

Probiotics: Beneficial Bugs for the Intestine, Metabolic Interactions Too

Lausanne, SWITZERLAND 10 January 2008—Nestlé Research Center, Lausanne, Switzerland, and Imperial College London, England, published a study in the January edition of *Molecular Systems Biology* expanding knowledge about the mechanisms of probiotic action on gut microbial activity and ultimately, metabolism. The full contribution is available on the [Molecular System Biology](#) website.

Though it is well established that probiotics are beneficial for digestive health, scientists are further exploring the mechanisms of action of probiotics on host physiology. Researchers evaluated the metabolic impact of probiotics supplementation by providing probiotic strains *Lactobacillus paracasei* and *Lactobacillus rhamnosus* to mammalian models with a microflora analogous to humans'. Metabolic changes in various biological compartments were analyzed using the nutrimetabonomics approach. Results revealed profound differences in the metabolic profiles obtained from the plasma, urine, and liver tissue.

Probiotic supplementation altered host intestinal microflora, leading to adaptations in mammalian energy, lipid and amino acid metabolism. Specifically, energy recovery from the diet was modified, with subsequent effects on circulating lipids in the plasma and liver glycolysis.

“Interestingly the primary influences of the probiotics appear to be via indirect or knock-on effects on the metabolic activities and populations of other gut microbes,” explained Prof. Jeremy Nicholson of Imperial College London. “Additionally, the two probiotics investigated had different metabolic effects in the host, suggesting the possibility of giving probiotic combinations according to a person’s individual metabolic profile.”

This study provides strong evidence that probiotics supplementation affects the intestinal microbiota, which then can significantly influence major metabolic pathways.

“This work demonstrates the potential of nutrimetabonomics for investigating the metabolic mechanisms of probiotic action, leading to the identification of biomarkers for effective nutrition solutions,” added Sunil Kochhar, Nestlé Research Center senior scientist. “Nestlé can apply this knowledge in the innovation of foods and beverages with probiotics to improve health and wellness.”

Article Reference:

Martin FP., Wang Y, Sprenger N, Yap I, Lundstedt T, Lek P, Rezzi S, Ramadan Z, Bladeren P, Fay LB, Kochhar S, Lindon J, Holmes E and Nicholson JK. Probiotic modulation of symbiotic gut microbial–host metabolic interactions in a humanized microbiome mouse model, *Molecular Systems Biology*, 15 January 2008, doi:10.1038/msb4100190.



Good Food, Good Life

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