



International Conference & Exhibition Bioequivalence and Bioavailability 2010

doi:10.4172/0975-0851.1000048

TITLE

EXPANDING APPLICATIONS FOR USE OF BIOLOGICALLY MODIFIED NANOPARTICLES IN CANCER RESEARCH

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Organisms often acquire unwanted DNA alterations in the form of cancers, viral infections, bacterial infections, or other avenues which may negatively impact an organism's health. Currently available techniques for cancer diagnosis often lack sensitivity (resulting in late detection) and methods of treatment often lack specificity (resulting in many undesired side effect). Biologically modified nanoparticles may be developed as a tool to enhance the sensitivity of imaging and increase the specificity of treatment in cancer research. Numerous types of nanoparticle-nucleic acid bionanoconjugates have been developed to target unwanted or deleterious DNA in a sequence-specific manner, but the efficacy of each has been limited by particular weaknesses in each regime. The purpose of this seminar is twofold: 1) to present how recent incorporation of DNA analogs into bionanoconjugates has broadened the DNA targeting capabilities of these gene targeting tools and 2) to demonstrate the manner in which rational fluorescent modification of bionanoconjugates has expanded the range of excitation and enhanced their capacities to induce DNA damage as a gene targeting agent.