

Exploring Nutrition and Exercise Metabolism with Metabolomics

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Abstract

The field of exercise physiology, nutrition and metabolism has undergone significant technological advancements since the pioneering works of exercise physiologists in the early to mid-20th century. Historically, the ability to detect metabolites in biofluids from exercising participants was limited to single-metabolite analyses. However, the rise of metabolomics, a discipline focused on the comprehensive analysis of metabolites within a biological system, has facilitated a more intricate understanding of metabolic pathways and networks in the context of exercise and nutrition.

This presentation will explore some of the pivotal advancements that have propelled metabolomics to the forefront of exercise physiology and nutrition research. Metabolomics offers a unique 'fingerprint' of cellular activity, extending a broader spectrum than traditional single-metabolite assays. The potential of metabolomics in bridging the gap between genotype and phenotype will be discussed, underscoring the critical importance of careful study design and the selection of appropriate metabolomics techniques. Examples of the application of metabolomics in sport and exercise nutrition research will be discussed as well as crucial considerations when deciding to implement metabolomics within an experimental workflow. Finally, this presentation will discuss the need to deeply understand the broader scientific context to discern meaningful metabolic changes.