傳統和次世代益生菌之交互作用以促進健康：以乳酸利用菌為例

Health promotion by bacterial interactions of traditional and next-generation probiotics: featuring lactate-utilizing anaerobes

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The human gut hosts numerous ecological niches for microbe-microbe and host-microbe interactions. The gut lactate homeostasis in humans is crucial and relies on bacteria. *Veillonella* spp., gut lactate-utilizing bacteria, and lactate-producing bacteria were frequently co-isolated. We first investigated the metabolism of *Veilloiella dispar* using lactate as major carbon source during anaerobic growth. And showed the unique dynamic global gene regulation for the higher production of short-chain fatty acids during the stationary phase. *V. diapar* and three representative traditional lactic acid probiotics was further co-cultivated. The bacterial growth, viability, metabolism, and gene level adaptations in bacterial mono-culture and co-culture were determined. The mechanism of mutualistic interaction between traditional probiotics and potential next-generation probiotic bacteria were elucidated for the production of several types of health-promoting metabolites. Our results also provide the potential of combined probiotics for the product development.

Keyword: *Veilloiella dispar,* lactobacilli, mutualism, short-chain fatty acids, lactate, cross-feeding, lactate-utilizing bacteria