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Polysaccharide of lactic acid bacteria using as yogurt starter

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Strains producing exocellular polysaccharide (EPS) exist in daily lactic acid bacteria. *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophilus*, both of which contain EPS producing strains, are generally used for fermented milk manufacture. They are widely used to improve texture and prevent syneresis in fermented dairy products. The physiological functions of EPS, such as reducing the cholesterol concentration in the blood as well as decreasing infectivity against influenza, have also been demonstrated. We investigated the relationship between the chemical structure and physiological functions of EPS on *L. bulgaricus* OLL 1073R-1. In our previous studies, it was found that this EPS constituted two kinds of polysaccharides, i.e., neutral polysaccharide (NPS) and acidic polysaccharide (APS), both of which had the same carbohydrate structure, but different phosphorus contents. APS induced B-cell mitogenic activity on murine lymphocytes, though NPS did not show it. In addition, APS was able to augment the cyto-toxicity and the gene expression of several cytokines in macrophages. Based on these results, it is believed that the phosphorus group in EPS is important for modulating the immune response. Biosynthesis, phosphorylation and the linkage of the phosphate group of NPS and APS from *L. bulgaricus* OLL1073R-1 are still unknown. Especially, the phosphorylation of bacterial EPS is rare. EPS production of *L. bulgaricus* had been obtained by the horizontal transmission of EPS gene in *S. thermophilus*; however, there is no report of EPS containing phosphorus in *S. thermophilus*. We are planning to further examine these details in the future.

Biography

Junko Nishimura graduated from Obihiro University of Agricultural and Veterinary Medicine. Upon entering the Graduate School of Agricultural Science, Tohoku University, she worked as a technical expert. She studied the function of dairy lactic acid bacteria in the Laboratory of Animal Products Chemistry, especially exopolysaccharide and bacteriocin of the *Lactobacillus* genus. She completed her PhD in the study of exopolysaccharide produced from *Lactobacillus delbrueckii* subsp. *Bulgaricus* in 2013 and is currently an Associate Professor at the Hachinohe Institute of Technology. Recently, she has also studied contributions to the environment by utilizing effective microorganisms.

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