

## **Probiotic bacteria may lessen anxiety and depression related disorders**

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

The research, carried out by Dr Javier Bravo and Professor John Cryan and their colleagues at the Alimentary Pharmabiotic Centre in UCC, along with collaborators from the Brain-Body Institute, 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 of bacteria in the bidirectional communication between the gut and the brain “the gut–brain axis” and opens up 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 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 offer the intriguing possibility that certain probiotic organisms may prove to be useful adjunct therapies in stress-related psychiatric disorders. Ends

The research is published online ahead of print in *Proceedings of the National Academy of Sciences USA* 29 August 2011 d.o.i.10.1073/pnas.1102999108 "Ingestion of *Lactobacillus* strain regulates emotional behaviour and central GABA receptor expression in a mouse via the vagus nerve" Authors: J.A. Bravo, P. Forsythe, M.V.Chew, E. Escaravage. H.M.Savignac , T.G. Dinan, J. Bienenstock & J.F.Cryan.

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### About the Alimentary Pharmabiotic Centre

The Alimentary Pharmabiotic Centre, (APC; <http://apc.ucc.ie>) is a research centre funded by Science Foundation Ireland and industry partners. The APC, a partnership between University College Cork, Teagasc, the Irish Agriculture and Food Development Authority, and the Cork Institute of Technology, focuses on research in gastrointestinal health. Pharmabiotic is a neologism devised by the APC to represent any material (including molecules and microbes) originating from the gut ecosystem that can be exploited for a health benefit, and includes probiotics, prebiotics, metabolites, and potential new anti-microbials and anti-inflammatories. The independent international ratings agency Thomson Reuters Science Watch global analysis, recently ranked University College Cork at number 2 in the world for probiotics research, due to publications from

researchers in the Alimentary Pharmabiotic Centre  
(<http://sciencewatch.com/ana/st/probiotics/institution/>)