

Self-sterilising microneedles being developed in Australia for safer vaccinations

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Researchers at the University of South Australia have developed a microneedle patch with antibacterial properties to make vaccinations much safer than traditional needles or other microneedles.

Professor Krasimir Vasilev, the lead researcher from the university's School of Engineering, said they incorporated antibacterial silver nano-

particles into the first generation microneedles to provide a sterilization mechanism.

"Injections are one of the most common health care procedures used for vaccinations and curative care around the world," Prof Vasilev said.

"But up to 40 per cent of injections are given with improperly sterilised syringes and needles, placing millions of people at risk of contracting a range of illnesses or diseases.

"Our silver-loaded microneedles have inherently potent [antibacterial properties](#) which inhibit the growth of pathogenic bacteria and reduce the chance of infection."

The study tested the antibacterial efficacy of silver-loaded microneedles against bacteria associated with common skin infections, such as Golden staph, and found that the silver-loaded [microneedle](#) patches created a 24-hour bacteria-free zone around the patch administration site, a feature unique to the new technology.

The 1 x 1 cm² vaccination [patch](#) is made up of 250 needles—each 700 micron in height and 400 micron in diameter—which pierce only the top layer of the skin without reaching the underlying nerves.

The microneedles are made from a biocompatible, water-soluble polymer that completely dissolve within one minute of application.

Prof Vasilev said the patches are a few years away from commercialisation but have they have begun the trial process. The study was published as a cover story in *Chemical Communications*.

Provided by The Lead

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