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DNA-Inspired Self-Assembly of Nanoscale Electronic Devices KUO YAO LIN, University of Texas at Dallas — Despite remarkable examples of difficult-to-produce isolated molecular devices, the scalable nanomanufacturing of such electronics remains at a standstill due to fundamental roadblocks associated with the synthesis of large quantities of modular nanoscale circuit elements. We have introduced a methodology for mass production of nanoscale electronic elements. We have synthesized organic semiconductor moieties within DNA-like scaffolds, leveraging the rapid, efficient, and precise coupling afforded by traditional DNA bioconjugate chemistry. These DNA-inspired nanowires enable the self-assembly of active, nanoscale circuit elements at patterned electrodes. The assembly and electrical performance of these arrayed devices have been characterized through scanning microscopy techniques and custom, automated electrical probe measurements. Our unique and economically viable approach offers a new paradigm for the fabrication of nanoscale electronic circuits.

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