Stability and Antimicrobial Activity of Synthetic Peptides Derived from Lactoferricin B20-30

T.I. Pajpanova[1], I.P. Bogdanov[1], M. Lambev[2], G.I. Ivanov[1], S. Mihaylova[2], V. Sándor[3], K. Kaliková[4], N.T. Tzvetkov[1] & F. Kilar[3]

[1]Institute of Molecular Biology "Roumen Tsanev", Bulgarian Academy of Sciences, Acad. G. Bonchev str.Bl. 21, Sofia 1113, Bulgaria; [2]Medical College, Medical University "Prof. Dr. Paraskev Stoyanov", 55 Marin Drinov str., Varna 9002, Bulgaria; [3]Institute of Bioanalysis, Faculty of Medicine, University of Pécs, Honvéd str 1, 7624 Pécs, Hungary; [4]Department of Physical and Macromolecular Chemistry, Faculty of Science, Charles University, Hlavova 8, 12800 Prague, Czech Republic

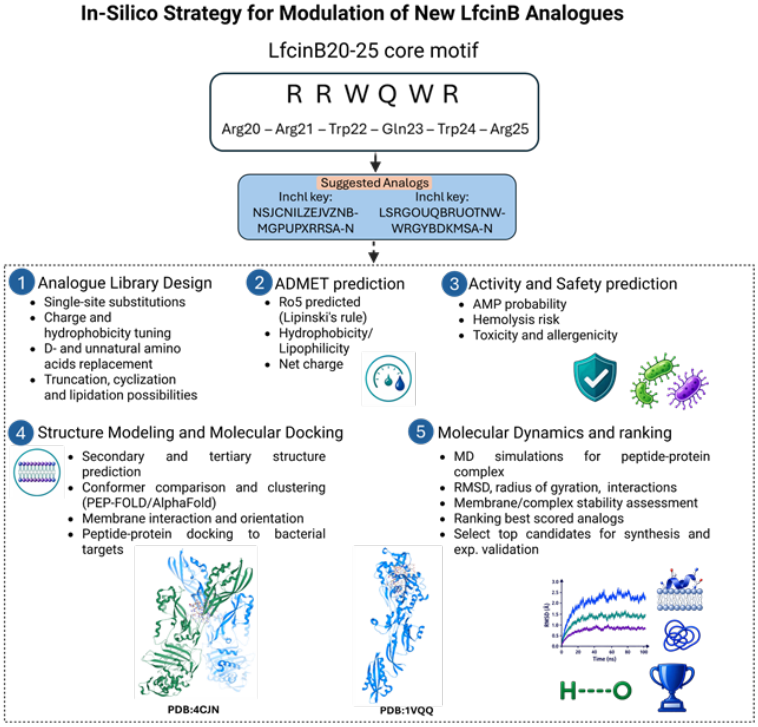
***Corresponding author:** tamara@bio21.bas.bg
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With the increasing prevalence of multidrug-resistant (MDR) bacteria, the design of new types of drugs, including synthetic antimicrobial peptides (AMPs), is highly urgent. Antimicrobial peptides are effective and selective for bacteria, i.e., are not toxic to mammalian cells.

Numerous natural AMPs, such as lactoferricin B (LfcinB) exhibit a cationic amphipathic helical conformation, wherein cationic amino acids such as lysine and arginine play pivotal role in antimicrobial activity due to their capacity to electrostatically interact with negatively charged bacterial membranes. However, these residues also constitute the vulnerable spot of many cationic AMPs, rendering them susceptible to proteolytic digestion.

In our previous studies, we developed and reported a series of short non-toxic LfcnB20-25 hexapeptides composed of various natural and unnatural amino acid residues, demonstrating promising antibacterial activity, as well as high hydrolytic stability [1,2].

Recently, we have created a new series of 12 hexapeptide analogues of ^{20}**RRWQWR**^{25} and 1 heptapeptide analogue of ^{20}**RRWQWRM**^{26}, based on the concept that cationic charge and lipophilicity are major factors determining the antibacterial activity of short cationic peptides, and modifications with unnatural and D-isomeric acids will potentiate their activity and stability. In-silico drug design was applied also.



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References

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