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Proline Effect on Structure and Activity of Antimicrobial Peptides

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Structure and activity of a helical antimicrobial peptide with a central proline (P14) and its alanine derivative (P14A) were investigated by NMR spectroscopy and biological assay. Chemical shift analysis showed that both of the peptides formed curved helix and P14 showed diminished stability near proline due to hindrance of hydrogen bonding by proline. Hydrogen exchange data showed remarkable difference in the location of stable amide proton. P14 showed stable region in the concave side of the curved helix, but P14A showed stable region in the central turn of the helix. Both P14 and P14A showed similar antibacterial activity to gram-positive and gram-negative bacteria with little hemolytic activity. However, antifungal activity was only seen in P14. This stable helical kink may play an important role in antifungal activity.