

The role of the hippocampus in inhibition and timing of behavioral responses of mice revealed by automated testing in a social home cage environment

S. Dudli (1), G. Colacicco (1), V. Voikar (1), H.-P. Lipp (1) , D.P. Wolfer (1,2)

(1) Institute of Anatomy, University of Zurich, Switzerland

(2) Institute for Human Movement Sciences, ETH Zurich, Switzerland

C57BL/6J mice with bilateral excitotoxic lesions of the hippocampus (HIPP) or of the prefrontal cortex (PFC) were used to validate IntelliCage, a fully automated system as a means to assess cognitive performance in a social context and without interaction of the mice with a human experimenter. HIPP mice showed overshooting activity and strongly delayed habituation when exposed to the testing system for the first time. Initial exploratory activity of PFC mice was slightly reduced. HIPP mice learned simple spatial learning tasks but responded to each change of rules with increased activity and their performance dropped when incorrect responses were punished. They were also unable to adapt their activity to a fixed schedule of drinking sessions. These results indicate that analysis of cognitive function in mice requires a constant environment and minimal aversive stimulation, conditions that are most efficiently established in automated home cage testing environments such as IntelliCage.

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