

Multi-lab consistency of mouse strain behavioral phenotypes in the IntelliCage

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The between-laboratory effects on behavioral phenotypes and spatial learning performance of 3 strains of laboratory mice were evaluated in a fully balanced and synchronized study using a completely automated behavioral phenotyping device, the IntelliCage. Activity pattern and spatial conditioning performance differed consistently between strains, i.e., exhibited no interaction with the between-laboratory factor, while the gross laboratory effect showed up significantly in the majority of measures. It is argued that overall differences between laboratories may not realistically be preventable, as subtle differences in animal housing and treatment will not be controllable, in practice. However, consistency of strain (or treatment) effects appears to be far more important in behavioral and brain sciences than the absolute overall level of such measures. In this respect, basic behavioral and cognitive measures proved to be highly consistent in the IntelliCage and, therefore, present a valid basis for meaningful research hypothesis testing. We conclude that the absence of human interference during behavioral testing as well as the heterogenisation of behavioral status due to environmental and social enrichment are the most prominent advantages of the IntelliCage that are responsible for its superiority with respect to the robustness of findings.

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