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Fabrication of Nanogap-Based PNA Chips for the Electrical Detection of Single Nucleotide Polymorphism

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Selective detection of single nucleotide polymorphism (SNP) of Cytochrome P450 2C19 (CYP2C19) was carried out by the PNA chips which were electrically-interfaced with interdigitated nanogap electrodes (INEs). The INEs whose average gap distance and effective gap length were about ~70 nm and ~140 μ m, respectively, were prepared by the combination of the photo lithography and the surface-catalyzed chemical deposition, without using the e-beam lithography which is almost inevitable in the conventional lab-scale fabrication of the INEs. Four different types of target DNAs were successfully detected and discriminated by the INE-based PNA chips.

Keywords: Interdigitated nanogap electrodes (INEs), Cytochrome P450 2C19 (CYP2C19), PNA chip, Selective detection, Functionalized au nanoparticle