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Fabrication of Parallel- and Latticed-Nanostructures Using DNA-Templated Gold Nanowires

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We report a new method to carefully control the interval of gold nanowires (AuNWs) using surface-patterning techniques. In this technique, a process to form parallel- and latticed-nanostructures involves three steps: (1) nano-road was generated on oxide surface, chemically treated with 3- (aminopropyl) triethoxysilane (APS) which has a NH_3^+ terminal group, patterned by electron beam lithography (2) λ-DNA molecules were stretched and aligned on chemical nano-road by tilting techniques. (3) AuNWs were formed by the electrostatic interaction between DNA and gold nanoparticles. By the combination of a tilting technique and surface-patterning technique, we could selectively align λ-DNA molecules and AuNWs by chemical nano-roads of 500 nm interval on Si substrate. We used atomic force microscopy (AFM) to analyze the configuration of AuNWs.