

Metabolic regulation during exercise: roles of creatine and carnitine.

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The body stores of creatine and carnitine are restricted almost exclusively to skeletal muscle. Creatine is essential to maintaining ATP turnover during intense contraction when energy demand exceeds the rate of mitochondrial ATP production, and also plays a role in spatial energy transfer. Carnitine is crucial to buffering acetyl group accumulation during intense exercise when the rate of acetyl group production from carbohydrate exceeds its rate of utilization by the TCA cycle. It is also better known for its vital role in mitochondrial fatty acid translocation. Muscle creatine and carnitine availability can be increased by dietary means, which has been shown to influence muscle metabolism and performance during exercise. This lecture will focus on illustrating these indispensable roles of creatine and carnitine in human exercise metabolism and performance and will highlight the significant contribution that Eric Hultman made to the scientific discovery and scientific understanding of these roles.