Glucose Biosensor Contacts Based on Monomolecular Layer of Glucose Oxide Covalently Immobilized on Indium-Tin Oxide Surface

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ABSTRACT

Diabetes affects millions of Americans each year. Due to its rampant nature, several devices were created as glucose sensors in order to monitor varying sugar levels. This research project aims to develop a noninvasive, electronic glucose sensor. This new form of glucose sensor, due to its keen sensitivity, will allow us to measure small concentration levels of blood sugar in your system. Indium-tin oxide (ITO) thin films have previously been found to bind Glucose oxidase (GOx) covalently to make a monomolecular layer. Glucose oxidase is an enzymatic substrate for glucose that causes a chemical reaction that allows for electronic sensing of glucose concentration in solution. If this mechanism is applied to a contact lens, analyzing the oxidation and reduction reactions of H₂O₂ and O₂, the concentration of glucose can be continually monitored in the tears of noninsulin and insulin dependent diabetics painlessly.