Understanding the roles of extracellular vesicles in maintaining human muscle and tendon

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Abstract

Fibroblasts are responsible for producing and assembling the extracellular matrix (ECM), the scaffolding material that gives tissues their structure, which is critical in shaping the form and function of muscle throughout the body. Fibroblast function is aided by the shuttling of extracellular vesicles (EVs) – tiny sacs of cellular material that facilitate communication between cells. EV research has focused largely on their role in cancer, but a new study has examined their function in human muscle. Proteomics experiments revealed three distinct profiles for EVs released from tendon fibroblasts, muscle fibroblasts, and differentiating myoblasts. Fibroblast-derived EVs were more similar to one another than to EVs from myoblasts. However, while EVs from tendon fibroblasts showed an abundance of proteins supporting ECM synthesis. EVs from muscle fibroblasts were enriched in proteins that support myofiber function and components of the skeletal muscle matrix. The findings, for the first time, establish critical roles for EVs in tendon and skeletal muscle in humans, which could set the stage for further research into the multiple functions of EVs throughout the body.