

Animal studies/Expert

Need for female laboratory animals

Research on animals has always been indispensable for medical practice. Until the 1960s, the sex of laboratory animals was almost completely disregarded (with the exception of studies on reproduction). Even today, in 22 to 42 percent of physiological, neuroscientific and biological studies, sex of animals used is still not apparent to the readers of research papers.^[1] Many studies still focus on male animals and exclude female animals from their study. There are many reasons for this: in particular, impact of hormonal differences on results should generally be avoided.^[2] During the menstrual cycle, the female sexual hormone levels fluctuate and may interact with experimental results. Such hormonal fluctuations can make scientific analysis more complex; workload and costs increase.^[3] More factors must be considered in research design as a consequence, the number of experimental animals, for example, must be increased in order to obtain conclusive results. Female laboratory animals also tend to be more expensive to purchase (due to the possibility of breeding).^[4]

Male animals are excluded from studies much less frequently than females.^[5] One reason for such an exclusion may be that in some species a high level of aggression between males makes cage management difficult. In toxicological studies, moreover, female rodents are preferred because they are more sensitive to some toxins.^[6]

The exclusion of female laboratory animals gives rise to various difficulties. First, a sound understanding of female disease processes is prevented. Results with male laboratory animals are often generalized to both sexes. Even health problems that occur more frequently in females are sometimes only studied in males. This creates a gap between the proportion of women in patient populations and the proportion of female animals in research. Furthermore, sex cannot be used as an important variable and sex related aspects (e.g. differences in the immune system) cannot be analyzed.^[7] Ultimately, the inclusion of female laboratory animals is a prerequisite for the proper investigation of female-specific phenomena: Studies on model organisms are particularly important, for example, with regard to pregnancy, in order to ensure the safe treatment of pregnant women in testing and practice.

Governance-financed studies in humans are usually subject to laws that guarantee the inclusion of female study subjects. However, these guidelines rarely apply to animal experiments. Nevertheless, experiments with animals of both sexes (and different hormonal levels) lead to new discoveries that influence patient care and drug development. The consideration of sex in animal research has led to numerous sex dependent innovations. For example, the study of pregnancy, menstrual cycle and menopause in animal models has confirmed the influence of hormones on basal molecular signaling pathways and made a fundamental contribution to the understanding of certain autoimmune diseases.^[8]

Greenland et al. (2007), among others, were able to demonstrate the considerable degree of sex bias in animal research: They showed that 79 percent of animal studies were conducted on male animals and only eight percent on female animals. Just four percent of the studies were planned in such a way as to allow sex effects to be tested.^[9]

Literature

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