

## An application of H<sub>2</sub>O<sub>2</sub> biosensor with anti-AFP for tumor marker immunosensor

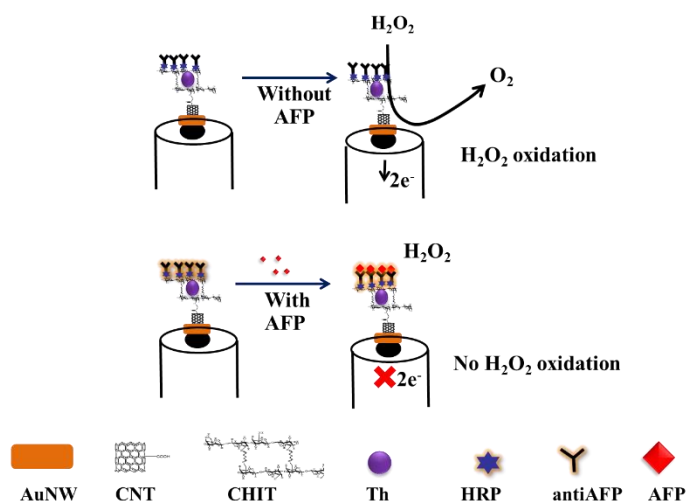
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A H<sub>2</sub>O<sub>2</sub> based biosensor was constructed using gold nanowire (AuNW), chitosan - crosslinking carbon nanotube (CHIT-CNT), and thionine (Th) modified on glassy carbon electrode (AuNW-CHIT-CNT-Th/GC). This method uses small amounts of starting materials with simple preparation methods and provides electrocatalytic properties of H<sub>2</sub>O<sub>2</sub>. It can also be applied in the detection of alpha fetoprotein (AFP) known as a tumor marker in human blood (anti-AFP/AuNW-CHIT-CNT-Th/GC). The detection mechanical of anti-AFP/AuNW-CHIT-CNT-Th/GC depended on the amount of AFP reacted with anti AFP. This result in the active site of AuNW-CHIT-CNT-Th layer was blocked and the H<sub>2</sub>O<sub>2</sub> diffusion was obstructed. The obtained current of anti-AFP/AuNW-CHIT-CNT-Th/GC in the present of AFP was lower than the system absent the AFP. The immunosensor was studied using cyclic voltammetry and chronoamperometry methods. The linear calibration was obtained from 0.50 ng mL<sup>-1</sup> to 1.0 μg mL<sup>-1</sup> with a detection limit of 90 pg mL<sup>-1</sup>. This sensor is simple to prepare, short analysis time, very accurate and highly sensitive.



**Keywords:** Immunosensor; Hydrogen peroxide; Alpha fetoprotein