Joint Department of BIOMEDICAL ENGINEERING | UNC CHAPEL HILL | NC STATE UNIVERSITY

An Investigation of Nanocellulose/Chitosan-Based Injectable Hydrogels

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Objective/Hypothesis

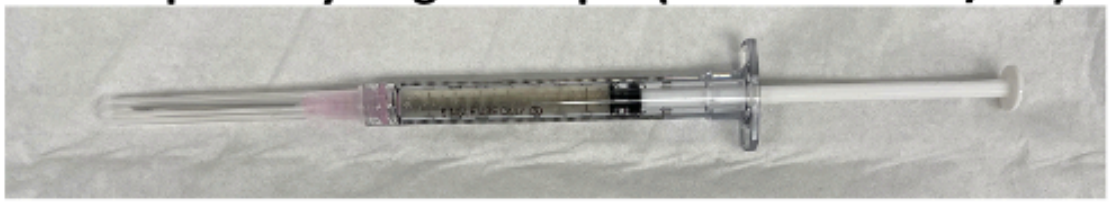
- **Goal:** To determine what effects cell density in the hydrogel scaffolds will have on

1. Osteogenesis Markers
2. Regenerative Outcomes

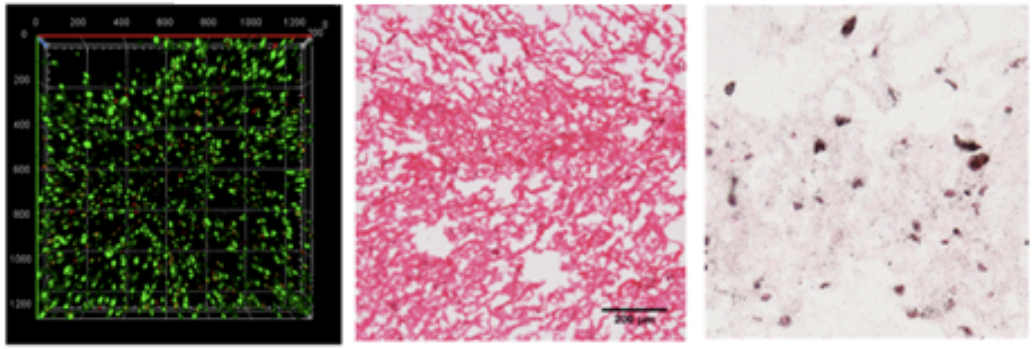
Osteoporosis is a highly prevalent disease throughout the United States. Optimizing a hydrogel's regenerative properties would aid in the treatment of this disease.

Results

Complete Hydrogel Sample (5 Million Cells/mL)



High Cell Viability and Promoted Osteogenesis



The results indicate great potential in the hydrogel. Future studies will aim to perfect the cell density contained in the scaffold.

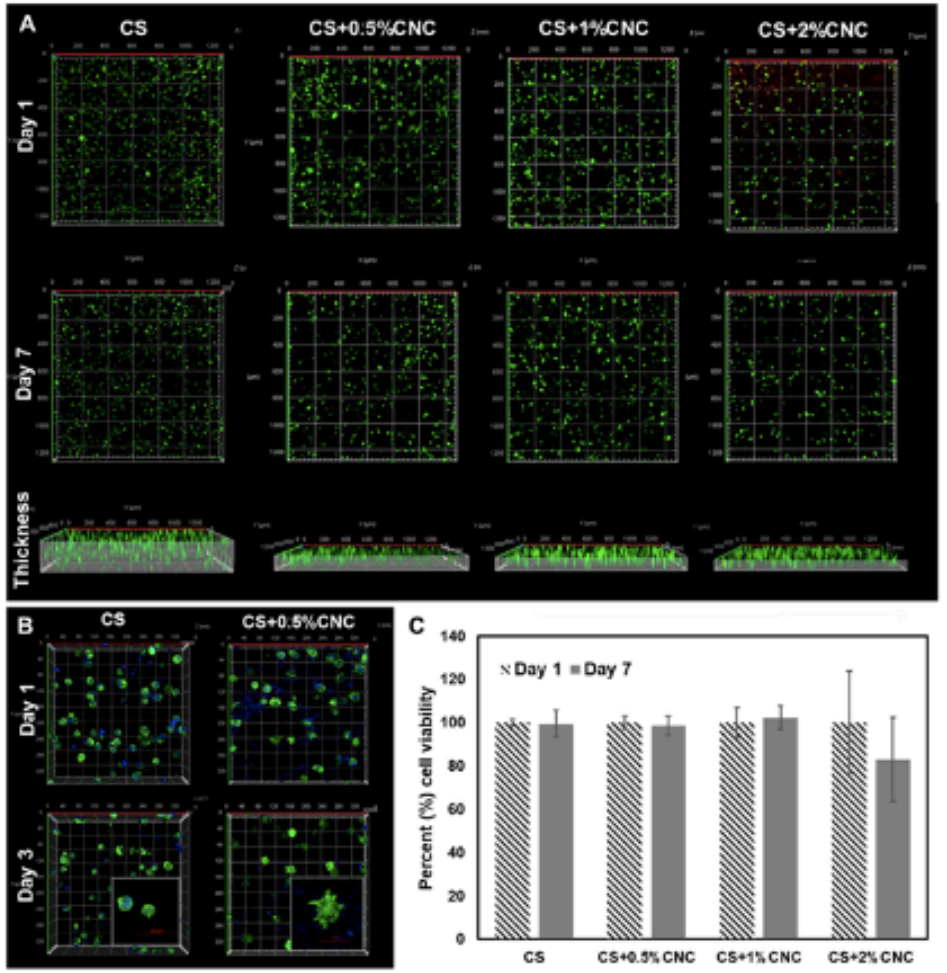


Fig. 6. In vitro cell-based assays of encapsulated cells in hydrogels A) Z-stacking confocal images of MC3T3-E1 cells encapsulated in different hydrogel formulations. Live cells stained by Calcein-AM are represented in green. Dead cells stained by Ethidium Homodimer-1 are represented in red. B) Morphology of MC3T3-E1 cells encapsulated in different hydrogel formulations. The cytoskeletons and nuclei of cells were stained by Acti-stain phalloidin and 4',6-diamidino-2-phenylindole (DAPI), respectively. C) Percent cell proliferation on day 7 compared to day 1 in each hydrogel formulation using cell counter imageJ analysis.