

### Fabrication of microfluidic chip using a bead-QD-DNA nanosensor for the detection of nucleotides

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In this study, PDMS based microfluidic chips have been fabricated for the detection of genetic disease (p53 gene) by using QD-DNA conjugate (QD-probe). The PDMS microfluidic chip with a weir has been utilized for capturing microbeads, sample injection to wells, and fluorescence detection. Carboxylated CdSe/ZnS QDs (Em: 605 nm) have been linked to microbeads of polystyrene/divinyl benzene via EDC/NHS crosslinking reaction. After loading to target gene in the inlet well of microfluidic chip, fluorescence quenching between QD and intercalating dye, TOTO-3, has been observed from the hybridized DNA at the channel of weir structure. The fluorescence quenching level has been dependent on the concentration of DNA. This experiment shows the possibility of rapid detection of DNA hybridization via bead-QD complex on microfluidic system.