

# Chemical Engineering: From Materials Engineering to Nanotechnology

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## Ultrasensitive cell detection based on new supramolecular probes and multifunctional nanocomposites

Xuemei Wang

Southeast University, China

The early efficient diagnosis and therapy of some important disease like cancers is still a hot topic in the relative areas involving in patient care and treatments. In this study, we have explored the possibility of the application of new supramolecular probes combining with nano-scaled materials in relevant biomolecular recognition and high-sensitive detection of disease like cancers. Especially, we have developed a new strategy for the fast and high sensitive recognition of the target biomolecules and cancer cells by combining the supramolecular probe and functionalized nano-interface with the spectro-electrochemical study. Our observations demonstrate that the self-assembly of the specific nanocomposites with the new molecular probes could provide a multifunctional interface for the rapid and high selective identification of cancer cells, with a broad

detection range and low detection limit. It is evident that different types of cancer cells or bacteria could be readily distinguished on the relevant nanocomposites modified nano-interface, which have the promising application to be adopted as a significant way to detect and identify various kinds of mutant cells and advance the clinic diagnosis and monitoring the treatment of target disease like cancers. Moreover, some ultrasensitive and intelligently multifunctional nanoprobe based on the *in vivo* bio-synthesized nanoclusters for multimodality imaging of cancer cells / exosomes or target tissues have been also explored for the real-time monitoring and dynamic analysis of some disease related biomolecules/cells/tissues.

e: [xuewang@seu.edu.cn](mailto:xuewang@seu.edu.cn)