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Engineering carbon-based nanostructures for DNA sensor**Jin Zhang**

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Carbon-based nanomaterials including graphene, graphene oxide and carbon quantum dots have shown special luminescence properties. This paper focuses on building an aptamer sensor by using Carbon quantum dots (C-dots) and graphene oxide nanosheet. C-dots were synthesized by microwave-assisted process. The average particle size of C-dots is estimated at 23 ± 5 nm. The fluorescence emission of C-dots shifts from 450 to 600 nm when excitation increases from 350-450 nm. The target-DNA is conjugated onto C-dots by different strategies. Meanwhile, the capture-DNA is modified on the surface of graphene oxide. The target-DNA conjugated with carbon dots can be hybridized with the capture-DNA conjugated with graphene oxide by hydrogen bonds between adenine and thymine, which can cause the fluorescence quench of C-dots. The fluorescence intensity of C-dots modified with target-DNA as a function of the concentration of capture-DNA modified graphene oxide nanosheet is investigated. The results indicate that this solution-based sensor can quickly measure the target-DNA in the range of 1 $\mu\text{g/mL}$ to 100 $\mu\text{g/mL}$.

Biography

Jin Zhang is a tenured Associate Professor in the Department of Chemical and Biochemical Engineering in the University of Western Ontario, Canada. Her research activities are related to the development of new biocompatible nanocomposites with enhanced chemical and physical properties. He has published over 66 peer-reviewed papers, including Biosensor and Bioelectronics, *Journal of European Cells and Materials*, *Journal of Nanobiotechnology*, *Journal of Chemistry Materials B*, etc. She has 3 issued patents and one patent application. She has gained many awards, including early Research Award of Ontario, the Grand Challenges Canada-Canadian Rising Stars in Global Health, outstanding mid-career achievements in Nanoscience and Nanotechnology in Ontario, etc.

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