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New study offers insight on how resistance training burns fat

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Source: University of Kentucky

Summary: Findings from a new study add to growing evidence that resistance exercise has unique benefits for fat loss. Researchers found that resistance-like exercise regulates fat cell metabolism at a molecular level.

FULL STORY

Findings from a new University of Kentucky College of Medicine and College of Health Sciences study add to growing evidence that resistance exercise has unique benefits for fat loss.

The Department of Physiology and Center for Muscle Biology study published in the *FASEB Journal* found that resistance-like exercise regulates fat cell metabolism at a molecular level.

The study results in mice and humans show that in response to mechanical loading, muscle cells release particles called extracellular vesicles that give fat cells instructions to enter fat-burning mode.

Extracellular vesicles were initially understood as a way for cells to selectively eliminate proteins, lipids and RNA. Recently, scientists discovered that they also play a role in intercellular communication.

The study adds a new dimension to how skeletal muscle communicates with other tissues by using extracellular vesicles, says John McCarthy, Ph.D., study author and associate professor in the UK Department of Physiology.

"To our knowledge, this is the first demonstration of how weight training initiates metabolic adaptations in fat tissue, which is crucial for determining whole-body metabolic outcomes," McCarthy said. "The ability of resistance exercise-induced extracellular vesicles to improve fat metabolism has significant clinical implications."

McCarthy's research team was led by post-doc Ivan Vechetti, now at the University of Nebraska, in collaboration with the Center for Muscle Biology, directed by Joseph Hamburg Endowed Professor Charlotte Peterson, Ph.D.

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Materials provided by **University of Kentucky**. Original written by Elizabeth Chapin. *Note: Content may be edited for style and length.*

Journal Reference:

1. Ivan J. Vechetti, Bailey D. Peck, Yuan Wen, R. Grace Walton, Taylor R. Valentino, Alexander P. Alimov, Cory M. Dungan, Douglas W. Van Pelt, Ferdinand Walden, Björn Alkner, Charlotte A. Peterson, John J. McCarthy. **Mechanical overload-induced muscle-derived extracellular vesicles promote adipose tissue lipolysis**. *The FASEB Journal*, 2021; 35 (6) DOI: 10.1096/fj.202100242R

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