

Biocompatible Nanoparticles with Well-defined Surface Chemistry for Smart Drug Delivery

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Many nanomaterials are being harnessed as critical components in various systems for biomedical applications including diagnosis, imaging, and drug delivery. Those systems necessitate biocompatibility and low toxicity within effective dose range while achieving enough efficacy. Even though many nanomaterials enjoy successful demonstrations in bioapplications, lack of biocompatibility and high cytotoxicity often become hurdles for practical bioapplications. On the other hand, it is important to achieve enough efficiency based on chemically well-defined systems with efforts to understand mechanism at molecular level. Here, we develop various biocompatible nanomaterials based on simple procedure using dextran as both reducing agent and surface coating. Dextran is one of the popular biocompatible polymers that have been used for drug delivery and biosensors. Dextran coated nanomaterials showed excellent colloidal stability, flexible surface chemistry for conjugation of bioactive molecules and low cytotoxicity with successful demonstrations in various bioapplications.