

Letter to the Editor

Organ crosstalk benefits during exercise

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Dear Editor-in-Chief

We are writing to highlight the significant benefits of organ crosstalk during exercise, a phenomenon that refers to the biochemical interactions among various tissues stimulated by different factors, with exercise being a prominent trigger (Sabaratnam et al., 2022). This phenomenon is increasingly acknowledged for its crucial role in sustaining metabolic health and staving off chronic diseases (Sabaratnam et al., 2022).

Typically, mechanisms of organ crosstalk encompass myokines, exerkinines and extracellular vesicles (EVs). Acting as an endocrine organ, skeletal muscle releases myokines (both cytokines and peptides) into the circulation during exercise. These myokines enhance interactions between muscles and other vital organs like the liver, adipose tissue and brain, thus modulating metabolism and promoting overall health (Sabaratnam et al., 2022; Severinsen & Pedersen, 2020). The term "exerkinines" collectively refers to exercise-induced signaling molecules released from various organs, including myokines from muscles, hepatokines from the liver and adipokines from fat tissue. These molecules are pivotal in mediating the beneficial effects of exercise on systemic health (Jaworska et al., 2024). Additionally, exercise prompts the release of extracellular vesicles that carry bioactive molecules, boosting organ communication. These vesicles transport proteins, lipids and nucleic acids, which play significant roles in intercellular communication and influence metabolic functions across different tissues (Severinsen & Pedersen, 2020; Verboven & Vechetti, 2023).

Current research highlights several key benefits of organ crosstalk during exercise, such as metabolic regulation, neuroprotective effects

Introduction

and adaptation to exercise. The interactions between myokines and other organ-derived factors are essential for regulating glucose and lipid metabolism as well as reducing inflammation, thus lowering the risk of metabolic disorders like type 2 diabetes and obesity (Sabaratnam et al., 2022; Severinsen & Pedersen, 2020). Some myokines are known to cross the blood-brain barrier, fostering neurogenesis and enhancing cognitive functions. For instance, myokines like irisin can affect levels of brain-derived neurotrophic factor (BDNF), which is vital for maintaining brain health (Severinsen & Pedersen, 2020; Verboven & Vechetti, 2023). Moreover, regular exercise modifies the concentration of circulating exerkinines associated with various health conditions, a necessary adaptation for enhancing cardiovascular health and promoting muscle regeneration (Jaworska et al., 2024).

In summary, understanding the mechanisms behind organ crosstalk during exercise is fundamental for developing targeted interventions aimed at preventing chronic diseases. The dynamic interaction between skeletal muscle and other organs highlights the critical role of physical activity in fostering holistic health through complex biochemical signaling pathways. Continued research in this area may lead to novel therapeutic strategies that leverage these interactions for improved health outcomes.

References

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