POLYSACCHARIDE HYDROGELS CROSS-LINKED VIA PEPTIDE-DENDRIMERS

Ronit Bitton, Ben–Gurion University of the Negev, Israel
rbitton@bgu.ac.il

Key Words: Hydrogels, Elastin-like Peptides, Hyaluronic Acid, Dendrimers

Dendritic and other highly branched structures are of importance in biomaterials since their topological features may lead to useful properties, including substantially improved resistance to proteolysis of branched peptides compared to linear ones. As crosslinkers, dendrimers offer the advantage of versatility in terms of number and chemical composition of surface functionalities; a versatility that can be translated to gels with easily tunable structure and properties.

Here we present gels prepared from hyaluronic acid (HA) and dendritic elastin-like peptides (denELPs) of generations 1, 2, and 3 (G1, 2, and 3) as crosslinking units.

The physical properties of these hydrogels were investigated by rheology, scanning electron microscopy (SEM), Small angle x-ray scattering (SAXS), and model drug loading and release assays.

Hydrogels made with different generation denELPs exhibited different structures and physical properties, demonstrating the importance of the multivalency effect in determining hydrogel characteristics.

Moreover, upon rehydration after lyophilization, a gradual decrease in hydrogel stiffness was observed. The rate of this decrease is also correlated to the denELP generation, highlighting the role that dendritic peptides can play in making new biomaterials.