Weibo Cai, J Nanomedic Nanotechnol 3:1
doi: http://dx.doi.org/10.4172/2157-7439.S1.03

OMICS Group Conferences
Accelerating Scientific Discovery

International Conference and Exhibition on
Nanotechnology & Nanomedicine
March 12-14, 2012 Omaha Marriott, USA

TITLE

Nanoplatforms for cancer targeting and imaging

Weibo Cai
University of Wisconsin, USA

Personalized medicine is the future of patient management. Molecular imaging, "the visualization, characterization, and measurement of biological processes at the molecular and cellular levels in humans and other living systems", plays a key role towards this goal. Commonly used molecular imaging techniques include fluorescence, positron emission tomography (PET), molecular magnetic resonance imaging (mMRI), among others.

Recently, nanoplatform-based molecular imaging has emerged as an interdisciplinary field which involves chemistry, engineering, biology, medicine, among others. In this talk, I will present our work on tumor targeting and imaging with a wide variety of nanomaterials, which include graphene, zinc oxide nanowires, unimolecular micelles, single-walled carbon nanotubes, quantum dots, iron oxide nanoparticles, gold nanorods, among others. Examples of dual-modality agents such as PET/optical and PET/MRI will also be described.

Due to the relatively large overall size, these nanomaterial-based agents do not extravasate well and mainly target the tumor vasculature. The majority of tumor targeting in this talk was achieved through the classic RGD peptide which binds to integrin $\alpha v\beta 3$, a cell adhesion molecule overexpressed during tumor angiogenesis (the formation of new blood vessels). Peptides with small size, high binding affinity and in vivo stability, are ideal for in vivo targeting of nanomaterials. Lastly, novel tumor targeting strategies for nanomaterials will also be presented. Upon further optimization and validation, molecularly-targeted nanoplatforms have the potential to profoundly impact disease diagnosis and patient management in the future.

Biography

Weibo Cai is an Assistant Professor of Radiology and Medical Physics at the University of Wisconsin - Madison. He received his Ph.D. degree from UCSD in 2004 and did his postdoctoral research at Stanford University. Dr. Cai has authored > 80 peer-reviewed articles and won many prestigious awards, including the Society of Nuclear Medicine Young Professionals Committee Best Basic Science Award (2007), the European Association of Nuclear Medicine Springer Prize (2011), among many others. Dr. Cai has served on the editorial boards of 18 scientific journals, participated in many grant review panels, and chaired sessions at multiple international conferences.