Chronic inflammation and inactivity may affect age-related changes in gene and protein expression in skeletal muscle

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New research indicates that some age-related changes in gene and

protein expression in the skeletal muscles of older individuals may be affected more by physical inactivity and chronic inflammation than primary aging, or intrinsic maturational processes.

Physical inactivity and chronic inflammation are the most important drivers of secondary aging, or changes over time that are caused by extrinsic factors such as diseases or poor health practices.

In the *Aging Cell* study that included 15 young healthy people and 8 young and 37 older patients with knee or hip osteoarthritis (who suffered from long-term inactivity and chronic inflammation), investigators found that age-related changes in the expression of approximately 4,000 genes regulating various processes such as mitochondrial function, protein balance, immune, and inflammatory responses were related to physical inactivity and inflammation rather than primary aging.

The team also identified fewer genes (approximately 200) where the opposite was true, as their expression was related to primary aging rather than other factors.

"The set of putative primary aging genes identified in this study can be used as a resource for further mechanistic studies examining the role of individual genes in the emergence of the senescent cell phenotype in skeletal muscle and other tissues," said co-corresponding author Daniil V. Popov, Ph.D., of the Institute of Biomedical Problems of the Russian Academy of Sciences. "This is important for developing approaches to slow aging by regulating the expression of these genes."

More information: Age-related changes in human skeletal muscle transcriptome and proteome are more affected by chronic inflammation and physical inactivity than primary aging, *Aging Cell* (2024). DOI: 10.1111/acel.14098 onlinelibrary.wiley.com/doi/10.1111/acel.14098

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