

# “To Beta or Not to Beta”

## Synthesis, Structures, & Biological Investigations of $\beta$ -Peptides

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$\beta$ -Peptides differ from their natural counterparts, the  $\alpha$ -peptides, by having a  $\text{CH}_2$ -group inserted into each and every amino acid residue, either between the CO- and the  $\alpha$ -carbon ( $\beta^3$ ) or between the  $\alpha$ -carbon and the nitrogen ( $\beta^2$ ). In spite of the increased number of possible conformers,  $\beta$ -peptides form secondary structures (helices, turns, sheets) with chain lengths as short as four residues. Furthermore, they are stable to degrading and metabolising enzymes in living organisms and can be designed to mimic key structural and activity-related features of natural peptides or proteins. Details of the preparation of  $\beta$ -amino acids and  $\beta$ -peptides, their structures and biological properties will be described.

