





Conference Proceeding

The Applications of Glutathione-Capped Gold Nanoclusters in Cancer Nanotheranostics

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Abstract

Among the thiolate protected gold nanoclusters (GNCs), chiral glutathione (i.e. GSH; γ -Glu-Cys-Gly), a naturally occurring and readily available tripeptide, has been commonly used as a monolayer thiolate ligand for GNCs synthesis. Moreover, GSH-capped GNCs are finding increasing acceptance in various biomedical fields, such as molecular imaging, cancer therapy, and gene delivery. In recent years, X-ray/CT imaging and in vivo fluorescence imaging demonstrated that GSH-capped GNCs were renal-clearable. We have developed several methods to self-assembly of GSH-capped GNCs into larger colloidal superstructure for the applications of cancer nanotheranostics, including: 1) the applications of GNCs assemblies induced by the gadolinium ions for in vivo X-ray CT/MR imaging of lung tumor-bearing mice, 2) GNCs assemblies induced by PEG and chemotherapeutics for lung cancer targeted near-infrared fluorescence imaging and chemo-photodynamic therapy, and 3) the complexes of GNCs-engineered assemblies and folic acid coming from water-evaporation-induced self-assembly to mimic pathogenic cellular invasion. In all, the promising prospect of GNCs renders them as multifunctional cancer nanotheranostics with specificity, efficacy, and safety.

Keywords: Glutathione; Gold nanoclusters; Nanotheranostics; Self-assembly

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