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Reduced graphene-oxide based in-line impedimetric biosensor for detecting prostate cancer specific antigen

Xiaoling Lu
University of Applied Sciences Kaiserslautern, Germany

Chemically exfoliated graphene-oxide (GO) is being exploited due to its similarity to graphene and tested out as an alternative to overcome the dilemma that graphene is facing towards wafer-scale and robust device preparation. In this work, we prepared GO thin-films in the manner of wafer scale by the spin-coat technique on the top of interdigitated electrodes (IDEs) with glass as substrates. The isolated GO thin-films are transformed into conductive rGO thin-films by thermal reduction. The residual -COOH groups on the surface of rGO thin film provide diverse possibilities of chemical functionalization to covalently immobilize the receptor molecules. An in-line impedimetric spectroscopy based rGO thin-films as transducer layers are tested out for label-free detection of Prostate Cancer Specific Antigen (PSA). This established biosensor exhibits ultra-sensitivity and announced sensing range because of the combination effect of tunable fermi level and fast charge/discharge behaviour of nanocapcitors. The pronounced PSA detection scale ranges from 33 fM to 330 nM at frequency 1000 Hz.

Biography

Xiaoling Lu is pursuing her PhD study at University of Applied Sciences Kaiserslautern, Germany. Her academic focus is about reduced graphene-oxide based opto-electronic biosensor platform for detecting prostate cancer biomarkers.

luxiao0@gmail.com

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