



# Animal Welfare Institute

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President of Baylor University

**Dr. Kevin Chambliss**

Institutional Official of Baylor IACUC & Vice Provost of Research

**Dr. N. Bradley Keele**

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**Dr. Ryan Stoffel**

Director of Animal Facility & Attending Veterinarian

President Livingstone, Drs. Chambliss, Keele, and Stoffel:

We were disturbed to learn that Baylor University’s IACUC has approved the use of about 60 rats for the undergraduate-level Learning & Behavior Lab (NSC/PSY3120), which was offered in the fall of 2022. Further, it appears that the IACUC has approved the use of rats for this lab for close to 20 years. The IACUC has a duty to demonstrate good ethics, and it has failed to do so as described below.

**(1) The use of live animals is not justified for this purpose.** Societal expectations and the ethical use of animals in science, including science education, mandate that animals should only be used if the research/learning objectives cannot be achieved using non-animal methods. It is appropriate that this lab makes use of a virtual learning tool – ‘Sniffy the Virtual Rat’ program. However, the subsequent use of live rats is not warranted. The course’s own lab manual acknowledges that:

- “The Sniffy Virtual Rat program is used extensively and often exclusively in many Universities for investigating learning & behavior phenomena in an accompanying lab for a learning and behavior course.” (p. 6)
- “Although using a real rat in an in-person lab format is nice, using the virtual Sniffy program has some really great benefits.” (p. 7)
- “Using Sniffy also allows for students to observe some learning experiences that a real rat lab could not provide.” (p. 7)

By all accounts, the virtual learning program offers an effective, and in some respects superior, learning experience and has completely replaced the use of live rats in similar courses at other Universities. We appreciate that working with a live animal is a more enjoyable experience for many students<sup>1</sup> (though for others, the use of live animals may present an emotional, ethical, religious, or health-related barrier to learning). However, the fact that working with a real rat may be “nice” does not outweigh the costs to the animals used as experimental subjects and teaches students that rats are expendable.

Point (1) notwithstanding, we are furthermore deeply troubled by the treatment of these rats. Their housing and husbandry conditions are unnecessarily and unjustifiably punitive.

**(2) Single-housing is not justified for this purpose.** The *U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training* requires that “VII. The living conditions of animals should be appropriate for their species and contribute to their health and comfort.” Furthermore, the *Guide for the Care and Use of Laboratory Animals* states that “Social animals should be housed in stable pairs or groups of compatible individuals unless they must be housed alone for experimental reasons or because of social incompatibility [...]” (p. 51) There is no scientifically justifiable reason for the rats used in this lab to have been separated from their same-sex littermates and placed in single isolation cages. Social companionship is likely the single most important factor impacting the psychological welfare of caged animals<sup>2</sup>. “Solitary confinement” – in the instructor’s own words (p. 41) – is inhumane and unnecessary.

**(3) Water restriction is not justified for this purpose.** Rats with unrestricted access to food and water will readily learn to press a lever for a sweet reward.<sup>3,4</sup> Indeed, their motivation for sucrose solution is stronger than their motivation for cocaine.<sup>5,6</sup> Asking rats to work to avoid death (see screenshot from the lab manual below, p. 41) is extreme – especially in the context of an undergraduate course – when the same aim (teaching a rat to press a lever) can easily be achieved by asking rats to work for a pleasant reward instead.

*(If you) lever-press --> (you get to) drink --> (and, therefore,  
you may continue to) live (in solitary confinement).*

1

*(If you) don't lever-press --> (you) don't drink --> (and you) die.*

<sup>1</sup> A little bit of humor here, folks. We are not going to abuse your animal.

**(4) The way in which rats are portrayed throughout the lab manual is factually wrong and harmful.** Many statements convey outdated thinking that has long since been debunked. Additionally, some of these statements intentionally belittle rats in a misguided attempt at humor. Language matters, particularly in a teaching situation. Educators have a duty to teach young scientists to honor and respect the animals whose lives they use in the name of science. The notion (see screenshot above) that it’s humorous to think of abusing lab animals is truly disturbing, and runs directly contrary to the ethical principles this

course should be teaching its students. In addition, we've flagged some other notable examples:

- “Again, we believe that experimentation is a worthwhile endeavor, and that rats housed in clean cages, with unlimited food, and sufficient access to water, in a temperature-controlled room, are being treated reasonably well (*or at least better than Mother Nature would treat them*).” (p. 39)

Actually, rats housed in shoebox cages have nothing to do and little control over their lives; this sedentary lifestyle coupled with lack of agency cause chronic stress<sup>7</sup>. Compared to rats housed in more species-appropriate, ‘enriched’ cages, these animals have shorter lifespans; higher incidence of anxiety, depression, and abnormal behaviors; and higher incidence and severity of myriad diseases including cancer, cardiovascular disease, and neurodegenerative disease.<sup>8,9,10</sup> Rats in the wild may have shorter lifespans, but their life has meaning.<sup>11,12</sup> At any rate, the relevant comparison here is not that to a wild rat, but to a captive rat for whom one has taken the responsibility to care.

- “your rat has had limited experiences, which helps to make a more optimum learning situation” (p. 40)

Limited experiences stunt brain development and impair memory and learning. Rats raised in complex environments with conspecifics are much more adaptable to new situations and better able to learn new tasks.<sup>13,14</sup> In the words of one psychologist, “rat intelligence continues to impress even behavioral scientists who work closely with them in controlled situations. Some of this surprise may stem from earlier use of conventional and relatively impoverished test environments.”<sup>15</sup>

- “Remember that your rat is already living in solitary confinement and has a brain about the size of the tip of your little finger.” (p. 41)

This statement implies a correlation between brain size and intelligence. In fact, there is no clear correlation between absolute or relative brain size and intelligence. Rather, intelligence is related to general information processing capacity (IPC), which is a combination of the number of cortical neurons, neuron packing density, interneuronal distance and axonal conduction velocity.<sup>16</sup> Rats are largely recognized as highly intelligent and are capable of metacognition.<sup>17</sup>

- “Rats are active because they are foraging for water to counteract the many hours of water deprivation. We should not say that water-deprived rats are “active because they are thirsty” because we cannot know exactly what is going on in a rat’s mind.” (p. 42)

It has long been recognized, as a matter of universal experience, that a water-deprived terrestrial vertebrate foraging for water is, in fact, thirsty.<sup>18</sup> The sensation of thirst is what motivates the animal to seek water. For example, in one article published in the journal *Current Biology*, “[...] water seeking and consumption have evolved to be motivated behaviors, meaning that animals are able to weigh their need for water against competing

survival demands and then devise flexible behavioral strategies to meet these goals. The sensation of thirst plays a critical role in this process, by apprising animals on a moment by moment basis of their degree of water need. Thirst motivates water seeking and consumption by both positive and negative valence mechanisms.”<sup>19</sup>

— “Why your rat prefers to be trained for four days each week: Actually, it doesn’t. It would much rather be eating, sleeping, or breeding.” (p. 43)

Actually, rats would much rather be performing a suite of active behaviors, such as exploration, play, or building and maintaining a shelter (burrowing).<sup>20,21</sup> Rats are not lazy and will even choose to work for resources that are freely available (a phenomenon known as contrafreeloading).<sup>22</sup>

**(5) Killing of these rats at the end of the term is not justified.** We recognize that these rats cannot languish at the University, and in approving the use of rats for this lab, Baylor University has the duty to explore non-lethal options. In response to concerns raised by a student who took this lab in 2022, Dr. Keele stated that the department is seriously considering alternatives to euthanasia, including a student adoption program.<sup>23</sup> Since it appears that the use of rats in this lab has been ongoing for close to 20 years, why are alternatives to euthanasia only now being considered? Baylor University should have in place a robust adoption policy, not only for the healthy rats used in this lab, but for all suitable animals used throughout its research programs.

Baylor University also has the responsibility to be transparent and truthful to its students about all aspects of animal use in science – especially animal use in which they are participating. In the *Frequently Asked Questions* section of the lab manual, the following information is given:

**“Question: What happens to these rats when the lab is finished?”**

**Answer:** These rats belong to Baylor University and they are used by other Baylor researchers for numerous other purposes (e.g., breeding, research and other experimentation, etc). Rest assured however that all animal research at Baylor University is conducted using ethical and humane guidelines and under the supervision of Baylor’s Animal Care and Use Committee.” (p. 39)

In reality, these rats are killed at the end of term, something students taking this lab last fall found out about through rumors,<sup>23</sup> which were later confirmed by the University. Misleading students into believing that the animals they have worked with – and formed bonds with – will not be killed is deeply troubling. Perhaps the problematic nature of these senseless killings is best illustrated by the alleged response of Dr. Hugh Riley, the lab professor, to one distressed student asking why he had been misled, as described in the Baylor Lariat: it is “better for students to not know.”<sup>23</sup>

The issues brought forth in this letter seem to be a reflection of the general anachronistic mindset at Baylor University. We assume that there is a more recent version of the *Baylor University Animal Care and Use Training Handbook* than the one freely available online<sup>24</sup>,

which was last updated in August 2005. Regardless, with respect to statements made about animals, the 2005 version was still woefully outdated for its time; notably, its reliance on the “recent” work of Lorenz in the 1970s (and, in fact, no reference later than 1986); its statements about differences in sentience between companion animals and so-called “laboratory species”; and numerous disproven statements in the last section *D. ETHICAL AND HUMANE CONSIDERATIONS IN THE USE OF ANIMALS FOR RESEARCH AND TEACHING* – some of which are repeated in the Learning & Behavior Lab manual. Note that several studies on animal capabilities cited herein were already available in 2005.

Nevertheless, section *C. ADMINISTRATIVE OVERSIGHT OF ANIMAL CARE AND USE AT BAYLOR UNIVERSITY* stated:

“It is the moral obligation of every teacher, student, and scientist to treat all animals humanely. Proper treatment of animals will promote among our colleagues and students the development of the proper levels of concern for the welfare of animals.” (p. 5)

Based on the information in this letter, we call on the Institutional Official to end the use of live rats in the Learning & Behavior Lab (NSC/PSY3120). Furthermore, in keeping with its own longstanding principles, we urge the Baylor University IACUC to do a thorough review of the Learning & Behavior Lab (NSC/PSY3120). Rather than rubber-stamp it, as seems to have been the case, we hope the lab can be updated to align with current scientific and educational standards, and current understanding of rat cognition and welfare. We request that the concerns raised in this letter be put on the agenda of the next IACUC meeting.

We look forward to receiving a formal response from the Institutional Official and the IACUC.

Sincerely,



Susan Millward  
Executive Director



Joanna Makowska, PhD  
Laboratory Animal Advisor

1. Hunt, M.J. & Macaskill, A.C. (2017) Student responses to active learning activities with live and virtual rats in psychology teaching laboratories. *Teaching of Psychology* 44, 160-164.
2. Patterson-Kane, E. et al. (2002) Rats demand social contact. *Animal Welfare* 11, 327-332.
3. Collier, G. & Bolles, R. (1968) Hunger, thirst, and their interaction as determinants of sucrose consumption. *Journal of Comparative and Physiological Psychology* 66, 633-641.

4. Brennan, K. et al. (2001) Individual differences in sucrose consumption in the rat: motivational and neurochemical correlates of hedonia. *Psychopharmacology* 157, 269-276.
5. Vandaele, Y. et al. (2020) Habitual preference for the nondrug reward in a drug choice setting. *Frontiers in Behavioral Neuroscience* 14, 78.
6. Lenoir, M. et al. (2007) Intense sweetness surpasses cocaine reward. *PloS one* 2, e698.
7. Cait, J. et al. (2022) Conventional laboratory housing increases morbidity and mortality in research rodents: results of a meta-analysis. *BMC Biology* 20, 15.
8. Martin, B. et al. (2010) 'Control' laboratory rodents are metabolically morbid: why it matters. *Proceedings of the National Acadademy of Sciences USA* 107, 6127-6133.
9. Laviola, G. et al. (2008) Effects of enriched environment on animal models of neurodegenerative diseases and psychiatric disorders. *Neurobiology of Disease* 31, 159-68.
10. Hermes, G.L. et al. (2009) Social isolation dysregulates endocrine and behavioral stress while increasing malignant burden of spontaneous mammary tumors. *Proceedings of the National Acadademy of Sciences USA* 106, 22393-22398.
11. Špinka, M. (2019) Animal agency, animal awareness and animal welfare. *Animal Welfare* 28, 11-20.
12. Nussenbaum, M.C. 2005. Beyond 'compassion and humanity'. In: Sunstein CR, Nussbaum MC, eds. *Animal Rights: Current Debates and New Directions*. Vol 1 New York, Oxford University Press, 299-320.
13. Patterson-Kane, E.G. et al. (1999) Behavioral indexes of poor welfare in laboratory rats. *Journal of Applied Animal Welfare Science* 2, 97-110.
14. Fox, C. et al. (2006) Therapeutic and protective effect of environmental enrichment against psychogenic and neurogenic stress. *Behavioural Brain Research* 175, 1-8.
15. Davis, H. (1996) Underestimating the rat's intelligence. *Cognitive Brain Research* 3, 291-298.
16. Dicke, U. & Roth, G. (2016) Neuronal factors determining high intelligence. *Philosophical Transactions of the Royal Society B Biological Sciences* 371, 20150180.
17. Foote, A.L. & Crystal, J.D. (2007) Metacognition in the rat. *Current Biology* 17, 551-555.
18. Fitzsimons, J.T. (1976) The physiological basis of thirst. *Kidney International* 10, 3-11.
19. Leib, D.E. et al. (2016) Thirst. *Current Biology* 26, R1260-R1265.
20. Makowska, I.J. & Weary, D.M. (2016) The importance of burrowing, climbing and standing upright for laboratory rats. *Royal Society Open Science* 3, 160136.
21. 3Rs Training Webinar: A Good Life for Laboratory Rodents? Lecture by Joanna Makowska, PhD. Available at: <https://www.youtube.com/watch?reload=9&app=desktop&v=O33dn7HJnNI> (starting at 27:00 min)
22. Inglis, I.R. et al. (1997) Free food or earned food? A review and fuzzy model of contrafreeloading. *Animal Behaviour* 53, 1171-1191.
23. Meisner, C. (2022) Student says federal agency to conduct review of BU neuroscience lab. *Baylor Lariat*, December 1, 2022. Available at: <https://baylorlariat.com/2022/12/01/student-says-federal-agency-to-conduct-review-of-bu-neuroscience-lab/>
24. Animal Care and Use Committee (1992) *Baylor University Animal Care and Use Training Handbook*. Available at: <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.baylor.edu%2Fcontent%2Fservices%2Fdocument.php%3Fid%3D22452&wdOrigin=BROWSELINK>