

Ethologic observation of rats and mice as a support for the strengthening of the Russell's "three Rs"

Jorge Enrique Bueno Prieto

Department of Biology, Universidad Nacional de Colombia, Biotechnology Institute, Biomimetics Laboratory,
jebuenop@unal.edu.co

Abstract

The use of animals in scientific experimentation causes a dual reaction between those who defend the use of non-human animals to certify practices and experimental processes, and those who are against of the use of animals based on the ethical principle of respect to other forms of life. The implementation of alternatives to the use of animals for experimentation has had its equilibrium point regarding the two former fronts, in the Russell's Rs (Reduction, Refinement and Replacement) [2]. The behavior study has became the main tool to transform the animal-world vision, especially of those animals used for scientific experimentation, which were before seen as machines; and in a slow but firm manner, such a conception has been turned into ethical principles for the animal handling in research [5]. Rats and mice are currently the most used animals in the scientific search. There are behavioral parameters known of wild animals, but in dealing with specific strains, Latin America's studies area scarce. This is the reason why an ethological evaluation program on the species *Rattus Norvegicus* (Wistar) and *Mus Musculus* (BALB/c – C57BL/6) [4], spf animals (*Specific Pathogens Free*) of the laboratory of biological reagents of Biotechnology Institute from Universidad Nacional de Colombia was started.

It has been chosen the video record system by a laptop computer and a web camera because it offers a reliable and cost-effective follow up, and in addition it is a non distraction element for the animals under observation. Both the rats and mice are placed in a micro-environment (box one cage) with permanent food and drink [1], and by the time of being submitted under observation, the video system is placed at a distance of approximately 2 meters away. Such a system allows that the collected data are based on an activity in place without any human presence and for the time esteemed by the researcher.

The collected information is unified in ethograms, and there the data are discriminated in behavioral patterns, specific units of both individual and group action, adaptability conditions and a brief description of the observed actions [3]. Finally, action-time frequencies of the behavioral units are established. Up to now low aggressive levels in mice and non-existent levels in rats are found, also found are the high preference in the use of enrichment tools and high interaction between individuals, as well as the establishment of activity "times" for feeding, nattiness and rest, with scarce modification under alteration external conditions, which is a sign of high adaptability. With this information, patterns of improvement and attention are generated for the animals' well-being in our laboratory and so to guarantee a responsible and ethical management, so as to strengthen the Russell-Burch's Reduction, Refinement and Replacement principles.

References

1. Booth, D.A. (1972). Conditioned satiety in the rat. *J. Comp. Physiol. Psychol.* **81**, 457–71.
2. Cardozo de Martínez, C.A., et.al. (2007). *El animal como sujeto experimental. Aspectos técnicos y éticos*. [Santiago de Chile]: Universidad de Chile, Centro Interdisciplinario de Estudios en Bioética, 2007.
3. Crawley J.N., Paylor R. (1997). A proposed test battery and constellations of specific behavior paradigms to investigate the behavioral phenotypes of transgenic and knockout mice. *Horm. Behav.* **31**, 197–211.
4. Self, D.W. (1999). Comparison of transgenic strategies for behavioral neuroscience studies in rodents. *Psychopharmacology* **147**, 35–7.
5. Spruijt, B.M.; Hol, Th.; Rousseau, J.B.I. (1992). Approach, avoidance and contact behavior of individually recognized animals automatically quantified with an imaging technique. *Physiology & Behavior* **51**, 747-752.