

Silver(I) coordination polymer meets chia seed mucilage based film – antimicrobial performance and evaluation of permeability trends through human skin *in vitro*

Autorzy

Sabina W. Jaros
Justyna Markieton
Magdalena Florek
Jarosław Król
Seeprarani Rath
Sesha Rajeswari Talluri
Nubul Albayati
Bożena Michniak-Kohn

Rok wydania

2026

Czasopismo

Dalton Transactions

Numer woluminu

55

Strony

2443-2451

DOI

10.1039/d5dt02494c

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Antimicrobial resistance is one of the critical threats, resulting in nearly 3500 deaths every day, jeopardizing the health system globally. This alarming issue demands urgent attention and action in the form of designing and generating new, effective disinfecting and therapeutic materials. Herein, we present a new chia seed-based film (CSM) and CSM-doped with therapeutic 1D coordination polymer $[\text{Ag}(\mu\text{-PTA})(\text{Df})(\text{H}_2\text{O})]_n \cdot 3n\text{H}_2\text{O}$ (**1**) (**composite1@CSM**). Both compound **1** and its **composite1@CSM** revealed a broad spectrum of antimicrobial action, with complete halting of the growth of clinically significant pathogenic microorganisms *E. coli*, *S. aureus*, and *C. albicans*. Simultaneously, *in vitro* drug permeation analysis of **1** using human cadaver skin as a membrane revealed the potential for topical delivery of antimicrobial compound **1** for localized action in the upper layers of the epidermis, specifically the stratum corneum, and the transdermal delivery of diclofenac sodium (a nonsteroidal anti-inflammatory drug, NSAID). This development not only opens the door to the exploration of Ag(i)-based coordination polymers as promising transdermal drug delivery systems, but it also significantly enhances the narrow field of therapeutic coordination polymers that exhibit synergistic effects of antimicrobial, anti-inflammatory, and demulcent action.

Adres publiczny

<http://dx.doi.org/10.1039/d5dt02494c>

Strona internetowa wydawcy

<https://www.rsc.org/>

Plik został wygenerowany dnia 2026-08-21 21:57:00

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/EGELxCl>.