3D artificial heart tissue

Commonly used acronym: *Heart Patch*

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SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research, Translational - Applied Research
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	3D heart

DESCRIPTION

Method keywords

heart model

3D

Human induced Pluripotent Stem Cell

multi electrode array

plasma treatment

Scientific area keywords

cell biology

Cardiology

cardiac function

Cardiac electrophysiology

Method description

Current pre-clinical drug safety evaluation methods remain costly, inefficient, and unreliable, with 80–90% of compounds ultimately failing in human trials — often due to poor predictive models and safety concerns. Scaffold-based 3D organ models offer a more promising and physiologically relevant alternative in pre-clinical drug testing. We aim to advance this field by optimizing a 3D artificial heart tissue model seeded with key human cell types—cardiomyocytes, fibroblasts, and endothelial cells. This model of heart patch surpasses current 3D cardiac constructs by incorporating bioinspired scaffolds and electro-mechanical stimulation to enhance cell differentiation and tissue maturity. By leveraging human induced pluripotent stem cells (iPSCs), our platform offers a more predictive and human-relevant system for cardiac drug safety and efficacy assessment, helping reduce reliance on *in vivo* animal testing.

Method status

Still in development

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

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