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## **Electrochemical DNA biosensors and their potential applications to nanobiotechnology**

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Electrochemical based biosensors have been recently recognized as potential candidates for the requirements of nanotechnology applications. Sensitive and rapid detection of very few amounts of target nucleic acids (DNA or RNA) in biological matrices has attracted considerable attention from many fields, such as clinical diagnosis, drug researches and environmental analysis. Electrochemical DNA biosensors offer a highly sensitive and promising method for the detection of hybridization, genetic polymorphisms and mutations, alterations of genes and potential drug-DNA interactions because of their short assay time, miniaturization, portability, and low-cost. The main principle of electrochemical DNA biosensors is based on the conversion of hybridization events into the analytical signals via a transducer. The most common way is the direct detection of DNA oxidation signals of guanine bases through voltammetric techniques by evaluating the intrinsic signal changes of bases. Specific DNA/RNA hybridization can also be monitored using selective redox indicators, amperometric techniques, nanomaterials or electrochemical impedance measurements indirectly. Electrochemical based detection methods meet the sensitivity requirements with its picomolar detection limit in real samples and selective for the target DNA/RNA.

### **Biography**

Seda Nur Topkaya has completed his PhD in 2013 at Analytical Chemistry from Faculty of Pharmacy, Ege University, Turkey. She also conducted her PhD researches at Harvard and MIT for 1 year about tissue engineering. Her main research interests are electrochemistry, electrochemical based DNA biosensors, detection of drug-DNA applications and also 2D-3D tissue engineering. She has published more than 10 papers in reputed journals and serving as a reviewer of many international journals.

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