

Molecular Mechanism of Protein Folding

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The polypeptide chain of a protein, synthesized in a biological cell, folds into its specific, native three-dimensional structure that exerts its biological activity. This process of the protein to form the native three-dimensional structure is called protein folding. The protein folding is not only a biological but also physicochemical process, determined solely by the primary sequence of amino acid residues of the protein, and the elucidation of molecular mechanism of protein folding from physicochemical perspectives is thus a very basic problem of biophysics and bio-molecular sciences. In this lecture, I will talk about the following two topics that have recently been worked out in my laboratory. (1) The analysis of the transition-state structure of protein folding by experiments and molecular simulations; and (2) the molecular action mechanism of a molecular chaperone that mediates protein folding in a biological cell.

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