

Title: Glycerol-Based Photocrosslinkable Biodegradable Polymeric Material for Additive Manufacturing

Name: Jane Wang

Affiliation: Department of Chemical Engineering, National Tsing-Hua University,
Hsinchu 300, Taiwan

Tel: +886-35715131 ext 33649, E-mail: janewang@mx.nthu.edu.tw

With the increasing demand in biomaterials for medical applications in the past two decades, the development of biodegradable materials with elastomeric properties had become one of the most popular research topics. With the emerging additive manufacturing technology, the fabrication of sophisticated medical devices from novel biomaterials became possible. In this work, a glycerol-based, photocrosslinkable, biodegradable polymer, poly(glycerol sebacate) acrylate (PGSA), is introduced.¹ PGSA is an extension from poly(glycerol sebacate) (PGS), and is an elastomer with good biodegradability and had been considered a very promising material for soft tissue regeneration. However, the biocompatibility of PGSA requires improvement. Here, we report a novel synthesis and processing method to create a highly biocompatible and photocrosslinkable version of PGSA with a wide range of Young's modulus from 0.12 to 3.17 MPa, ultimate tensile strength between 0.1 and 1.2 MPa and strain to failure from 121% to 39%. Linearly degradation properties are observed and characterized. Preliminary application in 3D printing of PGSA especially shows great potential for applications in tissue engineering.

References:

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