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MAKING NOVEL ENZYMATIC BIOSENSORS BY USING DTP TYPE CONDUCTING POLYMERS

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Scientists have been trying to develop biosensors with great efforts for the wide fields of application including medical diagnostics, environmental monitoring, and food analysis for many years. The development of biosensors has become increasingly important in molecular diagnostics. They need new methods continuously to get higher sensitivity, lower cost, and better reproducibility. Because of their high sensitivity property, fluorescence and chemiluminescence are widely used in clinical diagnostic laboratories. However, the high instrument cost is a major disadvantage for these methods. Compared to optical detection methods, electrochemical methods are much simpler and not expensive. Among the various electrochemistry-based biosensors developed so far, the amperometric glucose sensing approach has attracted a great deal of attention. Conducting polymers, CPs, are used as suitable matrices supplying common properties for biomolecule immobilization. Their compatibility with biological molecules, easy preparation, high reproducibility and electrochemical properties make them fascinating in biosensor design. The dithieno [3, 2-b:2',3'-d] pyrrole (DTP) based conjugated organic materials have been precursor materials because their chemical structure with strong electron donating ability promises easily functionalization for polymers. Different unit substitution from pyrrole unit in excellent molecular DTP structures has been bringing a breath of fresh air to the field of conjugated polymer since thiophene-pyrrole-thiophene comonomer structure has a fused ring system and good planar structure, which make an extended conjugated polymer during electropolymerization step. For that reason, a remarkable amount of research effort has been committed to synthesize and create applications of novel DTP based conjugated polymers. This presentation reports amperometric biosensors constructed by using DTP type conducting polymers and important enzymes in food technology which are glucose oxidase, alcohol oxidase, xantine oxidase. The biosensors showed outstanding analytical properties of high sensitivity, selectivity, and reliability being applied to food samples.

Biography

Huseyin Bekir Yildiz has completed his PhD in Chemistry from the Middle East Technical University and Postdoctoral studies from Institute of Chemistry at the Hebrew University of Jerusalem, Department of Chemistry at University of California Berkeley, Center for Molecular Protein Science at Lund University and Institute for Applied Biosciences at Technical University of Applied Sciences Wildau. He is affiliated to Department of Metallurgical and Materials Engineering, KTO Karatay University, where he is currently working as Professor. He is also the Director of Graduate School of Engineering and Natural Sciences at the same university. He has published more than 50 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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