

## Research Highlights

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### Silver nanoparticles: Protective paints

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#### Paints containing silver nanoparticles show antibacterial properties and are made by a simple and environmentally friendly method using vegetable oil

There is a growing need for surfaces to have bactericidal coatings for use in hospitals and around the home. Compounds containing silver ions — which are known to have long-lasting biocidal properties — have received much attention for this purpose because they are stable and exhibit a low toxicity to human cells. Efficient antibacterial agents have been made by incorporating Ag nanoparticles into polymeric materials, but the high production costs of the complex multistep preparation methods that are often required makes them unsuitable for commercial needs.

Now, George John and colleagues<sup>1</sup> (#B1) at the City University of New York and Rensselaer Polytechnic Institute in New York have used a simple and environmentally friendly process to make paints embedded with Ag nanoparticles. Instead of using toxic reducing agents to convert metal ions into nanoparticles, they make use of the oxidative drying mechanism that occurs in common oil-based household paints. Reactive free radicals generated naturally when oils dry were used to reduce Ag salts to give metal nanoparticles. Moreover, aldehydes produced in this process — along with the rigid crosslinked polymer that is formed on drying — prevent the nanoparticles from aggregating into clumps, therefore enabling the production of stable nanoparticle-embedded paints from vegetable oils.

To test for bactericidal activity, colonies of two common bacteria — *Escherichia coli* and *Staphylococcus aureus* — were grown on glass slides coated with the Ag nanoparticle paint. After overnight incubation, the remaining colonies were counted, and it was found that almost all of the bacteria had been killed, unlike in control experiments using plain glass slides or ones coated with ordinary paint.



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## REFERENCE

1. Kumar, A., Vemula, P. K., Ajayan, P. M. & John, G. Silver-nanoparticle-embedded antimicrobial paints based on vegetable oil. *Nature Mater.* doi: 10.1038/nmat2099 (2008). | [Article](#) (<http://www.nature.com.libproxy.mit.edu/doi/10.1038/nmat2099>) |