# Signal-amplified electrochemical detection of single base mismatched DNA using mismatch-specific endonuclease

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A new electrochemical detection method of DNA mutation on a gold electrode surface was developed utilizing mismatch-specific DNA cleavage and amplified electrocatalytic signaling. After target samples were hybridized with biotin-modified capture probes immobilized on the electrode, the hybridized dsDNA was treated with Surveyor™ nuclease. With subsequent addition of glucose oxidase-avidin conjugate, electrocatalytic current was generated when the dsDNA was perfectly matched. Successive addition of biotin-modified polyamidoamime dendrimer (G4) caused densely assembled GOX on the electrode surface generating highly enhanced electrocatalytic current. On the other hand, there was no significant electrocatalytic current observed when the dsDNA contained base-mismatched site because it was cleaved by the nuclease and removed from the electrode including biotin tag. We could detect the insertion, deletion, and displacement of single base in real BRCA1 gene samples. The results exhibited highly selective detection of DNA mutation on the electrode surface, and it could serve as a novel concept for the clinical genetic diagnosis.