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REVIEW ARTICLE

Review of Fructosyl Amino Acid Oxidase Engineering Research: A Glimpse into the Future of Hemoglobin A1c Biosensing

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Abstract

Glycated proteins, particularly glycated hemoglobin A1c, are important markers for assessing the effectiveness of diabetes treatment. Convenient and reproducible assay systems based on the enzyme fructosyl amino acid oxidase (FAOD) have become attractive alternatives to conventional detection methods. We review the available FAOD-based assays for measurement of glycated proteins as well as the recent advances and future direction of FAOD research. Future research is expected to lead to the next generation of convenient, simple, and economical sensors for glycated protein, ideally suited for point-of-care treatment and self-monitoring applications.

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Abbreviations: (1,5-AG) 1,5-anhydro-D-glucitol, (f-$^{\varepsilon}$Lys) fructosyl ε-lysine, (f-$^{\alpha}$Val) fructosyl valine, (f-$^{\alpha}$Val-His) fructosyl valyl histidine, (FAD) flavin adenine dinucleotide, (FAOD) fructosyl amino acid oxidase, (FPOX) fructosyl peptide oxidase, (A1C) glycated hemoglobin A1c, (HPLC) high-performance liquid chromatography, (mPMS) methoxy-5-methyl phenazinium methyl sulfate

Keywords: biosensing, fructosyl amino acid oxidase, glycated proteins, hemoglobin A1c, A1C, point-of-care treatment

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