Non-competitive antagonists of NMDA receptors can induce psychomimetic effects - they can cause schizophrenia-like behavior in healthy volunteers. MK-801 is such an agent. It is often used to model schizophrenia-like behavior in experimental animals.
On the other hand, non-competitive antagonists of NMDA receptors show antidepressant effects both in patients suffering from depression and in animal models.
Currently, cognitive deficit is considered to be a crucial symptom of the schizophrenia. Cognitive coordination is a process distinguishing irrelevant and relevant stimuli. A disruption of this process could play a pivotal role in cognitive deficit in schizophrenia. Active Allothetic Place Avoidance task (AAPA) could be a useful tool to study this phenomenon. In this task an animal has to distinguish between two spatial (reference) frames, whereas one of them is irrelevant and the other is relevant. The aims of my diploma thesis were: to study 1) behavioral strategies of laboratory rats in AAPA task and 2) effect of MK-801 on behavioral strategies and cognitive efficiency of rats in this task.
The rats demonstrated two different strategies in the AAPA task. The first strategy was an active avoidance of an aversive sector; the second one was “freezing” with minimal active movement on the arena.
Application of MK-801 affected rats with different behavioral strategies in different ways. We proved the ability of MK-801 to cause cognitive disturbances in rats in AAPA task. On contrast, we have demonstrated antidepressive effect of MK-801 on the rats with “passive” strategy, that had adopted learned helplessness.