Synthesis and characterization of spiropyran-based hyperbranched polymer (SP-HBP) for optomechanosensing applications

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Spiropyran (SP) exhibits its unique photochromic switching behavior reversibly between the colorless SP form in the dark or under visible light and the colored merocyanine (MC) form upon UV irradiation. There have been fascinating reports of SP-MC driven not only by UV light but also by other environmental variables such as pH, heat, and mechanical force. Recent progress in the development by employing this unique property of SP enabled potential applications such as optical and electrical switching devices, and light-driven actuators. Reversible fluorescence photoswitching of SP can be applied as potential bio-sensing platforms of which their environmental variables may cause enhanced modulation of the FRET process. Herein, we developed synthetic routes to novel spiropyran-based hyperbranched amphiphilic polymers (SP-HBPs). Their structures and properties have been characterized by means of various instrumental analysis techniques such as NMR, FT-IR, UV-VIS, etc. Results of structural and spectroscopic studies of SP-HBPs as well as potential ideas of using them will be discussed in this presentation.