

NEW GOLD NANOPARTICLES BASED GENOSENSOR DESIGN FOR DETECTION OF DNA HYBRIDIZATION

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The use of metal nanoparticles as labels (i.e. Au nanoparticles, quantum dots) for DNA genosensors and immunosensing has generated a great interest [1]. Gold nanoparticles (AuNPs) are a promising system for the development of ultrasensitive biosensors.

Previously, AuNPs based genosensors designs for detecting DNA hybridization based on a magnetically induced electrochemical stripping detection have been reported by our group. [2,3]

Recent advances with regard to new sandwich assay format based also on a magnetically induced direct electrochemical detection of AuNPs on magnetic graphite-epoxy composite electrode (M-GECE) will be presented. In this design the cystic fibrosis related DNA strand used as a target is sandwiched between two complementary DNA probes: the first one linked with paramagnetic beads and a second one modified with AuNPs (1.4 nm diameter) via reaction of maleimido-Nanogold with a thiol group.

Results related to the optimization of the developed genomagnetic sensor and the reliable discriminations against noncomplementary DNA as well against one and three-base mismatches strands will be shown.

This electrochemical detection method is very simple, sensitive and inexpensive. It doesn't require sophisticated analytical instrumentation rendering the technique potentially useful either in the quick diagnosis of diseases or in environmental monitoring related detections.

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References

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