



Binil Starly



Associate Professor,
**Manufacturing Lead within
Functional Tissue
Engineering (FTE) Group**

B.S. University of Kerala, India.
Ph.D. Drexel University, PA

His expertise is in digital design, modeling, simulation and manufacturing process technologies. He believes newer automation processes, particularly intelligent machines and cyber-physical manufacturing processes will impact every manufacturing industry, particularly the healthcare industry.

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Biomufacturing for Regenerative Medicine

Research emphasis:

Dr. Starly's laboratory is involved the digital fabrication of 3D scaffolds for tissue engineering and regenerative medicine applications. He has foremost experience in the 3D printing of cellular constructs for drug screening and toxicity testing. Bioprocessing for regenerative medicine is under-studied and essential to any translation of regenerative medicine therapies. He has specifically applied 3D culture based methods to improve stem cell expansion in bioreactors.

Selected publications:

Arun Kumar, **Binil Starly**, "Large Scale Industrialized Cell Expansion: Producing the Critical Raw Material for Biofabrication Processes", *Biofabrication*, 2015, Vol 7, 044103.

Rachel Dreher, **Binil Starly**, "Biofabrication of Multi-material 3D Constructs Embedded with Patterned Alginate Strands Encapsulated with PC12 Neural Cell Lines", *ASME Journal of Nanotechnology in Engineering and Medicine*, May 2015, Vol. 6(2)/0210003.

Lan, S.F., Kehinde T., Zhang X., Schmidtke, D., Khajotia, Sharukh, **Starly, B.**, "Controlled Release of Metronidazole from Composite Poly-ε-Caprolactone/Alginate Rings for Dental Implants", *Dental Materials*. 2013 Jun; 29(6):656-65.

Shih Feng Lan, Barbara Mroczka, **Binil Starly**, "Long-term cultivation of HepG2 Liver Cells Encapsulated in Alginate Hydrogels: A Study of Cell Viability, Morphology and Drug Metabolism", *Toxicology In Vitro*, Volume 24, Issue 4, June 2010, 1314-1323.

Application :

- Biofabrication of 3D Scaffolds
- Stem Cell Expansion
- Scale-up Manufacturing
- 3D *In-Vitro* Tissue Models
- Bioreactors for Reparative Medicine

Collaboration potential:

- High-Throughput Toxicity Testing Using 3D *In-Vitro* Models.
- Physiologically Relevant *In-Vitro* Tumor Models.
- Expanding Stem Cells for Therapeutic Care.