AAALAC Background

Why AAALAC International is different than a USDA or FDA inspection? AAALAC is not a regulatory agency. AAALAC is a voluntary, peer-review accreditation program. Site visitors are not inspectors—they are peer-reviewers, who will be visiting Duke to provide a collegial evaluation and verify we are meeting AAALAC International standards. The entire process is completely confidential and not subject to FOIA (the Freedom of Information Act).

How does AAALAC accreditation benefit our research program (both corporately and individually)?

Minimizing variables. As you well know, reliable research results depend on eliminating extraneous variables. AAALAC accreditation helps minimize the "animal variable" by encouraging consistent, high standards for animal care and use across the entire research community. The accreditation process engages scientists, veterinarians, managers and administrators in an independent, rigorous assessment of our animal care and use program. This validates the animals used in Duke research as healthy, well cared for, and free from undue stress—all of which translates into better, more consistent research outcomes and encouraging of collaboration with other researchers.

Encouraging performance-based oversight: AAALAC’s standards are "performance-based," meaning assessment includes the larger picture of the intent and process as well as the end result. AAALAC does not use a series of narrow, unyielding "engineering" requirements as is commonly seen in an inspection process. The assessment this fall will focus on the IACUC (Institutional Animal Care and Use Committee) and confirm the oversight process includes a performance-based approach. Unlike an inspection, the accreditation process provides an opportunity to explain and justify our methodology and anticipated outcomes, instead of being forced to follow prescribed approaches.

Continued on page 2, Column 1
Enhancing funding opportunities: Many private biomedical organizations strongly recommend that grantees be supported by AAALAC-accredited animal programs. Government agencies also regard AAALAC accreditation as evidence of a commitment to excellence. Accreditation ensures private and public funding sources that animal use will be justified and humane; our accredited status can have a favorable impact on your proposal's review.

The AAALAC process: The accreditation process includes an extensive institutional self-study during which a comprehensive document called a “Program Description” is created. The Program Description, which describes all aspects of animal care and use at your institution, is submitted to AAALAC and used as their p-revisit preparation document. The Duke animal program has been assembling our Program Description over the last several months.

In October 2015, an AAALAC site visit team will visit our campus. The site visit team is comprised of at least one member of AAALAC’s council on Accreditation and several more Ad Hoc representatives – most of whom will be bench scientists. During their review, the AAALAC team will assess our program to verify that we are upholding the principles outlined in the Guide for the Care and Use of Laboratory Animals and other appropriate reference resources. The site team’s report, which includes commendations and recommendations, is then reviewed and deliberated on by AAALAC’s Council on Accreditation and our accreditation status is determined. This entire process is completely confidential, allowing frank and open dialogue between our institution and AAALAC.

After an institution earns accreditation, it must be re-evaluated every three years in order to maintain its accredited status. Currently more than 1000 accredited organizations in 39 countries.

Accreditation benefits our institution and the animals in our care in many ways. Each time a new organization becomes accredited, or each time we are accredited, it helps to raise the global benchmark for animal well-being in science.

Duke was first accredited in 1976, and we have been continuously accredited since that time. We are one of the longest standing accredited institutions in the world.

AAALAC is Coming
Is Your Lab Prepared?

Do you know?
Who is AAALAC?
Why is AAALAC coming to Duke?
When will AAALAC be at Duke?
What will AAALAC do while at Duke?

What should every member of your lab know?
Location of your approved protocol.
Location of animal records.
What the protocol says is approved.
Proper procedures for animal use.
Correct sanitation for animal use.
Their training is current.
Where to confirm current certification dates of hoods.
How to report concerns with animal use.
When to report animal health issues and to whom.
How to get to the Duke Animal Program Web Site.
That IACUC@DUKE.EDU is for all IACUC business.
The animal hotline number is 684-3535.
The role of the IACUC.
The role of the DLAR.
The role of the OAWA.
The roles and responsibilities of the PI.
The roles responsibilities of the lab members.
The requirements for control drug management.
The requirements for anesthesia machine certification.
The requirements for waste anesthetic gas.
The lab member in charge of PI-managed housing.

What should your lab do before AAALAC comes?
Review your protocol.
Have a copy of the protocol (& amendments) in the lab.
Have a copy of ‘The Guide’ in the lab.
Confirm your procedures match the protocol.
Assure all animal procedures are in the protocol.
Be sure all animal handlers are IACUC approved.
Check sterilized equipment for current dates.
Double check drug dates, proper storage & accuracy of logs.
Discard / replace out-of-date items.
Alert DLAR about all diseased animals.
Know your HUMANE ENDPOINTS.
Confirm personnel skills with animal procedures.
Ensure that all animal records (e.g. analgesics used, surg cal procedures and post-op care) are current and available for inspection.
Know your approved methods of euthanasia.
Confirm accuracy of PI managed housing records.

QUESTIONS?
PLEASE CONTACT ANY OF THE FOLLOWING
• Your departmental representative to the IACUC.
• The IACUC Chairman (668-6720).
• A Duke Compliance Liaison (668-6720).
• DLAR veterinarians (681-6792).
• The Office of Animal Welfare Assurance (668-6720).
APPLICATIONS FOR 2015/2016 RAC COURSE

Applications for the 2015/2016 Research Animal Coordinator Certification (RACC) course are now being accepted.

If you are interested in attending or know someone who would be a good candidate, please go to the OAWA website, fill out an application and send it to Bill Wade at w.wade@duke.edu.

All applicants must be recommended their PI.

The next iteration of the RAC training course will begin mid to late September 2015.

Please address question to the RAC course administrator Bill Wade, LVT, RLATG, CPIA, at 668-6722 or w.wade@duke.edu

UPCOMING PROTOCOL EVENTS

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>June 25</td>
<td>New Protocol Meeting</td>
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<tr>
<td>July 2</td>
<td>Amendment Meeting</td>
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<tr>
<td>July 6</td>
<td>Amendment Deadline</td>
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<tr>
<td>July 6</td>
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<td>July 16</td>
<td>Amendment Meeting</td>
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<tr>
<td>July 23</td>
<td>New Protocol Meeting</td>
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<td>Aug 3</td>
<td>New Protocol Deadline</td>
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<td>Aug 6</td>
<td>Amendment Meeting</td>
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<td>Aug 10</td>
<td>Amendment Deadline</td>
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CO2 Euthanasia: Procedure Reminders

- The use of a Flow-Meter is required.
- Flow rate must be determined based on size of chamber and posted on chamber.
- DO NOT leave animals unattended during the procedure.
- Bags for carcasses must be labeled with date and name of individual who performed procedure.

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Help Reduce the Total Number of Animals Used in Research


POST SCRIPT

This month we have two very special items to add as an Appendices to the Newsletter. The first being the release of another sustained release medication! Meloxicam is used in dogs, rats, mice, rabbits, primates and other species for relief of inflammation and pain in both acute and chronic musculoskeletal disorders. When approved as part of a Duke protocol, Meloxicam may be used to reduce postoperative pain and inflammation following orthopaedic, soft tissue and other surgical procedures. One dose (in rats & mice) lasts for up to 72 hours! A great option for the animal (enhanced animal welfare from fewer injections) and research staff (decreased need to inject animals frequently).

The second is a wonderful article written by Duke’s own Sonia D. Doss, M.Ed., RLATG, CPIA and Meg H. Dye, BS. A great highlight of the Duke Lemur Center in the current edition of Laboratory Animal Professional. I am sure you will enjoy reading it. I know I did. Well done, colleagues!
**Meloxicam SR™**

**Description**

Meloxicam SR™ is a patented injectable, extended-release polymer system designed to release meloxicam for up to 72-hours following administration. It is available by prescription only.

**Key Features of Meloxicam SR™**

- Provides sustained release delivery of meloxicam in a fully biodegradable liquid polymer matrix
- Provides therapeutic blood levels for perioperative and postoperative analgesia in rats and mice (based on published studies1,2,3)
- Formulation can be injected subcutaneously through needles as small as 23 gauge

**How Supplied and Storage**

- To ensure stability the Meloxicam SR should be stored within a range of 3°C - 25°C. Prior to administration, the entire 5 mL vial should be brought to room temperature or patient body temperature for ease of injection.

**FAQ’s Regarding Optimal Administration**

**What are the recommended dose rates for Meloxicam SR in laboratory animals?**

**Laboratory Rats: 4 mg/kg** [In one 72-hour SC injection]  
**Laboratory Mice: 4 mg/kg** [In one 72-hour SC injection]

**NOTE:** Dose rates above are based on clinical research experience and studies published in refereed journals, as well as compiled from cited professional formularies, pilot studies and data reported from reviewed trials awaiting publication. Researchers and clinicians should rely on their professional knowledge and judgment when determining the prescribing dose for Meloxicam SR. If administering Meloxicam SR for the first time, it is suggested that initial dose determination be based on lowest dosing recommendations.

**Why should the Meloxicam be at room temperature or body temperature for use?**

The Meloxicam SR at a concentration of 2 mg/ml is viscous when cold and should be brought to room temperature or body temperature at least 30 minutes before use. This makes it easier to draw-up and inject the desired Meloxicam SR dose.

It has also been determined that injecting the Meloxicam SR formulation at room temperature with its lowered viscosity and using a slow injection technique, minimizes animal discomfort during administration.

**Are there any other helpful injection guidelines I should follow?**

Some helpful guidelines are:

1. While the formulation can be injected through needles as small as 23 gauge, it is recommended that a larger needle (16 gauge to 18 gauge) be used to draw the Meloxicam SR from its vial. This makes syringe loading easier and minimizes loss in handling. **NOTE:** A luer-lock syringe is recommended for this technique.
2. Once the required volume has been loaded into your injection syringe, simply remove/replace the larger needle with the desired smaller-gauge needle before administration.

**What is the shelf life for Meloxicam SR?**

ZooPharm is a compounding pharmacy. Expiration is one year from date of compounding. Typically vials of Meloxicam will expire 10-12 months from the date of purchase. To find expiry date, ask our staff when placing your order.

**PLEASE NOTE:** While it is not necessary to keep putting the vial in and out of refrigeration while using it during the day, the formulation vial should be refrigerated as much as possible for maximum stability and shelf life.

**REFERENCES**

1. Ulrich Busch, Jochen Schmid, Gu ’Nther Heinz, Helmut Schmaus, Ju ‘Rgen Baez, Claudia Huber, Willy Roth. Pharmacokinetics of meloxicam in animals and the relevance to human drug metabolism and disposition. The American Society for Pharmacology and Experimental Therapeutics, 1998 Vol. 26, No. 6

**Disclaimer:** The information is intended for use by veterinary professionals only and is made available on the express condition that no liability, expressed or implied, is accepted by the authors for the accuracy, content, or use thereof.
The Duke Lemur Center (DLC) is a unique place. It is home to the largest and most diverse collection of lemurs outside the island of Madagascar. Due to the size and diversity of this population, the DLC attracts individuals across the globe to participate in non-invasive research in many areas including behavior, biomechanics (locomotion and feeding), cognition, and communication. In order to meet the daily needs of the DLC veterinary, husbandry, education and research departments, the DLC has developed a comprehensive animal behavior program encompassing positive reinforcement training.

The animal training program employs basic operant conditioning techniques. The program began in 2008 and currently includes 106 animals covering 13 species. This accounts for nearly 50% of the animals housed at the DLC. Incorporated into a very busy day, training is part of the primate technician’s daily responsibilities. Interest in training and enrichment is one of the criteria evaluated when hiring a

Figure 1. Technicians pair the delivery of food with the sound of the whistle to condition a bridge.

Figure 2. When one technician is working with multiple animals, the goal of the session is to reinforce individuals for calmly participating in the training session.

Positive Reinforcement Training in Lemur Species

By Sonia D. Doss, M.Ed., RLATG, CPIA and Meg H. Dye, BS
new technician. Previous experience with training techniques is not a requirement for employment. All DLC technicians complete a course on operant conditioning techniques and application, attend required lectures, participate in training sessions, and work with the behavioral management coordinator to identify training goals and develop shaping plans.

Each technician is scheduled daily for up to three afternoon animal training sessions. The daily training schedule is discussed at each morning meeting to accommodate changes in staff, animal locations, or research projects. On average, each animal in the training program is trained three times a week with each training session lasting 5 minutes. The number of training sessions an animal participates in may vary from week to week due to staff availability, animal location, and accommodation for husbandry or research needs. Duration of a session may vary depending on the species, number of trainers on the session, and if the session is being used for data collection.

When establishing training with naïve lemurs, the technicians begin by conditioning a sound that means “good.” At the DLC, the technicians use a high pitched Acme dog whistle. In early conditioning, the delivery of a favorite food item from the individual’s diet is paired with a short, precise blast on the whistle. Through the positive association with the delivered food, the whistle becomes a conditioned “bridge” between the completion of a correct behavior and the time it takes to deliver the reinforcement (Figure 1).

As the animals progress, two short whistle blasts serve as a signal to the lemurs that a training session has begun. Training begins with the animals approaching the technician(s), stationing in front of a technician, being bridged (for completing the behavior of coming to the technician) and being reinforced. If one technician is working multiple animals, the focus of the session will consist primarily of the stationing behavior and reinforcing all individuals for calmly participating in the session. Groups that are more advanced with their training will readily move into different cells allowing one technician to separate each animal in the group. Easy and calm separations are invaluable for animal management, routine physicals, or simply one-on-one training time with an animal and a technician (Figure 2).

Shape recognition is a useful behavior that is conditioned with the lemurs. When working with multiple animals, shapes (circle, square, triangle, etc.) allow each animal to easily identify where it should station at the beginning of the session (Figure 3). Each lemur housed within a group is trained to touch a specific shape which is not conditioned with any other animal in their group. The behavior of shape recognition can also be used for additional cognitive challenges during a session when a lemur is asked to find its specific shape amongst other shapes within a close proximity.

During a training session, the lemurs can be asked to participate in a variety of husbandry and veterinary related procedures. Behaviors can include a visual examination, body tactile, acceptance of medication from a syringe, or an injection of insulin for a diabetic animal (Figure 4). Voluntary tail
shaves are conditioned through approximations of tail touches and tail manipulation. Tail shaves are a reliable method of identifying individuals within a group from a distance for both staff and observational research projects (Figure 5). The behaviors of voluntary ultrasound and abdominal palpation have assisted the veterinary staff with confirming pregnancies and postpartum examinations (Figures 6, 7).

Training animals to enter a transport kennel or sit on a scale are additional priorities within the training program. Animals are kenneled for a variety of reasons, including primary enclosure cleaning, veterinary procedures, movement from primary housing to the research room, transport to another area for breeding, or placement along the scheduled visitor tour path (Figure 8). All animals are routinely weighed for a variety of reasons and voluntary scale training reduces the stress for both the animals and the handlers. Each individual animal at the lemur center is weighed as often as once every two weeks to once every two months depending on health status, age, reproductive status, and species (Figure 9).

Some of the DLC’s female Cocquerel’s Sifaka (*Propithecus coquereli*) have been trained to voluntarily allow infant removal during a training session. Due to the species delicate husbandry, sifaka infants must be closely monitored and weighed on a frequent schedule. Conditioning a female to allow a technician to temporarily remove her infant to be weighed allows the process to be calmer for both mother and infant. The behavior of removing a sifaka infant during training sessions became highly useful when an infant male needed veterinary intervention. During training sessions, the infant was removed from his mother 151 times by the age of 4 ½ months. The reasons for the increased number of removals from his mother included routine weighing, administration of antibiotics, veterinary procedures, exploratory surgery, and assisted feedings up to 3 times per day. Due to the success of consistently removing the infant from his mother during a training session, the infant was always returned to his mother and did not need to be separated for extended periods of time.

Research specific training sessions can be led by the primary primate techni-
cian, the DLC behavioral manager, the research project coordinator, or the research technicians. Any proposed research project that requires animal manipulation, which is defined as interacting with the animal in any way, requires approval by both the DLC research committee and the Duke IACUC. The DLC research committee is more familiar with the animals’ capabilities and limitations; therefore, they are charged with assessing research design, proposed study subjects and sample size, frequency of use, and scientific merit. The Duke IACUC also reviews and discusses the proposed projects as any other Duke-based protocol, but does not approve any DLC-based protocols without the approval from the DLC research committee. Likewise, any proposed modifications must also be reviewed by both committees before approval. Any proposed research projects that are defined as observation-only, that is, no animal manipulation occurs, fall under the Duke IACUC approved DLC animal observation protocol. This type of research is reviewed on a case-by-case basis by the DLC research committee.

Once the needs and the goals of the proposed project are defined, the specific training can commence. For example, locomotion and grasping studies are often used to study gait, force, movements, and grasping. To assist with timely data collection, a target or point-follow behavior is conditioned. Both behaviors are greatly used during
many research projects where animals are expected to jump from one area to another, travel the length of a pole or ramp, or progress smoothly across a surface containing a force plate without hesitating or halting. When the animal has successfully traversed the medium of interest the behavior is bridged and the animal is reinforced (Figure 10).

The use of training techniques allows researchers to ask questions in which answers cannot be achieved through traditional methods. To understand if the nocturnal aye-aye can discriminate between a white card and a black card under extremely dark conditions, individual animals are conditioned to choose a white card. During a research trial when an animal is simultaneously presented with a white card and a black card, the researcher will rely on the aye-aye’s response to determine how well the aye-aye can discriminate the choices in dark conditions (Figure 11).

Overall, the positive reinforcement training program has continued to evolve the behavioral management of this unique population of animals to ensure the highest animal welfare standards are met. Use of the training methods discussed in this paper addresses a wide variety of the unique husbandry, veterinary, and research needs that have been identified at the Duke Lemur Center.

The authors thank all the staff at the Duke Lemur Center for their assistance with training session observations and the development of this article. All photo credits—David M. Haring, Duke Lemur Center. Duke Lemur Center publication #1290

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