TECHNOLOGY

Biocompatible 3D Printing Resin at Physiologic Temperature

OVERVIEW

Background

Cardiovascular disease (CVD) is the leading cause of death worldwide and congenital heart disease (CHD) is among the leading causes of death in newborns. In recent years, there have been complications with the use of synthetic materials such as artificial grafts or patches, two current treatments of CVD and CHD, which include but are not limited to increased susceptibility to infection, progressive obstruction, calcification, and poor durability. There is a need for a new graft that overcomes these challenges and is able to allow the patient's own cells to proliferate and provide physiological functionality post degeneration of the graft.

Innovative Technology

Researchers at the University of Maryland have developed a novel polymer-based Tissue Engineered Vascular Graft (TEVG) that utilizes spatially organized microparticles for the controlled release of bioactive molecules and growth factors, enabling the recruitment of leukocytes, endothelial cells, and smooth muscle cells. The recruitment of leukocytes, endothelial cells and smooth muscles cells by controlled release allows the graft to mimic the same mechanical properties as nearby tissue and thus, promote long-term survival and patency of the TEVG providing a biodegradable alternative to current treatments.

APPLICATIONS

- Heart or vascular surgical repair
- Tissue regrowth
- Tissue remodeling
- Tissue rebuilding

ADVANTAGES

- Uses own cells to proliferate and provide function (cell free graft prior to implant)
- Maintains patency and prevents stenosis
- Tunable Young's Modulus and compliance
- Recruitment of Endothelial and Smooth Muscle cells
- Higher qual

CONTACT INFO

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Pending

CATEGORIES

- Engineering
- Biomaterials
- Bioengineering
- Biological

EXTERNAL RESOURCES

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