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Journal Articles/Patents 2Q-2006

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Title	CAS Scientists' Comments
1. Chemical Genetic Identification of the IGF-Linked Pathway that Is Mediated by STAT6 and MFP2 [details]	Deregulation of IGF2 plays an important role in developing liver, breast, and prostate cancers. Multifunctional protein 2 (MFP-2), when bound to the synthetic small molecule chomceptin, activates STAT6 (signal transducers and activators of transcription 6), which in turn stimulates the expression of IGF-binding protein 1 (IGFBP-1) and suppressor of cytokine signaling-3 (SOCS-3). IGFBP-1 and SOCS-3 are attenuators of IGF signals. The study demonstrates the important role of STATs in IGF/insulin regulation, implicating a new pathway for STAT6 activation that is amenable to small-molecule intervention.
2. Anticancer Efficacies of Cisplatin-Releasing pH-Responsive Nanoparticles [details]	This study demonstrated that fast-releasing (pH-responsive) nanoparticles containing cisplatin is more effective against cancer cells than slow-releasing nanoparticles containing cisplatin or an equivalent dose of free cisplatin. Cisplatin-loaded nanoparticles with pH-responsive poly[2-(N,N-diethylamino)ethyl methacrylate] (PDEA) cores were synthesized from PDEA-block-poly(ethylene glycol) (PDEA-PEG) copolymer using a solvent-displacement (acetone-water) method.
3. Functionalized Gold Nanoparticles as Phosphorescent Nanomaterials and Sensors [details]	Ligand-capped Au nanoparticles were synthesized by capping monothiol derivatives of 2,2'-dipyridyl onto the surface of Au nanoparticles(Au-BT). The high local concentration of the chelating ligands (~5 M) around the Au nanoparticle makes these particles excellent ion sponges, and their complexation with EuIII/TbIII ions yields phosphorescent nanomaterials. These phosphorescent nanomaterials, designed by linking BT:EuIII complexes to Au nanoparticles, were further used as sensors for metal cations.
4. High-efficiency concave and conventional solar cell integration system using focused reflected light [details]	A concave Si single crystal prepared by mechanical polishing was successfully processed to a solar cell with a conversion efficiency of 14.7%. The concave solar cell could focus its reflection to a small spot, which generated further output in a conventional Si solar cell placed at the focal point. The total efficiency of this system became as high as 16.3%.
5. A Fourier Transform Infrared Spectroscopy Based Protocol for Measuring Direct Methanol Fuel Cell Methanol Crossover [details]	A protocol for measuring direct methanol fuel cell methanol crossover based on Fourier Transform Infrared spectroscopy is presented. The accuracy of the measurements is sufficient to yield methanol crossover results with <10% std. deviation, compared with an error of 20-95% using conventional CO2 method without correction for permeated CO2.

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