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Bacterial tresses conduct electricity

Christen Brownlee

Bacteria that have hairlike structures called pili usually use them to attach to objects and to move around. However, new findings suggest that pili on a group of species known as *Geobacter* play a different role: They act as nanowires that conduct electricity.

Geobacter has gained fame over the past several years as a promising treatment for radioactive pollution. By adding electrons to a toxic metal, such as uranium, the bacterium precipitates it out of wastewater.

Previous research had shown that many other bacterial species transfer electrons using proteins called c-cytochromes. However, since these proteins aren't found in all *Geobacter* species, researchers didn't know how the bacteria without the proteins accomplished the same feat.

Suspecting that *Geobacter's* pili might be responsible, Derek Lovley of the University of Massachusetts in Amherst and his colleagues shaved some off of the bacteria. The researchers found that the isolated pili efficiently conducted electricity generated by an atomic-force microscope.

After genetically modifying some *Geobacter* so that they didn't produce pili, Lovley found that the bacteria still attached themselves to surfaces. However, the modified microbes didn't shuttle electrons onto metals.

The researchers suggest in the June 23 *Nature* that information about how *Geobacter's* pili conduct electricity could provide ideas that might lead to synthetic nanowires made of protein.

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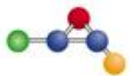

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