

Studies of three-dimensional Structure of Cathelin-Related Antimicrobial Peptide (CRAMP) in Trifluoroethanol containing aqueous Solution

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CRAMP was identified as a putative antimicrobial peptide from a cDNA clone isolated from a mouse femoral marrow cells as a member of cathelicidin-related antimicrobial peptides. CRAMP showed potent antimicrobial activities against Gram-positive and Gram-negative bacterial cells without hemolytic activity. CRAMP caused an immediate permeabilization of the inner membrane of *E.coli*. Antiserum against CRAMP represents the first antibiotic peptide found in cells of myeloid lineage in the mouse. In this study, tertiary structure of the CRAMP in 50% trifluoroethanol (TFE)-containing aqueous solution has been studied by CD and NMR spectroscopy. CD spectra analysis revealed that CRAMP forms an amphipathic α -helical conformation in a membrane-mimicking environment. Among the 38-amino acid of CRAMP, residues from 16 to 33 were found to have lytic activity against bacterial cells without hemolytic activity. The tertiary structure of CRAMP from residue 2 to 11 and from 19 to 34 displays amphiphilic α -helical structure and there is a flexible region from 12 to 18 in between. Thus, this amphiphilic α -helical structure from residue 9 to 34 plays important roles on antibiotic activities of CRAMP.