

# Tea brews up silver nanoparticles for wound healing in the developing world

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Wound infections, particularly associated with burns, are a serious health problem causing high morbidity and mortality. Aside from hygiene and basic dressings, antibiotics are the standard treatment for serious

wounds. However, cost, access, and emerging bacterial resistance, make their use difficult and ineffective, especially when a course of treatment is not completed. Globally, a huge number of deaths occur because of infected burns especially in low- and middle-income countries, and most commonly in rural areas.

Treating burn wounds is a complex process due to various factors. Burns disrupt the skin barrier, exposing fluid from the wound to opportunistic bacteria that thrive on the exuded nutrients. Such wounds also compromise [blood supply](#) and affect the local immune response. In addition, a large burn, covering more than a fifth of the skin will often lead to systemic inflammatory response syndrome (SIRS), further complicating infection management.

Research [published](#) in the *International Journal of Biomedical Nanoscience and Nanotechnology* has looked at how silver-containing antimicrobial nanoparticle preparations might be used, not as topical antiseptic creams, but as a sustained-release component of an advanced wound [dressing](#).

The cost of such a dressing would likely make it unviable in normal circumstances. However, the team involved from KLE University in Belagavi, India, has developed a low-cost, antimicrobial starch-based polymer film within which they can embed silver nanoparticles, synthesized using a simple method from tea extracts.

The team's environmentally friendly approach also benefits from using those plant extracts as they contain polyphenolic compounds, which have an additional antimicrobial character as they are antioxidants, anti-inflammatory agents, and antimicrobial.

In tests, the researchers—Sambuddha Dinda, Anuradha B. Patil, Sumati Annigeri Hogade, and Abhishek Bansal—showed that their starch-based

film showed significant antimicrobial activity against various types of bacteria, including the ever-troublesome *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

"This study showed anti-microbial efficacy of a low-cost starch-based polymer film containing Ag-NP with antioxidant biomolecules of green tea which can be easily fabricated and used for wound dressing," the researchers conclude.

**More information:** Sambuddha Dinda et al, Development of an anti-microbial starch-based polymer film embedded with silver nanoparticles by green synthesis from tea extract: a potential low cost wound dressing for rural population of developing countries, *International Journal of Biomedical Nanoscience and Nanotechnology* (2024). [DOI: 10.1504/IJBNN.2024.139295](https://doi.org/10.1504/IJBNN.2024.139295)

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