

Hydrogel prevents post-infarct cardiac arrhythmia

Heart attacks often lead to tissue damage and life-threatening arrhythmias, as current treatments cannot restore healthy cardiac function. This novel injectable, electrically conductive PEDOT:PSS hydrogel ((poly(3,4-ethylenedioxythiophene) polystyrenesulfonate)) is designed to improve electrical signal transmission and allow repairing damaged heart tissue, by cell therapy—a promising solution for long-term cardiac recovery.

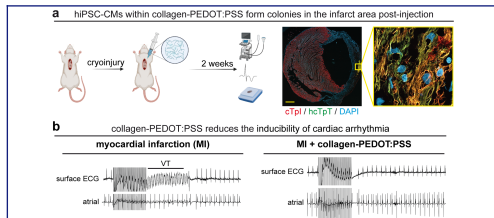


Electrically conductive collagen-PEDOT:PSS hydrogel

The collagen-PEDOT:PSS hydrogel is an injectable, electrically conductive hydrogel for post-infarct cardiac therapy. It prevents arrhythmias after myocardial infarction and enhances the integration and function of transplanted stem cell-derived cardiomyocytes. The material mimics native heart tissue, enabling new approaches for cardiac regeneration.

 Roshanbinfar et al., Wiley, 2024

- 01 Restores electrical conductivity in infarcted areas, reducing risk of post-infarct arrhythmias
- 02 Injectable hydrogel enables safe integration and maturation of stem cell-derived cardiomyocytes
- 03 Validated in vivo studies



IP RIGHTS

PCT filed

2025

CHALLENGE

Current therapies for post-infarct cardiac repair are unable to restore lost tissue or reliably prevent arrhythmias. Implantable devices only treat the symptoms but they do not heal the tissue. Drug therapies are only partially effective and can cause side effects. There is an urgent need for new, cell-compatible materials to enable lasting heart regeneration and electrical stability.

INNOVATION

This technology combines collagen and PEDOT:PSS to create an injectable, electrically conductive hydrogel that mimics native heart tissue. Unlike standard biomaterials, it restores electrical conductivity in damaged areas and allows ensures safe integration of stem cell-derived cardiomyocytes and effectively restores electrical conductivity in damaged areas. The hydrogel prevents arrhythmias, supports cell therapy, and enables true cardiac tissue regeneration—setting a new standard for post-infarct treatment.

01 Basic principles observed · 02 Technology concept formulated · 03 Experimental proof of concept · 04 Technology validated in lab · 05 Technology validated in relevant environment · 06 Technology demonstrated in relevant environment · 07 System prototype demonstrated in operational environment · 08 System complete and qualified

TRL 08

TRL 07

TRL 06

TRL 05

TRL 04

TRL 03

TRL 02

TRL 01

Technology Readiness Level (TRL)



BayPAT

Innovation from Research & Science –
BayPAT markets inventions on behalf
of the Bavarian universities and
universities of applied sciences.

An invention of Friedrich-
Alexander-University Erlangen-
Nürnberg



As one of the largest technology transfer offices in Germany, BayPAT evaluates and commercializes innovations from 28 research institutions. With our extensive experience and expertise in patenting and licensing technologies and our comprehensive range of services, we are your partner of choice. For more information visit www.baypat.de

Bayerische Patentallianz GmbH
Dr. Linda Keil
l.keil@baypat.de
+49 (0)89 5480177-30
Prinzregentenstr. 52
80538 München

