

Cutting Edge of Pharmaceutical Nanotechnology

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Nanoscience is the engineering of functional systems at the molecular scale. This covers both current work and concepts that are more advanced. In its original sense, nanotechnology refers to the projected ability to construct items from the bottom up, using techniques and tools being developed today to make complete, high performance products. Some researches and findings in the field of Nanoscience are selected and expended here: "Fabrication of Novel Poly (ethylene terephthalate)/TiO₂ Nanofibers by Electrospinning and their Photocatalytic Activity" reports on functional nanocomposites PET/TiO₂ nanofibers membranes prepared via simple electrospinning and hydrothermal processing, involving preparation of titania precursor sol solution, electrospinning the homogeneous mixture of PET solution and sol solution, and in-situ growth of nanoscale TiO₂ within PET nanofibers in hot water.

"Oxidation of glyoxal to glyoxalic acid by Prepared Nano-Au/C catalysts" describes that Nano-Au/C catalysts were obtained by loading the gold nanoparticles which were prepared by photochemical reduction method to the activated carbon, and were used for the catalytic oxidation reaction of glyoxal into glyoxylic acid.

"Preparation of the Al-CNT (Carbon Nanotubes) Compound Material by High Energy Milling" using high energy ball milling (HEM), researched the technology of preparation of Al-CNT compound material.

"Theoretical Prediction of Tensile Behavior of Single-Walled Carbon Nanotubes" establishes a link between molecular and continuum mechanics based on the Morse potential function.

In the paper "Research on the stress-relaxation characteristics of cancer cells based on Atomic Force Microscope", the AFM indentation experiments are carried out on two different transferring characteristic cancer cells (Anip-937 and AGZY-83a) under physiological conditions using the expansion of atomic force microscope (AFM) indentation and the improvement of Hertz model.

"Application of Nanoscale Zero-valent Iron (nZVI) to Enhance Microbial Reductive Dechlorination of TCE: A Feasibility Study" evaluates the feasibility of nanoscale zero-valent iron (nZVI) application to enhance microbial reductive dechlorination of trichloroethylene (TCE).

"Hydrothermal Processing-Assisted Synthesis of Nanocrystalline YFeO₃ and its Visible-Light Photocatalytic Activity" finds that the single

phase YFeO₃ can be obtained through the calcination of hydrothermally processed YFeO₃ precursors at 800°C, and the resulting product has a spherical shape and uniform size distribution.

"Preparation and exothermic characterization of HTPB-coated aluminum nano-powders prepared by laser-induction hybrid heating" calculates the temperature distribution of aluminum with the heating time and the distance from the crucible centre based on the ANSYS software.

"Application Thinking of Nanotechnology in Acupuncture" discusses the application of nanotechnology methods for the researches on meridians of Chinese medicine, acupoint catgut embedding therapy (ACET) and therapeutic mechanism in acupuncture field.

"The Research of Conjunction Calculated Relationships between Proteins with Gold Nanoparticles" researches the conjunction calculated relationship between proteins and gold nanoparticles.

"Engineered nanoparticles as precise drug delivery systems"- Nanoparticles, an evolvement of nanotechnology, are increasingly considered as a potential candidate to carry therapeutic agents safely into a targeted compartment in an organ, particular tissue or cell.

"Dendrimers: emerging polymers for drug-delivery systems", the unique properties associated with these dendrimers such as uniform size, high degree of branching, water solubility, multivalency, well-defined molecular weight and available internal cavities make them attractive for biological and drug-delivery applications.

"Strategies for *in vivo* siRNA delivery in cancer" - As a research tool, siRNA has proven to be highly effective in silencing specific genes and modulating intracellular signaling pathways.

"Rapid delivery of drug carriers propelled and navigated by catalytic nanoshuttles"- nanoshuttles' navigation ability is illustrated by the transport of the drug carriers through a microchannel from the pick-up to the release microwell. Such ability of nanomotors to rapidly deliver drug-loaded polymeric particles and liposomes to their target destination represents a novel approach towards transporting drug carriers in a target-specific manner.

"Multigram-scale fabrication of monodisperse conducting polymer and magnetic carbon nanoparticles" is an emerging tool for cutting edge nanotechnology approach.

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Received July 26, 2012; Accepted July 29 2012; Published August 01, 2012

Citation: Swain S (2012) Cutting Edge of Pharmaceutical Nanotechnology. Pharmaceut Reg Affairs 1:e110. doi:10.4172/2167-7689.1000e110

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