

MOLECULAR CHAPERONS: CHAPERONES AND CHAPERONINS

Summary

Proteins must be folded into their correct three-dimensional conformation in order to attain biological function. Conversely, protein aggregation and misfolding are primary contributors to many devastating “conformational” diseases. Proteins are synthesized and folded continuously. The last of these processes is greatly assisted by molecular chaperones. They are a group of structurally diverse and mechanistically distinct proteins that either promote folding or prevent the aggregation of other proteins.

Proteins that can be classified as molecular chaperones can be divided into two groups: (a) ribosome-associated chaperons responsible for co-translational folding of polypeptides and (b) cytoplasmic molecular chaperones including Hsp90, Hsp70/Hsp40 and chaperonin CCT in eukaryotic cells. Prokaryotic cells possess DnaK/DnaJ system and GroEL/GroES, respectively. This review focuses on the emerging role of molecular chaperones in protein quality control in eukaryotic and prokaryotic cells.