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## PROJECTS

### RESEARCH

# Bacteria-Activated Wallpaper that Generates Electricity

U.K. researchers printed microorganisms onto paper to create a wall finish as well as a solar bio-battery.

By [KATHARINE KEANE](#)

Courtesy Imperial College London

Researchers from [Imperial College London](#) (ICL), the [University of Cambridge](#), and [Central Saint Martins](#) have successfully created a wallpaper-like covering that also acts as both a solar bio-battery and solar panel—and it is environmentally friendly to boot. The team used an inkjet printer to print photosynthetic microorganisms called cyanobacteria onto conductive carbon nanotubes, all of which were then printed onto paper. The printed bacteria continue to perform photosynthesis, creating small amounts of electricity, which the researchers believe could power a small digital clock or LED lamp.

“Imagine a paper-based, disposable environmental sensor disguised as wallpaper, which could monitor air quality in the home,” said ICL department of chemical engineering research associate and study co-author Marin Sawa in a [press release](#). “When it has done its job it could be removed and left to biodegrade in the garden without any impact on the environment.”

This development furthers current research into microbial biophotovoltaics (BPV), considered to be a new alternative renewable energy technology. While current BPVs are still expensive to make, have low-power



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output, and relatively short lifespans, the organisms—unlike traditional photovoltaic cells—are capable of producing electricity in the dark from energy molecules produced in the daylight.

“Paper-based BPVs are not meant to replace conventional solar cell technology for large-scale power production, but instead, could be used to construct power supplies that are both disposable and biodegradable,” said ICL research fellow and co-author Andrea Fantuzzi in the release. “Their low power output means they are more suited to devices and applications that require a small and finite amount of energy, such as environmental sensing and biosensors.”

### ABOUT THE AUTHOR



**Katharine Keane**

Katharine Keane is the associate editor of technology, practice, and products for ARCHITECT and Architectural Lighting. She graduated from Georgetown University with a B.A. in French literature, and minors in journalism and economics. Previously, she wrote for *Preservation* magazine.

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### Keywords:

SUBJECT:

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ORGANIZATION:

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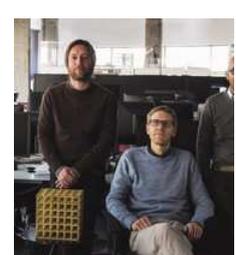
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