Eznyme reaction-based SERRS sensor for diagnosis of genetic disease

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Genetic diseases were caused by genetic mutations in genes that change amino acid or splicing sites. For the effective treatment of these diseases, mutation analysis must meet the demands for rapid, accurate, simple, cost-effective factor. In this study, the sensitive, specific, and quantitative detection of single mutation causing genetic disease was accomplished by combining specificity of S1 nuclease reaction with well-defined Au nanowire (NW)-on-film sensor. We detected single base mismatch of target DNA at a detection limit of 100 pM through the simple experimental process. Wilson disease (WD) and Avelllino corneal dystrophy (ACD) relevant mutations from clinical samples were successfully identified using Au NW-on-film sensor. We anticipate that our assay could be improved to high throughput mutation detection by using the tremendous multiplexing capacity. [This research was supported by WCU program through the Korea Science and Engineering Foundation funded by the Ministry of Education, Science and Technology]