The impact of prebiotics, probiotics, and gut-derived metabolites on intestinal health and skeletal muscle metabolic and oxidative capacity

Propositions

Propositions belonging to the thesis entitled:

The impact of prebiotics, probiotics, and gut-derived metabolites on intestinal health and skeletal muscle metabolic and oxidative capacity

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- The increase in serpin levels observed with *Bifidobacterium longum* NCC 2705 supplementation shows its therapeutic potential to support gluten-free diets. *This thesis*
- Modulation of the gut microbiota through prebiotics can enhance exercise performance in healthy individuals. *This thesis*
- A short-chain fatty acid mixture enhances glucose uptake and glutathione levels in skeletal muscle cells but does not prevent oxidative stress-induced impairments in glucose metabolism. *This thesis*
- A specific combination of short-chain fatty acids promotes oxidative muscle fiber characteristics more effectively than acetate alone. *This thesis*
- Interindividual variability in gut microbiota composition highlights the need for personalized prebiotic interventions to optimize health outcomes.
- Synbiotics combining targeted prebiotics with complementary probiotics can optimize gut microbiota composition, strengthen immune function, and support metabolic health.
- Future advancements in microbiome research will likely depend on the ability to personalize interventions based on functional microbial pathways rather than taxonomy alone.
- The systemic benefits of gut microbiota modulation extend beyond intestinal health and represent a key opportunity for holistic health interventions.
- Dietary modulation of the gut microbiome is a powerful strategy for developing interventions that benefit both athletes and individuals who suffer from metabolic disorders.
- Preventive lifestyle interventions remain insufficiently considered in public health, despite their potential to reduce the burden of chronic diseases.