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## A label-free genetic biosensor for diabetes based on AuNPs decorated with electrochemiluminescent signaling

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The variation of *I27L* gene associates with increasing risk of type 2 diabetes. It will be greatly significant to develop various methods to identify or monitor *I27L* genovariation. We report here a novel label-free electrochemiluminescent (ECL) DNA biosensor for simple and effective determination of *I27L* gene based on Au nanoparticles functionalized ITO electrode. The fabricated electrodes were characterized by scanning electron microscopy, cyclic voltammetry, and electrochemical impedance spectroscopy. The ECL technique was employed to monitor the hybridization of DNA by measuring the changes of its intensity. Here, the ECL signal was quenched since the electrostatic repulsion and space resistance of negatively charged sensor surface toward the probe (luminol anion) to block its access. The quantification of target strand was directly accomplished by calibrating the quenched ECL signals. Under optimal conditions, the decreased ECL intensity had a good linear relation upon the logarithm of target DNA concentration in the range of  $1.0 \times 10^{-11}$  to  $1.0 \times 10^{-7}$  M with a detection limit of  $8.06 \times 10^{-12}$  M. In addition, the biosensor exhibited acceptable stability, excellent reproducibility and outstanding selectivity against one-base mismatched DNA. What's more is that the simple, low-cost, sensitive device could be easily miniaturized, which makes it an attractive candidate for integrating into portable platforms for point-of-care molecular diagnostics.

### Biography

Tu Yifeng has completed PhD in 2002 from Nanjing University, China. He is currently a Professor and Supervisor of PhD students in Soochow University. He is the Director of the research group of "Analytical Chemistry for Life Sciences". He has published more than 100 papers in reputed journals.

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