

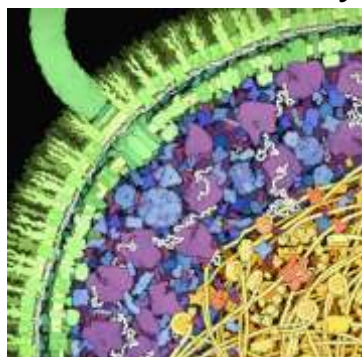
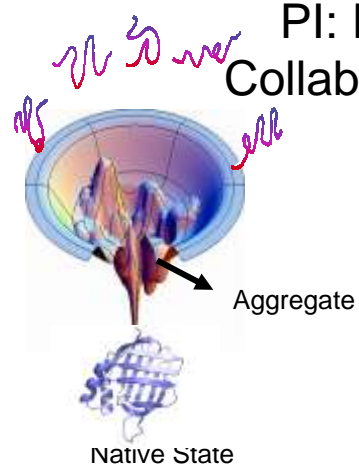


Protein Folding by Molecular Chaperone Hsp60 *in vitro*

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The inability of proteins to fold properly could lead to many pathological consequences. Protein folding is an essential process that can occur spontaneously in dilute solutions, but requires assistance inside the cell. Due to the complex interior of the cell, proteins are prone to misfold and aggregate. Molecular chaperones are a specialized family of proteins that help assist with the folding of proteins. In the Gierasch lab we are interested in determining whether the bacterial chaperonin GroEL with its co-chaperonin GroES, help with the folding of the model protein: cellular retinoic acid binding protein 1 (CRABP1). Our initial studies are carried out *in vitro* by adding various CRABP1 mutants to a solution containing chaperone molecules and then pulling down the chaperones by immunoprecipitation.

In vitro studies help dissect information about the fundamental mechanisms of protein folding. Once we know this, we can proceed to study how proteins fold *in vivo*, and have a better understanding of misfolding-based diseases such as Alzheimer's.

Figure 1. Folding funnel for Murine (*Mus musculus*) Cellular Retinoic Acid Binding Protein I. PDB IDs 1CBI and 1CBR

Figure 2. A cross-section of a small portion of an *Escherichia coli* cell. Drawing by David S. Goodsell

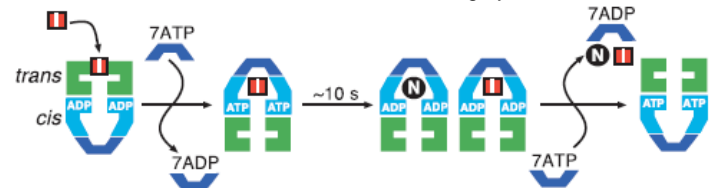


Figure 3. GroEL/S folding cycle.

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