

TITLE: EVALUATION OF ANTIDEPRESSANT ACTIVITY OF PREBIOTICS AFTER LIPOPOLYSACCHARIDE-INDUCED DEPRESSIVE-BEHAVIOR IN MICE

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ABSTRACT:

The brain-gut axis is a bi-directional pathway, where both organs influence each other's functions. The gastrointestinal tract (GI) harbors a microbial community in a complex network of interactions, which contribute to the health and well-being of the individual, as well as for the functioning of the immune system. Disorders in this route can generate pathophysiological consequences and alterations in the intestinal microbiota. Emerging evidence support the two-way relationship between intestinal microbiota and psychiatric disorders such as autism, depression and anxiety. Some studies suggest that modulation of the microbiota by administration of prebiotics and probiotics might be an interesting approach to treat neuropsychiatric patients. Prebiotics are defined as selectively fermented ingredients that result in specific changes in the composition and/or activity of the gastrointestinal microbiota, thereby conferring benefits on host health. The aim of the present study was to evaluate the anti-depressant effects of the prebiotic Inulin (0,001 mg/mL in drinking water) in behavioral models of depression. Three month-old male Swiss mice were used. The animals were treated with the prebiotic or vehicle for three weeks, before receiving a single i.p. injection of lipopolysaccharide (LPS; 0,83 mg/kg) and submitted to behavioral tests for evaluation of locomotion (open field), memory (novel object recognition), anxiety (pluz maze and open field), and depression (tail suspension test). Animals given fluoxetine for three weeks prior to LPS administration were used as control. Stool collection was performed individually, at different periods throughout the experiment. Mice were sacrificed and the cecal content and intestines were collected for stool extraction. Pretreatment with the prebiotic decreased the depressive-behavior induced by LPS in mice. There was no influence of prebiotics on cognitive impairment and anxiety levels induced by LPS. Our current results show that the prebiotic presented anti-depressant activity. Subsequently, the PCR technique will be performed to quantify DNA of the main bacterial phyla present in the microbiota and the influence of the prebiotic on the microbiota alterations. Pro- and anti-inflammatory markers will be measured in brain and plasma of mice by ELISA, and brain levels of catecholamines (noradrenaline, dopamine, serotonin) and their metabolites will be measured by HPLC.

Keywords: microbiota, prebiotic, depression, anti-depressant

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