

Cognitive impairments in rats selectively bred for audiogenic seizure susceptibility (Krushinsky-Molodkina rats)

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Krushinsky-Molodkina albino rats (KM) have been selectively bred for audiogenic seizure susceptibility and show clonic and tonic seizures to the sound of a electric bell. They were compared here with normal albino rats on three different tests. The cognitive tests revealed learning and memory deficits in KM rats. They showed slow acquisition in Morris water maze both in the spatial and in the cued version, a less effective strategy of goal platform searching, and high scores of floating and thigmotaxis. However, no significant strain differences as compared to Wistar rats were found during the probe trial in the spatial variant of the Morris test. Another test based on the localization of a shifting food bait (the Revecz-Krushinsky task) showed that KM rats have difficulties in remembering the exact location of the shifting bait. No working memory deficits was found in eight arm radial maze (procedure with 10 s confinement). However when another procedure was used (for every trial, only a subset of arms was opened, namely a newly baited arm and an empty arms that had been baited in previous trials) and rats have the possibility of free visits in open arms, the KM rats showed more errors than Wistar rats. These results are in agreement with reports of possible deficits in working memory in KM rats. Thus KM rats appear to have hippocampal deficits in spite of the fact that the origin of the audiogenic seizures is subcortical and that the anatomy of the hippocampus appears to be normal.

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