

# Electrified nano filter promises to cut costs for clean drinking water

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With almost one billion people lacking access to clean, safe drinking water, scientists are reporting development and successful initial tests of an inexpensive new filtering technology that kills up to 98 percent of disease-causing bacteria in water in seconds without clogging.

A report on the technology appears in [Nano Letters](#).

Yi Cui and colleagues explain that most water purifiers work by trapping bacteria in tiny pores of filter material. Pushing water through those filters requires electric pumps and consumes a lot of energy. In addition, the filters can get clogged and must be changed periodically. The new material, in contrast, has relatively huge pores, which allow water to flow through easily. And it kills bacteria outright, rather than just trapping them.

The scientists knew that contact with silver and electricity can destroy bacteria, and decided to combine both approaches. They spread sub-microscopic silver [nanowires](#) onto cotton, and then added a coating of carbon nanotubes, which give the filter extra [electrical conductivity](#). Tests of the material on E. coli-tainted water showed that the silver/electrified cotton killed up to 98 percent of the [bacteria](#). The filter material never clogged, and the water flowed through it very quickly without any need for a pump. "Such technology could dramatically lower the cost of a wide array of filtration technologies for water as well as food, air, and pharmaceuticals where the need to frequently replace filters is a large cost and difficult challenge," their report states.

**More information:** "High Speed Water Sterilization Using One-Dimensional Nanostructures", *Nano Letters*.

Provided by American Chemical Society

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