

Development of Multifunctional Nano-complex for Cancer Treatment based on RNAi Phenomenon

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Recently, multifunctional nanomaterials have been developed drastically as nanotherapeutic agent for cancer treatment because of its ease for synthesis, multi-functionality and low cytotoxicity. In this study, we developed two kinds of multifunctional nano-complex for cancer treatment, which are two-component nanorods and nanorod encapsulated bovine serum albumin (BSA) nano-complex. First, two-component nanorods with gold (Au) block and nickel (Ni) block have developed for targeting delivery of siRNA, dual-fluorescence imaging of cancer cell. Fluorescein (FITC) labeled LHRH (Luteinizing hormone-releasing hormone) peptides are attached on surface of Ni block for targeting delivery of breast cancer cell, MCF-7. Similarly, the Au block was modified with TAMRA-labeled thiolated-siRNA in order to induce the death of breast cancer cell. Second, thermo-responsive siBcl-2 and rod-encapsulated BSA nano-complexes (SREBs) were developed to enhance the biocompatibility and therapeutic effect. The photothermal induced death and RNAi effect using encapsulated siBcl-2 exhibits synergetic effect on photothermal cancer treatment. These nano-complexes were achieved successful cancer treatment with siRNA therapy.