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SYMPOSIUM

Single Walled Carbon Nanotubes as Reporters for the Optical Detection of Glucose

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Abstract

This article reviews current efforts to make glucose sensors based on the inherent optical properties of single walled carbon nanotubes. The advantages of single walled carbon nanotubes over traditional organic and nanoparticle fluorophores for *in vivo*-sensing applications are discussed. Two recent glucose sensors made by our group are described, with the first being an enzyme-based glucose sensor that couples a reaction mediator, which quenches nanotube fluorescence, on the surface of the nanotube with the reaction of the enzyme. The second sensor is based on competitive equilibrium binding between dextran-coated nanotubes and concanavalin A. The biocompatibility of a model sensor is examined using the chicken embryo chorioallantoic membrane as a tissue model. The advantages of measuring glucose concentration directly, like most optical sensors, versus measuring the flux in glucose concentration, like most electrochemical sensors, is discussed.

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Abbreviations: (CAM) chorioallantoic membrane, (Con A) concanavalin A, (GOx) glucose oxidase, (MW) molecular weight, (nIR) near-infrared, (PEG) polyethylene glycol, (SWNT) single walled carbon nanotubes

Keywords: carbon nanotube, glucose sensor, fluorescence

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