

Synergistic Effects between Membrane Active Peptides and Classical Antibiotics on Bacterial Membranes

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The occurrence of multidrug resistant pathogenic bacteria is increasingly threatening human health globally and may lead to a situation encountered in the preantibiotic era. In addition to the development of antimicrobials against novel targets, the identification of membrane active antimicrobial peptides (AMP) is regarded a valid and promising approach for the treatment of otherwise difficult to treat infections by antimicrobial resistant superbugs. They hold promise as complementary active drugs enhancing conventional antibiotics, yet possess such activity on their own as seen for polymyxins, of which colistin is regarded as one of the last resort antibiotics.

Our current work therefore aims at the identification and analysis of membrane-active peptides whose presence increase the uptake and efficacy of antibiotics. Elucidating their mechanisms of action when used in combination with classical antibiotics and their effect on bacterial membranes may lay the basis for the prediction of novel AMP circumventing resistance mechanisms.

We have therefore established artificial systems employing different membrane models to provide a comprehensive picture of the biophysically complex processes. High resolution techniques such as AFM, cryo-EM/ET and fluorescence microscopy will be used to study specific interactions.