of 12/2/2020, the 5 mice have been outed and are no longer on Dr. Impelluso's protocol 1807-36151A.