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**Self-assembly of Fibrous Proteins for Molecular Electronics** JIANHUA GU, DEBIN LI, DAVID LEDERMAN, Department of Physics, West Virginia University, AARON TIMPERMAN, Department of Chemistry, West Virginia University — Biomolecules can exhibit self-assembly, which would remove the need to individually pattern them into structures, and greatly aid the mass production of nanostructues.[1] Fibrous proteins tend to have relatively simple, regular linear structures, making them ideal candidates for the formation of nanowires. We have synthesized tropomyosin fibers for molecular electronics. Nanowire fibers with lengths ranging from 500nm-2000nm and 15nm-150nm in diameter have been fabricated. The length and diameter can be controlled with the ion ($Na^+$ or $Mg^+$) concentration in the protein solution. These deposition processes have been characterized with AFM and SEM. These wires can be deposited on to gold and silicon substrates using a self-assembly technique. These wires can be bridged between two-point or four-point gold nanoelectrtrodes. Electric conducting properties with these wires or wire-templates will be discussed.

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[1]T. Scheible, R. Parthasathy, G. Sawick, X. Lin, H. Jaeger, and S. Lindquist, PNAS 100, 4527 (2003)

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