## Can biopolymers heal a broken heart?

An Injectable, Hyaluronic Acid and Elastin-Like Protein hydrogel for cardiac stem cell therapy

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Cardiovascular diseases are the number one cause of death worldwide. A majority of these deaths is attributed to the heart attack. Stem cell therapies in development suffer from decreased retention of the cells to the infarction site. Therefore, there is a clear need for a scaffold to increase stem cell retention, while simultaneously stimulating growth of these cells.







**Inverse transition cycling** CSP: Cold spin pellet, CSS: Cold spin supernatant

into cardiac muscle cells. The main obstacle to surpass is the **retention** of the cells to the infarction site which could be solved by our hydrogel platform.

FTIR confirms NaIO<sub>4</sub> oxidation which is quantified by NMR following reductive amination of *tert*-butyl carbazate.

8.8% oxidation	23.9% oxidation



## **ELP's LCST** behaviour is proven by UV-VIS measurements

A model system utilizing oHA and adipic acid dihydrazide crosslinker confirms regenerative properties

Advances have been made in the synthesis of two components for the envisioned hydrogel platform. **ELPs** were **purified** and **LCST** behavior was proven. Additionally, HA was succesfully oxidized and utilized in a model system using a dihydrazide crosslinker. Further work will be performed to maximize ELP yield, after which the hydrogel can be synthesized and tested with the stem cells.





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