

# Programming adult stem cells to treat muscular dystrophy and more by mimicking nature

July 22 2015

---

Stem cells hold great potential for addressing a variety of conditions from spinal cord injuries to cancer, but they can be difficult to control. Scientists are now reporting in the journal *ACS Nano* a new way to mimic the body's natural approach to programming these cells. Using this method, they successfully directed adult stem cells to turn specifically into muscle, which could potentially help treat patients with muscular dystrophy.

In the 1990s, scientists first isolated human [embryonic stem cells](#), which can turn into any kind of cell in the body, and the promise of a new way to treat diseases emerged. Since then, scientists have also discovered [adult stem cells](#) in a number of organs in the body, including the brain, lungs and skin, that can turn into a limited number of cell types. However, harnessing these special cells to treat disease has been difficult. One of the main obstacles has been figuring out how to control them. Ki-Bum Lee and colleagues wanted to tackle this challenge.

The researchers created an artificial version of a transcription factor—a protein critical to orchestrating stem-cell differentiation—using gold nanoparticles. They added small molecules to mimic the structure and function of the natural transcription factor that induces muscle-cell growth. The synthetic proteins, called NanoScript, successfully coaxed [stem cells](#) derived from fat tissue to become muscle. The researchers say they can potentially design their NanoScript system to grow other cell

types, too.

**More information:** *ACS Nano*, Article ASAP. [DOI: 10.1021/acsnano.5b00709](https://doi.org/10.1021/acsnano.5b00709)

Provided by American Chemical Society

Citation: Programming adult stem cells to treat muscular dystrophy and more by mimicking nature (2015, July 22) retrieved 24 April 2024 from <https://phys.org/news/2015-07-adult-stem-cells-muscular-dystrophy.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.