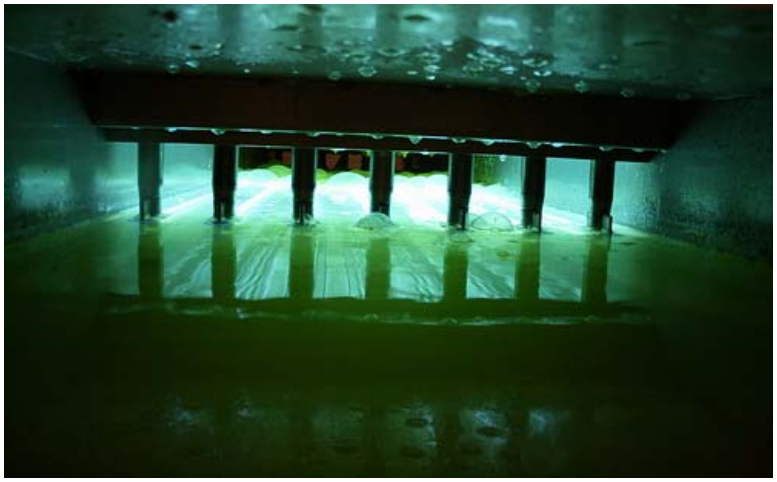
CleanTechnica

Like this post? **Subscribe to our RSS feed** and stay up to date.

Researchers Coax Electricity from Geobacter Super-Microbes (http://cleantechnica.com/2009/08/03/researchers-coax-electricity-from-geobacter-super-microbes/)

Written by **Tina Casey**
Published on August 3rd, 2009 in **alternative energy**, **technology**



(http://cleantechnica.com/2009/08/03/researchers-coax-electricity-from-geobacter-super-microbes/geobacter-could-turn-wastewater-into-electricity/) The workhorse of the microbe world could turn out to be **Geobacter**, a hairy looking organism that is actually capable of generating an electric current from mud or wastewater. **Professor Derek Lovley** and a team of researchers at the **University of Massachusetts Amherst** have announced that they successfully evolved a strain of Geobacter into a superbug that is eight times more powerful than other strains. The breakthrough could lead to the development of a **microbial fuel cell** system scaled to individual homes, capable of producing electricity from the occupants' household **wastewater**. Geobacter-powered microbial fuel cells for vehicles, portable electronics, and even medical implants are among many other potential applications.

- » See also: **UK Supermarket Turns 5,000 Tons Of Meat Into Energy (http://cleantechnica.com/2009/08/07/uk-supermarket-turns-5000-tons-of-meat-into-energy/)**
- » **Get CleanTechnica by RSS (/feed/)** or **sign up by email (http://feedburner.google.com/fb/a/mailverify?uri=cleantechnica/com)** .

A Brief History of Geobacter

Geobacter (http://www.umass.edu/newsoffice/storyarchive/articles/90975.php) is a mud-loving microbe that Lovley

and his colleagues first discovered over twenty years ago in the Potomac River. Initially the team developed Geobacter as a means of bioremediating contaminated soil. The organism "breathes" iron and other metals, which enables it to render **petroleum-based contaminants** (http://www.geobacter.org/) into carbon dioxide. It can even remediate radioactive metals in groundwater. In 2002 Lovley and his team discovered that Geobacter could generate electricity from organic matter in sediment and wastewater. By 2005 they had identified the mechanism: the "pili," hairlike protruberances that festoon Geobacter like nanowires. They create a thin biofilm that conducts electrons from the organism to iron in the mud or wastewater. Other bacteria colonies also anchor themselves to a food source by attaching a biofilm to it, but Geobacter is especially skillful at electron transmission. Possibly in combination with **other bio-based treatment systems** (http://cleantechnica.com/2009/08/01/bluewater-bio-makes-water-from-sewage-with-new-hybacs-system/) , Geobacter could help transform sewage treatment plants from energy-sucking pieces of infrastructure into electricity generators that produce reusable water.

Geobacter and Microbial Fuel Cells

Dr. Lovley and his team developed a more powerful strain of Geobacter by adding a small electric current to the growing medium, or substrate. The extra current forced Geobacter to work harder to shed its electrons. In a few months a new, more powerful strain developed that appears to be suitable for application to **microbial fuel cells** (http://www.microbialfuelcell.org/www/index.php/Principles/) using a variety of wastes or renewable substrates. In a conventional microbial fuel cell, glucose or acetate provide the juice. As a more powerful microbe, Geobacter could prove just as effective on less than ideal substrates such as **wastewater** (http://cleantechnica.com/2009/06/24/water-energy-crisis-and-an-opportunity/) or even **beer waste** (http://michaeldestries.greenoptions.com/2007/05/04/fosters-brewery-to-develop-fuel-cell-that-runs-on-beer/) .

Image: **elisfanclub** (http://www.flickr.com/photos/elisfanclub/2627984531/) on flickr.com.

Tweet This Post (http://twitter.com/home/?status=Researchers+Coax+Electricity+from+Geobacter+Super-Microbes+http://digg.com/u19rqV)

Tags: **Dr. Lovley** (http://greenoptions.com/tag/dr-lovley) , **Geobacter** (http://greenoptions.com/tag/geobacter) , **microbial fuel cells** (http://greenoptions.com/tag/microbial-fuel-cells) , **University of Massachussetts** (http://greenoptions.com/tag/university-of-massachussetts) , **wastewater** (http://greenoptions.com/tag/wastewater)

You might also like:

(http://cleantechnica.com/2009/08/08/alligator-tree-puts-more-bite-into-cellulosic-ethanol/) **Alligator Tree Puts More Bite into Cellulosic Ethanol** (http://cleantechnica.com/2009/08/08/alligator-tree-puts-more-bite-into-cellulosic-ethanol/)

(http://cleantechnica.com/2009/08/08/go-navy-us-ships-to-try-eco-safe-anti-barnacle-tactics/) **Go, Navy! U.S. Ships to Try Eco-Safe Anti-Barnacle Tactics** (http://cleantechnica.com/2009/08/08/go-navy-us-ships-to-try-eco-safe-anti-barnacle-tactics/)

(http://cleantechnica.com/2009/08/07/climate-change-watertech-boom/) **Climate Change = Watertech Boom** (http://cleantechnica.com/2009/08/07/climate-change-watertech-boom/)

(http://cleantechnica.com/2009/08/07/uk-supermarket-turns-5000-tons-of-meat-into-energy/) **UK Supermarket Turns 5,000 Tons Of Meat Into Energy** (http://cleantechnica.com/2009/08/07/uk-supermarket-turns-5000-tons-of-meat-into-energy/)

Add a comment or question (#respond)
Recommend this post (2) (javascript:void(0))