



## Non-enzymatic D-glucose plasmonic optical fiber grating biosensor

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### ABSTRACT

Saccharide sensors represent a broad research area in the scope of sensing devices and their involvement in the medical diagnosis field is particularly relevant for cancer detection at early stage. In that context, we present a non-enzymatic optical fiber-based sensor that makes use of plasmon-assisted tilted fiber Bragg gratings (TFBGs) functionalized for D-glucose biosensing through polydopamine (PDA)-immobilized concanavalin A (Con A). Our probe allows a live and accurate monitoring of the PDA layer deposition leading improved surface biochemistry. The SPR shift observed was assessed to  $3.83 \pm 0.05$  nm within 20 min for a 2 mg/mL dopamine solution. Tests performed in different D-Glucose solutions have revealed a limit of detection close to  $10^{-7}$  M with the highest sensitivity in the  $10^{-6}$  to  $10^{-4}$  M range. This configuration has the capability to overcome the limitations of current enzyme-based solutions.

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