

## **Molecular Origami: the delicate art of protein folding and misfolding and its relevance to health and disease**

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Achieving correct protein folding and quality control is essential for normal cellular function. The accumulation of misfolded proteins is emerging as central to a wide range of disease states, including many neurodegenerative disorders such as Huntington's and Prion Disease. Molecular chaperones are a diverse family of enzymes that monitor and maintain all aspects of protein homeostasis. The role of chaperones in protein quality control functions will be discussed.

Chaperones assist the folding of newly translated and stress-denatured proteins, as well as affects protein quality control. A stress-inducible chaperone network protects cells from environmental stress and assists quality control. These chaperones also communicate with the ubiquitin-proteasome pathway to clear misfolded proteins from the cell. Protein quality control in the eukaryotic cytosol relies on the sequestration of misfolded cytosolic proteins in specific quality control compartments. Our studies of chaperone function provide a framework to understand the link between protein misfolding and human disease.