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An Immunosensor for Parasite Lactate Dehydrogenase Detection as a Malaria Biomarker- Comparison with Commercial Test Kit

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Abstract

This paper describes the development of an affinity sensor for the detection of *Plasmodium falciparum* parasite Lactate dehydrogenase (pLDH) as one of the biomarkers used for malaria detection. The gold sensor was functionalised with anti-pLDH after cleaning the electrode surface to remove impurities (120 °C, 1 hour). The sensor was then treated to block unreacted groups on the surface and minimise matrix interference, before applying it in a sandwich assay to detect pLDH in buffer samples using dose concentration assay. The sensor was optimised to achieve the best detection sensitivity before using it for pLDH detection in serum samples. The developed sensor achieved a limit of detection (LOD) of 1.80 ng mL⁻¹ and 0.70 ng mL⁻¹ for the detection of pLDH in buffer and in serum samples respectively. The sensor sensitivity was enhanced further with the use of AuNP conjugated to the detection anti-pLDH-enzyme, achieving an LOD of 19 pg mL⁻¹ in buffer and 23 pg mL⁻¹ in serum

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