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Title:	Stimuli-Responsive Assemblies of G-quartets
Authors:	Davis, Joyal (/jspui/browse?type=author&value=Davis%2C+Joyal)
Keywords:	Supramolecular chemistry Experimental Procedures Gelation Experiments G-Quartet
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Abstract:	<p>Supramolecular polymers have been a considerable point of interest in past few years because of their novel properties such as reversibility, directionality, and functionality. The dynamic and directional non-covalent interactions involved in the supramolecular polymers makes them a promising system to mimic natural biomolecules. In this context, the purine nucleoside guanosine due to the presence of its multiple hydrogen bonding sites and aromatic surfaces, act as an apt moiety to form supramolecular assembly. Metal ion mediated G-quartet formation followed by self assembly leading to G-quadruplex systems are well studied since decades. Here in this project, we have focused our studies on designing stimuli-responsive assemblies of G-quadruplex. We have come with novel synthesis of redox responsive G quadruplex based hydrogels. Highly thermo stable and redox reversible ferrocene moiety was incorporated to guanosine to make the G-quadruplex system redox responsive. The ferrocene coupled G-quadruplex gel was able to display redox responsive cyclic transition from gel to sol with high turnover number. Our second approach was to synthesis photo-responsive G-quadruplex based hydrogels. We have successfully incorporated the photo-reversible azobenzene moiety into guanosine. The thermodynamically stable trans-azobenzene, planar form that is favourable for assembly. Trans-azobenzene isomerises into non-planar cis-azobenzene upon UV irradiation. Cis-azobenzene due to its non-planar nature hinders the assembly results in gel to sol transition.</p>
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