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## Capacitive malaria aptasensor using *Plasmodium falciparum* glutamate dehydrogenase as target antigen in undiluted human serum

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### Abstract

A capacitive aptasensor for detecting the malaria biomarker, *Plasmodium falciparum* glutamate dehydrogenase (*Pf*GDH), directly in human serum samples developed. A thiolated ssDNA aptamer (NG3) that binds specifically to *Pf*GDH antigen with high affinity ( $K_d = 79$  nM) was used to develop the aptasensor. The aptasensor produced capacitance response at an optimized frequency of 2 Hz in a non-Faradaic electrochemical impedance based signal transduction platform. The aptasensor exhibited a wide dynamic range of 100 fM - 100 nM with a limits of detection of 0.77 pM in serum samples. The interference from other predominant malarial biomarkers, namely, *Plasmodium falciparum* -lactate dehydrogenase and -histidine rich protein-II on the aptasensor was negligible. This *Pf*GDH aptasensor with highly sensitive and label free detection capability has great application potential for diagnosis of asymptomatic malaria and monitoring the regression of malaria during treatment regime with antimalarial drugs.

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