

Multifunctional Nanogel for Targeted Imaging, Delivery, and Therapy

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Nanogel, nano-sized (< several hundred nm) hydrogel, has intrinsic advantages as a delivery system for tumor sites due to 1) EPR effect based on its size and 2) excellent biocompatibility 3) as well as long circulation upon i.v. injection based on its hydrogel state. In my lab, nanogel was prepared using Pluronic, FDA-approved and temperature sensitive polymeric surfactant simply by one-pot synthesis in aqueous phase. This Pluronic-based nanogel has advantages as a delivery carrier including easy and efficient loading of any water soluble (bio)macromolecules while maintaining their bioactivities as well as nanoparticles that can be suspended in aqueous environment.

The surface of the nanogel can be modified to provide various functionalities for targeted delivery or imaging.

Various surface modifications of Pluronic nanogel could expand the functionalities of the nanogel. Several examples of the applications of this nanogel will be demonstrated including targeted delivery to the tumor, brain, oral route, imaging of selective inflammation sites and multimodality, and therapy for tumor and diabetes.