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### [Navy Develops Battery that Runs on Mud](#)

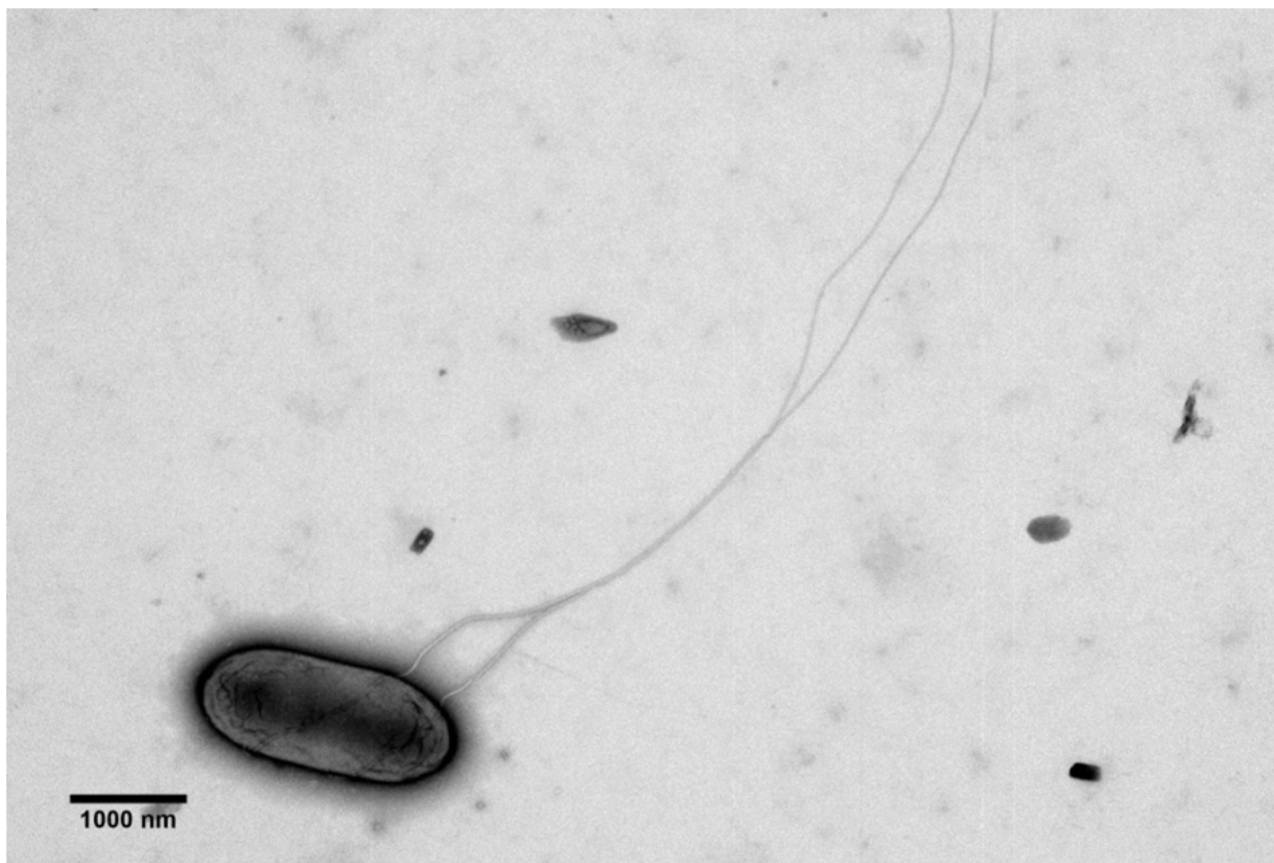
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The Office of Naval Research will highlight their microbial fuel cell that was one of TIME magazine's "Top 50 Inventions of 2009" for an Earth Day event on April 22.

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According to Peter Vietti of the Office of Naval Research the microbial fuel cell is a device “that could revolutionize naval energy use by converting decomposed marine organisms into electricity.”

By converting naturally occurring fuels and oxidants in the marine environment into electricity, Naval vessels could be running on a clean and efficient reliable alternative battery avoiding the harmful impact that standard batteries and fuels have upon the marine environment.

The fuel cell is already able to power many types of sensors and those behind the project believe that it could be installed in underwater unmanned vehicles, in-water sensors, as well as a bounty of devices currently being used to monitor the ocean environment, and in theory should be able to power these devices for years without any sort of battery replacement. Navy researchers at the Space and Naval Warfare Systems Center Pacific are already using fuel cell-powered devices to track Pacific-endangered green sea turtles.

“We work on the intersection of microbiology and electrochemistry,” said Dr. Leonard Tender, a research chemist in the Center for Bio/Molecular Science and Engineering at the Naval Research Laboratory who has been a central figure in the development of the microbial fuel cell. “The most fascinating aspect of the program is how these micro-organisms function and the mechanisms by which they take fuel, metabolize it and generate electrical current.”

Together with scientists from the University of Massachusetts at Amherst, Tender and his own team began investigating electricity-generating microorganisms. The most promising discovery is called Geobacter, and was found in the Potomac River downstream of the Naval Research Laboratory, and is believed to hold the key to understanding microbial energy conversion.

Geobacter uses hair-like extensions known as pili to generate electricity from mud and wastewater. Researchers have developed a new strain of Geobacter that is eight times more efficient at producing power than other strains.

“Microbial fuel cell research is a great example of naval needs propelling advanced technology that also has potential benefit to the public” said Chief of Naval Research, Rear Adm. Nevin Carr. “The Secretary of the Navy issued five energy goals to the Department of the Navy last October at ONR’s Naval Energy Forum and this fuel cell research will help provide part of the solution.”

“Think of it as a battery that runs on mud,” ONR Program Manager Dr. Linda Chrisey said. “They are sustainable, environmentally friendly and don’t involve hazardous reactants like a regular battery might because they use the natural carbon in the marine environment. For example, we are working on a 4-foot long autonomous underwater vehicle that will settle on the seafloor and recharge its batteries using this fuel cell approach. We are already able to

power many types of sensors using microbial fuel cells.”

Source: [Office of Naval Research \(http://www.eurekalert.org/pub\\_releases/2010-04/oonr-fbt041910.php\)](http://www.eurekalert.org/pub_releases/2010-04/oonr-fbt041910.php)

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