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PEG-fluorescein-GOx hydrogel for glucose biosensing

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Diabetes mellitus is one of the leading incurable diseases which may lead to severe health complications. The key for diabetes management is regular monitoring and maintenance of blood glucose levels in the body. We present herein an optical glucose biosensor for glucose monitoring, where a fluorescent enzymatic hydrogel consisting of fluorescein, polyethylene glycol and glucose oxidase (GOx) is employed. In the presence of GOx, chemical polymerization of poly ethylene glycol diacrylate (PEGDA) and fluorescein o-acrylate (FOA) results in the formation of fluorescent hydrogel with GOx entrapped into the hydrogel matrix. GOx catalyzes oxidation of glucose to gluconic acid that interacts with pH-sensitive fluorescein motif in hydrogel and thus significantly quenches its fluorescence, which was optically measured and correlated with glucose concentration. Furthermore, a fluorescent hydrogel microfiber was also developed as a potentially optical injectable glucose biosensor with improved response time. Both glucose-responsive hydrogel sensor and glucose-responsive hydrogel microfiber show good sensitivity and reproducibility for glucose detection.

Biography

Jun Chen is a PhD student in the Department of Biomedical Engineering, University of Connecticut, USA. She earned her Bachelor's degree in 2011 from Central South University, China. Her research concentrates on biocompatible and injectable biosensors.

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