3D Printing and Biofabrication Workshop

NIH Center for Engineering Complex Tissues (CECT)
June 8, 2018

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Welcome and Overview

BioLife4D

CECT Center for Engineering Complex Tissues
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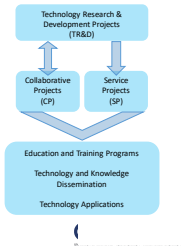
- The fabrication of complex engineered tissues remains a grand challenge in regenerative medicine
- CECT will pioneer the engineering of complex tissues by developing and disseminating techniques in *bioreactor culture*, *cell printing*, and *complex scaffolds*
- CECT will also establish a community of investigators in these endeavors through disseminating technologies and growing new technologies for fabricating complex tissues



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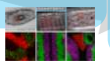
TR&D1: Bioreactor Culture

- 3DP Bioreactor Chambers
- Dynamic Coculture in Bioreactor Chambers
- Dynamic Coculture of 3DP Bone Mimetic

TR&D2: Cell Printing

- Cell Positioning in 3DP Tissues
- Cell-Substrate Printing to Control Microenvironment
- Bioprinting of Multiple Cell Populations



TR&D3: Complex Scaffolds

- Composite 3DP Scaffolds
- 3DP Scaffolds with Controlled Release
- Heterogeneously Distributed Growth Factors for Tissue Repair

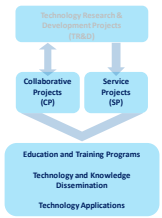
TR&D 1: 3D Printed Bioreactors for Cell Culture
Dr. John P. Fisher, University of Maryland

TR&D 2: Bioprinting Patterning for Cell-Laden Constructs
Dr. Anthony Atala and Dr. James J. Yoo, Wake Forest University

TR&D 3: Bioprinting for Complex Scaffold Fabrication
Dr. Antonios G. Mikos, Rice University

CECT Collaborations

- **Collaborative Projects**
  - Investigative projects establishing new technologies
  - Leveraging TR&D resources to provide additional functionalities
- **Service Projects**
  - Platform for implementation of TR&D facilities
  - Designed to increase CECT engagement
- Proactive dialogue between collaborating parties
  - Determine project aims, troubleshooting issues, and data exchange
  - Shipping materials or finished products as needed
  - Student visits and exchange as needed



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Goals

- Understanding the basic concepts of 3D Printing and Bioprinting
- The printing process: concept to product
- Applications in research

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Schedule

9:00 am – 9:10 am	Welcome and Overview
9:10 am – 9:30 am	Introduction to Tissue Engineering and Regenerative Medicine
9:30 am – 9:50 am	Introduction to 3D Printing. A brief description of tools and techniques involved
9:50 am – 10:20 am	The 3D Printing process
10:20 am – 10:40 am	Break
10:40 am – 11:10 am	Case Study
11:10 am – 12 pm	Printing Considerations
12 pm – 1 pm	Lunch
1 pm – 2:30 pm	Lab Tour and Demos
2:30 pm – 3:30 pm	Round Table Discussion
3:30 pm – 3:40 pm	Wrap up

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