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Antimicrobial peptide combinations against *Pseudomonas aeruginosa* and *Staphylococcus aureus*

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Today, we are facing a major challenge regarding the development of new strategies and the discovery of new compounds with effective antimicrobial outcomes. The emergence of resistance is a preoccupant health threat and conventional antibiotics are being rendered ineffective. Researchers are now focusing in alternatives, such as the discovery of new antimicrobials with different modes of action, and the combination of agents potentiating their efficacy. AMPs are an example of new antimicrobials with promising applications, since they have different and sometimes unspecific mechanisms of action compared to traditional antibiotics, reducing the chance of acquired resistance.

This work analyses AMP combinations against major pathogenic bacteria, *Pseudomonas aeruginosa* and *Staphylococcus aureus*, currently great contributors for resistance development and responsible for chronic infections, such as cystic fibrosis pneumonia. We present a screening of combinations of colistin with temporin A, citropin 1.1, tachyplesin I, lactoferricin B, magainin II and G10KHc, against these pathogens, including references and clinical isolate strains. Results show that most combinations have synergetic activities, which means that AMP combinations should be a viable way for the development of new antimicrobial treatments, thus reducing their toxicity and side effects, while maintaining efficacy. Some of the best combinations will be tested on biofilms of these bacteria, in order to test their prophylactic and therapeutic action against this different and more resilient mode of growth.

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