Editorial

Highlights of Analytical and Therapeutic Applications with Nanomaterials

Nanomaterials with small size and unusual electronic structure make them distinctly different from bulk materials. With the ever-increasing nanotechnology, the generation of numerous functional nanomaterials and their applications in sensing, imaging, catalysis and pharmaceutics attract growing attention in recent decades. So far, many nanomaterials have been widely utilized for the development of sensing platform with satisfying sensitivity and specificity, including metal nanoparticles/nanoclusters, metal oxide/sulfide nanomaterials, carbon nanomaterials, and rare earth nanoparticles. They also show great potential in imaging, catalysis and antimicrobials. Alternatively, nanomaterials have also become one of the most attractive new drugs and antibacterial reagents.

Among these nanomaterials, biocompatible gold and carbon nanomaterials have been widely investigated due to their easy preparation, tunable optical/chemical properties, and high stability. Interestingly, the performances of nanomaterials could be altered by controlling their shapes and compositions, as well as surface functionalization. To achieve various purposes, much effort has been devoted to the exploration of facile approaches for the preparation of gold or carbon nanomaterials with different morphologies and compositions.

The generation of function programmable gold and carbon nanomaterials inspires researchers to fabricate diverse nanostructures with favorable performance and activity. Hybrid nanomaterials with multilevel structures provide synergistic effects, promoting their functionality.

Since the wide use of these functional nanomaterials in various fields, deep understanding of the working principle of nanomaterials will lead to a completely new realm of design of nanoprobe, nanodevice and nanodrug. Thus, the understanding of the working fundamentals of functional nanomaterials is beneficial to the betterment of nanotechnology.

This collection aims to summarize recent works in sensing and therapeutic applications using gold and carbon nanomaterials and collect the use of new concepts to develop novel analytical or antibacterial formats for homogeneous assays and the treatment of targets efficiently. Other contributions present a fundamental illustration of designed optical probes and nanodrugs. Another aspect addressed by this collection is the discussion of new directions using gold and carbon nanomaterials, which guides the future research of junior scientists.

We are sure that the readers of Current Pharmaceutical Design will appreciate this collection, which will provide a useful reference for additional studies as well as inspiring new techniques based nanomaterials.

Zhiqin Yuan is currently an Associate Professor of the State Key Laboratory of Chemical Resource Engineering, College of Chemistry, Beijing University of Chemical Technology. He is an Editorial Board member of Current Chinese Chemistry from Bentham Science Publishers. His research interests focus on the synthesis and analytical application of small organic probes, metal nanoparticles and metal nanoclusters. He has published more than 50 articles in peer-reviewed journals.

Zhiqin Yuan
Guest Editor
State Key Laboratory of Chemical Resource Engineering
College of Chemistry, Beijing University of Chemical Technology
Beijing 100029, China
Tel/Fax: +86-10-64411957
E-mail: yuanzq@mail.buct.edu.cn