ELECTRICAL STIMULATION BIOREACTOR

BACKGROUND

Tissue engineering bioreactors attempt to simulate in-vivo growing conditions by cultivating the desired cells in precisely controlled environments that mimic as closely as possible what is found in nature. Despite recent advances, tissue engineering still faces some crucial issues regarding the efficient culture of cells in-vitro. One of these challenges is the reproduction of endogenous electric fields that are known to play a vital role in cellular proliferation, repair and regeneration.

TECHNOLOGY

The Cartmell group at the University of Manchester has now developed a novel, fully biocompatible 6 well plate design bioreactor that allows the delivery of homogenous electrical stimulation to cells. The design is compatible with standard multi well plate cell culturing systems and can be used with cells seeded on any type of construct or material. The simple design allows aseptic assembly with no extra training of personnel required.

KEY BENEFITS

- Easy to use, familiar 6 well plate design enabling products to be created with greater speed.
- Suitable for a wide range of cell cultures seeded as monolayers or on scaffolds (2D&3D).
- Can be used with electrically conductive scaffolds to regulate cellular activity throughout the scaffold.
- Facilitates a simpler method of delivering growth factors to the culture by inducing the cells themselves to produce these materials through natural pathways, this also reduces the need for expensive growth factors.
- The bioreactor can be individually optimized to culture different tissues and the homogenous electrical stimulation can be tailored as required.
- Fully autoclave compatible and reusable.
- Scalable by the attachment of multiple bioreactors to the same stimulation source.
- Robust system with no need for specialist tools.

OPPORTUNITY

We are looking to engage with companies interested in the development of the technology towards a product.

CURRENT STATUS

Initial prototype developed.

CONTACT

Simon Clarke, IP Development and Partnering Manager, UMIP, Core Technology Facility, 46 Grafton Street, Manchester M13 9NT ✉:Simon.Clarke@umip.com ☏: Tel: +44 (0) 161 306 8510