

Abstract Submitted
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DNA Templating of Au Nanowires DAVID WOOD, ANDREW CLELAND, Dept. of Physics, University of California, Santa Barbara, GARY BRAUN, ERAN LEVY, AUGUST ESTABROOK, STEPHANIE WILKINSON, NORBERT REICH, Dept. of Chemistry, University of California, Santa Barbara, KATSUHIKO INAGAKI, Dept. of Applied Physics, Hokkaido University, Sapporo, Japan — We have developed a process for fabricating nanoscale wires using DNA templates. The templates were subsequently decorated with gold nanoparticles to make metallic wires. We have successfully deposited linear, straight sections of random (λ -phage) and regular-repeat sequences of DNA, of various lengths, on oxidized silicon substrates. We have also successfully deposited thiolated DNA on gold electrodes, allowing the DNA to electrically bridge gaps between electrode pairs. Electrode gaps ranged from 50 nm to 300 nm, fabricated using electron beam lithography. We decorated the DNA with gold nanoparticles with diameters in the range of 1-13 nm, and have used the nanoparticles as nucleation sites for the growth of continuous gold wires. We have performed AFM characterization of all surfaces and structures. In addition, we have performed current-voltage measurements on the undecorated DNA, the nanoparticle-decorated DNA, and the gold nanowires.

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