



**PIONEERING
BIOADHESIVES
FOR SURGICAL
AND REGENERATIVE
MEDICINE SOLUTIONS**



The Problem

Myocardial infarction (MI), commonly known as heart attack, is the leading cause of death worldwide. Cardiac tissue dies after a heart attack and its functions can be permanently lost. The heart has limited ability for self-repair and clinical standards mainly aim at managing symptoms.

- ♥ Myocardial infarctions (MI) are mostly due to coronary heart disease (CHD).
- ♥ In the UK only, 1 person every 5 min is admitted into the hospital for a heart attack.
- ♥ Approximately 1.4 million people survive a heart attack every year in the UK.
- ♥ MI has a heavy healthcare burden due to the long recovery period, costing greater than £15,000 per year per person after the event.



250M

Suffer from CHD



100K

Yearly admissions



1.4M

Survivors

\$15K

Recovery Costs



Clinical Challenge

Current MI clinical treatments aim at managing symptoms and preventing potential MI recurrence. However, there is currently no effective and standardised method to repair or regenerate cardiac tissue, resulting in the potential for permanent cardiac function loss and patients being at severe risk of complications.

01 **Mechanical Instability of Infarcted Myocardium (or Weakened Heart Muscle)**

The damaged heart muscle, or infarcted myocardium, is prone to weakening, leading to potential rupture or aneurysm formation. Subsequent scar tissue formation further compromises cardiac function.

02 **Limitations of Invasive Cardiac Therapies**

Many current treatments for heart disease necessitate invasive procedures, such as open-heart surgery. These interventions can be risky, have a long recovery time, and may not fully address the underlying issue.

03 **Ineffective Cardiac Tissue Regeneration and Drug Delivery**

The adult heart has limited capacity for self-repair following injury. Additionally, delivering drugs directly to the damaged heart tissue is challenging, as they often disperse throughout the body.

We want to learn more about your challenges!

TAKE OUR SURVEY



Our Solution

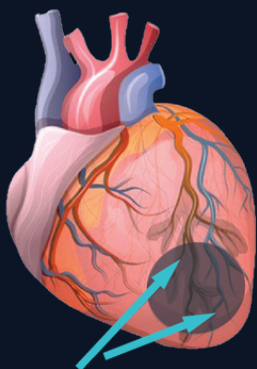
A new era for Heart Repair

Our patent-pending protein-based hydrogel will revolutionise cardiac care, offering a breakthrough solution for patients recovering from heart attacks to regenerate their cardiac tissue functions and save their lives. By leveraging cutting-edge biomaterials, we are developing an injectable, adhesive, regenerative patch that:

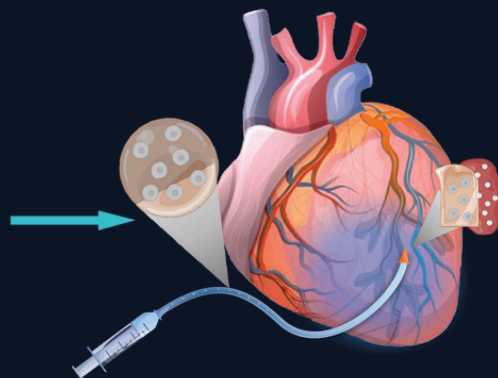


- **Adheres** to the heart
- **Delivers** therapeutics directly to the damaged tissue
- **Degrades** safely over time
- **Restores** heart function
- **Promotes** tissue regeneration

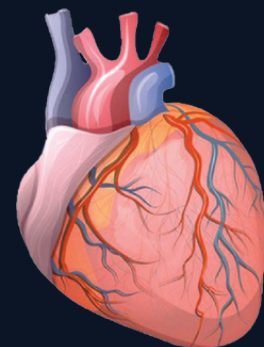
By minimising the risk of severe complications, we are reducing hospitalisation time and the need for follow-up care. This ultimately saves time, resources, and lives.



(1) **Myocardial infarction**
– permanent loss cardiac function



(2) **AdHeal** – injectable hydrogel adheres to heart surface and releases therapeutics



(3) **Hydrogel biodegradation and therapeutic release**
– cardiac function regain

Key Benefits

TRL 4 – Material Developed & In-vivo small animal tests completed.

Minimally invasive

Our product integrates seamlessly into existing clinical workflows and can be applied to the affected tissue through minimally invasive procedures, reducing patient risk.

Targeted drug delivery

Releases therapeutics directly to the target tissue, minimising systemic side effects and improving treatment efficacy.

Cardiac Tissue Regeneration

Promotes the regeneration of damaged heart muscle, restoring heart function and improving patient outcomes.

The Team



Adam Celiz,
Principal
Investigator



Nicola Contessi
Negrini,
Research Associate



Yipeng
(Peggy) Pi,
PhD Student



Yangshuo
(Jessie) Hu,
PhD Student



Aditi Sitolay
Business Development
Lead

Supported By





Join Us in Transforming Cardiac Care

Your expertise and collaboration can help shape the future of heart attack recovery.

Let's work together to bring innovative solutions to life and improve outcomes for patients worldwide.

TAKE OUR SURVEY



CONTACT US



Learn More

- [Ganabady, K. et al. \(2023\) High-Throughput Screening of Thiol-ene Click Chemistries for Bone Adhesive Polymers. ACS Appl Mater Interfaces 15, 50908-50915](#)
- [Contessi Negrini, N. et al. \(2021\) Tunable Cross-Linking and Adhesion of Gelatin Hydrogels via Bioorthogonal Click Chemistry. ACS Biomater Sci Eng 7, 4330-4346](#)
- [Celiz, A. et al. \(2017\) Tough Adhesives for Diverse Surfaces. Science 357, 378-381](#)