

Antibacterial Activity of New Aurein Analogs Containing Lysine and Fluorinated Phenylalanine

Veronica Nemska

University of Chemical Technology and Metallurgy, 8, Kliment Ohridski Blvd., Sofia, Bulgaria

Nora Angelova

University of Chemical Technology and Metallurgy, 8, Kliment Ohridski Blvd., Sofia, Bulgaria

Tsvetelina Foteva

University of Chemical Technology and Metallurgy, 8, Kliment Ohridski Blvd., Sofia, Bulgaria

Nelly Georgieva

University of Chemical Technology and Metallurgy, 8, Kliment Ohridski Blvd., Sofia, Bulgaria

Dancho Danalev

University of Chemical Technology and Metallurgy, 8, Kliment Ohridski Blvd., Sofia, Bulgaria

Emilia Naydenova

University of Chemical Technology and Metallurgy, 8, Kliment Ohridski Blvd., Sofia, Bulgaria

Aurein 1.2 (GLFDIIKKIAESF-NH₂) is a short-chain, multifunctional antimicrobial peptide, primarily isolated from the Australian bell frog *Litoria aurea*. However, the absence of strong activity failed to provide it with a competitive advantage for further use as a therapeutic agent. This necessitates a modification of the design of the peptide structure to improve its action and efficiency. The purpose of the present study was to investigate the antimicrobial activity of Aurein 1.2 analogs, substituted with Lys residue in position 4 and 4-fluorophenylalanine residue in positions 3 and 13 solely and in combination, against *Escherichia coli* NBIMCC 8785 and *Bacillus subtilis* NBIMCC 3562. The analogs were obtained via solid-phase peptide synthesis. Their antibacterial activity was assessed by measuring the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) against both strains. The MIC was determined using the broth microdilution method, while the MBC was assessed through the plate count method. The modifications significantly increased the antibacterial effect of Aurein 1.2, with stronger action observed against *B. subtilis* NBIMCC 3562. Among the analogs tested, the most potent activity against both strains is observed with the analog, containing Lys residue in position 4 and 4-fluorophenylalanine residue in position 13.

Acknowledgements: This study is funded by the European Union-NextGenerationEU, through the National Recovery and Resilience Plan of the Republic of Bulgaria, project N° BG-RRP-2.004.0002, "BiOrgaMCT".