

Sensitive and Optimal Detection of EGFR mutations via FRET between GNRs and QDs

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We studied a simple, sensitive fluorescence assay for the detection of mutations in epidermal growth factor receptor (EGFR) by using gold nanorods (GNRs). Almost of oncogenic mutations were located in exon 19 and exon 21 of EGFR gene from patients with non-small cell lung cancer (NSCLC). GNRs have shown greater potential for biomedical applications owing to controlling the size and the aspect ratio easily. Moreover, GNRs with localized surface plasmon resonance (LSPR) peak at 600nm well caused effective fluorescence quenching with quantum dots (QD) on the basis of the fluorescence resonance energy transfer (FRET). The quenching efficiency is related to the spectral overlap of the GNR absorption and QD emission, the distance between the two nanoparticles and probe length for hybridization. This study will be useful for sensitive and efficient detection of EGFR mutations in lung cancer.