

Molecular chaperones: nanomachines involved in proteostasis

José M. Valpuesta

Centro Nacional de Biotecnología (CNB-CSIC). Darwin 3. 28049 Madrid. Spain.

Most cell processes are executed by sets of proteins that work like molecular machines in a coordinated manner, thus acting as an assembly line and making the process more efficient. One such assembly line is that formed by molecular chaperones, a group of proteins involved in protein homeostasis (proteostasis)—the balance of protein synthesis, folding, trafficking, assembly, and degradation—, which is essential for correct cellular function. Impaired proteostasis occurs in aging and is associated with several human diseases. One of the most important chaperones is the heat shock protein 70 (Hsp70), which has an essential role in protein folding, disaggregation, and degradation (1,2). These processes are carried out through the transient formation of complexes between Hsp70 and different cochaperones. Hsp70 is a nanomachine that uses chemical energy to undergo a large conformational change which, in conjunction with different cochaperones, is used for many different purposes. The talk will describe some examples

1. Zuiderweg ER, Hightower LE, Gestwicki JE: The remarkable multivalency of the Hsp70 chaperones. *Cell Stress Chaperones*. 2017; 22(2): 173–189.

2.- Fernández-Fernández MR, Valpuesta JM. Hsp70 chaperone: a master player in protein homeostasis. *Hsp70 chaperone: a master player in protein homeostasis*. *F1000Res*. 2018 Sep 19;7:F1000 Faculty Rev-1497. doi: 10.12688/f1000research.15528.1.