

Stem cells may significantly improve tendon healing by regulating inflammation

May 23 2017

New research published online in *The FASEB Journal* suggests that tendon stem (TSCs) may be able to significantly improve tendon healing by regulating inflammation, which contributes to scar-like tendon healing and chronic matrix degradation. This has implications for the treatment of acute tendon injuries and chronic tendon disease.

"Inflammation plays a critical role in acute and chronic [tendon injuries](#) and healing," said Chang H. Lee, Ph.D., a researcher involved in the work and an assistant professor at the Regenerative Engineering Laboratory (Columbia University Irving Medical Center, New York). "Our findings represent an important foundation for the development of a new treatment that would regulate overwhelmed inflammation for [tendon ruptures](#) and tears, tendonitis, tendinopathy, and other tendon injuries and diseases."

In their study, Lee and colleagues used both in vitro human models and in vivo rat models. In vitro, isolated TSCs were stimulated with proinflammatory cytokines (proteins that can influence interactions between cells), and the expression of genes involved in inflammatory regulation was measured. In vivo, the researchers evaluated inflammatory responses by TSCs, including infiltration of macrophages (white blood cells that consume damaged or dead cells) and expression of anti-/proinflammatory cytokines, at different time points. Connective tissue growth factor (CTGF) was used in both models to stimulate the anti-inflammatory roles of TSCs. The researchers found that CTGF stimulation induced TSCs' production of anti-inflammatory cytokines,

consequently leading to improved tendon healing and matrix remodeling.

"Many would have predicted that tendon [healing](#) is inflammation-linked," said Thoru Pederson, Ph.D., Editor-in-Chief of *The FASEB Journal*, "but that the anti-inflammatory roles of TSCs could be so potent, and so amplifiable, is a striking finding."

More information: Solaiman Tarafder et al, Tendon stem/progenitor cells regulate inflammation in tendon healing JNK and STAT3 signaling, *The FASEB Journal* (2017). [DOI: 10.1096/fj.201700071R](https://doi.org/10.1096/fj.201700071R)

Provided by Federation of American Societies for Experimental Biology

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