

# Self-cleaning cotton breaks down pesticides, bacteria

September 28 2011

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UC Davis Professor Gang Sun inspects a sample of his self-cleaning cotton. The fabric is chemically treated to remove stains and contaminants when exposed to light. Credit: Andy Fell/UC Davis

(PhysOrg.com) -- UC Davis scientists have developed a self-cleaning cotton fabric that can kill bacteria and break down toxic chemicals such as pesticide residues when exposed to light.

“The new fabric has potential applications in biological and chemical protective clothing for health care, food processing and farmworkers, as well as military personnel,” said Ning Liu, who conducted the work as a

doctoral student in Professor Gang Sun's group in the UC Davis Division of Textiles of Clothing.

A paper describing the work was published Sept. 1 in the *Journal of Materials Chemistry*.

Liu developed a method to incorporate a compound known as 2-anthraquinone carboxylic acid, or 2-AQC, into [cotton](#) fabrics. This chemical bonds strongly to the cellulose in cotton, making it difficult to wash off, unlike current self-cleaning agents. Unlike some other experimental agents that have been applied to cotton, it does not affect the properties of the fabric.

When exposed to light, 2-AQC produces so-called reactive oxygen species, such as hydroxyl radicals and hydrogen peroxide, which kill [bacteria](#) and break down organic compounds such as pesticides and other toxins.

Although 2-AQC is more expensive than other compounds, the researchers say that cheaper equivalents are available.

Provided by UC Davis

Citation: Self-cleaning cotton breaks down pesticides, bacteria (2011, September 28) retrieved 26 April 2024 from <https://phys.org/news/2011-09-self-cleaning-cotton-pesticides-bacteria.html>

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