OPEN ACCESS Freely available online

Journal of Biomedical Engineering and Medical Devices

Perspective

Genetical Restoration of Damaged Heart Tissue

Pavan Kumar*

Department of Biotechnology, University of Zurich, Zurich, Switzerland

DESCRIPTION

Some bioengineers have developed a prototype patch which work as vital aspects of heart tissue. Their patch endures the mechanical demands and imitates the electrical signalling properties that allow our heart to pump blood rhythmically round our bodies. Their work basically takes us forward to a functional design that could fix a broken tissue of heart. One out of six men and one of every seven women in the EU will experience a coronary failure sooner or later in their lives. Around the world, coronary illness kills more women and men regardless of race, than any other disease.

Cardiac patches lined with heart cells can be applied surgically to restore the heart tissue in patients who have had damaged tissue removed after a coronary episode and to repair congenital heart defects in infants and children. At last, however, the objective is to make cell-free patches that can restore the simultaneous beating of the heart cells, without impeding the heart muscle movement.

Regardless of certain advances in the field, coronary illness actually puts a huge burden on medical care systems and the life quality of patients around the world. It influences entire society either in a direct or indirect way through family and friends. Subsequently, scientists are constantly hoping to develop new medicines which can include stem-cell treatments, biomaterial gel infusions and assistive devices.

The effective traditional material design permits bioengineers to imitate the direction-dependent mechanical movement of the heart, which can be sustained repeatably. This was accomplished through a novel strategy called Melt Electrowriting (ME). The team focused on the advancements made on the Spraybase® Melt Electrowriting (MEW) System. The achievement accomplished by the team features the potential applications of this novel technology in the cardiac field and briefly captures the advantages of industry and academic cooperation, through platforms like the IPP.

Engineering replacement materials for heart tissue is challenging since it is an organ which is constantly moving and contracting. The mechanical demands of heart muscle (myocardium) can't be met using polyester-based thermoplastic polymers, which are predominantly the approved options for biomedical applications. However, the functionality of thermoplastic polymers could be utilized by its structural geometry. The bioengineers then set about making a patch that had some control over the extension of a material in multiple directions and tune this utilizing an engineering design approach.

The patches were fabricated by means of melt electrowriting, which is a core technology of Spraybase®. It is reproducible, precise, and adaptable. The patches were additionally covered with the electroconductive polymer polypyrrole to give electrical conductivity while maintaining the cell compatibility. The patch endured continuous stretching, which is a dominant consent for cardiovascular biomaterials, and showed great flexibility, to accurately imitate the key property of heart muscle.

Essentially, this material tends to a lot of requirements. The bulk material is currently approved for medical device use; the design accommodates the movement of the pumping heart, and has been functionalised to accommodate signalling between isolated contractile tissues. This study at present reports the advancement of the technique and design, however the team is looking forward further to the next generation of designs and materials with the eventual aim of applying this patch as a treatment for a heart attack.

These electroconductive patches support electrical conduction between biological tissue in an *ex vivo* model. These outcomes therefore address a significant step towards generating a bioengineered patch capable of recapitulating aspects of heart tissue, particularly its mechanical movement and electrical signalling.

Correspondence to: Pavan Kumar, Department of Biotechnology, University of Zurich, Zurich, Switzerland, E-mail: pavan@gmail.com

Received: 01-Mar-2022, Manuscript No. BEMD-22-17060; **Editor assigned:** 03-Mar-2022, Pre Qc No. BEMD-22-17060 (PQ); **Reviewed:** 17-Mar-2022, QC No. BEMD-22-17060; **Revised:** 24-Mar-2022, Manuscript No. BEMD-22-17060 (R); **Published:** 04-Apr-2022, DOI: 10.35248/2475-7586.22.07.209.

Citation: Kumar P (2022) Genetical Restoration of Heart Tissue. J Biomed Eng & Med Dev. 07: 209.