

Self-ordering in solution of a novel polyamidoaminoacid with a chiral arginine side chain

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Polyamidoaminoacids (PAAC) are a new class of bioinspired polymers obtained by polyaddition of selected aminoacids with N,N'-methylenebisacrylamide. Here we report some results obtained for the first such polymer, ARGO7, obtained with arginine stereoisomers. The CD spectra of the ARGO7 isomers showed an important and unexpected indication of a self-ordered pH-dependent secondary structure that was however nearly unaffected by temperature, ionic strength and denaturing agents. Theoretical modeling studies of L-ARGO7 carried out with classical Molecular Dynamical simulations showed that it assumed a folded structure with a transoid arrangement of the main chain reminiscent of the protein hairpin motif due to the intramolecular interactions. Torsion angles along the backbone showed a similar distribution at pH 6 and 14 consistent with the similarity of the CD spectra from pH 6 onwards.