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Proceedings

Editor: Ivan Spasojević

Technical support: Dragana Robajac

Cover design: Zoran Beloševac

Publisher: Faculty of Chemistry, Serbian Biochemical Society

Printed by: Colorgrafx, Belgrade

Serbian Biochemical Society

Tenth Conference

with international participation

24.09.2021. Kragujevac, Serbia

“Biochemical Insights into Molecular Mechanisms”

Effects of fermented food on the body weight and behavior after repeated LPS administration in mice

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Non-communicable chronic diseases are largely driven by chronic inflammation, which can be in relation with poor diet and toxic products of commensal bacteria in guts. Diet intervention can change gut microbiota function and composition¹. The fermented foods containing microorganisms able to remodel host microbiota, can improve inflammatory status of the organism, including brain. Sauerkraut, produced by spontaneous fermentation of cabbage with lactic acid bacteria (LAB), is an important dietary ingredient, but studies of its effects are rather scarce². Here, we aim to examine whether sauerkraut brine is able to change physiological and behavioral response to systemic inflammation in mice induced by lipopolysaccharides (LPS), a constituent of the Gram-negative bacteria cell wall³. Three-month-old C57BL/6 mice were given 150 µL of sauerkraut brine (SB) or pasteurized sauerkraut brine (PSB) for 5 weeks by oral gavage. Control animals (CON) received the equivalent amount of water. During last week, animals were challenged by 5 injections of LPS (0.5 mg/kg, i.p.) Before and after LPS, behavior of animals was tested by open field, light-dark box, Y-maze, tail-suspension and rota rod tests. Food consumption and body weight were measured throughout the experiment. Quality analysis of in-home made sauerkraut produced by traditional spontaneous fermentation show that sauerkraut brine counts 2×10^5 colony forming units (CFU/mL) of LAB. SB and PSB treatments did not influence body weights and behavior compared to CON mice. LPS induced sick behavior characterized by weight loss and decreased food intake, where the fastest recovery was observed in the SB group. Behavioral analysis revealed similar response to LPS challenge between groups. However, further intra-group analysis and molecular screening is required to assess the possible subtle impact of sauerkraut on the mice behavior and immune status.

Acknowledgements

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (grant No. 451-03-9/2021-14/2007).