

Various binding of DNA oligonucleotides on single wall carbon nanotubes for electronic label-free detection

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Label-free electronic sensing is the major concern in genomics and clinical diagnostics. According to advancement of nanotechnology, one dimensional structured materials has been worthy of notice as an alternative for improved label-free diagnostic device. In particular, the application of single wall carbon nanotubes(SWNTs) paves the way for label free detection in the DNA biosensors, since electronic properties of SWNTs are more sensitive to DNA-associated charges as a result of their 1-dimensional structure and high surface-to-volume ratio. Moreover, SWNTs have so flexible surface chemistry that they can be used as a platform of biological elements.

In this study, we have developed various binding methods of DNA oligonucleotides on SWNT substrates. The surface characteristics were adjusted by introduction of various kinds of linker agents. In according to surface functionality of SWNT, more effective bonding method were selected and confirmed by fluorescence analysis. It is expected that this strategy will be provide the protocol of DNA immobilization on SWNT for electronic label-free detection.