

Bimetallic nanoparticles-based biosensor for managing diabetes

The glycated hemoglobin test gives the information about average level of blood sugar over the past 2 to 3 months. It's also called HbA1c, glycated hemoglobin test, and glycohemoglobin. Persons who have diabetes require this test regularly to see if their levels are staying within range. The glucose level measurement in the diabetic patient plays a vital role in identification of the treatments going on and it also provides the control over the diabetics.

A new electrochemical sensing device was constructed for determination of HbA1c in whole blood samples. Fructosyl amine oxidase (FAO) was bioconjugated onto hybrid nanocomposite i.e., gold nanoparticles-platinum nanoparticles (AuNPs-PtNPs) and poly indole-5-carboxylic acid (PIN5COOH), deposited electrochemically on gold electrode. Bimetallic nanoparticles not only show their individual properties but also provides the synergistic effect between the two noble metal nanoparticles. AuNPs-PtNPs shown as an amplified sensing interface at lower voltage which makes the sensor more sensitive and specific.

The FAO/AuNPs-PtNPs onto PIN5COOH/Au electrode shows a promising future in diagnosis of HbA1c and diabetes management. The novel sensor formed has good accuracy, selectivity, sensitivity, precision and reliability. In addition to these, it showed good storage stability and retained 50% of its initial activity within 12 weeks at 4°C.

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[Construction of an amperometric glycated hemoglobin biosensor based on Au-Pt bimetallic nanoparticles and poly \(indole-5-carboxylic acid\) modified Au electrode.](#)

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