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## **Two's a crowd for probiotic cytokine production**

By Shane Starling

19/03/2008- Finnish researchers have found single strains of probiotic bacteria have a greater effect on cytokine production than those used in combination.

Of the 11 strains tested from six bacterial genera, *Streptococcus* (in particular *S. thermophilus*) and *Leuconostoc* - were found to be the most potent inducers of cytokine activity, exceeding that of the more commonly utilised *Lactobacillus*.

Other bacteria were from the *Bifidobacterium*, *Lactococcus*, and *Propionibacterium* genera. All 11 strains induced a cytokine reaction when used in isolation but in combination were found to have little or no effect on cytokine production.

Probiotics are bacterial strains that benefit gut health and immunity while cytokines are proteins that play an important role as signalling agents in assisting the body to maintain immune system function.

### **Potentialities**

The researchers from Finland's National Public Health Institute, the University of Helsinki and Finnish dairy giant Valio's Research Centre (a *Lactobacillus*-using pioneer) called for further research, noting that "*the ways in which probiotic bacteria elicit their health effects are not fully understood.*"

But they stated probiotic bacteria had the potential to direct immune responses in a "*bacterial genera-specific manner*" and noted application potential from their findings in "*designing probiotics for specific preventative or therapeutic purposes.*"

"*At present there is only a limited amount of comparative data available on the ability of different probiotic strains to induce cytokine responses within the same experimental system,*" they said. "*Also, the effect of probiotic bacterial combinations on cytokine production in vitro is not well documented although bacterial combinations have been used in many clinical trials.*"

The peer-reviewed study, published in the February 28 issue of the weekly *World Journal of Gastroenterology*, was conducted in human peripheral blood mononuclear cells in order to identify potential "*enhancing or synergistic effects.*"

One of these could be the ability to induce and regulate innate and adaptive immune responses.

### **Methods**

The researchers looked for cytokine production in human peripheral blood mononuclear cells

(PBMC) after stimulation with the "potentially probiotic" bacterial strains. Production and mRNA expression of TNF-a, IL-12, IFN-g and IL-10 were determined by ELISA and Northern blotting, respectively.

"Stimulation of PBMC with any bacterial combinations did not result in enhanced cytokine production suggesting that different bacteria whether gram-positive or gram-negative compete with each other during host cell interactions," they noted.

Some probiotic bacteria genera have grown rather quickly as companies develop, and sometimes patent, individual strains.

There are about a dozen variants of the *Lactobacillus* family alone including *L. acidophilus*, *L. brevis*, *L. casei*, *L. delbrueckii*, *L. helveticus*, *L. reuteri* and *L. sanfranciscensis*.

Source: *World Journal of Gastroenterology*

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*Probiotic Leuconostoc mesenteroides ssp. cremoris and Streptococcus thermophilus induce IL-12 and IFN- $\gamma$  production.* <http://www.wjgnet.com/1007-9327/14/1192.asp>

Authors: Kekkonen RA, Kajasto E, Miettinen M, Veckman V, Korpela R, Julkunen I.

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