

# **Polymeric Micelles with Thermosensitive Patchy Domains as Building Blocks for an Injectable Hydrogel System**

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**Abstract:** Thermosensitive injectable hydrogels composed of polymeric micelles hold great potential in tissue engineering, non-invasive treatments, embolism interventions, and wound healing. However, the gelling behavior of the currently available injectable hydrogels, which rely on the morphology transition of self-assembled structures at body temperature, faces challenges as their mechanical and thermal properties are difficult to control. The objective of this project is to develop a thermosensitive injectable hydrogel system with controllable gelling behavior and mechanical properties. Here, we will present the design and preparation of polymer micelles with a shell containing thermosensitive domains, which aggregate to form a three-dimensional network structure at body temperature. The inter-micellar aggregation at 37°C as analyzed by negatively stained TEM, AFM, and small-angle X-ray scattering as well as the gelation behavior of the micelles will also be discussed.