



## A device for electromechanical stimulation of 2D monolayer and 3D stem cell's cultures for tissue engineering applications

New device and apparatus for mechanical or simultaneous electromechanical stem cell cultures have been designed and patented by UPC and IGTP. The device is disposable and allows sterile mechanical stimulation on standard Petri dishes without breaking the sterile barrier. Partners to further develop the system and/or to establish commercial agreements along with technical cooperation are sought.

### The Challenge

Cardiovascular diseases have a huge impact on population health. Heart failure is the end-stage of many cardiovascular diseases, but the leading cause is the presence of a large scar due to an acute myocardial infarction. Current treatments for repairing tissue rely on achieving in vitro cardiac differentiated cells that mimic the native cardiac electromechanical cell physiology. Electrical and mechanical stimulation of stem cell cultures may help to improve their cardiac differentiation and tissue structure formation. Current devices for electromechanical stimulation have major flaws on the use of standard laboratory sterilizing procedures.

### The Technology

The device presented enables combination of both electrical and mechanical stimulation either independently or simultaneously. The mechanical stimulation is performed with a non-invasive and aseptic novel approach. A sterile, single use device is placed into a standard Petri dish. The cells are seeded in a volume contained in the central area of the device, which goes through mechanical stimulation thanks to the embedded magnets and the external magnetic field.

### Innovative advantages

- Mechanical or simultaneous electromechanical stimulation on standard Petri dishes.
- The device can be fully sterilized prior cell culture seeding or may be sold directly pre-sterilized for immediate use.
- The benefits of the electromechanical stimulation can be non-destructively and on line monitored using Electrical Impedance Spectroscopy.

### Current stage of development

- Device, device fabrication procedure and apparatus already developed
- Electrical impedance spectroscopy on-line monitoring — in process

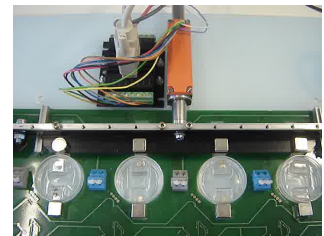
### Applications and Target Market

- Tissue engineering
- Regenerative medicine
- Stem cells research
- Metabolic studies

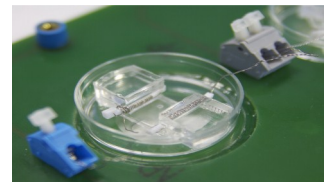
### Reference number

MKT2012/0130\_H

**Sterile mechanical or electromechanical stimulation of 2D or 3D cultures on standard Petri dishes**



**Disposable (single use) sterile device + external stimulation apparatus**



**Optional on-line, non-destructive monitoring using electrical impedance spectroscopy**

### Business Opportunity

Technology available for licensing with technical cooperation

### Patent Status

EP / US patent application

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