

Abstract Submitted
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Large-scale assembly of CNT based DNA sensor array on SiO₂ substrate¹ JOOHYUNG LEE, BYUNG YANG LEE, DONG JOON LEE, KYUNGEUN BYUN, SEUNGHUN HONG, School of Physics and Astronomy, Seoul National University — DNA sensors based on CNTs have been attracting attention due to their possible applications such as genotyping, disease diagnosis, etc. Previous works were mostly based on CNTs functionalized with DNA molecules. However, a major bottleneck holding back their practical applications has been a lack of mass production method of such sensors. Furthermore, immobilization of DNA on CNTs using linker molecules can severely degrade their electrical properties. Herein, we report a new method to fabricate a large-scale array of CNT-based DNA sensors on SiO₂ and glass substrates. In this method, non-polar molecular patterns guide the assembly of CNTs onto uncoated bare surface regions (Nature Nanotechnology 1, 66 (2006)). After fabrication of electrodes on the CNT patterns, we further functionalized the bare surface regions with single-stranded (ss) PNA and successfully demonstrated detection of target ss-DNA with high sensitivity. Since we functionalize the bare surface between CNTs, this process can be applied to virtually general nanotubes circuits on SiO₂ or glass substrates to fabricate DNA sensors.

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Joohyung Lee
School of Physics and Astronomy, Seoul National University

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