

MSE SEMINAR

April 20, 2018

113 McBryde Hall

3:30 – 4:30 PM

Refreshments at 3:00 PM

Wyatt Surbey

Graduate Student

Materials Science and Engineering, Virginia Tech

“3D Printing Gelatin Methacrylate”

ABSTRACT

Gelatin methacrylate (GelMA) is a ubiquitous biocompatible photopolymer used in tissue engineering and regenerative medicine due to its cost-effective synthesis, tunable mechanical properties, and cellular response. Biotechnology applications utilizing GelMA have ranged from developing cell-laden hydrogel networks to cell encapsulation and additive manufacturing (3D printing). However, extrusion based 3D printing is the most common technique used with GelMA. Mask projection microstereolithography (MP μ SL or μ SL) is an advanced 3D printing technique that can produce geometries with high resolution, high complexity, and feature sizes unlike extrusion based printing. There are few biomaterials available for μ SL applications, so 3D printing GelMA using μ SL would not only add to the repertoire materials, but also demonstrate the advantages of μ SL over other 3D printing techniques. A novel GelMA resin was tested with μ SL to create a porous scaffold with a height and print time that has not been displayed in the literature before for a scaffold of this size. The resin consists of GelMA, deionized water, lithium phenyl-2,4,6-trimethylbenzoylphosphinate (LAP, photoinitiator), and 2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid (sulisobenzone, UV blocker) and can be processed at room temperature.

BIOSKETCH

Wyatt Surbey is a Master's student in Dr. Abby Whittington's lab. He graduated from Virginia Tech with a bachelors of science in Materials Science and Engineering and minor in Biomedical Engineering and Sciences in 2017. In 2016 Wyatt won the student speaking competition at MS&T representing the MSE department at Virginia Tech. Wyatt is also one of the recipients of the Dr. Gary S. Clevinger, Sr. Memorial Endowed Scholarship for 2018. Currently, he is the GTA for Polymer Engineering taught by Dr. Rick Clark and plans to graduate in June 2018.