

Near Infrared Fluorescent Sensors

and Their Use *In Vivo*

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Abstract

In an effort to design near-infrared (NIR), water soluble glucose sensors, several pH sensitive NIR cyanine derivatives were synthesized to provide insight into the viability of the cyanine platform as the fluorophore core for performing minimally invasive long term glucose monitoring *in vivo*. Many previous efforts to build effective fluorescent sensors for glucose have provided guidance towards the architecture of binding groups and fluorescent response required to achieve this goal, but have not provided appropriate solubility, or excitation and emission characteristics for *in vivo* sensing. In an effort to address the aqueous solubility of the highly rigid cyanine platform, a tetra sulfonated core was chosen for this work. Though fully water soluble, pH sensitive derivatives still showed some aggregation characteristics. Simple sugar-binding boronic acid derivatives showed appropriate fluorescent responses, but poor binding. Efforts to improve binding through synthesis of bis-boronic acid compounds proved elusive.