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Archaea: Microbial Candidates in Next-generation Probiotics Development

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Abstract

Pharmabiotics and probiotics in current use or under development belong to 2 of 3 domains of life, Eukarya (eg, yeasts) and Bacteria (eg, lactobacilli). Archaea constitute a third domain of life, and are currently not used as probiotics, despite several interesting features. This includes the absence of known pathogens in humans, animals, or plants and the existence of some archaea closely associated to humans in various microbiomes. We promote the concept that some specific archaea that naturally thrive in the human gut are potential

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next-generation probiotics that can be rationally selected on the basis of their metabolic phenotype not being encountered in other human gut microbes, neither Bacteria nor Eukarya. The example of the possible bioremediation of the proatherogenic compound trimethylamine into methane by archaeal microbes is described.

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