

CONCANAVALIN A FUNCTIONALIZED GRAPHENE BASED ELECTROCHEMICAL
SENSOR FOR MONITORING CANCER CELLS

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ABSTRACT

Cancer is a cell malfunction disease that leads to morbidity and mortality. Diagnosing of cancer cells and distinguishing cancer from normal cells at an early stage can be greatly beneficial to significantly reducing the lethal rate in cancer patients. Herein, an electrochemical biosensor was fabricated by functionalizing Concanavalin A (Con A), a sugar binding protein on graphene using carbodiimide (EDC) as a zero linker, covalently immobilizing Con A on the graphene structure. The Con A functionalized graphene electrochemical sensor showed good performance in detecting cells and differentiating ovarian cancer cells from normal fibroblast, relying on cells electrochemical activity. The results revealed unique electrochemical patterns of ovarian cancer cells, and good sensitivity of ovarian cancer cells detection in concentration windows of 1×10^4 to 2×10^7 cells/ml. The sensor could be of great benefit to early cancer diagnosis, and could be used as a preliminary test that indicates whether the cell is a cancer in a matter of few hours.

KEY WORDS: ELECTROCHEMICAL SENSOR / GRAPHENE / CONCANAVALIN A /
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