Poly-L-proline is one of a family of poly-imino acids which can exist in two distinct conformations characterised by differences in optical rotation and other properties. Poly-L-proline II, stable in acid media, has *trans*-peptide groups and forms left-handed helices. We have now found poly-L-proline I, which is stable in alcoholic media, to have the unusual *cis*-peptide configuration and to form right-handed helices. This result explains the observed differences in optical rotation of the two forms, and the need for acid catalysis of the isomerisation process.

We have also studied crystalline complexes of poly-L-proline I with small amounts of formic, acetic, and propionic acids. These complexes were found to have tetragonal packing of poly-L-proline I chains in contrast to the hexagonal packing of the dry form. Incorporation of a greater amount of propionic acid leads to the formation of another complex consisting of alternate layers of propionic acid and of poly-L-proline chains with a conformation slightly different from that of the dry form.

Crystalline and oriented complexes of poly-L-proline II with water and *m*-cresol have also been obtained, and investigations of their structures are in progress.

X-ray studies of polypeptides of ordered amino-acid sequence related to collagen

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Collagen, the main protein of bone, skin, and other connective tissue, is generally believed to have a three-stranded helical structure. However, the elucidation of structural details, including the mode of interchain hydrogen bonding, is made difficult by the complexity of the amino-acid sequence of collagen and the limited detail of its X-ray pattern. X-ray investigations were therefore undertaken of several possible polypeptide models for collagen with, like the protein, every third residue glycine and a large proportion of imino acids.

Poly-(L-prolyl-glycyl-glycine) has been found to form helices which resemble the individual strands of collagen, but do not coil about each other. Both poly (L-prolyl-L-alanyl-glycine) and poly-(L-prolyl-glycyl-O-acetyl-hydroxyproline) show X-ray patterns resembling that of collagen, but too diffuse for detailed analysis. Poly-(L-prolyl-glycyl-L-proline), however, shows an X-ray pattern which has all the main features of the collagen pattern, but is appreciably sharper and more detailed. Analysis of the pattern shows the polypeptide to have the same helical parameters as have been found for collagen, but only one of the structures that have been proposed for the protein, collagen II, is compatible with the observed X-ray spacings. These results indicate that neither hydroxyproline nor more than one interchain hydrogen bond per tripeptide is required for the formation of a collagen-like structure.