Research concerns and animal welfare important in the balance of interests

Animal testing: concerted use for new challenges

Diseases such as Alzheimer's, Parkinson's, multiple sclerosis and attention-deficit hyperactivity disorder are increasing worldwide as a consequence of higher life expectancy. Animal testing research creates an essential groundwork for the understanding of these complex diseases and for the development of differentiated therapies. Animal testing research attaches great weight to animal welfare and conducts its trials in compliance with strict ethical and legal rules.

People's growing life expectancy results in an increase in both diseases and signs of age-related wear and tear. At the same time, people aspire to a higher quality of life and to a more independent lifestyle – in parallel with rising health costs. With the introduction of molecular biological methods and the development of high-precision imaging technologies, medicine and biomedical research have access to new approaches to improved diagnostics and therapies. Particularly the complete decoding of the human genome (the entirety of the hereditary information of a cell) provided scientists with an utterly new understanding of molecular processes in cells, organs and even in the human body as a whole. Thus new branches of so-called systemic research have evolved in biology.

All these research successes are based on the principle of observation, which is indispensable to natural science, and on proof of cause/effect relations. Crucial contributions towards these scientific advances were made by laboratory animals, particularly by transgenic laboratory mice. Such mice carry a foreign or mutated gene or lack a certain gene. For this reason, they can be used to study the influence of an individual gene on cells or organs and on the organism as a whole, as well as any interactions with external influences. If, earlier on, genetic causes of disease patterns could only be examined in certain individual cases, transgenic animals now enable researchers to examine any number of genes. It is for the benefit and safety of patients that animal testing remains indispensable for the development and approval of drugs and therapies.

The significance of animal testing research for the ETH Domain

In Switzerland's education, research and innovation landscape, the ETH Domain plays a key role in biomedical and medical engineering teaching and research. The ETH Board and the Swiss Federal Institutes of Technology in Zurich and Lausanne promote biomedical research by means of strategic research topics and institutional innovations. Thus, in 2010, ETH Zurich decided to set up a new Department of Health Science and Technology, just as the ETH Domain's National Competence Center for Biomedical Imaging was established in 2006 and the EPFL's School of Life Sciences in 2002. The ETH Domain's research institutes, notably PSI and Empa, also make vital contributions. For instance, they develop new types of materials for the protection of the human body and prepare pioneering procedures for the diagnosis of and fight against diseases (e.g. fMRI, PET, proton therapy).

All these research and development activities, which are important for society, the economy and Switzerland as a centre of innovation, were and are not conceivable without trials on animal models. For this reason, animal testing research has increased substantially in the past decade: according to a register of officially approved animal experiments commissioned by the ETH Board, a total of 47,851 animals were used for research purposes in the ETH Domain

The significance of biomedical research for Switzerland

Switzerland's universities and research institutes are among the international world leaders in the field of biomedical research. According to a ranking published by the news portal ScienceWatch in February 2010, Switzerland occupies first place in the "Citations per paper" category (http://www.sciencewatch.com/dr/cou/2010/10febBIO/). The two Swiss Federal Institutes of Technology in Zurich and Lausanne, as well as the Basel pharmaceutical groups Roche and Novartis, made a substantial contribution to this excellent ranking.

Facts and figures for Switzerland

After the first animal testing statistics for Switzerland were published in 1983, the number of animals used for animal trials continually decreased until 2000, namely from 1,992,794 to 566,398 animals (– 72 %). Since then, this number has again been constantly rising (2008: 731,883 animals; + 29 % since 2000). This increase since 2000 is largely accounted for by biological and medical basic research at universities and university hospitals.

The 3R principle: Reduce, Replace, Refine

Modern animal protection laws oblige researchers to look for alternative methods to animal experiments. Science accepts this provision and implements it with the so-called 3R principle (Reduce, Replace, Refine): more and more experiments can be conducted in established cell cultures for whose production hardly any animals must be killed. Laboratory animals are only used in cases of scientific hypotheses which have been substantiated and have first been tested outside a living organism. This not only reduces the number of animal trials but also the number of animals used and the stress they are subjected to.

in 2008. This was approximately double the number used in 2004 (21,236). 97 % of the animals (46,322) were used for basic research, whereas the use of laboratory animals in teaching (120) and for development, diagnostics and safety checks (1,409) is small.

In terms of species, laboratory mice and laboratory rats occupy first place. With 22,857 (ETH Zurich) and 23,076 (EPFL), both Federal Institutes of Technology used almost the same number of laboratory rodents. At PSI, a small number of rodents contribute towards diagnostics and safety checks. Empa and WSL do not conduct any trials on animal models. By way of contrast, primates only account for about 0.05 % of all the animals used in approved experiments in Switzerland (2008: a total of 345, of which five were used by ETH Zurich in conjunction with the University of Zurich). Of these experiments, 88 % were not stressful or only slightly so. The Swiss National Science Foundation makes approved primate trials transparent on its website on an annual basis (http://www.snf.ch/E/current/Dossiers/Pages/animaltests.aspx).

Commitment to ethical behaviour towards people and animals

With its compliance with the 3R principle (see Box), Swiss animal protection legislation has played a pioneering role worldwide. Other European countries have adopted this principle. The ethical principles for the conduct of animal experiments formulated by the Swiss Academy of Medical Sciences and the Swiss Academy of Sciences have been binding on Swiss research ever since 1983. The Swiss Animal Protection Act, which was revised in 2005, and the associated Ordinance of 2008 are consistent with the European Council's and the EU's regulations concerning animal testing research, which have meanwhile become highly demanding and very costly.

For the institutions of the ETH Domain, ethical action and the competent, respectful and responsible treatment of laboratory animals constitute an integral component of research. These institutions set great store by the professional training of researchers and personnel, by species-appropriate breeding, rearing and care of the laboratory animals before and after experiments, as well as by the supervision of experiments by veterinary surgeons. It is for this reason that the ETH Board opposes the idea of keeping animals centrally for the whole of Switzerland, thus placing animal welfare above considerations of financial efficiency.

In view of the significance of animal testing research for the mastery of challenges related to human health, and in view of the high value creation of biomedical and medical engineering innovations for Switzerland, transparent general conditions will remain indispensable. This also applies to basic research, which is conducive to innovation but in which new findings and thus any application-related benefits cannot be predicted. Recent examples have provided evidence of the fact that the discovery of drugs and therapeutic approaches is often an unplanned surprise in the context of basic research projects. Any complication of the approval procedures of animal trials for research that is not immediately application-oriented would therefore inhibit innovation processes.

Published by:
ETH Board
Dr Fritz Schiesser, President
Häldeliweg 15
8092 Zurich
Phone +41 (44) 632 20 01

Specialist questions:
ETH Zurich, Animal Behaviour, Health and Welfare Unit
Dr Markus Stauffacher
Member of the ETH Board
LFW B55.1 – Universitätsstrasse 2
8092 Zurich
Phone +41 (44) 632 30 19

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