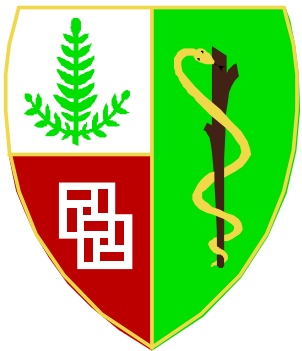


Ethics of Animal Research



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What is “Ethics?”

Merriam-Webster’s Medical Dictionary:

“The principles of conduct governing an individual or group.”

Why is it important to discuss the ethics (principles of conduct) of the use of animals in research?



To Keep You (and Your Supervisor) Out of Trouble

“**A Cautionary Tail.** Immunologist X has a message for his fellow researchers: When in doubt, check with your Institutional Animal Care and Use Committee (IACUC). The University of Washington (UW), Seattle has barred [him] from conducting animal research for at least a year after the committee documented an array of violations, including cutting the tips of mouse tails (for tissue analyses) without proper anesthesia.”

X, who came to UW 3 years ago, has also had to retract a recent high-profile paper from the *Journal of Clinical Investigation* because the IACUC hadn't fully approved the study.”

“A contrite X says his inexperience led to the potentially career-ending missteps, and that he plans to repeat and resubmit the retracted results. And he's relieved that his studies will be able to continue under the watchful eye of [a] colleague, who has been given temporary oversight of animal work in X's 12-person lab.

“I regret that I didn't understand how things worked,” he says. “And I strongly recommend that everyone work closely with [the] IACUC.”

Science. 2003. 302:1657

- If you are ignorant of the ethics of animal research you may do something that is not accepted as being proper behavior.
- “Noncompliance” → IACUC → Institutional Official → Federal agencies.
- Stop your use of animals, return / loss of funding, fines (you and Stanford).

Ethical beliefs on animal use

- Ethical beliefs (concept of right and wrong) are not constant but evolve with society.
- Ethical beliefs vary:
 - Between societies (farm vs. urban)
 - Between different cultural backgrounds
 - dog as food, horse as food, swine as food, cows as food
 - vegan / vegetarian
 - Between fishing / hunting vs. research
- Society holds animal researchers to a very high standard.

Overview

- Philosophies regarding animal research
- Animal rights vs. Animal welfare
- “3 R’s” and Regulations



Philosophies Regarding Animal Use

- Judeo-Christian
- Cartesianism
- Utilitarianism
- Reverence for Life



Judeo-Christian

- Dominance of humans over all other living creatures.
- Must be attended by responsibility and caring.
- America's laws and regulations largely reflect these beliefs.

Rene Descartes (1596-1650) – Cartesianism



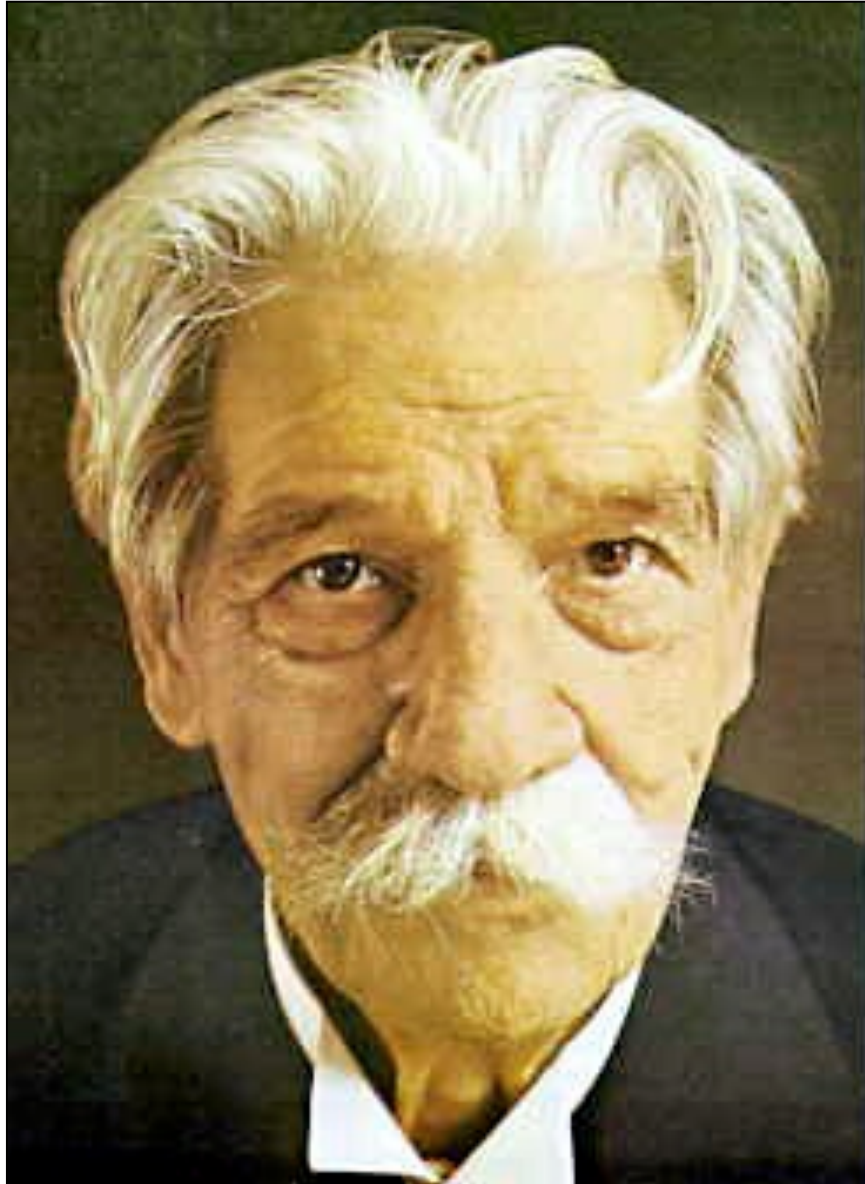
- Mathematician (analytical geometry, Cartesian coordinate system)
- Father of Modern Philosophy
- “I think, therefore I am.”
- Scientific Revolution

Cartesianism & Animals in Research

- Only humans have a soul (mind).
- Animals do not have conscious thought.
- Therefore animals can not suffer.
- Influenced animal use during the Scientific Revolution.

Utilitarianism - value of animal use

- **Strict** – Individual animal must benefit from the research performed on it (philosophy of many animal rights activists).
- **Permissive** – Society must benefit from the research performed on the animal(s) (utility must exceed the cost; philosophy of many scientists).



“Reverence for Life”

Albert Schweitzer
(1875-1965)

- Medical doctor
- Missionary
- Humanitarian
- Nobel Peace Prize 1952

“Reverence for Life”

- Revere all life –animal, plant, microbial.
- Stressed the importance of use of life for the benefit of others.
- “Ethics is nothing else than reverence for life.”



Science. 2004. 306:2184

SARS War Memorial

China has no animal-rights movement to speak of. But its scientists still think about the sacrifices made by their research animals. The latest memorial sits on the lawn at the Animal Research Institute of the Chinese Academy of Medical Sciences in Beijing, a tribute to the animals that gave their lives to develop a vaccine against severe acute respiratory syndrome (SARS).

The "Soul-Consoling Stone," as it is named in Chinese, was installed in spring 2003, not long after SARS swept through Asia. Qin Chuan, a pathologist and head of the institute, says the monument is only now being publicized because of promising early vaccine trials (Science, 17 December, p. 2021). Qin says she hopes the stone will remind people of the contribution of mice, guinea pigs, rabbits, and monkeys to human health. "After all," she says, "human beings or animals, we are all Nature's creatures."

Animal Rights Activists & Ethics



Animals should not be exploited - strict utilitarianism.

Some Believe Violence is Justified



- Intimidation
- Vandalism
- Floodings
- Bombings

- 25% of incidents occurred in California

Animal Rights ≠ Animal Welfare

- **Rights**

- Legal standing
- Determined by society
- Responsibilities



- **Welfare**

- Responsibility for well-being
- Shelter, food/water, protection from predators, medical tx
- Used for specific purposes



What Can YOU Do?

- Always consider Alternatives to the use of animals in testing, research, and training and follow the “3 R’s”.
- Always follow the Regulations governing the use of animals in testing, research, and training.

Alternatives to the Use of Laboratory Animals



The Principles of Humane Experimental Technique (1959)

3 R's:

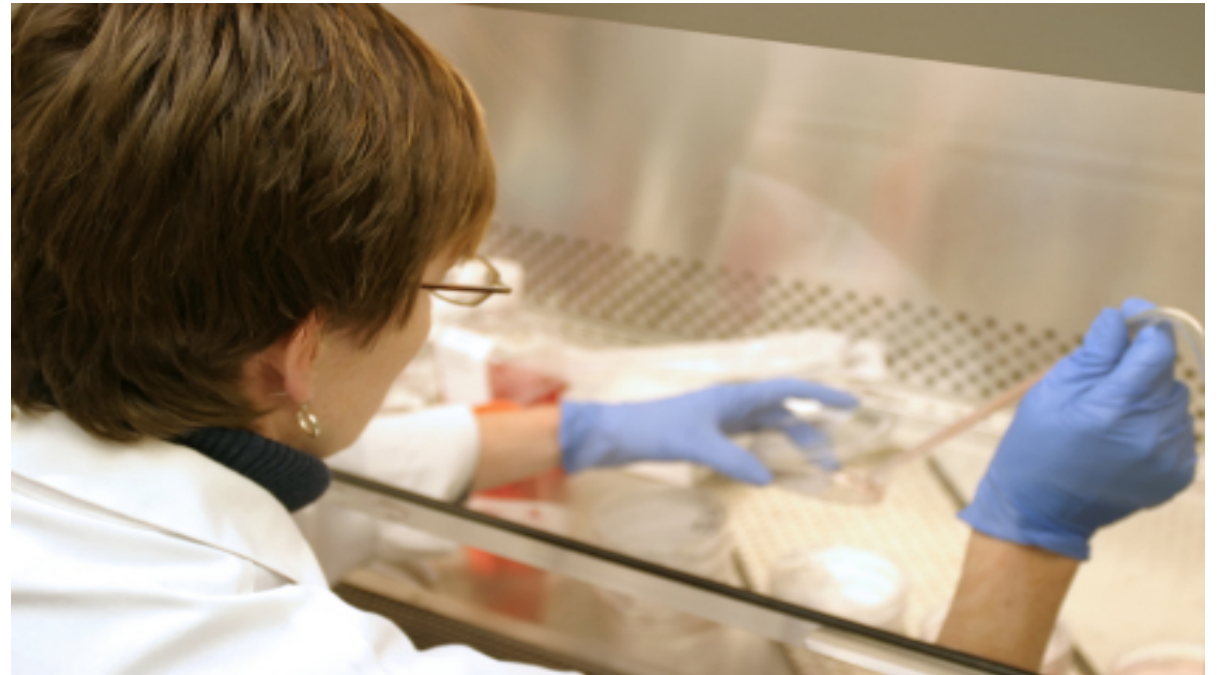
- Replace
- Reduce
- Refine

Rex Burch (microbiologist) and William Russell (zoologist)

The Three “R’s”

Replace the use of animals.

- Non-living systems
- *In vitro* methods
- Lower life forms



The Three “R’s”

Reduce animal use.

- Use statistics to ensure you do not use too many OR too few animals.
- Use quality animals.
- Pilot studies.



The Three “R’s”

Refine your techniques.

- Trained personnel
- Anesthetics and analgesics
- Euthanasia (AVMA 2013 Guidelines on Euthanasia)



<http://www.prairieswine.com>

Federal Regulations & Research Animals

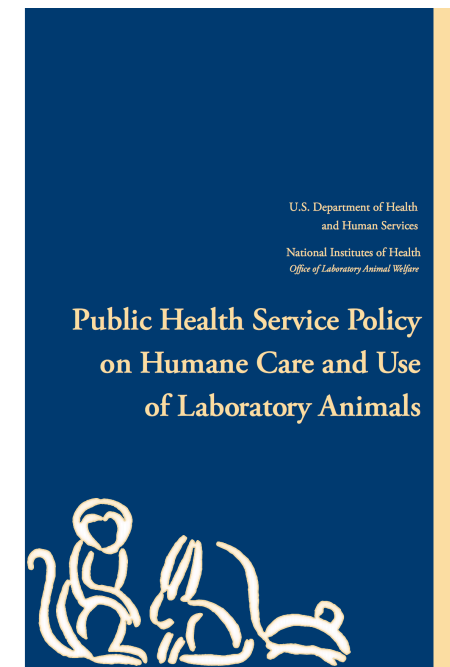
- **Animal Welfare Act (USDA)**

- Live or dead, warm-blooded vertebrate used for testing, research, training, exhibition, or a pet, e.g., hamsters, rabbits, swine, NHP.
- Excludes: Birds, livestock, horses; mice of the genus *Mus* and rats of the genus *Rattus* bred for research.



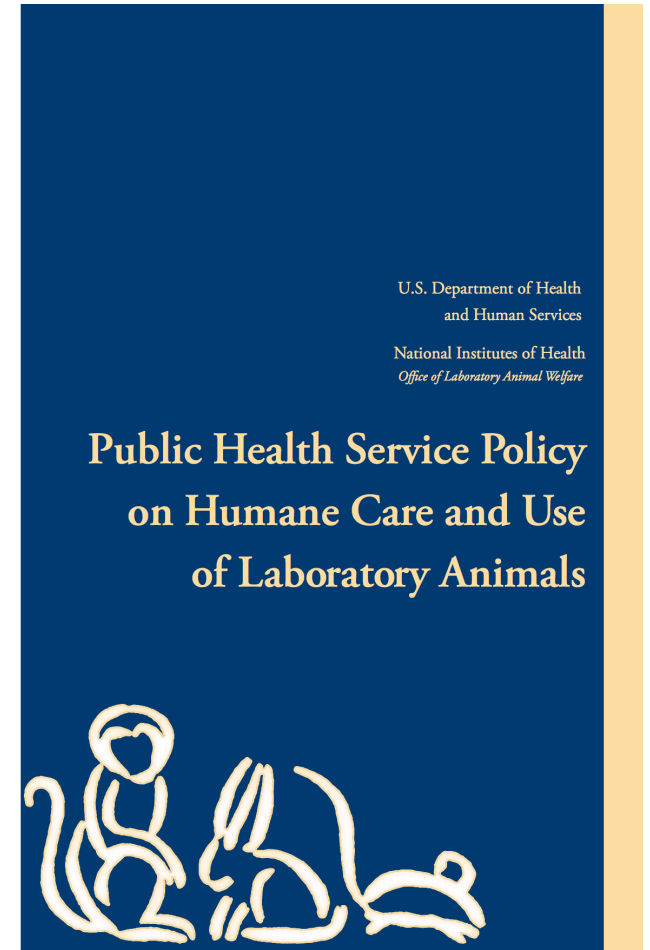
- **Public Health Service Policy on Humane Care & Use of Laboratory Animals (OLAW)**

- Live vertebrate (cold- or warm-blooded) used or intended for use in testing, research, and training funded by the PHS (NIH).



“PHS Policy”

- Stanford must submit an “Animal Welfare Assurance” to OLAW outlining its program for animal care / use.
- **Researchers must submit an animal use protocol prior to starting vertebrate animal research.**
- Stanford’s Institutional Animal Care and Use Committee (= APLAC) reviews the protocol according to the “U.S. Govt. Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research and Training” and gives or denies approval.



If you do not use NIH funds but obtain funding from the Department of Defense (DOD), National Science Foundation (NSF), or the California Institute for Regenerative Medicine (CIRM), do you still have to submit an animal use protocol to the Stanford IACUC (APLAC)?

If you do not use NIH funds but have funding from the DOD, NSF, or CIRM, do you still have to submit an animal use protocol?

Yes. Many funding agencies require review and approval of your proposed use of animals before funding is granted.

Suppose you have your own funding, e.g., from a pharmaceutical company or a gift, do you still have to submit an animal use protocol to the APLAC?

This is at the discretion of your institution. At Stanford, “Yes” to ensure a uniform standard of ethical animal care (Stanford Research Policy Handbook)

What are the “U.S. Govt. Principles” on which your protocol will be judged?

U.S. Govt. Principles

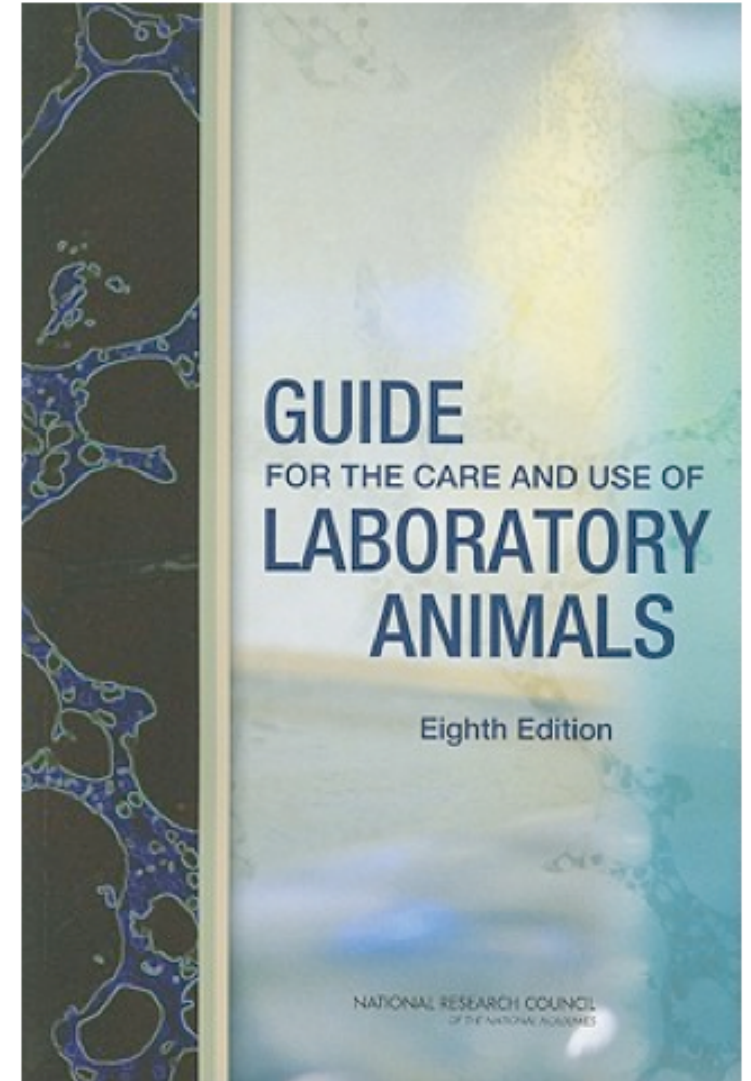
- I. Transportation, care, and use must be in accordance with the Animal Welfare Act.
- II. Animal experiments should be relevant to human or animal health, the advancement of knowledge, or the good of society.
- III. Animals should be of the appropriate species, health status, and minimum number to obtain valid results. Alternatives to the use of animals should be considered.
- IV. Pain / distress should be avoided or alleviated unless scientifically justified.
- V. Procedures that cause more than momentary pain / distress should be performed with sedation, analgesia, or anesthesia unless scientifically justified.
- VI. Animals that would suffer severe or chronic pain / distress that cannot be relieved should be euthanized at the end of or during the procedure.
- VII. Husbandry should be appropriate for the species and contribute to their health and comfort. Veterinary care must be available.
- VIII. Researchers must be qualified for the proposed procedures or must be trained.
- IX. Exceptions granted only by the IACUC (... not the Researcher).

PHS Policy (2002)

- Institution must follow the “**Guide**” (5 sections, 2011).
(see <http://www.nap.edu/readingroom/books/labrats/>)
 - Key Concepts - Ethics, 3 R's,
 - Animal Care and Use Program, Policies, and Responsibilities
 - Animal Environment, Housing and Management



- Veterinary Care
- Physical Plant
- **AVMA 2013 Guidelines on Euthanasia**



What if you get your protocol approved but your technician ignores providing pain-relief to an animal following a surgical procedure as listed in your protocol?

Your protocol can be suspended (“noncompliance”). If your protocol is suspended, all animal work **MUST** stop and the suspension **MUST** be reported to the federal Office of Laboratory Animal Welfare and/or the USDA through the Institutional Official (Dean of Research).

OLAW has the power to revoke Stanford’s Animal Welfare Assurance, stopping all Federally-funded research on campus.

USDA has the power to fine Stanford and post its findings on its website.

Animal Research is Expensive !

Species	\$ per day (2015)	\$ per month
NHP (rhesus)	\$35.36	\$1105
Pig (<100 kg)	\$57.69	\$1754
Rabbit	\$14.03	\$427
Guinea pig	\$7.30	\$222
Hamster	\$2.34	\$71
Rat (2/cage)	\$2.66	\$81
Mouse (5/cage)	\$1.02	\$31

You are at a party and meet a person who is upset that you are doing research using live animals.

How do you respond to this person?

How do I respond?

- Vaccines - smallpox, polio, dengue – both animal and human.
- Antibiotics, antivirals (HIV, hepatitis C), antifungals.
- Medical treatments – cancer, infectious diseases (Ebola) - others.
- Medical devices - imaging modalities, catheters, implants,
- Nobel Prizes in Physiology / Medicine – 89 based on animal research.

Use of animals in research is a privilege.

“In every single instance (investigators) must consider whether it is really necessary to demand of an animal (its) sacrifice for man.”

Albert Schweitzer

Ethics in Animal Research - Key Points

- Animal research is a privilege, not a right.
- Society holds animal researchers to a very high standard.
- Animal research is highly regulated (AWA, PHS Policy); you must have an IACUC-approved protocol prior to starting animal research.
- 3 R's - Replace, Reduce, Refine - mandated by the the regulations.
- If you fail to follow your animal use protocol, your research and those of others at Stanford can be jeopardized.

Questions?

