J Nanomed Nanotechnol 2014, 5:5
http://dx.doi.org/10.4172/2157-7439.S1.019

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Nanotek & Expo

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Dendrimers as carriers of anti-leukemia drugs

Barbara Klajnert-Maculewicz
University of Lodz, Poland

Anticancer drugs such as cytarabine (araC) belong to nucleoside analogues (NAs). NAs are commonly used in the treatment of acute myeloid leukemia, acute lymphocytic leukemia, and lymphomas. AraC acts by interfering with newly synthesized nucleic acids or by modifying physiological nucleosides metabolism. Like most nucleoside analogs, araC is administered as an inactive prodrug and requires specialized nucleoside transporters to cross plasma membranes. Inside a cell, araC is activated to cytotoxic 5'-triphosphates form (araCTP) by intracellular kinases. Unfortunately, a therapy based on cytarabine has its limitations due to several primary and acquired resistance mechanisms that arise during prodrug activation steps. It may lead to inefficient concentration of the therapeutics in cancer cells. Carrier systems that would deliver active forms of NAs are currently seeking. It has been demonstrated that polypropylene imine (PPI) dendrimers with a partially modified surface by maltose residues (PPI-m) easily form complexes with negatively charged 5'-triphosphates of nucleoside analogues. It happens due to the presence of protonated primary and tertiary amino groups. PPI-m dendrimers are non-toxic and highly biocompatible. Moreover, PPI-m dendrimers protect bound drug molecules from enzymatic degradation. Complexes of araCTP and PPI-m dendrimers show enhanced cytotoxic activity against an acute myeloid lukemia cell line 1301 in comparison with free cytarabine and 5'-triphosphate of cytarabine. Thus, PPI-m dendrimers improve stability of NAs and efficiently deliver the active drug forms directly to cancer cells. To sum up, maltose-modified polypropylene imine dendrimers are attractive systems as anticancer drug carriers, especially with a vision to apply them when drug-resistance occurs.

aklajn@biol.uni.lodz.pl

Comparing the effect of Ti doped into Fe_2O_3/FTO and Fe_2O_3/Ti doped Fe_2O_3/FTO as a photoanodes for high performance of water splitting

Aryan Azad and Sun-Jae Kim
Sejong University, Korea

H_2 is photocatalytically generated from water utilizing solar radiation as one of the renewable energy sources to compare with the fossil fuels. It has attracted interest as a clean energy carrier environmental friendly and free from carbon dioxide emission. TiO_2 by many advantages such as chemical stability, nontoxicity, biologically inertness, activity, high photocatalytic efficiency, low cost, reactivity, and chemical inertness could be one of the most promising materials for water splitting. On the other hand, hematite (α-Fe_2O_3) due to its favorable optical band gap (2.2 eV) chemical stability, abundance, non-toxicity and low cost has been attracted much attention for application as a photoanode. Doping Ti into Fe_2O_3 will be one of the solutions for the limited of the measured performance of hematite. In this study Ti-Fe_2O_3/FTO and Fe_2O_3/Ti-Fe_2O_3/FTO photocatalysts have been compared with Fe-TiO_2/FTO and Fe_2O_3/Fe-TiO2/FTO structures by using layer by layer-self assemble (LBL-SA) method and dipping process on the FTO glass. For synthesizing the water splitting Fe_2O_3/Ti-Fe_2O_3 and Ti-Fe_2O_3 as photoanodes were used on the FTO substrate. Results by SEM microstructure, I-V photo current density, Raman Spectroscopy and UV-Vis light irradiation have been shown that among all samples Fe_2O_3/Ti-Fe_2O_3/FTO has been had best performance because excited electrons and holes could live longer, rather than recombination with each other.

aryanazad24@yahoo.com