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Strategies for development of antimicrobial peptides and proteins

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Due to the several unresolved challenges of antimicrobial peptide and protein agents including low bioavailability, high manufacturing cost and toxicity concerning their delivery to the target site, their potential has yet to be concerned [1].

Novel chemical modification approaches and novel formulations within the limits of nanotechnology offer several opportunities to overcome these barriers. However, these approaches hide several risks. To avoid these risks and control the quality of the final product, this study presents a Quality by Design (QbD) based peptide and protein modification and formulation design.

Evaluation of the potential risks in the peptide PEGylation process through the example of PGLa as well as, the effective delivery of proteins with antimicrobial activity was accomplished through the example of lysozyme in a novel formulation strategy as layer-by-layer polyelectrolyte core-shell nanoparticle [2]. The precipitation method was applied for the formulation of core and the second step was the layering of polymers according to the factorial design. The samples were lyophilized and then analytical investigations were performed such as e.g. measurement of FTIR and zeta potential. The particle size, encapsulation efficiency, content of α -helix structure and enzyme activity were the optimization parameters.

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References:

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