

New antibacterial coating for sutures could reduce infections after surgery

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Responding to an urgent need for better antibacterial coatings on surgical sutures, scientists are reporting the discovery of a new coating that is almost 1,000 times more effective than the most widely used commercial coating. Their report appears in ACS' journal *Langmuir*.

Professor Gregory Tew, who is from UMass-Amherst, and colleagues explain that infection at the site of surgical incisions is one of the most common post-surgical complications that keep patients hospitalized longer and boost [hospital bills](#). The most common antibiotic coating contains triclosan, but its use in many consumer products over the years has led to the emergence of strains of bacteria that shrug off its effects. Triclosan also can be absorbed into the body, raising concerns about possible [adverse health effects](#). Another downside to triclosan: It slows the growth of bacteria, but does not actually kill those already present. That's why the scientists turned to PAMBM, a new substance designed from naturally occurring [antimicrobial peptides](#) that can kill a wide range of bacteria. And because of the way it works, PAMBM has a very low chance of causing [bacterial resistance](#) and the emergence of so-called superbugs.

The report described laboratory tests in which PAMBM greatly reduced the amount of bacteria compared to triclosan. In a head-to-head test with triclosan-coated sutures, those coated with PAMBM were much more effective against bacteria. "As bacterial resistance to current agents continues to increase and with resistance to triclosan now documented, the discovery of new antimicrobial agents that remain active in

biomedical device coatings is essential," say the researchers.

More information: "New Bactericidal Surgical Suture Coating" Langmuir, 2012, 28 (33), pp 12134–12139. [DOI: 10.1021/la302732w](https://doi.org/10.1021/la302732w)

Abstract

This paper demonstrates the effectiveness of a new antimicrobial suture coating. An amphiphilic polymer, poly[(aminoethyl methacrylate)-co-(butyl methacrylate)] (PAMBM), inspired by antimicrobial peptides, was bactericidal against *S. aureus* in time-kill experiments. PAMBM was then evaluated in a variety of polymer blends using the Japanese Industrial Standard (JIS) method and showed excellent antimicrobial activity at a low concentration (0.5 wt %). Using a similar antimicrobial coating formula to commercial Vicryl Plus sutures, disk samples of the coating material containing PAMBM effectively killed bacteria (98% reduction at 0.75 wt %). Triclosan, the active ingredient in Vicryl Plus coatings, did not kill the bacteria. Further Kirby-Bauer assays of these disk samples showed an increasing zone of inhibition with increasing concentration of PAMBM. Finally, the PAMBM-containing coating was applied to sutures, and the morphology of the coating surface was characterized by SEM, along with Vicryl and uncoated sutures. The PAMBM-containing sutures killed bacteria more effectively (3 log₁₀ reduction at 2.4 wt %) than Vicryl Plus sutures (0.5 log₁₀ reduction).

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