

Title: The impact and therapeutic potential of antimicrobial textiles

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ABSTRACT (250-300 words)

In order to support the elevated market demand for the development of textiles with specific benefits for a healthy and safe lifestyle, several bioactive textiles with defined properties, including antimicrobial, antioxidant, anti-inflammatory, anti-odor, and anti-repellent, anti-ultraviolet (UV) radiation, have been proposed. Antimicrobial textiles, particularly, have received special interest considering the search for smart, protective textiles that also impact health and well-being. Although the incorporation of antimicrobials into textile material has been well succeeded, the addition of such components in textile clothing can influence the balance of the skin microbiota of the wearer. However, little is known about the impact of such antimicrobial textile-products on human skin microbiota. To address this issue, this present study highlights the main effects of antimicrobial textiles, *i.e.*, antibacterial, antifungal, and antiviral, on skin microbiota while driving future investigation to elucidate their putative clinical relevance and possible applications according to their impact on skin microbiota. Different antimicrobial textiles can provide protection against textile attack and colonization by microorganisms, biological degradation, discoloration, and unpleased odor both in the textile material and in humans. Such products can also be used to significantly decrease the propagation and consequently the transmission of several infectious diseases. According to their direct effects on the human skin microbiota, antimicrobial textiles can also find many biomedical applications, including 1) the prevention, control, and treatment of numerous cases of microbiota skin dysregulation (e.g. bacterial dysbiosis and superficial fungal infections; 2) antimicrobial wound dressings, where they can act as a barrier to prevent microbial invasion and colonization while at the same time stimulate skin regeneration; and 3) target the skin cancer microenvironment, acting as regulator of the skin microbiota while fight skin cancer cells.

BIOGRAPHY (100-150 words)

Cláudia S Oliveira has expertise in cell biology, microbiology, and medical biotechnology. She has been involved in the development of 3D bioengineered models to mimic human microenvironments with elevated complexity and regenerative properties to be used as an alternative to animal experimentation, disease models, and drug screening platforms. Currently, she is conducted several *in vitro* assays aiming to explore the main biological properties (antimicrobial, anti-biofilm, anti-inflammatory, and anti-cancer) of different plant extracts to be incorporated in textile materials. This research aims the development of more sustainable textiles presenting key bioactive compounds for specific skincare applications.

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