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3D Printing of Engineered Tissues with Vascular Networks

Abstract:

The lack of sufficient numbers of donor organs for human transplantation therapies results in the loss of tens of thousands of lives and costs tens of billions of dollars each year in the US alone. However, the ability to create, *de novo*, functional organ replacements to treat human disease is fundamentally limited by the lack of a comprehensive vascularization strategy for engineered three-dimensional (3D) tissues. We are developing advanced materials and 3D printing strategies to enable the rapid fabrication of engineered tissues containing perfusable vascular networks. Here, I will elaborate some of the current challenges on the design of vascular networks for engineered tissues, and our efforts to realize and analyze these architectures within biocompatible hydrogels through adaptations of stereolithography. Stereolithography, the localized gelation of photosensitive scaffolds using patterned light projection, and other 3D printing technologies promise to revolutionize tissue engineering and regenerative medicine by providing unprecedented control of 3D scaffolds and the cells that they support. These technologies provide a flexible platform for a wide array of specific applications, and may enable the scaling of densely populated tissue constructs to arbitrary size.

Keck Seminar

Friday, September 29, 4pm

BioScience Research Collaborative

Room 280 (2nd Floor)

Gulf Coast Consortia
QUANTITATIVE BIOMEDICAL SCIENCES

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