

Nano rescues skin: Shrimp shell nanotech for wound healing and anti-aging face cream

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Nanoparticles containing chitosan have been shown to have effective antimicrobial activity against *Staphylococcus saprophyticus* and *Escherichia coli*. The materials could be used as a protective woundhealing material to avoid opportunistic infection as well as working to facilitate wound healing.

Chitosan is a natural, non-toxic and biodegradable, polysaccharide readily obtained from chitin, the main component of the shells of shrimp, lobster and the beak of the octopus and squid. Its <u>antimicrobial</u> <u>activity</u> is well known and has been exploited in dentistry to prevent caries and as preservative applications in food packaging. It has even been tested as an additive for antimicrobial textiles used in clothing for healthcare and other workers.

Now, Mihaela Leonida of Fairleigh Dickinson University, in Teaneck, New Jersey and colleagues writing in the *International Journal of Nano and Biomaterials* describe how they have prepared nanoparticles of chitosan that could have potential in preventing infection in wounds as well as enhancing the wound-healing process itself by stimulating skin cell growth.

The team made their chitosan nanoparticles (CNP) using an ionic gelation process with sodium tripolyphosphate. This process involves the formation of bonds between polymers strands, a so-called cross-linking process. Conducted in these conditions it precludes the need for complex preparative chemistry or toxic solvents. CNP can also be made in the



presence of copper and <u>silver ions</u>, known antimicrobial agents. The researchers' preliminary tests show the composite materials to have enhanced activity against two representative types of bacteria.

Understanding the mechanism of inhibition of bacteria by these particles may lead to the preparation of more effective <u>antibacterial agents</u>. The team has also demonstrated that the CNP have skin regenerative properties in tests on skin cell fibroblasts and <u>keratinocytes</u>, in the laboratory, which might even have implications for anti-aging skin care products.

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