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A facile route to glycated albumin detection

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Abstract: In this paper we propose an easy way to detect the glycated form of human serum albumin which is biomarker for several diseases such as diabetes and Alzheimer. The detection plateform is a label free impedimetric immunosensor, in which we used a monoclonal human serum albumin antibody as a bioreceptor and electrochemical impedance as a transducing method. The antibody was deposited onto a gold surface by simple physisorption technique. Bovine serum albumin was used as a blocking agent for non-specific binding interactions. Cyclic voltammetry and electrochemical impedance spectroscopy were used for the characterization of each layer. Human serum albumin was glycated at different levels with several concentrations of glucose ranging from 0 mM to 500 mM representing physiological, pathological (diabetic albumin) and suprapathological concentration of glucose. Through the calibration curves, we could clearly distinguish between two different areas related to physiological and pathological albumin glycation levels. The immunosensor displayed a linear range from 7.49 % to 15.79 % of glycated albumin to total albumin with a good sensitivity. Surface plasmon resonance imaging was also used to characterize the developed immunosensor.

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