

Title: Breast Cancer Theranostics Based on Nanoparticles

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Abstract:

Various types of nanoparticle materials are good candidates as shuttles of drug delivery and contrast agents in different biomedical imaging modalities such as magnetic resonance imaging (MRI), computed tomography (CT), ultrasound tomography, positron emission tomography (PET), and optical imaging based on their special properties in magnetism, acoustics, optics, and electrics. Here we show some metal oxide-based nanoparticles of Fe_3O_4 , Gd_2O_3 , or TiO_2 , and their composites along with targeted molecules such as NPY and folic acids, acting as shuttles of drug delivery and contrast agents in MRI and optical therapeutic agents for breast cancer.

In this presentation, we will show that nanoparticles could act as imaging agents and therapeutic agents for cancer cells, overcome multidrug resistance in human breast cancer cells, or target to cancer and decrease the cytotoxicity in vitro/in vivo. In future, we might use these nanoparticle probe materials not only localize the cancer/diseases area acting as contrast agents in biomedical imaging, but also target and treat the cancer/diseases acting as therapeutic agents.

Short Biography:

Aiguo Wu, is current a full Professor at NIMTE, CAS, China. After obtaining his PhD in analytical chemistry in Chinese Academy of Sciences in Changchun, China in 2003, he ever worked in University of Marburg in Norbert A. Hampp group, Germany and California Institute of Technology (Caltech) in Ahmed H. Zewail (Nobel Laureate for Chemistry in 1999) group, USA. In 2006, he moved to Feinberg School of Medicine at Northwestern University in Gayle E Woloschak group in Chicago to do some researches in nanoparticle materials as contrast agents in biomedical imaging and as manipulation tools in cancer therapy. In 2009, he joined in NIMTE, CAS as a faculty member.



He was selected as Hundred Talents Program professor by CAS in 2010. At NIMTE, Dr Wu's research interests are applications of nanomaterials in biomedicine, particularly multifunctional magnetic resonance imaging (MRI) contrast agents for cancer theranostics, and environmental sciences. Up to now, Dr Wu has published almost 100 peer-review papers (5 cover papers) in the international journals and applied over 60 patents (awarded 31 ones) in China and USA, edited 1 one book in English, published 2 book chapters. He is also the special prize winner (R2) of China Association for Instrumental Analysis (CAIA) in 2014. His group Homepage is: <http://page.nimte.ac.cn/pages/wuaiguo/en/index-En.htm>.