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Gastrointestinal stress changes the autoinducer-2 activity of Lactobacillus spp.

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Quorum sensing is a bacterial communication system that controls the expression of certain target genes with auto-inducers in a cell density-dependent manner. The universal *luxS*-mediated quorum sensing using Autoinducer-2 (AI-2) signal is present in a wide variety of bacteria. However, there is less information about probiotic *Lactobacillus* strains. In order to influence the physiological activity of a host, probiotics must have tolerance to the various human gastrointestinal tract stress conditions and possess high adhesion ability to human intestinal epithelial cells.

According to recent reports, the AI-2 signal system plays an important role in the response of probiotic lactobacilli to the surrounding environment. In order to analyze changes in their inter-species quorum signal in the gastrointestinal tract (GIT), we monitored the AI-2 activity of *L. rhamnosus* strains LGG and BFE5264, and *L. plantarum* strains 299v and NR74 under various stress conditions typical of the GIT. Although the mechanisms are not known yet, our observations indicated that the AI-2 activity of the strains can be changed by stress conditions such as pH, bile acid, temperature, osmotic pressure, and starvation. These dynamic changes were based on species-specific and strain-specific responses. In addition, AI-2 inhibition resulted in reduction of the stress-related genes of *L. rhamnosus*. Therefore, we suggest that AI-2 quorum signaling of probiotic lactobacilli should be taken into account for understanding their host related adaptation and interaction with the intestinal environment.

Biography

Soyoung Yeo has completed her Master Degree at the age of 25 years in February 2013 at the Department of Life Science at Handong Global University in South Korea. She has research experience in food microbiology and bacteriology. Her study interests are focused on the interaction between the host and probiotics in the gastrointestinal tract, verification of probiotic properties, quorum sensing signaling, and stress responses in probiotics.

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