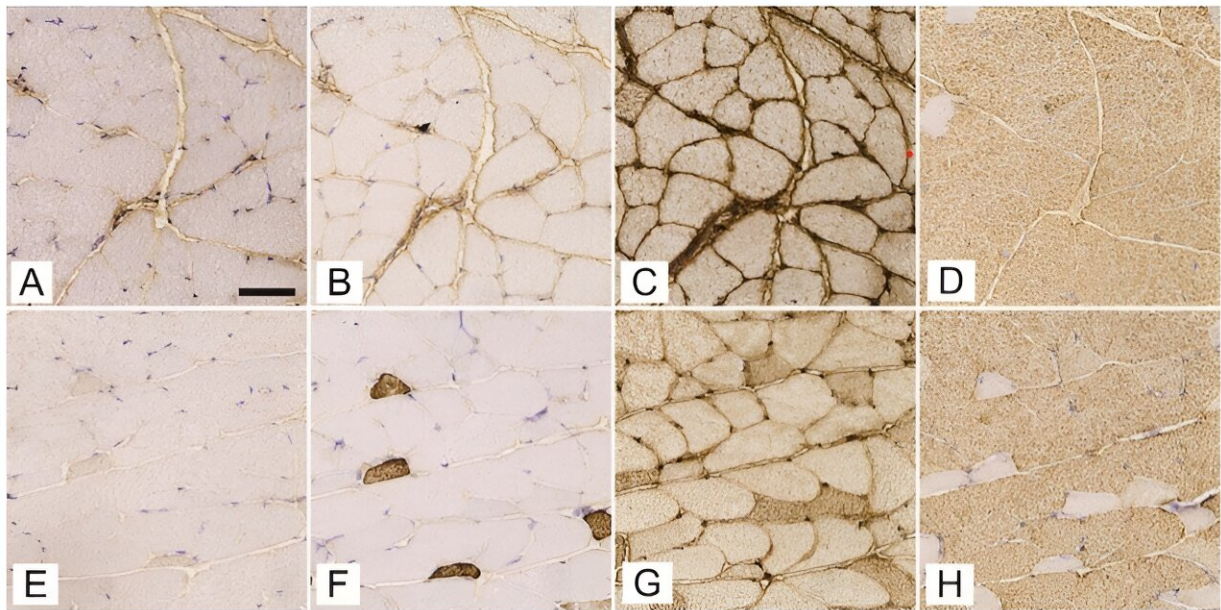


# How does type 1 diabetes alter muscle structure and blood supply?

February 8 2024



Expression of myosin heavy chain isoforms 1 (A, E), 2a (B, F), 2x/d (C, G), and 2b (D, H) in successive cross-sections of gluteus maximus muscle of streptozotocin-induced diabetic mice (A–D) and age-matched non-diabetic mice (E–H). The scale bar indicates 50  $\mu$ m. Credit: *Biomolecules and Biomedicine* (2023). DOI: 10.17305/bb.2023.9843

In a recent study conducted by the Institute of Anatomy, Faculty of Medicine, University of Ljubljana, researchers have provided new insights into the detrimental effects of type 1 diabetes mellitus (T1DM)

on skeletal muscle structure and capillary networks. Utilizing state-of-the-art 3D imaging technology, this comprehensive study marks a significant leap in understanding the multifaceted impact of T1DM on the body's muscular system.

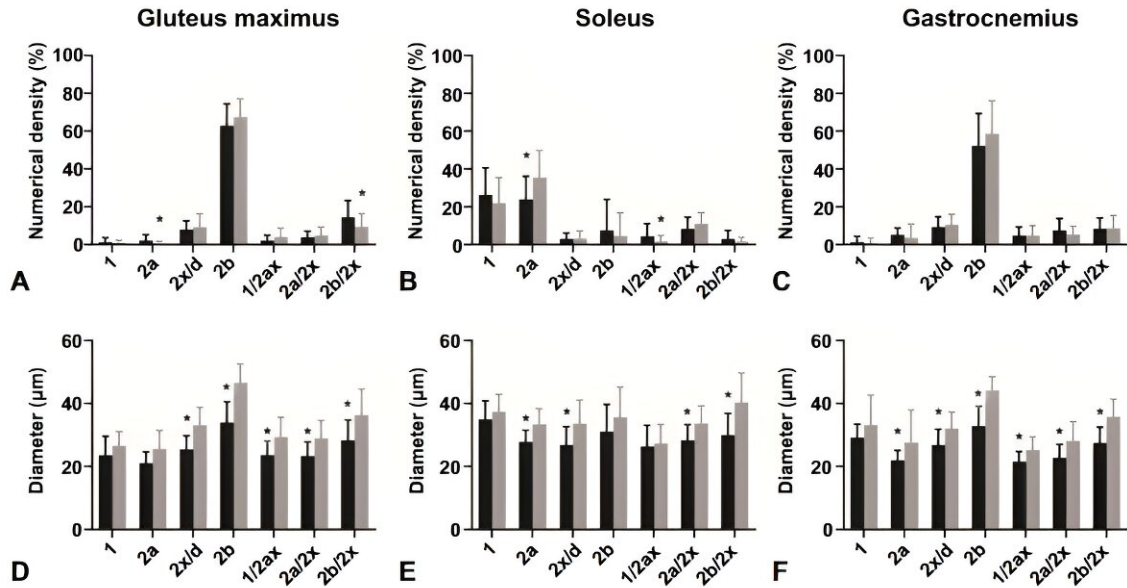
Diabetes mellitus disrupts the regulation of glucose levels, leading to high blood sugar and a myriad of related health issues. T1DM, characterized by the immune-mediated destruction of insulin-producing pancreatic  $\beta$  cells, has profound effects on various organs, especially skeletal muscles, which play a crucial role in glucose uptake and regulation.

This [study](#), published in the journal *Biomolecules and Biomedicine*, aimed to explore the structural and functional adaptations of skeletal muscles to the metabolic disturbances caused by T1DM.

## **The hidden changes in muscle and blood vessels**

Conducted on female C57BL/6J-OlaHsd mice using a streptozotocin (STZ)-induced model to simulate T1DM, the research focused on critical muscles like the soleus, gluteus maximus, and gastrocnemius. Researchers meticulously analyzed the expression of myosin heavy chain (MyHC) isoforms and the intricacies of the 3D capillary network.

"Our study provides a deeper understanding of how type 1 diabetes not only affects muscle fiber composition but also significantly alters the capillary networks that are essential for muscle health," explained Nejc Umek, the study's lead author.



Numerical density and diameter of (A,D) gluteus maximus, (B,E) soleus, and (C,F) gastrocnemius muscle fibers. Comparison between type 1 diabetes mellitus mice (black columns; n=12) and non-diabetic mice (gray columns; n=12). Data are presented as mean±standard deviation. \*P

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