A Natural Route to Nanowires and Energy Storage

Organic electronics is a burgeoning area, with a growing range of applications. This new research – in which nanowires are grown naturally rather than synthesized chemically – may provide new methods for biologically-produced or biologically-inspired materials for sustainable nanomanufacturing. Pilin nanofilaments (pili) — known now as “microbial nanowires” — are a class of fibrous proteins found in the sediment bacteria Geobacter. Temperature studies find metallic characteristics. The conductivity can be modulated by doping or by using an applied voltage in an electrochemical transistor configuration, showing the potential for device applications, including supercapacitors for energy storage.

Nature Nanotechnology, 2011. 6, 573-579

Dr. Nikhil Malvankar, Professors Mark T. Tuominen, Vincent M. Rotello, and Derek R. Lovley
University of Massachusetts

This work supported by The Center for Hierarchical Manufacturing at the University of Massachusetts Amherst
CMMI-1025020