SUSTAINABLE ANTIMICROBIAL POLYMERIC FOOD PACKAGING AND ANTI-INFECTION MEDICAL CATHETER PREPARATION USING ANTIMICROBIAL PEPTIDE AND Ag+ NANORESERVOIR FORMULATIONS.

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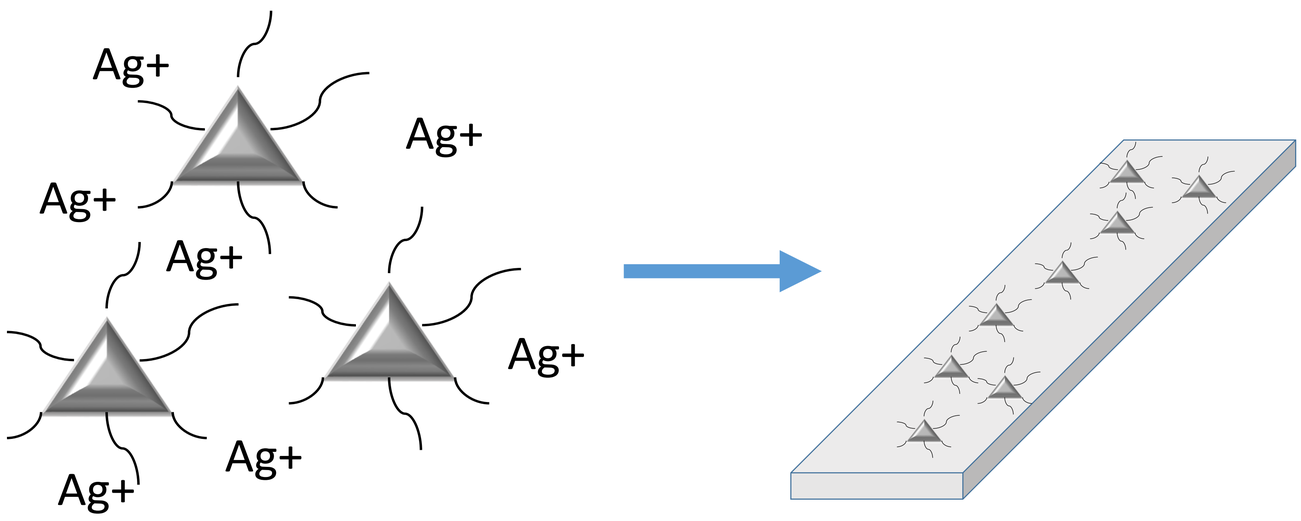
INTRODUCTION

New antimicrobial interventions are urgently required to combat rising global health and medical infection challenges. Here, an innovative antimicrobial technology, providing price competitive alternatives to antibiotics and readily integratable with currently technological systems is presented. Two cutting edge antimicrobial materials; antimicrobial peptides (AMPs) and triangular silver nanoplate (TSNPs) reservoirs for sustained Ag^{+} action, are incorporated within plastic and bioplastics for the provision of versatile effective antimicrobial action where current approaches fail. TSNP's are highly discrete, homogenous and readily functionisable Ag+ nanoreseviors that have a proven amenability for operation within in a wide range of bio-based settings.

TSNP Synthesis → TSNP Formulation → TSNP-AMP Functionaliza-tion → Polymer integration treatment → Evaluation of Antimicrobial activity → Evaluation of mechanical properties



RESULTS

CONCLUSIONS

- TSNP were successfully integrated within the polymer through a solvent casting method, conserving the structure and shape of the nanoplates.
- However, deep encapsulation of the nanoplates within the polymer (carried out by solvent casting) can prevent sufficient Ag+ release required for effective antimicrobial action. Thus, integration through a method that would allow the released Ag+ easier access to the polymer surface is explored.
- The use of calendering rolls, combined with a suitable TSNP formulation is currently being developed and is expected to provide promising results towards the achievement high performance antimicrobial plastics.

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