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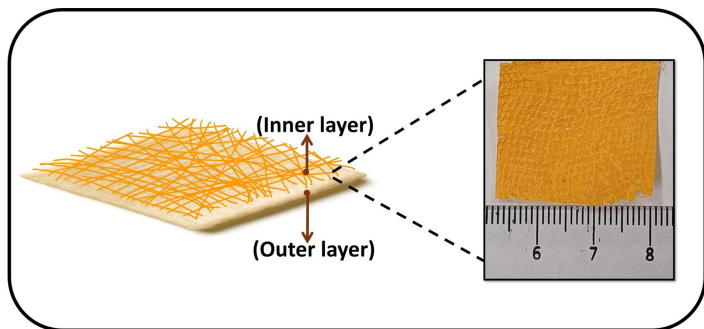
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NIT Rourkela engineers smart bandage for advanced wound care

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In comparison to the commonly used cotton gauze, the developed technology will cost around Rs 50-60



Researchers at the National Institute of Technology Rourkela (NIT Rourkela) have developed a smart wound dressing that prevents infections, minimises pain during removal, and promotes faster healing. In cases of injuries that require repeated dressing changes, patients usually suffer from the trauma and discomfort associated with them. The innovative wound

dressing developed by Prof. Prasoon Kumar, Assistant Professor, Department of Biotechnology and Medical Engineering, addresses this under-recognised challenge.

Due to its affordability, absorbency, and ease of usage, cotton gauze bandage is most commonly used for wound dressing. It is widely used to absorb blood and wound exudates and ointment applications.

However, these conventional dressings are not capable of preventing infections or managing discomfort. Another limitation of the traditional cotton gauze is that it sticks to the wound surface and damages newly formed tissue when dressing is changed. Additionally, it also increases the susceptibility to infections.

To address these limitations, NIT Rourkela researchers have developed a smart cotton gauze dressing that integrates chitosan-coated cotton gauze with an electrospun nanofibrous layer.

This layer is filled with curcumin, a natural compound known for its antimicrobial properties. Placed between the wound and gauze, this layer minimises adhesive's direct contact with the wound thereby reducing the risk of tissue damage during gauze removal.

These curcumin-filled nanofibers slowly release the medication onto the wound and maintain sustained drug delivery. This approach helps maintain a sterile wound environment while reducing dependence on repeated gauze changes and additional medications.

As the next step, the research team plans to file a patent for the developed technology and explore potential industry collaboration opportunities for clinical trials.

Speaking about the cost-effectiveness of the developed wound dressing Prof. Kumar said, "Cotton Gauze Bandage Roll (10 cm × 4 m) costs around Rs 30 and our advanced smart bandage of similar size will cost around Rs 50-60 when fabricated at a commercial scale"