TECHNOLOGY OFFER

NEW CATIONIC STEROID WITH ANTIMICROBIAL PROPERTIES METHOD AND USES THEREOF

The present invention relates to cationic steroid compounds of formula (I) and methods of obtaining them. The present invention further relates to the incorporation of such compounds in a polymeric matrix composition or a coating composition, as well as their use as antimicrobials.

KEYWORDS

Antibiotic

Antimicotic

Biofilm

Cathether

Surfactant

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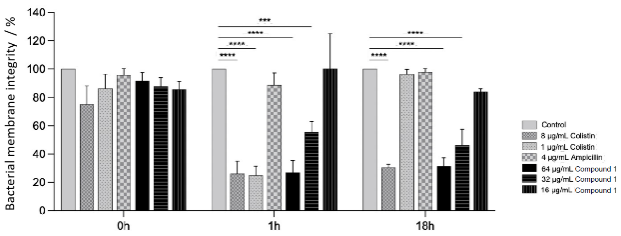
DESCRIPTION

Currently, multidrug-resistant (MDR) infections are one of the most worrisome threats, driving the search for new antimicrobials compounds. In 2015, in Europe, around 670000 infections were caused by antibiotic-resistant pathogens and 33000 deaths resulted from antibiotic-resistant infections.

The present invention provides an amphiphilic small-molecule with bactericidal and fungicidal activity. The compound is synthetized in scalable conditions from readily available and cheap building blocks.



The molecule shows significant biocidal activity against multidrug-resistant bacteria, including the ESKAPE pathogens, and fungi. Notably, the compound acts synergistically with amphotericin B and fluconazole against the reference *Candida albicans* strain. Significant dose-dependent disruption of bacterial membranes is observed upon treatment with the new cationic steroid. Polymeric coatings containing up to 1.5 % w/v cationic steroid sustain effective reduction of the formation of *Escherichia coli* biofilms in ureteral stents, in relevant hydrodynamic conditions.

ADVANTAGES & INNOVATIONS

One-step scalable synthesis starting from low-cost commercial building blocks; Antibacterial and antifungal activity with minimal inhibitory concentrations between 16 and 128 µg/mL; Retains antibiofilm activity when incorporated in polymeric coatings.

Antimicrobial therapeutics against veterinary and/or human pathogens; Antimicrobial coating or disinfection of medical devices; Mild detergent for emulsification of lipids; Aquaculture feed formulations for infectious disease control.

INTELLECTUAL PROPERTY RIGHTS

Patent status

International Patent Application via PCT WO2023105494

Priority date: 10.12.2021

Pending

STAGE OF DEVELOPMENT

TRL 3 – Experimental proof of concept

COOPERATION OPPORTUNITY

Licensing agreement.

R&D partnership.

RELEVANT PUBLICATIONS

Neves, Ana Rita; Freitas-Silva, Joana; Durães, Fernando; Silva, Elisabete R.; Rodrigues, Inês C.; Mergulhão, Filipe; Gomes, Marisa; et al. "Insights into the antimicrobial properties of a cationic steroid and antibiofilm performance in PDMS-based coatings to potentially treat urinary infections". Journal of Materials Chemistry B 11 36 (2023): 8697-8716. http://dx.doi.org/10.1039/d3tb01185b

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