Animal Research

'Animal research' involves the use of non-human animals in scientific experiments to understand biological systems, diseases, and the effects of treatments.

What is Animal Research?

Animal research is conducted to study:

- Biological systems (e.g., neurobiology, physiology)
- Disease models (e.g., cancer, Alzheimer's, infections)
- Drug development and safety testing
- Behavioral and psychological processes

Why Are Animals Used?

Reasons for using animals in research:

- Biological similarity to humans
- Short lifespans and rapid reproduction (ideal for generational studies)
- Some studies are unethical or impossible in humans
- Controlled environments reduce confounding variables

Common Species Used

- Rodents (mice, rats): genetics, cancer, neuroscience
- Primates: infectious diseases, brain studies
- Zebrafish: developmental biology, toxicology
- Fruit flies and nematodes: aging, genetics
- Pigs, dogs, cats (less common): organ studies, surgical techniques

🕸 Ethical Considerations

Animal research raises important ethical issues:

- Animal suffering and welfare
- Scientific necessity and justification
- Use of alternatives (in vitro models, simulations)
- Oversight to ensure humane treatment

The '3Rs principle' guides ethical animal research:

1. 'Replacement': use non-animal methods when possible

- 2. 'Reduction': use the minimum number of animals necessary
- 3. 'Refinement': minimize suffering and improve conditions

Regulations and Oversight

- 'EU': Directive 2010/63/EU
- 'USA': Animal Welfare Act; IACUC review
- 'Spain': Real Decreto 53/2013

Example Study: Brain Changes in Captivity

A recent study on the common shrew (Sorex araneus) showed that:

- Seasonal brain size changes remain intact under semi-natural captivity
- However, captivity increased activity and reduced learning motivation
- Results suggest chronic stress in captivity, which can bias experimental outcomes

Conclusion: Even well-controlled captive environments may affect research results and must be accounted for in experimental design.

From: https://neurosurgerywiki.com/wiki/ - **Neurosurgery Wiki**

Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=animal_research



Last update: 2025/05/27 11:01