

LECTURE #3: CHAPERONES AND PROTEIN FOLDING *IN VIVO*

1. Overview of the issues
 - Roles of chaperones, chaperonins & their cofactors
 - Promoting protein folding
 - Preventing protein aggregation
 - Assembly and disassembly of oligomeric proteins
 - Related escorts, guides, templates and scaffolds
 - Protein translocation
 - Formation and dissociation of protein complexes
2. The function of “heat shock” (stress-induced) proteins
 - Hsp70/DnaK
 - Hsp40/DnaJ
 - Co-factors
 - GrpE
 - Hip and Hop
 - Ribosomes and ribosome-associated factors
 - Hsp90/HtpG
 - Hsp104/Clp’s
3. The function of “cages” (chaperonins) in protein folding
 - GroEL and GroES in bacteria
 - Hsp60 and Hsp10 in mitochondria (and chloroplasts)
 - TCP complexes in eukaryotic cytosol (“TriC’s are not just for kids”)
4. Scaffolds and assembly factors
 - Formation of supramolecular structures
 - Viral capsid assembly
 - Accessory factors
 - Peptidylprolyl-*cis*, *trans*-isomerases
 - Protein disulfide bond formation pathways
 - Protein-disulfide isomerase
5. The prion conundrum
 - Amyloid fibrils