Optimised bacterial production and characterisation of natural antimicrobial peptides with potential application in agriculture

A group of antimicrobial (antibiotic) peptides, the tyrocidines from soil bacteria, was identified as potential nature-friendly biocides. The optimised production of tyrocidines in bacterial cultures delivered appreciable amounts of these high value peptides. A novel mathematical model of the production was generated and applied to produce tailored peptide subsets. Tailored production eased purification of six peptides, which were then biophysically characterised in different solvent systems that were utilised in formulations. These peptides alone and in combination have potent antifungal and antibacterial activities, while they were not toxic towards beneficial insects such as bees. There is also a limited potential for resistance towards the tyrocidines due to their rapid membranolytic activity and alternate cellular targets.

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