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## Comparative study of novel in situ decorated porous chitosan-selenium scaffolds and porous chitosan-silver scaffolds towards antimicrobial wound dressing application

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**Abstract:** Dermal defects caused by trauma or disease are challenging to treat due to difficult-to-treat infections that impair wound healing. Due to the widespread emergence of drug-resistant bacteria and dwindling discoveries of new antibiotics, there is currently an urgent need to introduce novel antimicrobials effective against antibiotic-resistant bacteria without causing damage to host tissues. As selenium (Se) and silver (Ag) are known for their antimicrobial properties, we investigated the separate loading of these materials into porous chitosan/PVA (CS) scaffolds through a simple *in situ* deposition method to create two distinct wound dressing materials (CS-Se and CS-Ag). Scaffolds with Se nanostructures and scaffolds containing Ag nanostructures were characterized and their activities against *S. aureus* – (a Gram-positive bacterium), *E. coli* – (a Gram-negative bacterium) and Methicillin-Resistant *S. aureus* (MRSA) – (a multi-drug resistant bacterium) were compared. The release of Ag and Se *in vitro* was shown to depend strongly on the release medium used (deionised water, mammalian or bacterial culture

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