Quantum Dot Electrochemical Sensor Detects Bladder Cancer Marker

Bladder cancer is the most common malignant tumor in the urinary system. The early diagnosis methods of bladder cancer mainly include transurethral cystoscopy, urine exfoliated cytology, biochemical examination of urine tumor markers, and clinical medical imaging examination. Alfa Chemistry is currently cooperating with the advanced quantum dot research team to develop a new technology. Using lead sulfide colloidal quantum dots as the modified material, a planar chemically modified electrode (CME) has been prepared, which is based on a colloidal quantum dot surface ligand replacement strategy. The colloidal quantum dot electrical labeling of the cytokeratin CK18 antibody was used to transduce the specific binding reaction of the CK18 protein antigen antibody to the sensor electrical signal for detection.

Background

The electrochemical sensor fused with the principle of immunological detection can recognize the specific binding reaction of antigen and antibody and convert it into electrical signals, so as to realize the rapid detection of relevant disease markers in liquid samples. Based on chemically modified electrodes, an electrochemical sensor for detecting cytokeratin 18 (CK18), a marker for bladder cancer, is constructed. The electrode surface is modified with semiconductor colloidal quantum dots, and the significant surface effect, size effect and unique quantum effect of quantum dots are used to improve the enrichment and signal transduction of biomolecules on the surface of the working electrode. The interface between lead sulfide (PbS) colloidal quantum dots and carbon electrodes is stable and has good charge transfer ability. The electrode is prepared by antibody coating and sealing treatment on the surface, combined with differential pulse voltammetry (DPV) that can significantly reduce background current. Electrochemical performance test.

Application

The colloidal quantum dot immunoassay technology can have a good level of detection in the development of low-cost, high-throughput clinical diagnostic equipment, point-of-care testing (POCT), and home testing.

Reference :

https://pqds.alfa-chemistry.com/quantum-dot-electrochemical-sensor-detects-bladder-cancer-marker-services.html