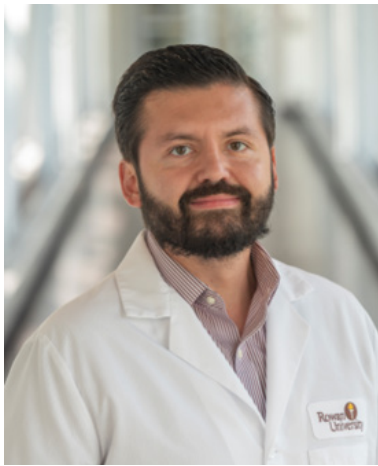


CARNEGIE MELLON UNIVERSITY

BME 2024 SPRING SEMINAR SERIES

Injectable Hydrogels that Direct Stem Cell Fates and Induce Targeted Bone Formation



PRESENTED BY

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SCHEDULE

Doherty Hall (DH) 2315

**Thursday,
February 29, 2024
(11:00-12:00PM)**

Injectable hydrogels are a class of soft biomaterials that are delivered to a region of interest and solidify into a hydrated polymeric network in situ. Our lab develops injectable hydrogels with customizable biophysical and biochemical properties to study cell-matrix interactions and to locally deliver therapeutics noninvasively. In this seminar, I will first overview the chemistry behind our two-component system that upon mixing, forms a hydrogel with tunable stiffness, gelation time, and 3D cell-mediated enzymatic hydrogel remodeling. I will then detail our ability to pre-functionalize hydrogel components with cell-instructive peptides, and how we used this process to create injectable hydrogels that facilitate 2D cell adhesion and induce 3D osteogenic differentiation of encapsulated stem cells. Finally, I will share a translational angle, using this system to accelerate bone formation in a rodent intramedullary canal femur model. Ultimately, the long-term vision of this work is to create a minimally invasive injectable therapeutic to prevent osteoporosis-related bone fractures, a condition which affects millions worldwide.

