Since the mid-20th century, boron has been studied for its ability to form reversible covalent bonds, as well as for use in inorganic and semi-inorganic polymers for high temperature applications. However, it wasn’t until the ‘90s that interests grew for using boron-containing polymers in biomedical applications. In particular, boronic acid polymers have become popular as responsive materials for their sensing ability based on reversible complexation with diols (most notably, sugars) and amines. The responsive nature of boronic acid polymers can be modulated by stimuli that include, but are not limited to, temperature, pH, and oxidizing environments. This tunability lends itself to biomedical applications when selective recognition or targeted delivery is desired. Recently, boronic acid polymers have been studied for numerous biomedical applications including self-regulated insulin delivery, cancer therapeutics, selective epitope-targeting, and programmed degradation of a nanocarrier, among others. These selective examples will be used to highlight the versatility of boronic acid polymers in biomedical applications.

References