



Lokesh Karthik Narayanan



### 3D Tissue Engineering and Bio-manufacturing

#### Research emphasis:

Mr. Narayanan's research centers on the area of biomedical devices and bio-manufacturing processes. He has been researching on harnessing additive manufacturing techniques to fabricate functional human tissues such as knee menisci and trachea. He is currently involved in the development of a process to assess the biological quality of bioprinted constructs, utilizing dielectric spectroscopy. He is interested in translation and scaling up tissue engineering processes to address the growing demand.

#### Applications:

- 3D Tissue engineering
- Patient specific clinical
- Biomedical devices

#### Research Strengths:

- Additive manufacturing
- CAD/CAM
- Bioprinting
- Mechanical characterization of biomaterials

#### Publications and Abstracts:

**Narayanan, L. K.**, Huebner, P., Fisher, M., Spang, J., Starly, B., Shirwaiker R.A. (2016) 3D-Bioprinting of Polylactic Acid (PLA) Nanofibers-Alginate Hydrogel Bioink Containing Human Adipose-Derived Stem Cells. ACS Biomaterials Science & Engineering, 2 (10), 1732–1742.

**Narayanan, L. K.**, Kumar, A., Tan, Z., Bernacki, S., Starly, B., & Shirwaiker, R. A. (2015). Alginate Micro-spheroid Encapsulation and Delivery of MG-63 Cells into PCL Scaffolds: A New Biofabrication Approach for Tissue Engineering Constructs, ASME Journal of Nanotechnology in Engineering and Medicine, 6 (2): 021006

Johnson, C., Sheshadri, P., **Narayanan, L. K.**, Ketchum, J. M., Weinberger, P. M. and Shirwaiker, R. A. (2016) In Vitro Characterization of Design and Compressive Properties of 3D-Biofabricated/ Decellularized Hybrid Grafts for Tracheal Tissue Engineering. Journal of the Mechanical Behavior of Biomedical Materials, 59, 572-585.

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