Development of target-specific theranostic agents for cancer treatment

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Human disease developments involve multiple components that contribute to transformation over time. Diseased cells, including cancer cells, have the ability to adapt to varying conditions. Cancer cells have the ability as a population to maintain uncontrolled proliferation and metastasis. Systemic therapy is essential to long-term management of chronic diseases. Many significant advances have been made in fighting cancer and cardiovascular diseases. Systemic therapeutic agents are used to effectively control specific steps in disease progression. One limitation of many current drug delivery systems is the lack of ability to monitor drug biodistribution, host response, and therapeutic efficacy in real time. Differences between individuals may cause some to receive drug doses exceeding the biologically effective dose. Changes in disease characteristics may diminish the efficacy of target-specific drugs, and may increase drug side-effects and toxicity. These obstacles can be overcome by imaging-guided therapy, which entails the use of the therapeutic agent in combination with a reporter that can be imaged in the body. We present noninvasive longitudinal imaging to visualize drug distribution in vivo, observe drug localization at the target, and monitor therapeutic processes. Imaging-guided drug delivery can be used to optimize dose and delivery schedules to individuals needs based on the expression of the disease targets at a particular time.

Biography
Dr. Shi Ke's research career started in M.D. Anderson Cancer Center after 7 years clinical practice as a general surgeon. His molecular imaging research project started in 2002. All of target-specific agents he developed are dual-labeled for imaging and therapy. His researches focus on the combination of imaging, chemistry and biology to address the disease diagnosis and treatment. His facility has capability perform bioluminescence, optical, nuclear, X-ray, SPECT, PET and CT imagings. He filed 5 patent disclosures since 2008 and more than 40 publications. He is the member of the Scientific Advisory Board for Carestream Molecular Imaging.