A novel antibacterial peptide in the fight against AMR

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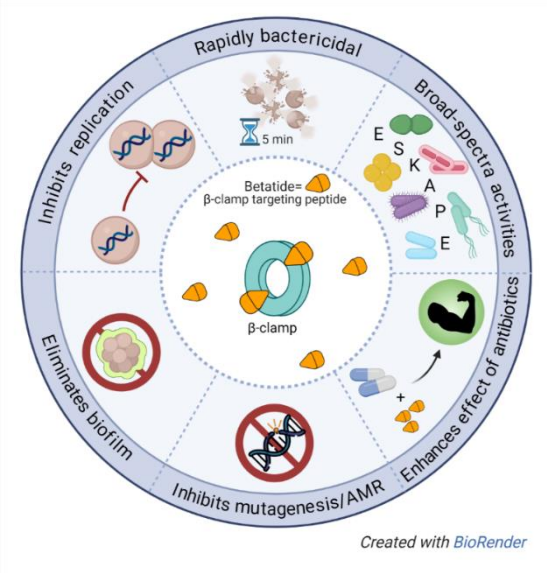
New antibiotics with new targets and mode of action are urgently needed as antimicrobial resistance (AMR) is increasing worldwide. A cell penetrating b-clamp targeting peptide (Betatide), inhibits replication in both G+ and G- bacteria, including multidrug resistant ESCAPE species. Further, bacteria have problems gaining resistance toward the peptide as it also inhibits mutagenesis (1-4).



An anticancer peptide was accidentally found to have antibacterial activities (1). This peptide is recently shown to have a favorable toxicity profile in a Phase I study (5). A modified version of this peptide, Betatide, has 8x increased antibacterial activity. It has additive effects when used in combination with other antibiotics and reduces the development of resistance against these. In addition, Betatide both inhibits formation of and eradicate existing biofilm, has low nephrotoxicity, long shelf life and is distributed to lungs when given intravenously.

Betatide irradicate both intracellular and extracellular bacteria (2), and in a mice model and in human co-cultures we have shown that Betatide can be used as a gel, ointment or drops in topical infections. Betatide does not affect epithelialization at >12x high doses than required to kill the bacteria. Further, we have shown in a rat model that Betatide can be used as an additive in orthotopic cement to prevent prosthetic joint infections alone or together with the currently used antibiotic, gentamycin (4). Betatide has antibacterial activity against multiple microbes causing lung infections, as well as against *Escherichia coli* and *Staphylococcus aureus* that often cause bacteremia in humans. Betatide efficiently kills bacteria in whole blood, and intravenously administered peptide was able to reduce the bacterial load in lungs using a *Streptococcus pneumonia* lung infection mice model. A preliminary toxicity study supported that daily infusion of Betatide in rats for 7 days was well tolerated. Current efforts are on bacteraemia and sepsis models in animals, new IP developments and testing Betatide with oral delivery. Betatide may be used broadly, in combination or alone and could have the potential to make a huge impact on the issues of concern for AMR.

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