

TCU Annual Vivarium Training



Fall 2018, Texas Christian University

Outline

- 1. Why we do what we do
- 2. Viv Dos and Don'ts
- 3. Your health and safety
- 4. Health and safety of the nonhuman animals

Be Educated

Be aware of the risks!



A Novartis executive has his house burned down by the Animal Liberation Front in August 2009. Animal research extremism has the effect of overshadowing the important debate on the need for animals in research, scaring many scientists into silence; this means that the debate becomes one-sided, monopolized by animal rights activists.

And the cost of ignorance!

Inquiry into 'abuse' of lab rats at college

Marie Woolf and Seth Jacobson Published: 13 April 2013

Comment (1) Print



Campaigners obtained film of rats being mistreated

ONE of Britain's most respected research establishments has ordered an urgent inquiry after claims that its staff breached welfare standards by mistreating laboratory animals.

Footage secured by an animal care technician working undercover at Imperial College London for the British Union for the Abolition of Vivisection (BUAV) appears to show rats being decapitated with a guillotine and moving during operations. Rodents are also heard squealing as parts of their ears are cut off with scissors for biopsies.

Researchers at the university, which came 8th in the Times Higher Education World University Rankings for 2012-13, are heard confessing ignorance about what the rules permitted them to do and technical issues such as how much pain relief to give the animals.

This entire investigation could have been avoided and animal welfare enhanced by educating the researchers involved. Ask questions to your professor and fellow researchers!

Why we do what we do

“In today’s society, much controversy exists concerning the use of animals in research. In the past 10 years, public opinion polls have shown a remarkable decline in the number of Americans who strongly support animal research. In the mid-1980’s, more than 70% of the adult population showed strong support for humane animal research; recent poles have shown an erosion to less than 55%. Polls of our nation’s young people show less than 33% believe that animal research is necessary or humane. Even those who support research have a poor understanding of how research is conducted and most still express concern that regulations governing the use of animals are not stringent enough.”

Why we do what we do

THE TOLL OF MAJOR BRAIN AND NERVOUS SYSTEM DISORDERS*

<u>Disease</u>	<u>Total Cases</u>	<u>Costs/Year</u>
Chronic Pain	97,000,000	\$ 100 billion
Hearing Loss	28,000,000	\$ 56 billion
All Depressive Disorders	18,700,000	\$ 30.4 billion
Alzheimer's Disease	4,000,000	\$ 90 billion
Stroke	3,800,000	\$ 40 billion
Epilepsy	2,500,000	\$ 3.5 billion
Traumatic Head Injury	2,000,000	\$ 25 billion
Schizophrenia	2,000,000	\$ 32.5 billion
Parkinson's Disease	500,000	\$ 5.6 billion
Multiple Sclerosis	300,000	\$ 2.5 billion
Traumatic Spinal Cord Injury	250,000	\$ 5 billion

** Estimates provided by the National Institutes of Health and voluntary organizations, 1997.*

- The monetary costs associated with brain and nervous system disorders are substantial, not to mention the personal costs which are not represented.
- Animals models can help us better understand the cause of disease, develop new drugs, vaccines, and test the safety of produces we use everyday.
- Additionally, we use knowledge gained from animal research to develop better industrial efficiency, and better educational and health strategies.
- Sometimes the animals benefit as well – Parvovirus – further cases of dogs exhibiting vomiting, diarrhea, dehydration, and frequently death were prevented as a result of transfer of knowledge from studying viruses in other animals and a vaccine for dogs was quickly developed.

Why we do what we do



20 of the 21 institutes of NIH use animals in their research programs, from studies on stroke to cardiovascular disease.

Just because it's
popular, doesn't
mean it's effective.

Can tangible
benefits from
animal research be
identified?

Just because it's popular, doesn't mean it's effective.
Can tangible benefits from animal research be identified?

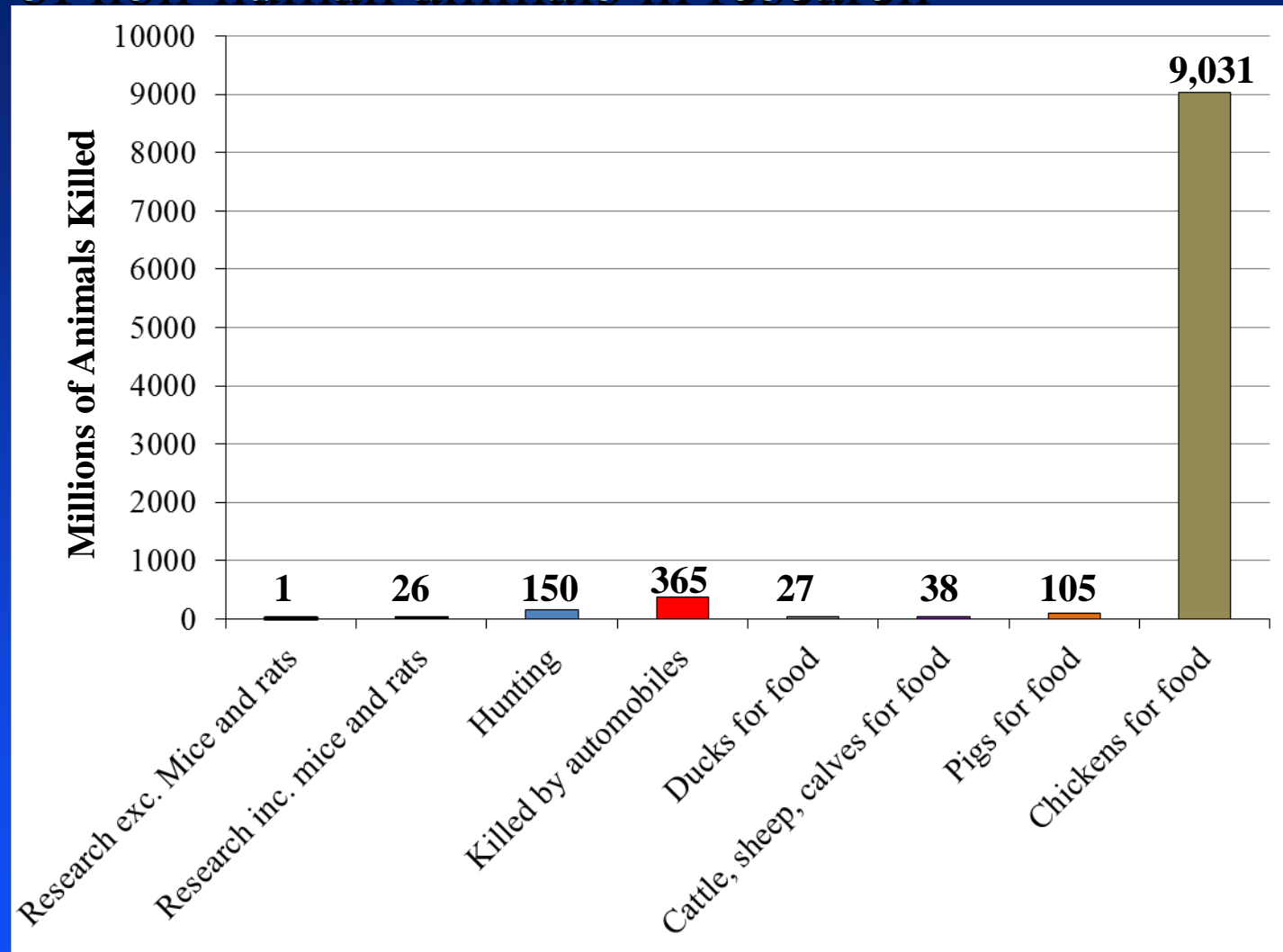
YES!

Animal Roles in Medical Discoveries

A look at the Nobel Prizes for Medicine and Physiology awarded from 1901 to the present shows that animal research played a key role in these important discoveries. Animal research must continue for similar medical advances to occur in the future.

Year	Scientist(s)	Animal(s) Used	Contributions Made
1901	von Behring	Guinea pig	Development of diphtheria antiserum
1902	Ross	Pigeon	Understanding of malaria life cycle
1904	Pavlov	Dog	Animal responses to various stimuli
1905	Koch	Cow, sheep	Studies of pathogenesis of tuberculosis
1906	Golgi, Cajal	Dog, horse	Characterization of the central nervous system
1907	Laveran	Bird	Role of protozoa as cause of disease
1908	Mechnikov, Ehrlich	Bird, fish, guinea pig	Immune reactions and functions of phagocytes
1910	Kossel	Bird	Knowledge of cell chemistry through work on proteins, including nuclear substances
1912	Carrel	Dog	Surgical advances in the suture and grafting of blood vessels
1913	Richet	Dog, rabbit	Mechanisms of anaphylaxis
1919	Bordet	Guinea pig, horse, rabbit	Mechanisms of immunity
1920	Krogh	Frog	Discovery of capillary motor regulating mechanism
1922	Hill	Frog	Consumption of oxygen and lactic acid metabolism in muscle
1923	Banting, Macleod	Dog, rabbit, fish	Discovery of insulin and mechanism of diabetes
1924	Einthoven	Dog	Mechanism of the electrocardiogram
1928	Nicolle	Monkey, guinea pig, rat, mouse	Pathogenesis of typhus
1929	Eijkman, Hopkins	Chicken	Discovery of antineuritic and growth stimulating vitamins
1932	Sherrington, Adrian	Dog, cat	Functions of neurons
1934	Whipple, Murphy, Minot	Dog	Liver therapy for anemia
1935	Spemann	Newt, frog	Organizer effect in embryonic development
1936	Dale, Loewi	Cat, frog, bird, reptile	Chemical transmission of nerve impulses
1938	Heymans	Dog	Role of the sinus and aortic mechanisms in regulation of respiration
1939	Domagk	Mouse, rabbit	Antibacterial effects of prontosil
1943	Dam, Doisy	Rat, dog, chick, mouse	Discovery of function of Vitamin K
1944	Erlanger, Gasser	Cat	Specific functions of nerve cells
1945	Fleming, Chain, Florey	Mouse	Discovery of penicillin and its curative effect in various infectious diseases

Perspective is important when evaluating the use of non-human animals in research



(1) AWA 2010 Report

(2) <http://www.idausa.org/facts/hunting.html>

(3) Wall Street Journal, August 1, 2002. "In the Headlights: As Man and Beast Clash on Highways, Both Sides Lose."

(4) National Agricultural Statistics Service 2007 – <http://www.nass.usda.gov/>

Bottom Line

- We use other methods whenever we can. Computer models and cell tissue studies are used in addition to animal research to discover new ways of solving complex problems. Using these methods can tell us much about human physiology.
- But cells and computer models simply cannot mimic the complexities of our bodies. And that's where animals come in.
- For a model to be valid, it must be comparable to the target with respect to the feature or function under study. Animals are good models for humans; they are biologically similar to humans.



- However, using animals in research poses risks and places the primary responsibility for the health and well-being of the animals on the shoulders of the researcher

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Vivarium Policies

- Dot In / Dot Out
- Wear a lab coat
 - ◆ Lab coats, gloves, and masks are standard
 - ◆ Hair nets and shoe covers are recommended
- Do not wear open-toe shoes
- No food or drinks (except H₂O in a closed container)
- Do not wear heavy cologne or perfume
- If you are a smoker, try to quit. Otherwise try to minimize residual smell on your clothes
- Don't be loud or disruptive
- Pay attention to door signs for ongoing activity
- Be careful



Health Record Requirements

- Lindy, or the animal care staff, will only do daily checks for food and water
- Individual labs are responsible for the care and well being of their animals
- Computers, scales, equipment in animal rooms must be clean well organized.
- Notes from visual inspections & weight logs must be recorded and stored in animal rooms
- Weighing procedure for rodents:
 - ◆ Animals on food/water-deprivation: *at least 3 times/week*
 - ◆ Regular animals: *at least 1 time/week*
 - ◆ Breeder animals do not need to be weighed, only visually inspected

Why?



- Temp and humidity - Exposure to a wide temperature and humidity fluctuations or extremes may result in behavioral, physiologic, and morphologic changes, effecting well-being and research outcomes
- Lights – important for neuroendocrine, circadian, and neurobehavioral regulation
- Sound – increase weight and decrease fertility

Check Every Cage/ Every Animal Twice a Day

- M-F, Room checks must be completed twice a day.
 - Morning by animal care staff (or your lab)
 - Afternoon by a member in your lab
 - EACH LAB IS RESPONSIBLE FOR THE CARE AND WELL BEING OF THEIR ANIMALS
- When in doubt, there is no doubt, make sure all animals have access to food and water.

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Lab specific training

- You must be trained and approved by an advisor or graduate student perform performing any procedures involving animal handling.
- These will be checked off in a special form provided by the animal care technician and kept in a folder in their office.



Occupational Health & Safety: Animal Allergens



- Allergens

Many animal byproducts, such as animal dander, scales, fur, body wastes (urine, feces) or saliva, can cause allergic reactions.

- Even if you are not allergic today, you may be tomorrow.
- Training and fit testing for N95 Respirator is available through the university.
- You must pick up a medical risk assessment form from the Psychology Main Office (WIN 246). Return the form to Ken Leising directly. You must sign the envelope. It will then be submitted to a medical professional for approval.



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-- IACUC --

- Must have approval from an animal care and use committee before you can conduct animal research.
 - ◆ Animal research is a privilege, not a right.
 - ◆ Those who care for, use, or produce animals must assume responsibility for their well-being.
 - ◆ All personnel must be adequately trained



History and Background

The history of IACUCs evolved from the history of regulation of animal welfare in the USA. Prior to 1963, regulation was conducted solely by investigators, and research laboratories had inconsistent animal care policies and standards of care. A group of veterinarians formed the Animal Care Panel and began work in 1961, and in 1963 they published the first edition of "The Guide for the Care and Use of Laboratory Animals", referred to hereafter as the Guide. Subsequent editions of the Guide were supported by NIH and published by the Institute of Laboratory Animal Research branch of the National Academy of Science. Currently, the Guide is in its eighth edition.

<http://students.cis.uab.edu/rwians/IACUC.html>

History and Background

The Animal Welfare Act (AWA) was passed in 1966 to address concerns regarding the acquisition and use of animals in research and as such Congress established the USDA as responsible for oversight of research institutions and required a self-oversight mechanism for all research institutions

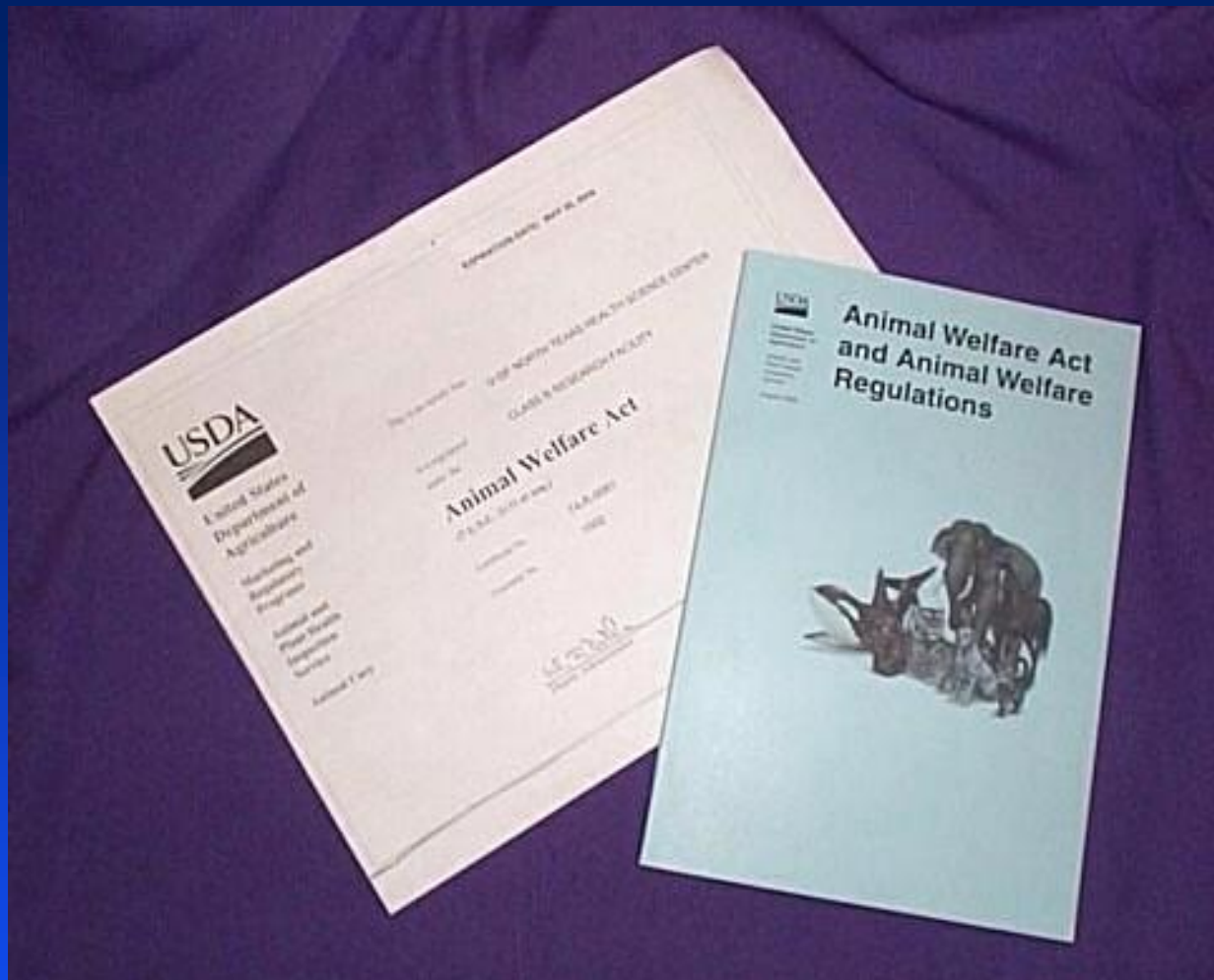
In 1985 amendments to the AWA and concurrent changes in the PHS policy of “Use of Animals by Awardee Institutions,” required that every institution conducting animal based research, teaching or testing, must establish an *Institutional Animal Care and Use Committee (IACUC)*.

History and Background

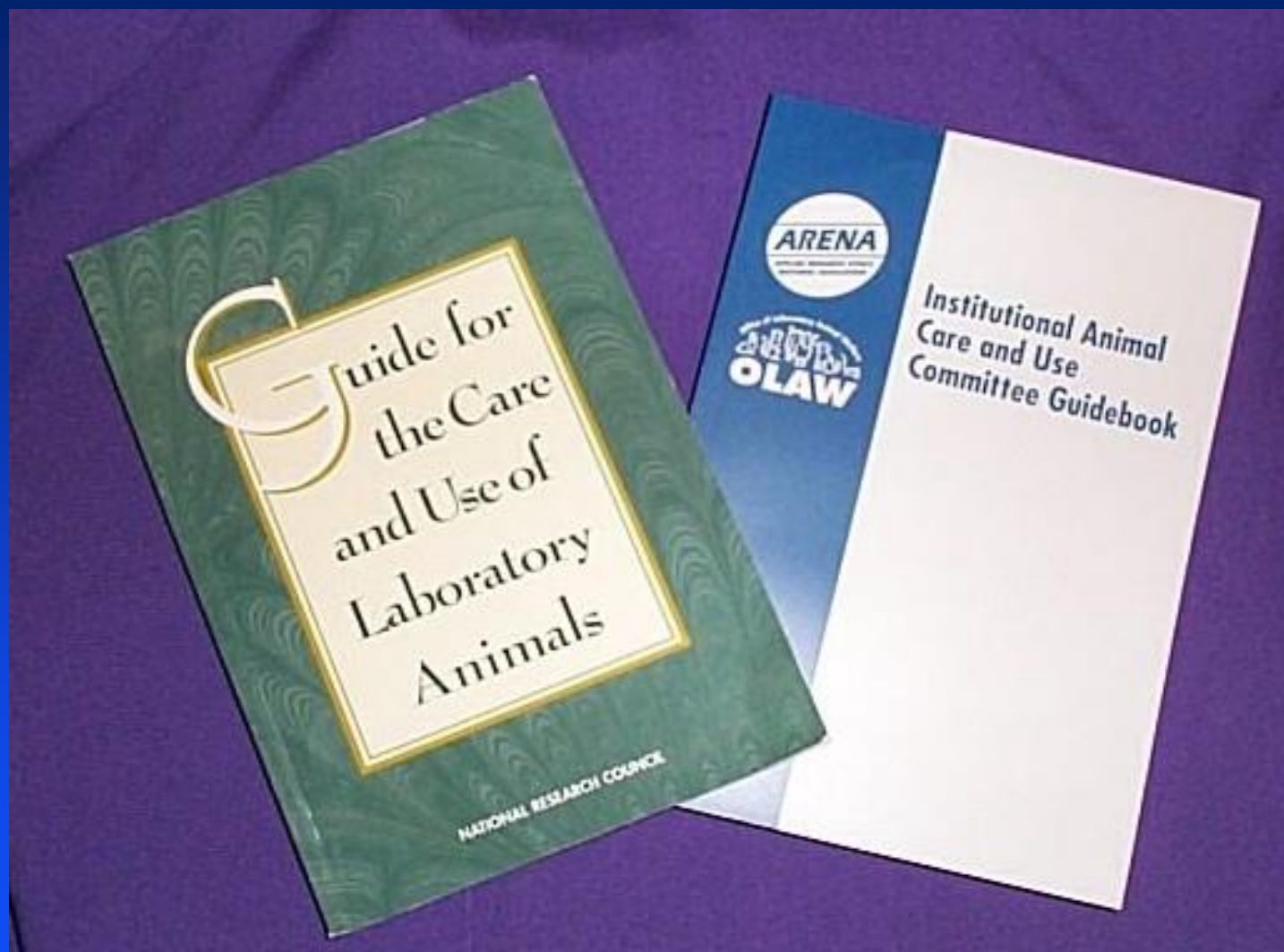
The result of this regulation is a mutual respect between researchers and IACUC members.

Researchers recognize the concerns of the IACUC members for good science and animal care, and the IACUC members recognized the well-intentioned efforts of the researchers.

The result is that all research has been reviewed for its positive benefits to society and contribution to general knowledge, and for the three Rs – use alternative lower species when possible (replace), minimize the need for animals (refine), and minimize the degree of harm (reduce).



- *USDA conducts annual unannounced inspections (as part of the Animal Welfare Act)*
- *IACUC: Conducts bi-Annual inspections of the vivarium*
- *Assume that we will be inspected TODAY!!!*



***“The Guide” – the bible for animal research and the PHS Policy.
A copy of the guide is available in the Vivarium Manager’s office.***

To use any vertebrate animals for research purposes, you must have an approved (and current) IACUC protocol!

Ask your professor for a copy if you have questions!

Who makes up the TCU IACUC?

- The IACUC must be appointed by the Chief Executive Officer and consist of at least five members, including at least one of the following
 - ◆ a veterinarian with program responsibility,
 - ◆ a practicing scientist,
 - ◆ an individual whose expertise is in a non-scientific area and an
 - ◆ Individual who is not affiliated with the institution.
- This Committee must use the Guide to review the animal facilities and the institutional program for humane care and use of animals at least once every six months and prepare reports of these evaluations for the responsible institutional official.
- Follow this link to access and REVIEW the current committee info: [TCU IACUC](#)

What is involved in a protocol?

- Follow this link to access current protocol info and review the information at the two links:
 - ◆ [TCU IACUC forms](#) (notice the documents available)
 - ◆ [Submission Process](#) (read “Reporting Animal Welfare Concerns)
- Write protocol using lay, accessible language. Focus on the broad significance of the work, procedures conducted on the animals, and novelty of the work.
 - Emphasize the 3 R’s, Replace -- reduce -- refine.
- The TCU IACUC will review the protocol.
- Once approved, write annual reports.

Caring for Experimental Animals After a Protocol Is Approved

- Each cage must have a cage card
 - Clearly indicate if animal is food restricted
- Protocol # must be on the cage card

If something does go wrong, we
have a policy for what to do next

Guidelines for Reporting Adverse Events in the TCU Vivarium

What constitutes an adverse event due to negligence, mistreatment, or protocol noncompliance?

- Any injury, death, or other health-related event which occurs as a result of procedures, activities, or policies NOT included in a principle investigator's approved IACUC protocol or from an unexpected change in environmental conditions.
- These include, but are not limited to, unauthorized surgery or drug injections, accidental water deprivation, unauthorized restraint of animals, negligent handling of animals, food deprivation for punitive reasons, taunting of animals, flooding in the vivarium, and temperature or humidity fluctuations.

If you are not sure if an event should be reported

- Meet with your supervising professor immediately and report the event to them.
 - ◆ Your professor knows the details of their protocols and can help identify adverse events.
 - ◆ It is now the responsibility of the professor to report the event
- If your professor is out-of-town or is not responding, report the event immediately (description for reporting on the next slide).

Reporting Adverse Events

If an adverse event has been observed, the details of the event (written and/or verbal communication) must be reported by a student, principle investigator, or the Vivarium manager to all of the following parties within 48 hours of becoming aware of the situation:

- On-Call Veterinarian, Lloyd Phinney
- Vivarium Manager, Lindy Bledsue
- Vivarium Coordinator, Ken Leising
- IACUC Chair, Dean Williams
- If the reporting individual is an undergraduate or graduate student, report the adverse event to the student's supervising professor.

- Additionally, in the case of environmental conditions contact:
 - ◆ TCU Physical plant, 817-257-7955

Responsibilities of the Principle Investigator

Complete the adverse events form and submit it to the Research Integrity Office and the chair of the TCU IACUC as soon as possible, but no later than seven (7) days in the case of death or life-threatening serious adverse events or within fifteen (15) days after the occurrence of all other forms of serious adverse events.

Responsibilities of the Principle Vivarium Coordinator

Follow-up on adverse events immediately and coordinate communication between the principle investigator supervising the research, veterinarian, vivarium manager, and IACUC chair.

Additionally, the vivarium coordinator should gather sufficient information to file a formal written report to the IACUC chair. A formal written report should be filed as soon as possible (within 30 days of the first report).

What if the conditions leading to the adverse event haven't changed?

- Communicate your concerns with your supervising professor.
- If your concerns are not addressed, communicate them to the IACUC chair (Dr. Dean Williams)

What about a severe injury to an experimenter?

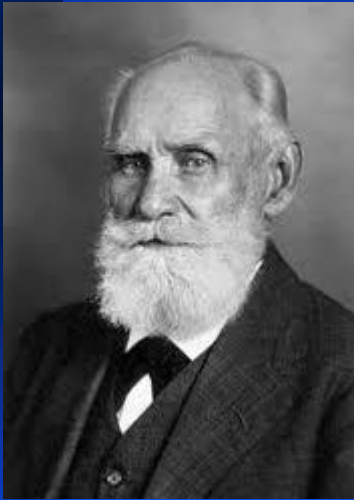
A workplace adverse event is any cut, contusion, or other bodily damage incurred while conducting research on or caring for protocol-approved non-human animals.

What about a severe injury to an experimenter?

Students must report all injuries immediately to their supervisor. In order that employees receive prompt care and coverage the following basic reporting procedure should be followed:

- Immediate medical attention should be given to the student in accordance to the severity of the injury.
- The student should be referred to the TCU Health Center (817-257-7940).
- Additional Responsibilities of the *Principle Investigator*
 - Complete the adverse events (workplace injury) report found at tcu.edu and submit it to the chair of the TCU IACUC (Dr. Dean Williams) and Vivarium Manager, Lindy Bledsue as soon as possible, but no later than seven (7) days in the case of death or life-threatening serious adverse events or within fifteen (15) days after the occurrence of all other forms of serious adverse events.

Poor animal care / husbandry leads to poor science!



Pavlov

The third factor determining the facility with which new conditioned reflexes can be established is the health of the animal. A [p. 29] good state of health will ensure the normal functioning of the cerebral hemispheres, and we shall not have to bother with the effects of any internal pathological stimuli.

If you have any questions, please contact:

- Laboratory PI
- Animal Care Technician
 - ◆ Lindy Bledsue
- Vivarium Coordinator
 - ◆ Dr. Kenneth Leising
- Veterinarian
 - ◆ Dr. Lloyd Phinney
- IACUC Chair
 - ◆ Dr. Dean Williams



Thanks for your time!