

Antimicrobial Peptides: A Mechanistic Study on the Influence of the Antimicrobial Peptide LL-37 on the Bacteriophage Phi6

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Enveloped viruses have repeatedly been a social and economic problem. For many enveloped viruses, there are currently no vaccines available. Our immune system has evolved its own defense against pathogens with antimicrobial peptides playing a major role. Nevertheless, there need to be active measures to counter infections with viruses. LL-37 is one of the most studied human antimicrobial peptides. Still its mechanism of action is not yet fully understood. In this study, the effect on the infectivity and structure of LL-37 on the bacteriophage Phi6 has been investigated using SAXS and DLS as main analytical methods. The insertion of LL-37 into the lipid membrane of the virus with subsequent separation between envelope and nucleocapsid leading to significant loss in infectivity was observed. Notably, the nucleocapsid of the virus appears to remain unchanged. Understanding the fundamental mechanism of the workings of our immune system is crucial for furthering medical sciences. These insights into the working of LL-37 help to simplify decisions made in the process of developing new antiviral medicine by explaining one of the mechanisms used by nature, and encouraging scientists to mimic and improve on methods that have been proven to work.

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