Institutional Animal Care and Use Committee (IACUC) General Training

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• iacuc.web.wesleyan.edu

• olaw.nih.gov

• www.aphis.usda.gov/animal_welfare

• IACUC Central: iacuc.org
Animal Welfare Act

- AWA was enacted in 1966, covers warm-blooded vertebrates except lab mice (*Mus*), lab rats (*Rattus*), birds bred-for-research, and farm animals and horse not used in biomedical research.
- Registers animal dealers, exhibitors, carriers, and research facilities and requires annual reporting (*Wesleyan: dropped*)
- Has specific standards for transportation and care of dogs, cats, hamsters, guinea pigs, rabbits, and non-human primates and general standards for other mammals (*e.g.*, gerbils)
- Mandates adequate veterinary care – Attending Veterinarian
- Is enforced by unannounced site visits by APHIS AC vets
- 1985: Institutional Animal Care and Use Committee (IACUC), pain/distress, survival surgery, dog exercise, NHP enrichment, Animal Welfare Information Center (AWIC)
• Includes at least 1 veterinarian and at least 1 member not otherwise affiliated with the institution appointed by CEO
• Reviews and approves protocols for:
  – Justification of species and numbers of animals
  – Procedures to minimize pain and distress
  – Method of euthanasia (or other disposition)
• Inspects housing and study areas and submits evaluations to Institutional Official (IO) at least once every 6 months
• Ensures training of animal care staff and researchers
• Addresses concerns regarding animal care and use
Public Health Service Policy

- Health Research Extension Act of 1985 (Public Law 99-158)
- U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research and Training
  grants.nih.gov/grants/olaw/references/phspol.htm#USGovPrinciples
  (life sciences and medical research)
- Animal Welfare Assurance; IACUC, Annual Report
  Wesleyan #A3956-01
  nap.edu/catalog.php?record_id=12910
  olaw.nih.gov
Wildlife in Research

- American Society of Ichthyologists & Herpetologists Guidelines to the Use of Amphibians & Reptiles in Research
- American Fisheries Society, American Institute of Fisheries Research Biologists & American Society of Ichthyologists and Herpetologists 2004
- American Society of Mammalogists Animal Care and Use Guidelines 2011
- Ornithological Council Guidelines to the Use of Wild Birds in Research 2010
- Federal and state scientific collectors permits and import permits: Federal: fws.gov/endangered
  CT State: ct.gov/deep/cwp/view.asp?
a=2702&q=323460&deepNav_GID=1628#ScientificCollectionPermits

iacuc.org has links for organizations
AAALAC

Association for Assessment and Accreditation for Laboratory Animal Care International
(founded in 1965 as American Association for Accreditation of Laboratory Animal Care)

UCHC 1977

aaalac.org
Animal Care (Husbandry)

- Environmental factors
- Chemical factors
- Microbial factors

aalas.org

Notify Veterinarian of unanticipated problems
Pain and Distress

- Behavioral signs
- Physiology & biochemistry

- Notify veterinarian of unanticipated problems for veterinary care.
Alternatives to Painful Procedures

- USDA Animal Care Policies #11 & 12 --- Pain/Distress

- WMS Russell and RL Burch's ‘3Rs’ (The Principles of Humane Experimental Technique, 1959)
  altweb.jhsph.edu/pubs/books/humane_exp/het-toc
Replacement

- Substituting conscious living “higher” animals with less sentient materials
  - "Lower" living systems: rodents, fish, invertebrates
  - Non-feeling systems: tissue cultures, Ames test
  - Computer simulation: chemical reactions, dissections

The Visible Mouse:
Mouse Necropsy Etc. On-Line:
tvmouse.compmmed.ucdavis.edu
eulep.pdn.cam.ac.uk/Links/index.php
Several Species Dissections:
oslovet.veths.no/produkter.aspx?
category=6_Dissection
Reduction

• Using fewer animals to obtain the same amount or more scientific information
  – Improved statistical design
  – Animal sharing
  – Improved quality of animals
• Genetic modified (GM)
  – carcinogenicity models: Tg.AC and rasH2 transgenic and p53+/- and XPA-/- knockout mice
Refinement

• Altering experimental procedures to minimize discomfort
  – Improved control of pain
  – Improved technical skills
  – Application of endpoints
  – Improved instrumentation
  – Less stress: telemetry
  – Less invasive procedures
    • Endoscopy/laparoscopy
    • Confocal microscopy
    • Magnetic resonance imaging
    • Biophotonics
    • MicroCAT system
Drug Violations

• USDA Animal Care Policy #3 --- Veterinary Care http://www.aphis.usda.gov/animal_welfare/policy.php
  – Prohibits use of expired medical materials
  – Prohibits use of non-pharmaceutical-grade chemical compounds
    • oacu.od.nih.gov/ARAC/documents/Pharmaceutical_Compounds.pdf
  – Requires good record keeping
• Controlled substances
  – Each secure storage site requires CT registration
    • www.ct.gov/dcp/cwp/view.asp?a=1620&q=512944
    • www.deadiversion.usdoj.gov/drugreg/categories.htm
• ACLAM Formulary (3rd Ed 2005)
  – www.aclam.org/books
Surgery & Aseptic Techniques

- Instruments
- Facilities
- Animal preparation
- Surgeon preparation

STERILIZATION (methods)
- Physical
  - Autoclave, Dry Heat, Ethylene Oxide, Radiation
- Chemical
  - Aldehydes, Peroxides, Chlorites
- Indicators
- Critical Parameters, eg., time, temp., pressure (autoclave).

Critical Planning
- Mask
- Surgical Hand Scrub
- Sterile Surgical Gloves
- Cap (long hair)
- Surgery Scrub Shirt
Occupational Health

- Zoonoses
- Protocol – related
- Trauma
- Allergies – >10%

Euthanasia/Training

AVMA Guidelines on Euthanasia (2013)
• avma.org/KB/Policies/Documents/euthanasia.pdf
• oacu.od.nih.gov/ARAC/documents/Rodent_Euthanasia_Adult.pdf

Internet training resources
• NIH OACU Guidelines: oacu.od.nih.gov/ARAC/index.htm
  NIH Training Resources: oacu.od.nih.gov/training_resources/index.htm
  – Aquatics Training Resources
  – Rodent Restraint Procedures
  – Rodent Blood Collection Procedures
  – Rodent Compound Administration Procedures
  – Rodent Genotyping & Identification Procedures
  – Rodent Euthanasia Procedures
  – Survival Rodent Surgery
  – Transgenic mouse Breeding

jove.com video articles on many procedures
Ethical Considerations

- Foundation for Biomed Research fbresearch.org
- Scientific American sciam.com (Feb 1997 issue debate)
- February 4, 1966 Life Magazine, page 22
Birds as Animal Models in the Behavioral and Neural Sciences

Volume 51 Issue 4; 2010: ilarjournal.oxfordjournals.org/content/51/4.toc

- Contributions of Bird Studies to Behavioral and Neurobiological Research
- The Role of Hair Cell Regeneration in an Avian Model of Inner Ear Injury and Repair from Acoustic Trauma
- Applications of Avian Transgenesis
- The Songbird as a Model for the Generation and Learning of Complex Sequential Behaviors
- Sleep, Learning, and Birdsong
- A Social Ethological Perspective Applied to Care of and Research on Songbirds
- The Use of Passerine Bird Species in Laboratory Research: Implications of Basic Biology for Husbandry and Welfare
- Guidelines and Ethical Considerations for Housing and Management of Psittacine Birds Used in Research
- IACUC Perspective on Songbirds and Their Use in Neurobiological Research
Zebrafish Health and Husbandry

Volume 53 Issue 2; June 2012: ilarjournal.oxfordjournals.org/content/53/2.toc

• Introduction: Use of Zebrafish in Research and Importance of Health and Husbandry
• Fundamental Approaches to the Study of Zebrafish Nutrition
• Zebrafish Breeding in the Laboratory Environment
• Aspects of Larval Rearing
• Zebrafish Housing Systems: A Review of Basic Operating Principles and Considerations for Design and Functionality
• Anesthesia and Euthanasia in Zebrafish
• Zebrafish Housing, Husbandry, Health, and Care: IACUC Considerations
• Zebrafish Resources on the Internet
Behavioral Assessment in Animal Models: Relevance for Human Psychopathology

Volume 55 Issue 2; 2014: ttp://ilarjournal.oxfordjournals.org/content/55/2.toc

- Social Defeat as an Animal Model for Depression
- Maintaining the Clinical Relevance of Animal Models in Translational Studies of Post-Traumatic Stress Disorder
- Animal Models of Fear Relapse
- Behavioral, Physiological, and Genetic/Epigenetic Methodologies
- The Ups and Downs of Modelling Mood Disorders in Rodents
- Assessing Spatial Learning and Memory in Rodents