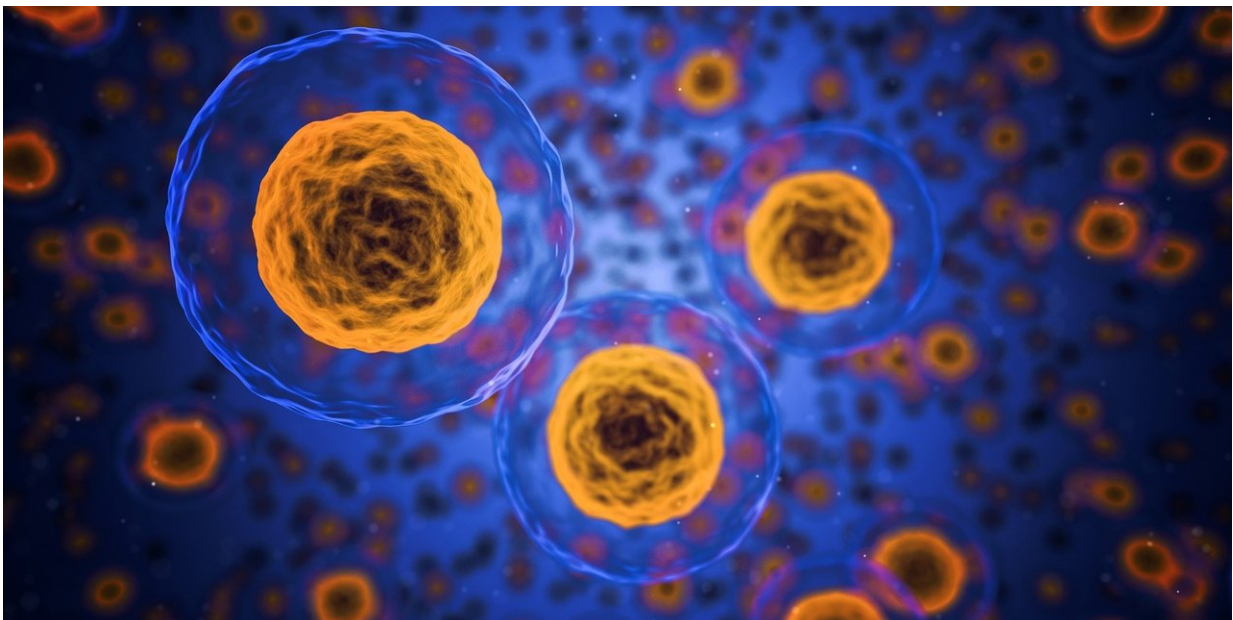


Researchers characterize important regulators of tissue inflammation, fibrosis and regeneration

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Credit: CC0 Public Domain

Although macrophages (cells involved in the detection and destruction of bacteria and other harmful organisms as well as dead cells) are classified as immune cells functioning in the activation and resolution of tissue inflammation, it is now clear that they are critically involved in a variety of disease processes, such as chronic inflammatory diseases, tumor growth and metastasis and tissue fibrosis.

For the first time, researchers from Boston University School of Medicine (BUSM) have characterized the origins, gene expression and diverse functions of resident macrophages in normal skeletal muscle. The findings they believe will provide a knowledge base for future studies of the roles of skeletal muscle resident macrophages in skeletal muscle diseases such as muscular dystrophies as well as muscular injuries such as muscle trauma.

People frequently suffer muscle injuries caused by accidents or sports, while others develop muscle diseases such as [muscular dystrophies](#) that display prominent muscle inflammation. Duchenne muscular dystrophy is the most common genetic muscle disease. It causes severe disability and [premature death](#) caused by breathing and heart muscle weakness. Currently, the disease has no cure.

"Macrophages are important effectors and regulators of muscle inflammation, fibrosis and regeneration. Our findings build a [knowledge base](#) for future studies of resident macrophages in skeletal muscle development, injury repair and diseases with prominent muscle inflammation," explained corresponding author Lan Zhou, MD, Ph.D., professor of neurology at BUSM. "Understanding their respective origins, tissue-specific characteristics and disease-related functions is absolutely essential to harness their therapeutic potential."

Zhou and her team used experimental models to allow macrophage lineage tracing and performed bone marrow transplant experiments to study the origins of skeletal muscle resident macrophages. They also performed single cell-based transcriptome analyses to analyze subsets of skeletal muscle resident macrophages and their functions.

These findings appear online in the journal *PNAS*.

More information: Xingyu Wang et al., "Heterogeneous origins and

functions of mouse skeletal muscle-resident macrophages," *PNAS* (2020). www.pnas.org/cgi/doi/10.1073/pnas.1915950117

Provided by Boston University School of Medicine

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