In this issue

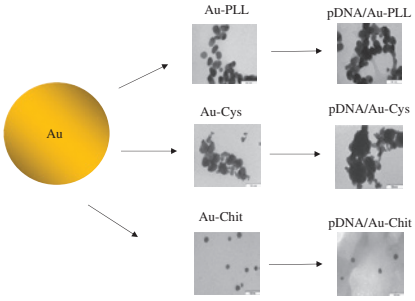
Geraldine Genevive Lazarus and Moganavelli Singh

Cationic modified gold nanoparticles show enhanced gene delivery *in vitro*

DOI 10.1515/ntrev-2016-0003
Nanotechnol Rev 2016; 5(5): 425–434

Research highlight: Diagrammatic representation of functionalised gold nanoparticles and their respective nanocomplexes.

Keywords: cell viability; chitosan; cysteine; gold nanoparticles; pDNA; poly-L-lysine; transfection.



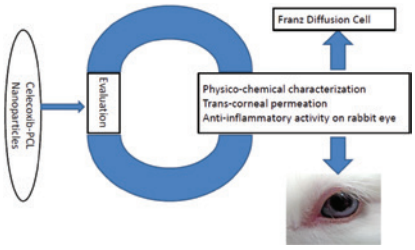
Anil K. Sharma, Pravat K. Sahoo, Dipak K. Majumdar and Amulya K. Panda

Topical ocular delivery of a COX-II inhibitor via biodegradable nanoparticles

DOI 10.1515/ntrev-2016-0004
Nanotechnol Rev 2016; 5(5): 435–444

Research highlight: Fabrication, physicochemical, and pharmacodynamic evaluation of PCL NPs containing celecoxib

Keywords: nanoparticles; nanosuspension; ocular inflammation; protein estimation.



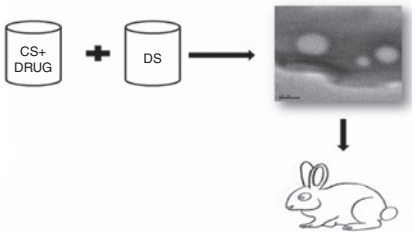
Satish Manchanda, Pravat K. Sahoo and Dipak K. Majumdar

Mucoadhesive chitosan-dextran sulfate nanoparticles of acetazolamide for ocular hypertension

DOI 10.1515/ntrev-2016-0011
Nanotechnol Rev 2016; 5(5): 445–453

Research highlight: Acetazolamide-loaded chitosan-dextran sulfate are prepared and characterized for *in vitro* and *in vivo* parameters.

Keywords: acetazolamide; chitosan; ionotropic gelation; nanoparticles; ocular hypertension.



Lei Wang, Sidi Gong, Cihui Yang and Jing Wen

Towards low energy consumption data storage era using phase-change probe memory with TiN bottom electrode

DOI 10.1515/ntrev-2016-0029
Nanotechnol Rev 2016; 5(5): 455–460

Research highlight: A novel phase-change probe memory architecture that replaces conventional DLC bottom electrode with TiN electrode was proposed here. Because of its high electrical conductivity and great stability, the re-designed probe memory device has exhibited several advantages such as ultra-high density, low power consumption, fast switching speed, and long data retention time compared to that with DLC bottom electrode.

Keywords: energy consumption; nanocrystalline materials; phase-change probe memory; phase transformation; titanium nitride.

Structure	Bit writing	Data rate	Energy
Capping: DLC Under: DLC	Yes	Medium	High
Capping: DLC Under: TiN	Yes	High	Low
Capping: TiN Under: DLC	No	N/A	N/A
Capping: TiN Under: TiN	No	N/A	N/A

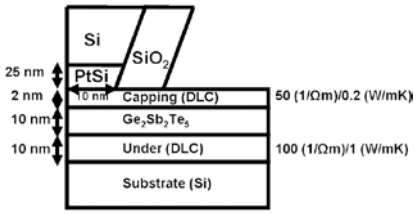
Lei Wang, Sidi Gong, Cihui Yang and Jing Wen

Electrical resistivity optimization of diamond-like carbon thin film for electrical probe storage application

DOI 10.1515/ntrev-2016-0032
Nanotechnol Rev 2016; 5(5): 461–466

Research highlight: The structure of the phase-change probe memory has been previously optimized by simulation, while the evidence that such an optimal design can be fabricated in practice is still missing. To investigate this, the electrical resistivity and the stability of the DLC thin film for different thickness and exposure time were measured, whereby the previously proposed media stack was reoptimized based on the experimental observations.

Keywords: crystallization; diamond-like carbon; electrical probe memory; energy consumption; phase transformation.



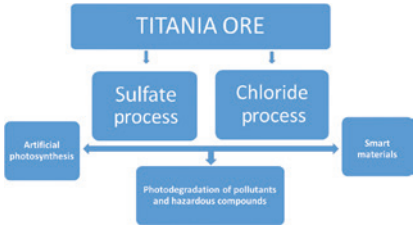
Norma A. Ramos-Delgado, Miguel Á. Gracia-Pinilla, Ramalinga Viswanathan Mangalaraja, Kevin O'Shea and Dionysios D. Dionysiou

Industrial synthesis and characterization of nanophotocatalysts materials: titania

DOI 10.1515/ntrev-2016-0007
Nanotechnol Rev 2016; 5(5): 467–479

Review: This review examines the importance and versatility of TiO_2 as a photocatalyst, solar cell component, remediator of chemical pollutants and toxins, and other industrial uses. Traditional and new industrial synthesis routes as well as nanoscale characterization techniques are presented, complete with application examples such as photocatalysis, water/air purification, or disinfection.

Keywords: industrial synthesis; nanomaterials; nanophotocatalysts; photocatalysis; titania.



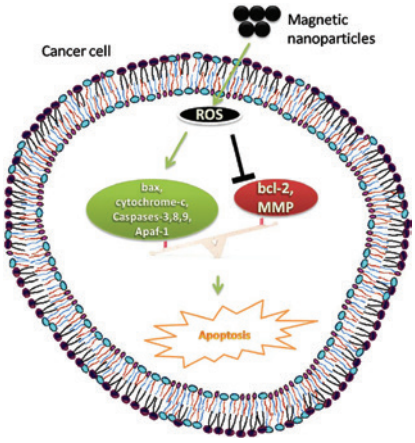
Joe Antony Jacob, Jumah Masoud Mohammad Salmani and Baoan Chen

Magnetic nanoparticles: mechanistic studies on the cancer cell interaction

DOI 10.1515/ntrev-2016-0022
Nanotechnol Rev 2016; 5(5): 481–488

Review: The review focuses on the plausible molecular mechanism by which magnetic nanoparticles induce cytotoxicity in cancer cell lines.

Keywords: anticancer; apoptosis; cytotoxicity; magnetic; nanoparticles.



Jie Yang, Haijun Zhang and Baoan Chen

Application of nanoparticles to reverse multi-drug resistance in cancer

DOI 10.1515/ntrev-2016-0023
Nanotechnol Rev 2016; 5(5): 489–496

Review: In the present review, we focus on the application of nanoparticles to reverse multi-drug resistance in cancer. Several kinds of NPs developed for the reversal of MDR are summarized. Investigations into NPs' ability in overcoming MDR *in vitro* and *in vivo* are also illustrated.

Keywords: cancer; multi-drug resistance (MDR); nanoparticles (NPs).