

### An electrochemical one-step DNA detection based on transport control of gold nanoparticle-labeled signaling probe

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A one-step electrochemical method for the detection of DNA based on transport control of the signaling probe labeled with gold nanoparticles has been developed. On the gold matrix immobilized with capture probe, both unpurified target DNA sample amplified from the hemagglutinin(HA) gene of the H1N1 virus and AuNP-tagged signaling probe are introduced. The target DNA induces sandwich DNA hybridization with both the capture probe immobilized on the gold matrix and signaling probe labeled with gold nanoparticle leading to the immobilization of the AuNP on the gold matrix. In this state, the square wave anodic stripping voltammetry (SWASV) of the gold nanoparticle on another bismuth-coated glassy carbon (GC) electrode show no current signal because there is no AuNP transported to the GC electrode surface. When there is no target DNA in the sample, on the other hand, freely diffusible AuNP-labeled signaling probe can transport to the GC electrode and generate electrochemical current signal. Finally, our system shows the reliable signal change according to the concentration of target DNA without any DNA purification or secondary reaction step.