TEENS IN THE LAB THIS SUMMER?  TAKE NOTE....

Summer is a great time for potential young scientists to gain some valuable experience working in a “real world” research laboratory. However, if you plan on hosting minors (anyone under the age of 18) this summer, please note there are special policies in place for minors working in labs. In addition to policies to protect Duke employees in the lab, there are also measures in place to ensure the safety of any minors in the work area. Research labs, in particular, can have a number of physical, chemical, radiological and biological hazards that may be unfamiliar to minors, and these policies help keep them protected during their time in the lab.

The Occupational and Environmental Safety Office (OESO) has a safety policy that covers minors and non-employees in the work area (http://www.safety.duke.edu/SafetyManuals/University/I_6MinorsNon-Employees.pdf). This policy states that no one under the age of 14 can work or volunteer at Duke Medicine, and children under 14 must have written OESO approval to enter a lab. Those between the ages of 14-17 may not perform any work that is determined to be hazardous or potentially harmful, including:

- work that may expose them to infectious diseases transmitted via aerosols.
- tasks that may expose them to blood or body fluids, infectious diseases or hazardous chemicals as listed on OESO’s Particularly Hazardous Substance List (http://www.safety.duke.edu/LabSafety/Docs/PHS_by_CAS.pdf).
- areas where there is potential exposure to radiation in excess of 0.1 rem (0.001 sievert) total effective dose equivalent or in excess of 10% of the limits for general employees. No minor is allowed to handle radioactive materials directly. If an AU (Authorized User) is planning on hosting minors in the lab this summer, notify the Radiation Safety Officer (684-2194) prior to arrival.
- areas that are under construction.
- areas where ABSL2 studies are being performed.

NEW DUKE ANIMAL PROGRAM POLICIES

In January 2012, the National Institutes of Health mandated the 8th Edition of The Guide for the Care & Use of Laboratory Animals as the primary reference resource for animal programs receiving federal funds. The Duke IACUC has completed a review of this new reference and is adjusting, enhancing, or modifying current policies to match the new requirements from the NIH. While overall, the effect is minimal, there are several changes which are of interest to the Duke animal care community. These modified or enhanced policies include:

- Adverse Event or Animal Welfare Concerns: Consolidation of several prior policies and inclusion issues from the 8th Edition of The Guide
- Bilateral Use of Eyes for Research: Clarification of when it is acceptable / advisable to perform bilateral procedures
- Categories of Potential Pain & Distress: Clarification of which types of animal procedures at Duke are considered distressful or painful.
- Enrichment for Species other than NHPs: Updating of an existing policy; providing DLAR veterinary staff with enhanced options for assuring animal welfare and well-being.
- Use of Non-Pharmaceutical Agents in Animals: A new policy clarifying when non-pharmaceutical grade agents are acceptable in animal research. See Page 2 for a detailed review of this policy.
- Personal Electronic Device Use: A new policy clarifying when ipods or like devices are acceptable in an animal facility.
- Scientific Merit Reviews of Animal Use Protocols: A new policy identifying when a merit review will be required by the IACUC.
- Collaboration MOUs (memo of understanding): A new policy clarifying under what circumstances MOUs are required for collaborative work.
- Controlled Substances Procedures: A new policy to address the North Carolina requirements for use of controlled substances in animals. This is such an important process that the animal program will be hosting Brown Bag Seminars in the weeks ahead to discuss the guidelines and provisions of this procedure.
USE OF NON-PHARMACEUTICAL GRADE SUBSTANCES IN ANIMAL RESEARCH

Recently, the Duke IACUC approved a policy that mandates the use of pharmaceutical grade materials in animal research. This policy was developed to address language in the 8th edition of the “Guide for the Care and Use of Laboratory Animals”. As with any new provision, there are probably lots of questions regarding implementation, so let’s begin:

Why do we need a policy on the use pharmaceutical grade substances? There are a number of reasons why Duke has instituted this policy. The first and foremost reason is the pharmaceutical grade compounds reduce the likelihood that research reagents introduced into laboratory animals will have unintended side effects, which affect animal health and well-being as well as your research results. Another reason is that AAALAC, the NIH, and the USDA have clearly stated it is their expectation that animal researchers use pharmaceutical grade substances, when available.

What is a pharmaceutical grade substance? A pharmaceutical grade substance as any drug, biologic, reagent, carrier, adjuvant, etc. which is approved by the Food and Drug Administration or for which a chemical purity standard has been written/established by the United States Pharmacopeia, National Formulary or British Pharmacopeia.

What if I can’t find my compound in pharmaceutical grade? This is quite common as many of the substances researchers use are typically experimental in nature and would not have gone through the rigorous process of gaining FDA approval or having USP/NF/BP standards set. You will need to justify why you cannot use a pharmaceutical grade compound. Acceptable reasons may include the non-availability of pharmaceutical grade compounds or the need to provide dosages or formulations not available with a pharmaceutical grade compound. Unacceptable reasons include the cost of a non-pharmaceutical grade compounds over a pharmaceutical grade compound, or because we have always used non-pharmaceutical grade compounds before. Since the primary focus is quality research outcomes (e.g., solid and reliable data obtained from animals that were in a good state of welfare), the researcher must strive to find the purest compound available for their animal experiments.

What if I don’t know if something is pharmaceutical grade or any other question? There are a number of resources to determine if a substance is pharmaceutical grade and how to obtain it. The first is the Duke OAWA website. Another source is OLAW (http://grants.nih.gov/grants/olaw/educational_resources.htm ). This link provides guidance on this and other questions.

What is the NIH position on non-pharmaceutical grade compounds? From the NIH/OLAW FAQ, it reads: ‘OLAW and USDA agree that pharmaceutical-grade chemicals and other substances, when available, must be used to avoid toxicity or side effects that may threaten the health and welfare of vertebrate animals and/or interfere with the interpretation of research results. However, it is frequently necessary to use investigational compounds, veterinarian- or pharmacy-compounded drugs, and/or Schedule I controlled substances to meet scientific and research goals.

The IACUC is responsible for evaluating the potential adverse consequences of such agents when used for research. In making its evaluation, the IACUC may consider factors including, for example: grade, purity, sterility, acid-base balance, pyrogenicity, osmolality, stability, site and route of administration, compatibility of components, side effects and adverse reactions, storage, and pharmacokinetics.

Although the potential animal welfare consequences of complications are less evident in non-survival studies, the scientific issues remain the same. The principles and need for professional judgment outlined above apply to non-survival studies.

May investigators use expired pharmaceuticals, biologics, and supplies in animals? The use of expired pharmaceuticals, biologics, and supplies is not consistent with acceptable veterinary practice or adequate veterinary care. Euthanasia, anesthesia and analgesia agents should not be used beyond their expiration date, even if a procedure is terminal. Other expired materials should not be used unless the manufacturer verifies efficacy beyond the expiration date, or the investigator is able to document to the satisfaction of the IACUC that such use would not negatively impact animal welfare or compromise the validity of the study. The veterinarian and IACUC must maintain control over the use of expired medical materials in order to meet their responsibilities to avoid or minimize discomfort, pain or distress to animals.
In addition, OESO requires supervisors/PIs to fill out the “Workplace Safety Statement for Minors and Non-Employees at Duke” for any minors they wish to bring into the lab. The form can be found on the OESO Laboratory Environment page, under the “Lab Safety Audits and Onsite Evaluations” heading (http://www.safety.duke.edu/LabSafety/Default.htm). Once completed, this form should be sent to OESO Laboratory Safety for approval (fax: 681-7509).

Because of additional hazards that exist in animal facilities, as well as for protection of the animals, the Division of Laboratory Animal Resources (DLAR) policy is that no one under the age of 18 is permitted to enter any areas where lab animals are present. The only exceptions to this are minors who are Duke employees (i.e., summer interns) that have been given a risk assessment by EOHW medical personnel. Contact with lab animals means potential exposure to animal hair, dander and urine proteins, which can contribute to allergies. There is also the potential for exposure to infectious diseases that can be transmitted to humans or other animals. If you are considering employing minors in animal facilities this summer, please contact the main DLAR number (684-2797) for more information.

The OESO policy states that “employees who escort or supervise the activities of minors and other non-employees shall assess the potential risk of exposure to hazards and direct the non-employee’s access accordingly”. Assessing this potential risk includes supervisors orienting the minors to their work area, including providing any orientation training needed. For example, DLAR requires any minors working in its facilities to complete the “Hazard Awareness for Animal Facilities” training.

Summer jobs and internships can be a great way for teens to gain some valuable work experience, and it introduces them to a variety of work environments. But minors in labs require additional protections, and we need to help keep them safe while hosted in our labs. For more information on the OESO policy, call 684-2794. For more information on the DLAR policy, call 684-2797.

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### NIH and Research Funding

**Have Strong Support**

(From NABR Newsletter)

NABR (National Associate for Biomedical Research) has joined more than 160 other medical research advocacy groups in urging appropriators to provide at least $32 billion for NIH in FY 2013. The recommendation is contained in a joint letter organized by the Ad Hoc Group for Medical Research, which will be sent to the Appropriations Committee leaders.

Members of the House and Senate are also expressing their support for NIH funding. Reps. Ed Markey (D MA) and Brian Bilbray (R CA) led the preparation of a bipartisan letter, signed by 153 Members of the House. Senators Robert Casey (D PA) and Richard Burr (RNC) are circulating a similar letter to colleagues, which thus far has been signed by 30 Senators.

NIH funding supported more than 432,000 jobs and generated more than $62.1 billion in economic activity last year according to a new state by state report from United for Medical Research, a coalition that seeks increased funding for NIH. An article based on the report was recently published in The Hill, a Washington based newspaper read in Capitol Hill offices. Opinion editorials by medical science leaders also continue to appear around the country explaining that although the federal deficit must be addressed, medical research funding remains critical to the economy and the nation’s health. Most recently, such op-eds were published in the Illinois State Journal Register, the Boston Business Journal, Arkansas Democrat Gazette and the Lubbock Avalanche Journal.

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### Important Dates & Deadlines

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**Deadlines are 5 PM on the date listed!**

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### IACUC SEMI-ANNUAL FACILITY INSPECTION SCHEDULE

- March 29th: CCIF
- April 5th: Foster St.; Biology; French
- April 12th: Duke South; CR2; GHGR; CIEMAS
- April 19th: Vivarium; MSRB 1
- May 3rd: MSRB2; Lemur Center; Ecotox Aquatics Facility
USING RECOMBINANT DNA (RDNA) IN ANIMALS? NEW IBC FORM!

Researchers who create or handle recombinant materials at Duke must comply with the NIH Guidelines for Research Involving Recombinant DNA Molecules, including the creation or cross-breeding of transgenic animal strains, and the insertion of rDNA (plasmids, viral vectors, RNA produced from DNA, siRNA, miRNA, shRNA, or synthetic DNA or RNA) into animals or cells transferred into animals. All animal rDNA work must be registered with the Duke Institutional Biosafety Committee (IBC). The IBC has recently updated the Recombinant DNA Registration Form to assist researchers who perform work with rDNA. The new form is found on the IBC website under “IBC Forms”: http://www.safety.duke.edu/BioSafety/ibc.htm, and must be used when submitting rDNA work for review by the IBC. Questions? Contact Biological Safety, 684-8822.

GLOBAL RESEARCH ANIMAL TRANSPORTATION PROBLEMS AIRED BY MEDIA (EXCERPTS FROM NABR)

British scientists warned that research into debilitating diseases is under threat from a refusal by ferry operators and airlines to transport laboratory animals into the country. Lord Drayson, former UK Science Minister, told The Times: “Although small in number, animals such as mice contribute significantly to the development of new medicines to combat human and animal diseases. If companies continue to withdraw from transporting these animals, the search for cures will shift to other countries, some of which do not have welfare regulations as stringent as those we rightly insist upon in the UK. Medical research will wither in our universities, and as a result, more people will suffer and die.”

The UK story was reported by many news outlets, including the Associated Press, Reuters, the BBC (see their FAQs about animal research here), Pharmalot, The Guardian and Science.

These news reports bounced to hundreds of additional media outlets around the world. The extensive coverage prompted statements from industry and research supporters as well as animal rights organizations. A coalition of governmental, scientific and health-related groups is reported to be working on the UK research animal transport issue.

This week Nature focused the story on airlines refusing to transport non-human primates and expanded the subject to consequences to North American research. NABR Vice President Matthew Bailey is quoted in the Nature piece. Regarding the airline capitulations, Matt Bailey told the Animal Transport Association (ATA) meeting in Vancouver on Monday, "It is an honor to be a part of the process of improving human health, no matter how seemingly small, and it's time we all take a stand for what is right rather than what's convenient at the moment." An editorial published today in Nature entitled Flight Risk echoes this sentiment saying, “Urgent and dramatic action is necessary.”

UPCOMING BROWN BAG SEMINARS

April 10th:
♦ NABR Webinar: Animal Rights: What to Do When Your Institution is Targeted.
  ◦ Location: Jones building, Room 143.
  ◦ Time: 12:30 to 1:30 PM

April 16th:
♦ Primate Bio-Safety (for primate research staff).
  ◦ Location: MSRB 1, Room 001.
  ◦ Time: 12:00 to 1:00 PM

AAALAC IS COMING!

Not quite as important and the call that rang through colonial America to prepare for battle, but still a very important alert. AAALAC, International is coming to Duke this fall for our once-every-three year accreditation visit. Keep alert for the various seminars and training sessions planned over the summer! Don’t let your lab Be the one that is unprepared for AAALAC’s visit. You might Become well-recognized on campus for the wrong-reason! Stay tuned for more news in the next Animal Tracks!
The AALAS Learning Library provides training that is essential for technicians, veterinarians, managers, IACUC members, and investigators working with animals in a research or education setting. Emphasizing the appropriate handling, care, and use of animals, the courses are designed to help you study for AALAS certification, meet training mandates of regulatory agencies, and improve your knowledge in technical areas. The AALAS Learning Library, or ALL, organizes courses in libraries according to topical area or source of the material. Current available libraries are as follows:

**The Animal Care and Use Library** has courses on certification, regulatory mandates, bioethics, bio-methodologies, biosafety, and management. Enrollment in this library for individuals or groups gives a one-year access to all courses in this library. Course activity is recorded in the transcript on the AALAS Learning Library.

**JAALAS CEU Test Library** offers you the opportunity to earn continuing education units (CEUs) by taking the self-administered test based on the scientific articles in *Contemporary Topics* online. These tests are published six times a year. The online test questions are the same as the questions published in each issue of *Contemporary Topics*. New questions will be posted online after each issue has been printed and mailed. The test for each issue will remain available for two months, after which the questions for the next issue will be posted. Answers to the previous issue’s questions are also posted.

Enrollment in the AALAS Learning Library is free - you do not need to purchase an account. However, you must be enrolled in the AALAS Learning Library to take advantage of the documentation and transcript features. To join the Duke community on the AALAS Learning Library, contact Bill Wade at 919.668.6722 or w.wade@duke.edu

GUIDE BRIEF—MARCH 2012

**AQUATIC ANIMALS**

The 8th edition of the Guide for the Care and Use of Laboratory Animals (2011), includes for the first time a section dedicated solely to aquatic animals.

For those research staff who work with aquatic species, you can find this information on pages 77–88. Subject headings include: Aquatic Environment; Water Quality; Life Support System; Temperature, Humidity and Ventilation; Illumination; Noise and Vibration; Behavioral and Social Management; Husbandry; Population Management.

We encourage all aquatic species users to familiarize themselves with this information, particularly as we prepare for the triennial AAALAC, Intl. accreditation site visit scheduled for this October.

An on-line pdf version of the guide is available through the OLA/NIH at the following link.


If you have any questions about the interpretation of this information please contact the OAWA.
IMPROVING THE REPORTING OF ANIMAL EXPERIMENTS

The ARRIVE Guidelines
(Excerpted from the PLOS Biology Report: 2010)

Most bioscience journals provide little or no guidance on what information to report when describing animal research. Our review found that 4% of the 271 journal articles assessed did not report the number of animals used anywhere in the methods or the results sections. Reporting animal numbers is essential so that the biological and statistical significance of the experimental results can be assessed or the data reanalysed, and is also necessary if the experimental methods are to be repeated. Improved reporting of these and other details will maximise the availability and utility of the information gained from every animal and every experiment, preventing unnecessary animal use in the future. To address this, we led an initiative to produce guidelines for reporting animal research. The guidelines, referred to as ARRIVE (Animals in Research: Reporting In Vivo Experiments), have been developed using the CONSORT Statement as their foundation.

The ARRIVE guidelines consist of a checklist of 20 items describing the minimum information that all scientific publications reporting research using animals should include, such as the number and specific characteristics of animals used (including species, strain, sex, and genetic background); details of housing and husbandry; and the experimental, statistical, and analytical methods (including details of methods used to reduce bias such as randomisation and blinding). All the items in the checklist have been included to promote high-quality, comprehensive reporting to allow an accurate critical review of what was done and what was found.

Consensus and consultation are the corner-stones of the guideline development process [51]. To maximise their utility, the ARRIVE guidelines have been prepared in consultation with scientists, statisticians, journal editors, and research funders. We convened an expert working group, comprising researchers and statisticians from a range of disciplines, and journal editors from Nature Cell Biology, Science, Laboratory Animals, and the British Journal of Pharmacology (see Acknowledgments). At a one-day meeting in June 2009, the working group agreed the scope and broad content of a draft set of guidelines that were then used as the basis for a wider consultation with the scientific community, involving researchers, and grant holders and representatives of the major bioscience funding bodies including the Medical Research Council, Wellcome Trust, Biotechnology and Biological Sciences Research Council, and The Royal Society.

The guidelines are intended to:

⇒ Improve reporting of research using animals.
⇒ Guide authors as to the essential information to include in a manuscript, and not be absolutely prescriptive.
⇒ Be flexible to accommodate reporting a wide range of research areas and experimental protocols.
⇒ Promote reproducible, transparent, accurate, comprehensive, concise, logically ordered, well written manuscripts.
⇒ Improve the communication of the research findings to the broader scientific community.

The guidelines are NOT intended to:

⇒ Promote uniformity, stifle creativity, or encourage authors to adhere rigidly to all items in the checklist. Some of the items may not apply to all studies, and some items can be presented as tables/figure legends or flow diagrams (e.g. the numbers of animals treated, assessed and analysed).
⇒ Duke researchers may consider the ARRIVE Guidelines when preparing documents for publication. The Guidelines are consistent with the recent publication ‘Guidelines for Description of Animal Research in Scientific Publications.’

The ARRIVE Guidelines are:

| TITLE | Provide as accurate and concise a description of the content of the article as possible. |
| ABSTRACT | Provide an accurate summary of the background, research objectives, including details of the species or strain of animal used, key methods, principal findings and conclusions of the study. |
| INTRODUCTION | |
| Background | A. Include sufficient scientific background (including relevant references to previous work) to understand the motivation and context for the study, and explain the experimental approach and rationale. |
| | B. Explain how and why the animal species and model be used can address the scientific objectives and, where appropriate, the study's relevance to human biology. |
| Objectives | Clearly describe the primary and any secondary objectives of the study, or specific hypotheses being tested. |

Continued … Next Page
METHODS

Ethical Statement
Indicate the nature of the review permissions, relevant licenses, and national or institutional guidelines for the care and use of animals, that cover the research.

Study Design
For each experiment give brief details of the study design including:
A. The number of experimental and control groups.
B. Any steps taken to minimise the effects of subjective bias when allocating animals to treatment (e.g. randomisation procedure) and when assessing results (e.g. if done, describe who was blinded and when).
C. The experimental unit (e.g. a single animal, group or cage of animals).

A time-line diagram or flow-chart can be useful to illustrate how complex study designs were carried out.

Experimental procedures
For each experiment and each experimental group, including controls, provide precise details of all procedures carried out. For example:
A. How (e.g. drug formulation and dose, site and route of administration, anaesthesia and analgesia used [including monitoring], surgical procedure, method of euthanasia). Provide details of any specialist equipment used, including supplier(s).
B. When (e.g. time of day).
C. Where (e.g. home cage, laboratory, water maze).
D. Why (e.g. rationale for choice of specific anesthetic, route of administration, drug dose used).

Experimental animals
A. Provide details of the animals used, including species, strain, sex, developmental stage (e.g. mean or median age plus age range) and weight (e.g. mean or median weight plus weight range).
B. Provide further relevant information such as the source of animals, international strain nomenclature, genetic modification status (e.g. knock-out or transgenic), genotype, health/immune status, previous procedures, etc.

Housing and husbandry
Provide details of:
A. Housing (type of facility e.g. specific pathogen free [SPF]; type of cage or housing; bedding material; number of cage companions; tank shape and material for fish).
B. Husbandry conditions,
C. Light/dark cycle, temperature, quality of water for fish, type of food, access to food and water, environmental enrichment.
D. Welfare-related assessments and interventions that were
E. Carried out prior to, during, or after the experiment.

Sample size
A. Specify the total number of animals used in each experiment and the number of animals in each experimental group.
B. Explain how the number of animals was arrived at. Provide details of any sample size calculation used.
C. Indicate the number of independent replications of each experiment, if relevant.

Allocating animals to experimental groups
A. Give full details of how animals were allocated to experimental groups, including randomization or matching if done.
B. Describe the order in which the animals in the different experimental groups were treated and assessed.

Experimental outcomes
Clearly define the primary and secondary experimental outcomes assessed (e.g. cell death, molecular markers, behavioral changes).

Statistical methods
A. Provide details of the statistical methods used for each analysis.
B. Specify the unit of analysis for each dataset (e.g. single animal, group of animals, single neuron).
C. Describe any methods used to assess whether the data met the assumptions of the statistical approach.

RESULTS

Baseline Data
For each experimental group, report relevant characteristics and health status of animals (e.g. weight, microbiological status, and drug or test naïve) prior to treatment or testing. (This information can often be tabulated).

Numbers analyzed
A. Report the number of animals in each group included in each analysis. Report absolute numbers (e.g. 10/20, not 50%).
B. If any animals or data were not included in the analysis, explain why.

Outcomes and estimation
Report the results for each analysis carried out, with a measure of precision (e.g. standard error or confidence interval).

Adverse Events
A. Give details of all important adverse events in each experimental group.
B. Describe any modifications to the experimental protocols made to reduce adverse events.

DISCUSSION

Interpretation/scientific implications
A. Interpret the results, taking into account the study objectives and hypotheses, current theory and other relevant studies in the literature.
B. Comment on the study limitations including any potential sources of bias, any limitations of the animal model, and the imprecision associated with the results.
C. Describe any implications of your experimental methods or findings for the replacement, refinement or reduction (the 3Rs) of the use of animals in research.

Generalisability/translation
Comment on whether, and how, the findings of this study are likely to translate to other species or systems, including any relevance to human biology.

Funding
List all funding sources (including grant number) and the role of the funder(s) in the study.