Abstract Submitted
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Complex multi-cellular manifolds[1] TAPOMOY BHATTACHARJEE, KYLE G. ROWE, Department of Mechanical and Aerospace Engineering, University of Florida, Gainesville, Florida, 32611 USA, SUHANI JAIN, Stanton College Preparatory, Jacksonville, Florida, 32209 USA, STEVEN M. ZEHNDER, RYAN M. NIXON, Department of Mechanical and Aerospace Engineering, University of Florida, Gainesville, Florida, 32611 USA, W. GREGORY SAWYER, Department of Mechanical and Aerospace Engineering, Department of Materials Science and Eng., University of Florida, Gainesville, Florida, 32611 USA, THOMAS E. ANGELINI, Department of Mechanical and Aerospace Eng., Department of Biomedical Eng., Institute for Cell and Regenerative Medicine, University of Florida, USA — Investigation of collective cell behavior is critical for developing an understanding of tissue regeneration, embryonic morphogenesis, wound healing, and cancer invasion. Collective behavior has been widely studied in 2D cell monolayers, providing great fundamental understanding of multi-cellular motion and mechanics. Living tissues, by contrast, are densely permeated with complex 3D structures including curved manifolds and tubular networks. Exploration of collective cell behavior within such complex 3D structures is essential to connect our knowledge of cells in 2D monolayers to their motion and mechanics in tissues. In this study, complex structures have been generated by 3D printing living cells into a viscoelastic cell growth medium, creating cellular manifolds with a wide range of mean and Gaussian curvature, such as linear cylinders and branched tubular networks. Preliminary data describing collective cell behavior within these complex manifolds will be presented.

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