

Detection of GABA via Quantum dot immobilized Optical Fiber Sensor

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Recently, various semiconductor nanomaterials were studied widely. Quantum dots (Qdots) are one of the useful semiconductor materials which have unique optical properties and has the possibility to be a substitute of traditional organic dyes in fluorescence based biological assays. In this study, CdSe Qdots have been immobilized into the surface of optical fiber, and the fluorescence were detected with various concentration of gamma amino butyric acid (GABA), which is one of chief inhibitory neurotransmitters. The surface of optical fiber was silanized by aminopropyltriethoxysilane (APTES) in ethanol. Qdots with carboxyl group have been bound to the amino terminated optical fiber by the coupling reaction using zero-length cross-linker (N-hydroxysuccinimide (NHS) and N-(3-Dimethyl aminopropyl)-N'-ethylcarbodiimide hydrochloride (EDC)). The immobilization of Qdots has been confirmed by the measurement of fluorescence using spectrofluorometer with an adaptor for optical fiber. The photoluminescence intensity dependence on the concentration of GABA shows that functionalized quantum dots can be used as sensing media for GABA.