

Faculty Name:

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Lab:

Tissue Engineering and Active bioMaterials (TEAM)

Project Title:

3D printing plant-derived biomaterials for bone regeneration

Description:

Zein is a biocompatible, biodegradable corn-derived protein that has shown promise for bone tissue engineering. It is rich in glutamine and has been shown to be favorable for cell adhesion with recent studies by the PI showing it can promote osteogenesis. However, developing processing methods in order to achieve well-defined scaffold geometries to support bone growth in vivo are needed. Lignin, a natural polymer found in plants, is a promising candidate as a binder due to its abundance, low cost, and sustainability. The aims of this summer project are to 1) develop a 3D printable zein-based bioink using lignin as a binder to achieve shear thinning rheology, 2) evaluate the structural integrity of the scaffold after crosslinking, and 3) evaluate cytocompatibility and osteogenic capacity of mesenchymal stem cells (MSCs) on the zein scaffolds. The successful completion of this work will lay the foundation for future studies demonstrating bone repair in vivo.

Location of Research:

On-Site

of hrs/week:

35

Department/Program:

Biomedical Engineering

Eligibility:

MS

To apply, please contact:

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