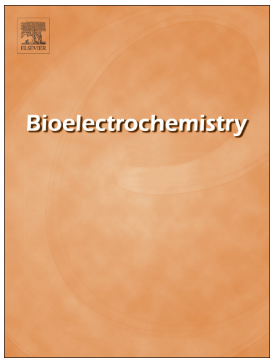

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A new composite consisting of electrosynthesized conducting polymers, graphene sheets and biosynthesized gold nanoparticles for biosensing acute lymphoblastic leukemia

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Abstract:

In this work we report the synthesis of a stable composite with excellent electrical properties, on the surface of a biosensor. Conductive polymers offer both high electrical conductivity and mechanical strength. Many reports have focused on synthesizing conductive polymers with the aid of high-cost enzymes. In the current work we introduce a novel electrochemical, one-step, facile and cost effective procedure for synthesizing poly (catechol), without using expensive enzymes. The poly (catechol) conductivity was enhanced by modification with graphene sheets and biosynthesized gold nanoparticles. Four different robust methods, DPV, EIS, CV and chronoamperometry, were used to monitor the biosensor modifications. The peak currents of the catechol (an electroactive probe) were linearly related to the logarithm of the concentrations of target DNA in the range 100.0 µM to 10.0 pM, with a detection limit of 1.0 pM for the DNA strand. The current work investigates a new, stable composite consisting of conductive polymers and nanoparticles, which was applied to the detection of acute lymphoblastic leukemia.