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A Non-Enzymatic Two Step Catalytic Reduction of Methylglyoxal by Nanostructured V₂O₅ Modified Electrode

^{1,2}Lakshmishri Ramachandra Bhat, ^{3,4}Srinivasan Vedantham, ^{1,3}Uma Maheswari Krishnan and
^{1,2}John Bosco Balaguru Rayappan

¹Centre for Nanotechnology & Advanced Biomaterials (CeNTAB), SASTRA University,
Thanjavur – 613 401, India

²School of Electrical & Electronics Engineering (SEEE), SASTRA University, Thanjavur – 613
401, India

³School of Chemical and Biotechnology (SCBT), SASTRA University, Thanjavur – 613 401,
India

⁴Disease Program Lead-Diabetes, MedGenome Inc., Narayana Health City,
Bangalore – 560 099, India

Corresponding author: *Prof. John Bosco Balaguru Rayappan School of Electrical & Electronics Engineering (SEEE) & Centre for Nanotechnology & Advanced Biomaterials (CeNTAB) SASTRA University, Thanjavur – 613 401, India Email: rjbosco@ece.sastra.edu

Tel.: +91 4362 264101-108 x2255; Fax: +91 4362 264120

Abstract

Methylglyoxal (MG) is a predominant precursor for advanced glycation end products (AGEs) due to its protein glycation reactions, which are the major causes of diabetic complications. MG is explored as a significant biomarker towards the prediction of diabetic complications. With this background, a non-enzymatic electrochemical biosensor has been developed to detect MG in human blood plasma samples. Microwave synthesized V₂O₅ nanoplates were used as interface material in the fabrication of modified gold (Au) working electrode for electrochemical MG biosensor. Orthorhombic crystal structured V₂O₅ with an oxidation state of +5 exhibited specific MG sensing performance. Cyclic voltammetry and amperometry studies confirmed the electrocatalytic nature of V₂O₅ nanoplates modified Au

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