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Editorial

Nanomaterials for Cancer Diagnosis and Therapy

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The early diagnosis of cancer, that is, prior to the visibility of anatomic anomalies, has been universally accepted to be essential for the success of cancer treatment. However, it remains challenging to detect tumors at a very early stage. For instance, traditional medical imaging may require more than a million cells for accurate clinical diagnosis. By contrast, an ideal molecular imaging is expected to correctly diagnose early-stage tumor of approximately 100–1000 cells. On the other hand, in the clinical cancer therapy process, anticancer drugs are simply employed to kill cancer cells. Unfortunately, nontargeted drugs may be rapidly and widely distributed in healthy organs and tissues. As a result, a high dose of anticancer drugs is normally needed to obtain favorable therapy efficacy. Moreover, the patients have to suffer from severe side effects or even from the drug toxicity far earlier than the tumor burden. Presently, these clinical difficulties have largely impeded successful cancer therapy.

Nanomaterials are anticipated to revolutionize the cancer diagnosis and therapy. Nanoscale particles decorated with multiple functionalities are able to target and, subsequently, visualize tumor site via an imaging technology, thereby allowing for the early detection of cancers. Furthermore, intelligent nanosystems can be constructed as controlled delivery vehicles for improved therapy efficacy; that is, such vehicles are capable of delivering anticancer drugs to a predetermined site and then releasing them with a programmed rate. These nanomaterials are composed of natural or synthetic materials, such as, polymer, carbon nanotube, quantum dot, superparamagnetic iron oxide, and their composites. They represent new directions for accurate diagnosis and effective administration in cancer.

We organize this special issue of *Journal of Nanomaterials* to give state-of-the-art findings in nanomaterials for cancer diagnosis and therapy. In this special issue, three review articles firstly shed light on some important topics on the design, preparation, and integration of nanomaterials aiming at cancer diagnosis and therapy. The following ten research articles focus on a broad spectrum of nanomaterials with diagnosis and/or therapy functionalities. Toxicity of nanomaterials has been also included in some studies. All of the authors in this special have extensive research experience in nanomaterials and biomedical sciences. We are indebted to them for their important contributions and believe that readers will benefit considerably.

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