



SPEECH INFORMATION (For Conference Program Book)

Topic

Harnessing Seaweed-Driven *Bacteroides plebeius* Metabolism for Sustainable Microbiome-Based Therapeutics and Bioactive Compound Production

Abstract

Our study first discovered that *Bacteroides plebeius* (*Bp*) colonization is modulated by dietary seaweed, which promotes its growth in the gut and reshapes the gut microbial community. Further metabolite analysis revealed that *Bp*, when supported by a seaweed-containing diet, produces beneficial compounds with anti-inflammatory and anti-cancer properties, including short-chain fatty acids such as propionic acid and bile acid derivatives like chenodeoxycholic acid, ursodeoxycholic acid, and muricholic acids. In vitro cultivation experiments confirmed that *Bp* can utilize seaweed components, such as polysaccharides, to induce the production of these specific metabolites. These findings suggest that bacteria can harness seaweed or be stimulated by seaweed components to generate bioactive metabolites with health benefits. Moving forward, this research opens up opportunities for developing sustainable, eco-friendly biotechnological applications leveraging seaweed-derived substrates, aligning with zero-carbon technology principles and promoting a circular, environmentally conscious approach to health and food production.

