



Hydrogels via Thiol-ene Chemistry using Norbornene-functionalized PEG

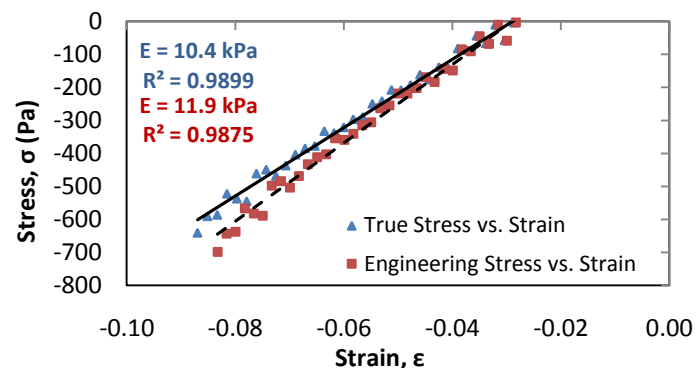
Aleksandr Gerasimenko

PI: Prof. Gregory Tew (UMass Polymer Science and Engineering)

Collaborators: Ahmad Madkour and Melissa Lackey (Polymer Science and Engineering)

Hydrogel properties are readily tunable by tailoring functional groups, using different polymerization methods, and by controlling the molecular weights of the precursor units. These variations produce hydrogels with different swelling, mechanical, and physical properties suitable for a range of applications including immunomodulation and stem cell culturing, as well as tissue scaffolding and optics.

In this project, covalently crosslinked hydrogels were made using thiol-ene chemistry. Norbornene-functionalized poly(ethylene glycol) (PEG) precursors were photocrosslinked with tri- and tetra-functional thiol compounds to create hydrogel structures. Characterization of the hydrogels consisted of quantifying the swelling and degradation properties, as well as compression analysis and shear rheometry for determining mechanical properties. The data will provide insight on potential uses for cell and tissue engineering that will better mimic biological environments to provide ideal conditions for these engineering applications.



Low-strain linear elastic regime on a stress-strain curve obtained from compression testing. The elastic modulus, E , can be derived from the slope.



Hydrogel is optically clear and transparent