

# Pre-treatment of bandages may improve the antibacterial properties of nanoparticles

18 October 2016

Pre-treating the fabric surface of the bandages used to treat burns with enzymes and polyethylene glycol or cellulase may promote the adhesion of antibacterial nanoparticles and improve their bacteria-repelling ability. These are the findings of a group of scientists from the Islamic Azad University, Iran, published in *The Journal of The Textile Institute*.

Injuries caused by burns are a global health problem, with the World Health Organisation citing 195,000 deaths per year worldwide as a result of burns from fires alone. Burn injuries are particularly susceptible to infections, hospital-acquired or otherwise, with the bacteria *Pseudomonas aeruginosa* accounting for over half of all severe burn infections.

Noble metal (particularly silver) antimicrobials have long been identified as having potential for combating bacterial infection; however, there are concerns about dressings adhering to wounds and toxic effects on skin cells. Currently, scientists are researching nanoparticles which can be used to introduce these antimicrobial properties into the textiles used in dressings.

The authors of this paper have studied 150 cases to identify the most common infections in burns. In the paper, they also identified a method for giving cotton bandages antibacterial properties by coating the fabric surface with a Nickel oxide (NiO)/organic polymer/enzyme matrix in order to promote their bacteria-resistant qualities and suitability for use on burn victims.

*Pseudomonas* and *Staphylococci* infections emerged as the two most common pathogens in the Iran Burn Centre, where the study took place, and the authors evaluated their design of the bandage against these as well as fifteen other strains of bacteria. They conclude by proposing further studies into the combination of bactericidal polymers with bacteria-killing metal-oxide

nanoparticles in cotton fabrics. Whilst their current design does not meet the criteria for a susceptibility test, they are hopeful that further studies will reveal the clinical relevance of their design.

**More information:** Azadeh Basiri et al. NiO-/cotton- modified nanocomposite as a medication model for bacterial-related burn infections, *The Journal of The Textile Institute* (2016). [DOI: 10.1080/00405000.2016.1222863](https://doi.org/10.1080/00405000.2016.1222863)

Provided by Taylor & Francis

APA citation: Pre-treatment of bandages may improve the antibacterial properties of nanoparticles (2016, October 18) retrieved 17 October 2021 from <https://phys.org/news/2016-10-pre-treatment-bandages-antibacterial-properties-nanoparticles.html>

*This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.*