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SYMPOSIUM

Fluorescence Intensity- and Lifetime-Based Glucose Sensing Using Glucose/Galactose-Binding Protein

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Abstract

We review progress in our laboratories toward developing *in vivo* glucose sensors for diabetes that are based on fluorescence labeling of glucose/galactose-binding protein. Measurement strategies have included both monitoring glucose-induced changes in fluorescence resonance energy transfer and labeling with the environmentally sensitive fluorophore, badan. Measuring fluorescence lifetime rather than intensity has particular potential advantages for *in vivo* sensing. A prototype fiber-optic-based glucose sensor using this technology is being tested.

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Abbreviations: (CGM) continuous glucose monitoring, (FLIM) fluorescence lifetime imaging microscopy, (FRET) fluorescence resonance energy transfer, (GBP) glucose/galactose-binding protein, (MDCC) N-[2-(1-maleimidyl)ethyl]-7-(diethylamino)coumarin-3-carboxamide, (NIR) near infrared, (NTA) Ni-nitrolotriacetic acid, (PEG) poly(ethylene glycol), (RCT) randomized controlled trial, (SWCN) single-walled carbon nanotubes, (TCSPC) time-correlated single-photon counting

Keywords: continuous glucose monitoring, diabetes, fluorescence, glucose/galactose binding protein, glucose sensor

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