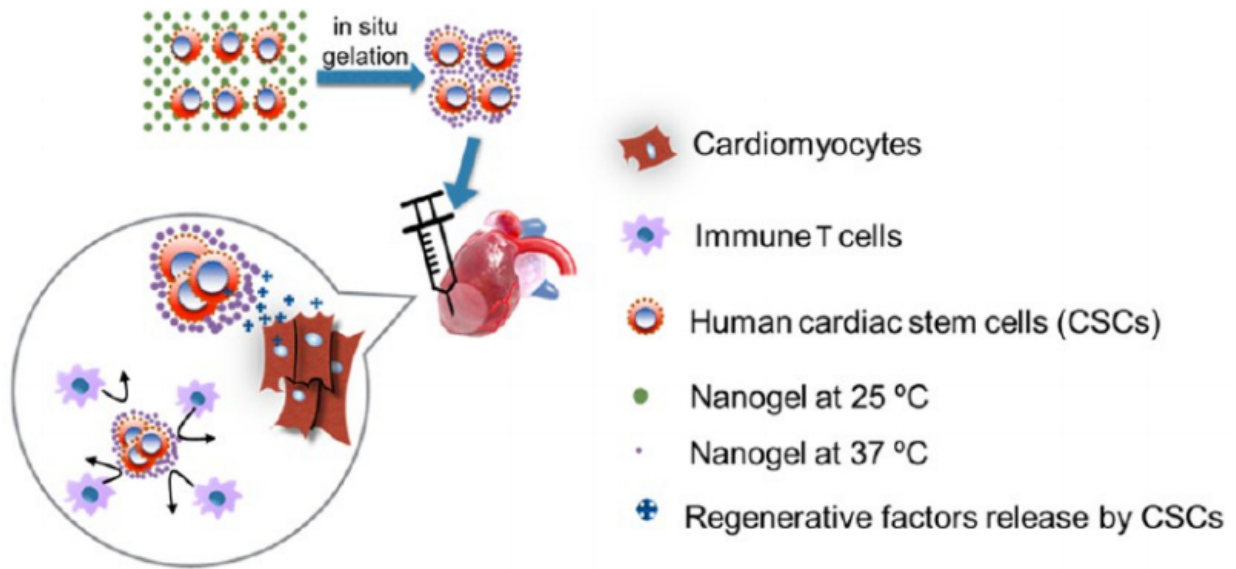


# Getting to the heart of the matter: Nanogels for heart attack patients

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Credit: American Chemical Society

Heart disease and heart-related illnesses are a leading cause of death around the world, but treatment options are limited. Now, one group reports in *ACS Nano* that encapsulating stem cells in a nanogel could help repair damage to the heart.

Myocardial infarction, also known as a heart attack, causes damage to the muscular walls of the heart. Scientists have tried different methods to repair this damage. For example, one method involves directly

implanting stem cells in the heart wall, but the cells often don't take hold, and sometimes they trigger an immune reaction. Another treatment option being explored is injectable hydrogels, substances that are composed of water and a polymer. Naturally occurring polymers such as keratin and collagen have been used but they are expensive, and their composition can vary between batches. So Ke Cheng, Hu Zhang, Jinying Zhang and colleagues wanted to see whether placing stem cells in inexpensive hydrogels with designed tiny pores that are made in the laboratory would work.

The team encapsulated stem cells in nanogels, which are initially liquid but then turn into a soft gel when at body temperature. The nanogel didn't adversely affect stem cell growth or function, and the encased stem cells didn't trigger a rejection response. When these enveloped cells were injected into mouse and pig hearts, the researchers observed increased cell retention and regeneration compared to directly injecting just the stem cells.

In addition, the heart walls were strengthened. Finally, the group successfully tested the encapsulated [stem cells](#) in mouse and pig models of [myocardial infarction](#).

**More information:** "Heart Repair Using Nanogel-Encapsulated Human Cardiac Stem Cells in Mice and Pigs with Myocardial Infarction" *ACS Nano* (2017).

[pubs.acs.org/doi/abs/10.1021/acsnano.7b01008](https://pubs.acs.org/doi/abs/10.1021/acsnano.7b01008)

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