Abstract

The rapid antidepressant effect of ketamine changed the direction of the research of potential antidepressants and its effect was also evaluated in this thesis. However, the main focus of this thesis is a new methodological approach to the research of depressive disorder. The main interest lies with the evaluation of automated monitoring of behaviour in this research.

The first aim of this thesis was to evaluate the antidepressant effect of ketamine in the forced swimming test using software enabling automated monitoring of behaviour. The second aim was to meassure the change in phosphorylated Mammalian target of rapamycin (mTOR), using Enzyme-Linked ImmunoSorbent Assay (ELISA). The last, but the most important aim of this thesis was to implement the utilization of Phenotyper boxes in the automated behavioural evaluation of the olfactory bulbectomy model of depressive disorder and also evaluate the effect of ketamine in this model.

Ketamine did not show an antidepressant effect in forced swimming test, however this observation could be influenced by chosen dose and mouse strain. Sensitivity of the test to chosen experimental protocol shows insufficient validity of this test. Observed change in level of phosphorylated mTOR corresponded with the behavioural results. Data collected from Phenotyper boxes did not show a significant difference between bulbectomized and control animals, also the effect of ketamine was not confirmed. This observation could be contributable to low amount of animals. However the range of collected data confirms good potential of this experimental approach in the research of depressive disorder.

Key words: Depressive disorder, ketamine, olfactory bulbectomy, forced swimming test, mTOR, Ethovision XT, behaviour, new methods