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MEETING ABSTRACT

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Dahi-derived probiotic *Enterococcus munditii* QAUEM2808 ameliorates stress-induced depression-like behaviour and tryptophan metabolism

Aitak FARZI[1,*], Misbah TUBASSAM[2], Laura SCHMIDT[1], Peter HOLZER[1], Muhammad IMRAN[2]

[1]*Division of Pharmacology, Otto Loewi Research Center for Vascular Biology, Immunology and Inflammation, Medical University of Graz, Austria;* [2]*Department of Microbiology, Faculty of Biological Sciences, Quaid-i-Azam University, Islamabad, Pakistan*

Background: A growing number of findings link the gut microbiota with psychiatric disorders due to bidirectional gut–brain communication. Several preclinical and clinical studies reported significant changes in gut microbiome composition and function in depression. This emerging link suggests that gut microbiome modulation by probiotics may have a translational potential in the treatment of depression. Mechanistically, changes in tryptophan metabolism and immune modulation could underly the central effects of probiotics. The current project is designed to evaluate the role of the probiotic *Enterococcus munditii* QAUEM2808, isolated from Dahi, an indigenous fermented milk product of Southern Asia, in a mouse model of stress-induced of depression-like behaviour.

Methods: To induce depression-like behaviour, BALB/c mice were subjected to unpredictable chronic mild stress (UCMS) [1]. Concomitantly, *E. munditii* QAUEM2808 was administered via drinking water for 28 days at 109 CFU/ml. Depression-like behaviour and anxiety were evaluated by a behavioural test battery including the forced swimming test, open field test, splash test and sucrose preference test. Fecal pellets, serum and brain tissue were collected at the end of the experiment in order to determine gut microbiome composition by 16S rDNA sequencing and molecular analysis.

Results: *E. munditii* QAUEM2808 was able to ameliorate stress-induced depression-like behaviour and anxiety as exemplified by a reversal of stress-induced decrease in sucrose preference. Molecular analysis revealed probiotic-induced expression changes of genes involved in tryptophan and serotonin metabolism (*e.g.* central *Slc6a4*, *Tph2*) in the hippocampus. Similarly, microbiome analysis indicated changes in bacterial taxa involved in tryptophan metabolism (*e.g. Clostridia UCG 014*) in the probiotic-fed groups.

Discussion: In conclusion, *E. munditii* QAUEM2808 has the potential to ameliorate stress-induced depression-like behaviour and changes in tryptophan metabolism could underly the observed behavioural effects.

Keywords: gut–brain axis – microbiome – depression-like behaviour – hypothalamus

Reference:

1. Burstein O, Doron R: **The Unpredictable Chronic Mild Stress Protocol for Inducing Anhedonia in Mice.** *J Vis Exp,* 2018; (140): e58184. doi:10.3791/58184

*Corresponding author e-mail: *aitak.farzi@medunigraz.at*