
**Seminar 1**

# The Role of Molecular Chaperones in Preventing Protein Misfolding and Aggregation Related to Neurodegenerative Diseases

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## Abstract

Many neurodegenerative diseases including Parkinson's disease, Alzheimer's disease, Prion's disease, Huntington's disease, and ALS share abnormal folding of potentially cytotoxic protein species associated with degeneration and death of specific neuronal populations. cellular protein homeostasis (proteostasis) is essential for the retention of the functionality of the proteome and, ultimately, of cells. In order to maintain cellular protein homeostasis, neurons have developed an intrinsic protein quality control system as a strategy to counteract protein aggregation and their toxicity. Heat shock proteins are an essential component for regulating protein quality control and potentially contribute to protein folding, preventing protein aggregation and disaggregation in several neurodegenerative diseases. Therefore, molecular chaperones are considered an exciting therapeutic target. The focus of this presentation is on the potential importance of different heat shock proteins in neurodegenerative diseases in order to understand their mechanisms in protecting neurons from protein aggregation and their toxic effects.

**Keywords**: Neurodegenerative diseases, Molecular chaperones, Protein aggregation, Misfolded protein, Protein toxicity