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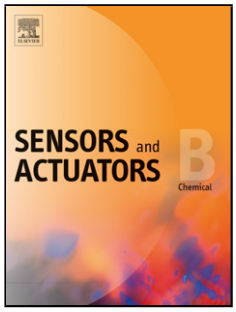

Title: Highly sensitive electrochemical immunosensor based on polythiophene polymer with densely populated carboxyl groups as immobilization matrix for detection of interleukin 1β in human serum and saliva

Authors: Elif Burcu Aydın, Muhammet Aydın, Mustafa Kemal Sezgintürk

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ACCEPTED MANUSCRIPT

Highly sensitive electrochemical immunosensor based on polythiophene polymer with densely populated carboxyl groups as immobilization matrix for detection of interleukin 1β in human serum and saliva

Elif Burcu Aydın[a*], Muhammet Aydın[a], Mustafa Kemal Sezgintürk[b]

[a]Namık Kemal University, Scientific and Technological Research Center, Tekirdağ-TURKEY

[b]Çanakkale Onsekiz Mart University, Faculty of Engineering, Bioengineering Department, Çanakkale-TURKEY

***Corresponding Author:**

e-mail: b_e_bahadir@hotmail.com

ebbahadir@nku.edu.tr

Tel:+90 282 250 11 37

Highlights

- An impedimetric biosensor based on P3-TMA was developed for detection of IL-1β.
- P3-TMA provided a lot of carboxyl groups for antibody binding.
- The modified immunosensor had a wide linear detection range of 0.01-3 pg/mL
- Furthermore, this biosensor had a low detection limit 3 fg/mL.
- This immunosensor had good selectivity and stability for IL-1β detection.

Abstract

A new impedimetric immunosensor was fabricated for detection of Interleukin 1β (IL-1β) by using semi-conductive poly(2-thiophen-3-yl-malonic acid) (P3-TMA) as an immobilization matrix material and anti-IL-1β antibody as a biorecognition element for the first time. The polymer P3-TMA bound onto hydroxylated ITO surface via ester bond to form a polymer

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