

**Real-time and selective detection of biomolecules and metal ion using aptamer immobilized nanosensor**

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Nanoscale biosensors are emerging as one of the most impressive platforms for specific identification of biomolecules in the life sciences, with the nanotechnology revolution up to the scale that concert with the biological system. To date, there have been many reports for chemical and biological nanosensors using one dimensional nanostructure and various functionalization schemes. In this work, we present novel aptamer immobilized nanowire sensor which is one of the promising platforms toward the real-time and selective detections of biomolecules or metallic ions in solutions. The aptamers with specific binding to hepatocellular carcinoma markers and Cu ions were functionalized into the surface of ZnO/amorphous carbon core-shell nanowires. Finally, the electrical signals of nanosensors according specific bindings over nanowire field effect transistor could be obtained for the purpose of real-time and selective detections of biomolecules and Cu metallic ions.