

DNA Biosensor with Poly(amidoamine) Dendrimer Coated Glass Slide

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In this experimentation, we used generation 3(G3) poly(amidoamine) (PAMAM) dendrimer to improve DNA chip properties. Amine groups of G3 PAMAM dendrimer were modified to biotin and then immobilized on glass sides by biotin-avidin conjugation. Several biotin-NHS and avidin concentrations were compared. The surface morphology of fabricated DNA chip were observed by Atomic Force Microscope (AFM) and Scanning Electron Microscope (SEM). Using the SEM, we could identify different aggregated morphology of dendrimer-biotin-avidin complex in different condition. Overall, the sensitivity for detecting fluorescence-labeled target DNA was increased about four times and specificity to single nucleotide polymorphism (SNP) was increased about six times by dendrimer coated slide. But the morphologies of dendrimer-biotin-avidin complex had little effect on the sensitivity. Moreover, dynamic range was improved by dendrimer coated slide compared with not used dendrimer slide. This research was supported by the Korea Foundation for International Cooperation of Science & Technology (KICOS) grant number K20601000002-07E0100-00230 and Seoul Research and Business Development program 10920.