

Progress Report Project ID RDU1703176

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Title of the project: DEVELOPMENT OF GLUCOSE BIOSENSOR BASED ON NANOMATERIALS-ENZYME CROSS-LINKED NETWORK

Aim:

The aim of the project is to improve scientific develop, optimize and deploy nanomaterials and enzyme cross-linked network to construct biosensor devices. Establishing efficient electrical communication between biomolecules and the electrode is the most challenging task for a bioelectronics system. A key issue in this area is biotic-abiotic interfaces that should not degrade over time for high-impact applications, such as functional prosthetics and diabetes management. Therefore, a high performance, robust, and reliable bio-abiotic interface is required.

Accomplished work

Lab work: The modification of the biosensor surface modified with different type of nanoparticles, and enzymes were done by PI and a postgraduate student. However, still more experimental results are yet to obtain including optimal conditions and real sample analysis.

Paper works: Under this project, upto now total **THREE (3)** Q1 journals have been published. The performance of the proposed biosensor showed very high sensitivity and stability.

[1] AKM Kafi, Samiul Alim, Mashitah M Yusoff, Jose Rajan Application of polymerized multiporous nanofiber of SnO₂ for designing a bienzyme glucose biosensor based on HRP/GOx, 123, 2019, 1028-1034, International Journal of Biological Macromolecule. (Q1;IF 3.9).

[2] A.K.M. Kafi, Samiul Alim, Jaya Vejayan, Mashitah M. Yusoff Recent Uses of Carbon nanotubes & Gold nanoparticles in Electrochemistry with application in Biosensing: A review, Biosensors and Bioelectronics, Volume 121, 2018, Pages 125-136. Q1;IF 8.17).

[3] A.K.M. Kafi, Samiul Alim, Rajan Jose, Jaya Vejayan, Mashitah M. Yusoff, 'Enhanced direct electron transfer of redox protein based on Multiporous SnO₂ nanofiber-Carbon nanotube nanocomposite and its application in biosensing.' accepted version in online, International Journal of Biological Macromolecules. Volume 114, 15 July 2018, Pages 1071-1076 (Q1;IF 3.9).

Conferences: I have presented my work in conference at 4TH INTERNATIONAL CONFERENCE OF CHEMICAL ENGINEERING & INDUSTRIAL BIOTECHNOLOGY, in kuala lumpur, (1-2 August, 2018). My newly developed biosensors based on nanostructured materials networks has attracted the attention of many researchers.

Post graduate student:

Samiul Alim : MKT16004 Worked in a project.



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