



## Abstract book of the XVIII National Meeting of the Portuguese Society of Chemistry



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*O Presidente da República*

**Title**

*Abstract book of the XVIII National Meeting of the Portuguese Society of Chemistry*

**Editors**

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## Peptide conjugates for the topical treatment of infected wounds

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Due to widespread multidrug-resistant (MDR) microbes, efficient treatments for infected wounds are being exhausted.<sup>1</sup> The symptoms of wound infection are consistent with local polymicrobial biofilms, which are difficult to eliminate and delay the healing process. The current standard of care requires oral antibiotics and other measures, often complex and distressing (e.g., amputations). A perfect treatment should promote both antimicrobial protection and fast tissue regeneration, to improve the inefficient healing in elderly people affected with, e.g., diabetes or venous/arterial insufficiency.<sup>2</sup>

Considering the above, we advance peptide conjugates as potential active pharmaceutical ingredients for topical formulations to tackle skin infections. Such conjugates are anticipated to concomitantly display antimicrobial and anti-biofilm action along with fast healing through, e.g., collagenesis-inducing effects. Promising results were obtained with chimeric peptides combining a *de novo* designed antimicrobial peptide sequence<sup>3</sup> with a cosmetic peptide, used as anti-aging, with ability to induce collagen production.<sup>4</sup> The best constructs exhibited: (i) antibacterial and anti-biofilm activity against Gram-positive and Gram-negative bacteria, including MDR clinical isolates; (iii) improved action against *S. aureus* (prevalent pathogen in chronically-infected wounds) in simulated wound fluid; and (v) antifungal activity.<sup>5</sup> The replacement of the antimicrobial peptide by an ionic liquid afforded a new conjugate, a peptide-ionic liquid construct, with broad-spectrum antibacterial activity, antifungal action, and collagen-inducing effect. These results will be shown alongside the most recent findings that provide deeper insight into the mode of action of the best conjugates.

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