Probiotics Promote Brain Health

Probiotic bacteria have the potential to alter brain neurochemistry and treat anxiety and depression-related disorders according to research published in the Proceedings of the National Academy of Sciences.

The research, carried out by Dr Javier Bravo, and Professor John Cryan at the Alimentary Pharmabiotic Centre in University College Cork, along with collaborators from the Brain-Body Institute at McMaster University in Canada, demonstrated that mice fed with Lactobacillus rhamnosus JB-1 showed significantly fewer stress, anxiety and depression-related behaviours than those fed with just broth. Moreover, ingestion of the bacteria resulted in significantly lower levels of the stress-induced hormone, corticosterone.

"This study identifies potential brain targets and a pathway through which certain gut organisms can alter mouse brain chemistry and behaviour. These findings highlight the important role that gut bacteria play in the bidirectional communication between the gut and the brain, the gut-brain axis, and opens up the intriguing opportunity of developing unique microbial-based strategies for treatment for stress-related psychiatric disorders such as anxiety and depression," said John F. Cryan, senior author on the publication and Professor of Anatomy and Principal Investigator at the Science Foundation Ireland funded Alimentary Pharmabiotic Centre, at UCC. The APC researchers included Dr Hélène Savignac and Professor Ted Dinan.

The researchers also showed that regular feeding with the Lactobacillus strain caused changes in the expression of receptors for the neurotransmitter GABA in the mouse brain, which is the first time that it has been demonstrated that potential probiotics have a direct effect on brain chemistry in normal situations. The authors also established that the vagus nerve is the main relay between the microbiome (bacteria in the gut) and the brain. This three way communication system is known as the microbiome-gut-brain axis and these findings highlight the important role of bacteria in the communication between the gut and the brain, and suggest that certain probiotic organisms may prove to be useful adjunct therapies in stress-related psychiatric disorders.