

Animal research in the UK - what, where and how much?

- Scientists use animals in medical, veterinary, environmental and scientific research to develop treatments for humans and animals and to understand the biological processes associated with health and disease. This takes place across a range of institutions including medical and veterinary colleges, universities, teaching hospitals, pharmaceutical companies and other research facilities.
- There are many comparable physiological processes in humans and animals. These similarities mean that scientists can study animals as models of human biological processes and the diseases which affect them.
- Genetically altered (GA) animals, usually mice, rats and fish, help scientists understand the function of particular genes and genetic factors that cause diseases. 61% of procedures in the UK involve genetically altered animals.
- Animal research programs benefit from a team of people, including veterinarians, animal technicians and scientists, who together manage day-to-day care and welfare needs of the animals.
- In 2013, the number of animals used in research was 4.02 million, down 0.4% from 2012. By species this was: 76% mice, 12% fish, 7% rats, 3% birds and 2% other species. Dogs, cats and primates together accounted for less than 0.2% of the total.

Why is animal research necessary?

- Basic research aims to address fundamental biological questions about humans and animals. This contrasts with applied research, which focuses on a specific disease or treatment. Without basic research we would not have the knowledge that underpins the development of new medical and veterinary treatments.
- New medical treatments are required by law to be tested on animals before they can enter human clinical trials. Safety regulations to protect patients also require that batches of certain drugs be screened in animals.

When are animal studies allowed?

- The “3 Rs” – Replacement, Reduction and Refinement – guide the ethical use of animals in science. Researchers must *replace* animal studies with other research methods wherever possible; employ strategies that will *reduce* the number of animals as far as possible while maintaining scientific rigor; and *refine* experimental and husbandry procedures to minimize potential pain and distress for the animals.
- Biomedical research is one of the most heavily regulated industries in the UK.
 - Facilities using animals covered by the Animals (Scientific Procedures) Act are subject to both announced and unannounced inspections by the Home Office Inspectorate.
 - Three kinds of licenses are required before any animal research can go ahead. An animal experiment requires a project license and the person applying the procedure must also be licensed. Finally, the institution must hold an establishment license to conduct animal research on its premises.
- Before a project is approved it must first go through an institution’s Animal Welfare and Ethical Review Body (AWERB) which will promote implementation of the 3Rs and find ways to raise standards of both the science and animal welfare.
- Special protections are provided to primates, dogs, cats and equidae (horses) which may only be used if the researcher first shows why they cannot use another species for their project.
- Better standards of welfare produce better quality research. Most improvements to animal welfare have come from within the scientific community.

Where do the scientific community and general public stand on animal research?

- Surveys consistently show the vast majority of scientists support the use of animals in research (see links below), but there has always been a small minority that is sceptical of its utility.
- Public attitudes have remained positive over the last decade with approximately two-thirds of the British population in support of the use of animals in medical research (see links below).

Topics raised by animal rights activists

Success/failure in developing medical treatments

Animal research has contributed to the overwhelming majority of medical and veterinary advances, often through basic research to understand disease. Animal testing is also a crucial safety screening process in the development of new treatments. Although safety screening does not directly lead to medical advances, it has ruled out many treatments that would have posed a threat to human health.

Are results of animal experiments relevant to human health?

Specific animals are chosen because they are similar to humans in a particular way, e.g. susceptibility to a certain disease. Genetically altered animals, usually mice, are bred to increase those similarities. Novel drugs are screened in animals to help identify potentially dangerous side effects and many drugs originally developed for people are later used to treat animals with conditions such as heart disease, diabetes, and cancer. Researchers are also interested in the differences between species, such as why naked mole rats don't get cancer, or how zebrafish can regenerate damaged heart tissue.

Pain and distress

In deciding whether a project can go ahead, the likely adverse effects on the animals used must be weighed against the potential benefits (to humans, other animals or the environment) that are expected to accrue from the work. All procedures must be conducted under general or local anaesthesia unless administering the anaesthetic would cause more suffering for the animal than the procedure itself. If anaesthetic cannot be used then analgesia or other appropriate way of minimising pain, suffering, distress or lasting harm must be used instead. Researchers must, by law, show that the project could not be carried out using non-animal alternative methods before it can be approved.

Non-animal research methods

Various non-animal research methods are used together with animal studies and reduce the number of animals needed. These methods include stem cells, tissue cultures and computer models. Non-animal methods account for the majority of biomedical research. Nevertheless, there are important research questions that still require animals. For example, in drug development, a large initial group of chemical candidates may be screened using non-animal methods, and only the most promising ones are taken through animal testing and human clinical trials. Before animal studies can go forward, investigators must detail how they have considered non-animal methods, and why they are not appropriate for answering their research question.

Secrecy

Activists have claimed that the animal research visible to the public only represents a sanitized fraction of what is actually going on. While the legacy of extremism makes some researchers cautious, institutions are increasingly giving journalists access to their facilities. In 2014, more than 80 organisations involved in conducting or funding animal research signed the Concordat on Openness on Animal Research in the UK, committing to provide the public with more information and materials about the animal research they are involved in. The bioscience community has been instrumental in efforts to reform Section 24 in order to provide more information to the general public, whilst protecting intellectual property and staff.

What does the future hold for animal research?

The need for animal research changes as technology advances, new scientific questions arise, and new diseases emerge. The research community continues to find ways to reduce the potential for pain and distress in research animals; much of this work is done under the umbrella of the 3Rs – Replacement, Reduction and Refinement. New scientific methods, such as organ-on-a-chip, have the potential to reduce the numbers of animals used in certain experimental areas, however there are limits to all technologies and it is unlikely animal research will be completely replaced in the foreseeable future.

Links to further information:

The Government provides information on both the legal framework surrounding animal research and detailed statistics of the research carried out each year

<https://www.gov.uk/research-and-testing-using-animals>

Speaking of Research (SR) provides accurate scientific information on the role of animals in research in the US and beyond. It also offers extensive links to other organizations also focused on animal research.

www.speakingofresearch.com

AnimalResearch.info is a collaboration of scientists and expert contributors who provide information about the contribution of animals to scientific advances.

www.animalresearch.info

Public opinion in the UK on animal research has been tracked by Ipsos MORI

www.ipsos-mori.com/researchpublications/publications/1512/Views-on-the-use-of-animals-in-scientific-research.aspx

A 2011 poll in Nature found that 92% of scientists believed “animal research is essential to the advancement of biomedical science”, with only 3.3% disagreeing.

<http://www.nature.com/news/2011/110223/full/470452a/box/1.html>

Understanding Animal Research is a British not-for-profit which provides information about animal research in the UK.

www.understandinganimalresearch.org.uk

The National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs) is tasked by Government with supporting the UK science base through the application of the 3Rs.

www.nc3rs.org.uk

The Science Media Centre is an independent science press office. They provide briefings on numerous scientific issues and their briefing notes on animal research provided the template for our own Background Briefings.

<http://www.sciencemediacentre.org/publications/publications-for-journalists/briefing-notes-for-journalists/>