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Evaluation of Antidepressant Drug Effect on Depression Mouse Model by MRS

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Purpose: The aim of the present study was to investigate the efficiency of tail suspension test (TST) and antidepressant and to demonstrate the feasibility of measuring metabolic alterations in depression mouse model by proton magnetic resonance spectroscopy (MRS). To make a heavier depression model, it is used not forced swimming test (FST) but TST. Also to make the observation of metabolic alteration easier, C57B1/6J mice are utilized due to possessing the highest cellular density among many kinds of mice strains.

Materials and Methods: C57B1/6J mice weighting 25-30 g were used throughout this study. According to tail suspension test, each mouse was hung on a hook by an adhesive tape and examined immobility time for 6 min. The 2x2x2 mm3 voxel was placed in the left dorsolateral prefrontal cortex (DLPFC). The antidepressant (i.e., citalopram) was administrated 30 min prior to the test and was injected intraperitoneally at a constant volume of body weight.

Results: C57B1/6J strain shows a significant difference in the immobility time in comparisons to the control group. All together, metabolic alterations after administrating the antidepressant are observed.

Discussions: Proton magnetic resonance spectroscopy has been performed psychiatric disease patients such as schizophrenia and bipolar/unipolar disorder. According to the human study, metabolite ratios normalized to Cr showed significantly lower NAA/Cr, Cho/Cr and mI/Cr for patients as compared with healthy controls. For all these results, it could be inferred the identical situation could be obtained in animal study.

Conclusions: It is confirmed that 1H MRS has an enough potential not only the human study but also in animal psychiatric research as a method of measuring the effect of antidepressants

Keywords : MRS, Tail Suspension Test, Antidepressant