

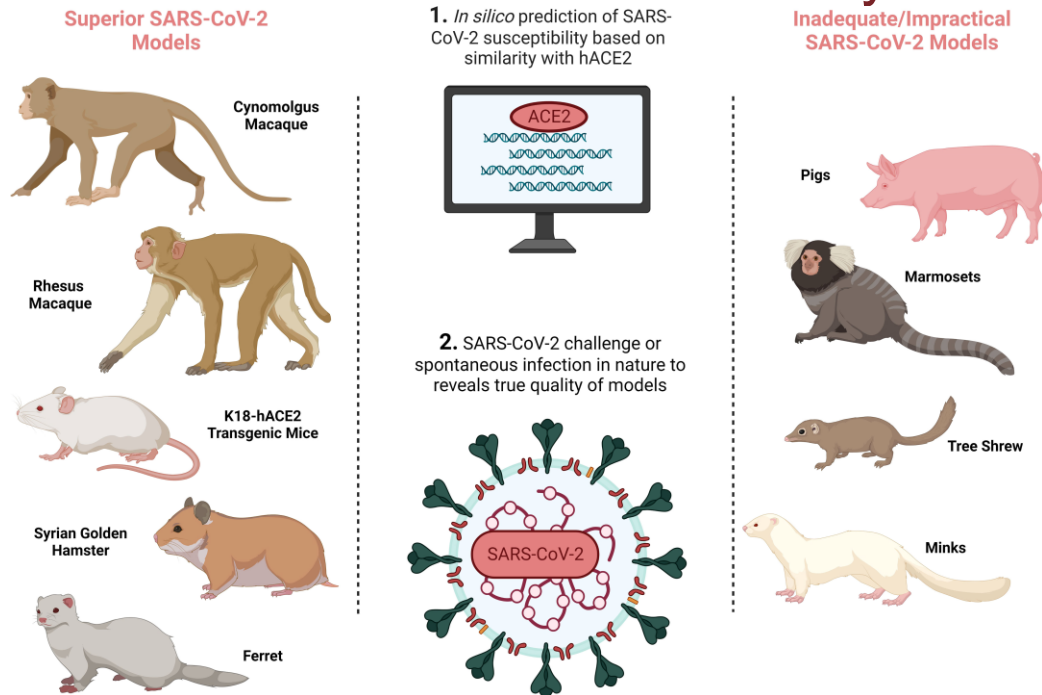
The Role of Animals in Basic, Medical, and Veterinary Health Research

Revised: 2024



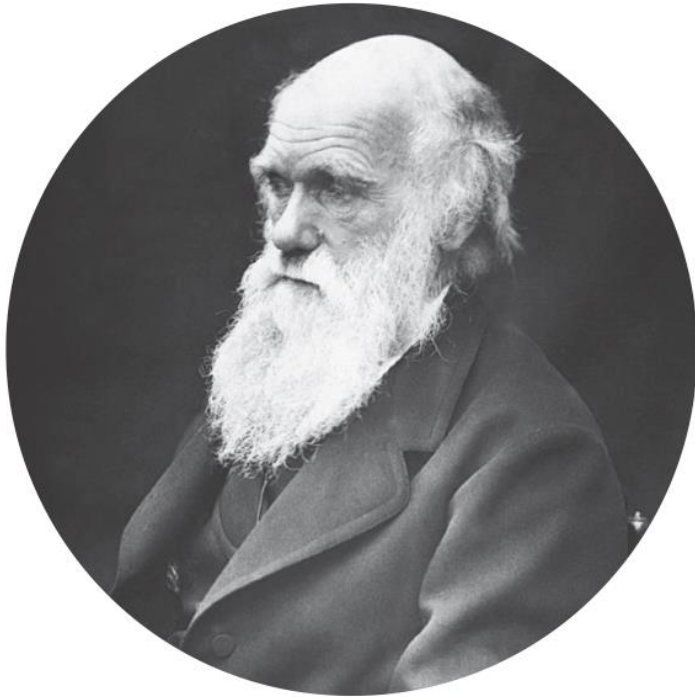
Why Researchers Select A Specific Animal Model

- Biological similarity between animal model and human
 - Genetic traceability
 - Behavioral similarity



For example, animals models used to study COVID-19

Animal research contributed to **70% of Nobel prizes** in physiology or medicine



"I know that physiology cannot possibly progress except by means of experimenting on live animals, and I feel the deepest conviction that he who retards the progress of physiology commits a crime against mankind."

Charles Darwin
The London Times, 1881

The Beneficiaries of Animal Research



Our Communities

Our families, friends and peers all benefit from the lifesaving advances made possible with the use of animals in biomedical research



Our Environment

Animal research provides an understanding of the environment and the interconnected/biodiversity of life



**SOCIETY for
NEUROSCIENCE**



Our Pets

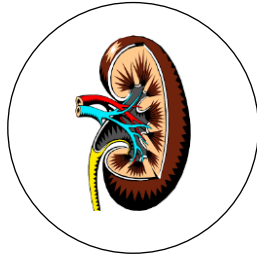
(Image: SVPAZ)

Pets suffer from many of the same diseases as humans and thus benefit from some of those same treatments developed from animal models

Human Health Advances

Examples of medical advances based on animal research:

kidney transplants



KIDNEY TRANSPLANTS

dogs and pigs

INSULIN

dogs, rabbits, and mice

BLOOD TRANSFUSIONS

dogs, guinea pigs, and rabbits

GENE THERAPY RETINITIS PIGMENTOSA

dogs

COVID-19 VACCINE

mice and nonhuman primates

insulin injections



MMR VACCINE

nonhuman primates

POLIO

mice and nonhuman primates

DEEP BRAIN STIMULATION

nonhuman primates

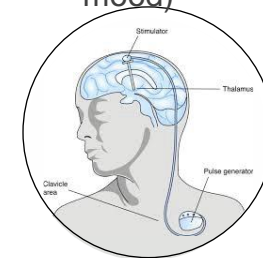
PENICILLIN AND STREPTOMYCIN

mice and guinea pigs

HIV TREATMENT

mice, felines, nonhuman primates

deep brain stimulation
(Parkinson's disease and
mood)

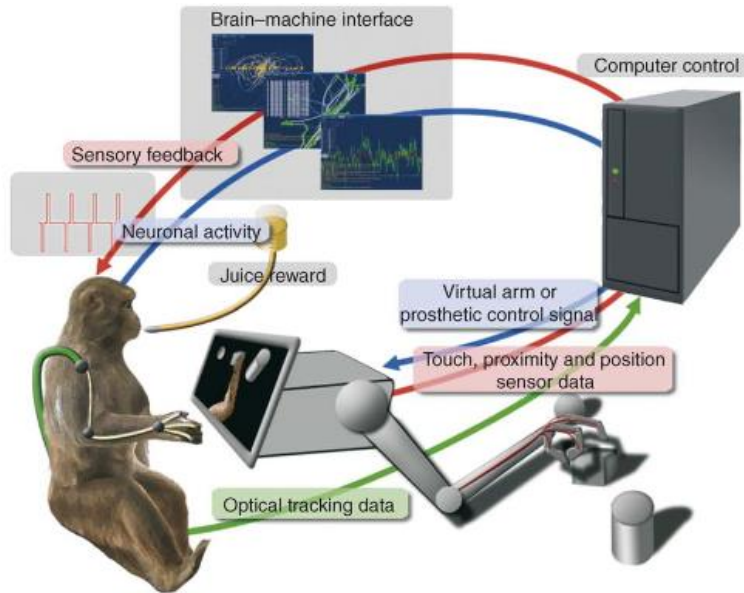


“There could have been no oral polio vaccine without the use of innumerable animals.”

Albert Sabin, Polio researcher

Limb Function Through Advances in Brain Machine Interfaces (BMI)

BMI technology informed by nonhuman primate neuronal recordings



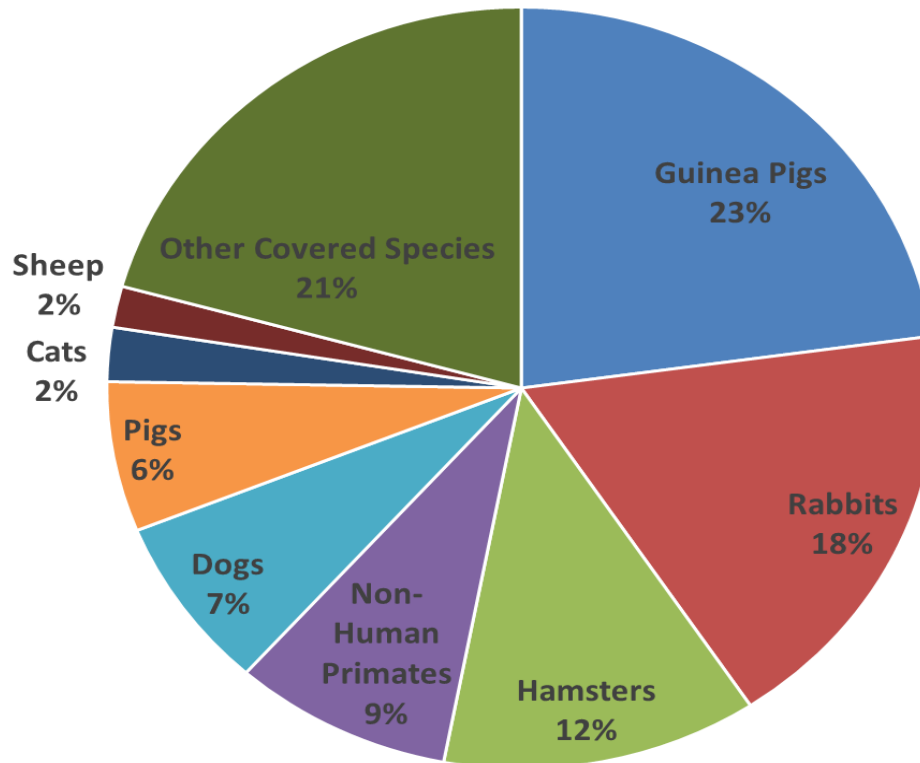
BMI's potential to restore limb mobility



Laboratory Animals: 'Partners' in biomedical innovation

Laboratory Animals in U.S.

Number of Animals used in research in the US in 2019 by Species



©Speaking of Research 2021

Source: Speaking of Research. 2021.

The Health and Wellbeing of Animals is Critical for Rigorous Science



HEALTH CARE

cared for daily by animal welfare staff and regularly monitored by veterinarians

NUTRITION

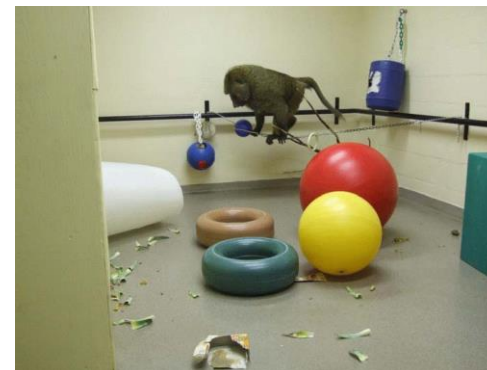
veterinarian approved diet

ENVIRONMENT

clean with minimal stressors

PSYCHOLOGICAL

species specific enrichment



Scientific Progress and Ethical Progress

Scientific Progress and Ethical Progress should go hand-in-hand

- Scientists take what they learn via the scientific process and turn that into ethical advancements
- Examples:
 - Scientists learned that nursery rearing of monkey's results in abnormal behavior, so many scientists are turning to other methods such as developmental studies in naturalistic contexts
 - Scientists now understand that how samples are collected (sedated vs “forced” vs “PRT”) has influences on many biological factors
 - Scientists now know that the animal’s environment can impact immune function which has consequences for disease progression and treatments

Veterinary Advances

FOWL POX VACCINATION

mice



WHITE NOSE SYNDROME

brown bats



ELEPHANT ENDOTHELITROPIC HERPES VIRUS

mice and rabbits



EBOLA IN WILD NONHUMAN PRIMATES

mice, guinea pigs, nonhuman primates



RUMENSIN ANTIMICROBIAL

mice



Regulations Governing Animal Research

Animal Welfare Act (AWA) and the **Public Health Service (PHS) Policy** require each research institution to appoint an **Institutional Animal Care and Use Committee (IACUC)** including a veterinarian and a non-affiliated public representative to review all experimental protocols, inspect facilities, and suspend any research practice not in compliance



In IACUC proposals, scientists must...

1. Cite literature to explain:

- Why their model is the **appropriate experimental subject** to address the research question
- Why **alternative research subjects** (e.g., cell culture and computer simulation) would not yield similar information
- Why their potential results would not **unnecessarily duplicate** previous research

2. Perform sample size calculations to determine **number of animals necessary**

Many institutions are implementing animal research conduct by following the 3 R's:

- Replace with an alternative
- Refine methods to minimize pain and invasiveness
- Reduce the number of animals

Animal Research Regulation and Scientific Merit

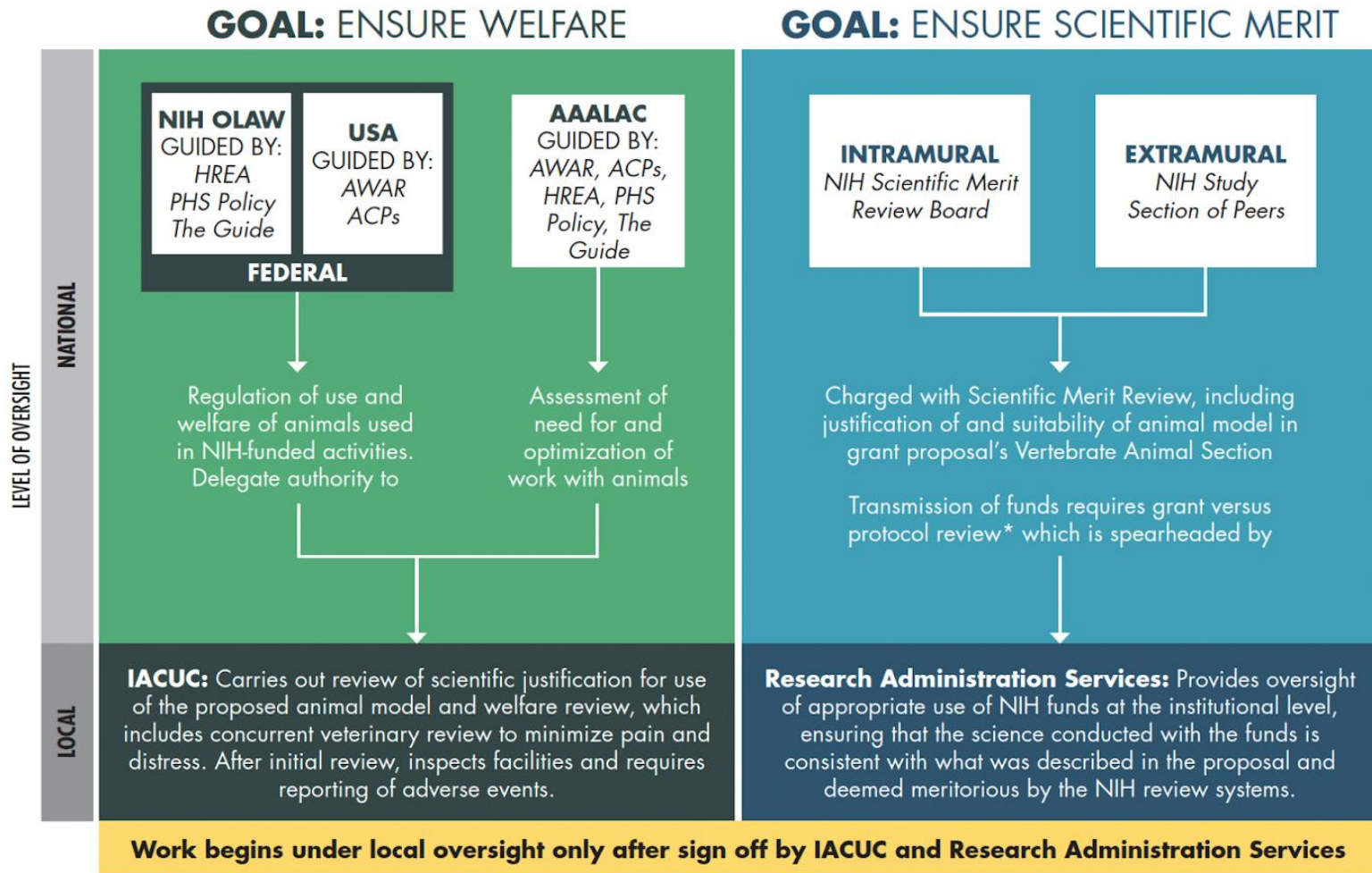


FIGURE 1-2 Elements of oversight of animal research in the United States.

*Grant versus protocol review is a process whereby an institution's Research Administration Services

Animal Research Resources

Foundation for Biomedical Research



FOUNDATION FOR
BIOMEDICAL RESEARCH

Love ANIMALS?



SUPPORT ANIMAL
RESEARCH

Animals behind the 25 most
prescribed drugs

Species-specific examples of
animal research:

1. Rodents
2. Dogs
3. Cats
4. Nonhuman primates

Americans for Medical Progress



AMERICANS FOR MEDICAL PROGRESS

Protecting Your Investment in Research

Come See Our World video

Love Care Progress
nonhuman primate video

Federation of European Neuroscience Societies

FENS

Federation of
European
Neuroscience
Societies

Speaking of Research

Speaking of
research 

Association for Assessment and Accreditation of Laboratory Animal Care International

