

### Detection of mutation in exon 19 and 21 using the selective aggregation of CdSe quantum dots

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We have detected mutations in the epidermal growth factor receptor (EGFR) of non-small cell lung cancer patients using the selective aggregations of quantum dots. Mutations in exon19 and exon21 of EGFR gene were detected in non-amplified genomic DNAs isolated from both the lung cancer cell lines and the cancer tissues of non-small cell lung cancer patients. To fabricate this sensor, we synthesized water-soluble CdSe quantum dots using ligand exchange. For detection of mutation in Exon 19 and 21, we functionalized CdSe quantum dots using two different types of probe DNA. In case of perfectly matched dsDNA pairs, fluorescence quenching and color change was observed. However, did not exhibit significant aggregation of quantum dots and the color remained unchanged with the addition of the wild type DNA hybridized with the probe. To monitor selective aggregation of quantum dots, we use the photoluminescence spectroscopy and TEM. We could detect the deletion mutant form in exon19 and the point mutation in exon21 mutations by selective aggregation with quantum dots. These results were also confirmed by the direct sequencing method.