**Regulation of Proteasome Homeostasis**

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The major protease responsible for the degradation of misfolded proteins is the proteasome, a multisubunit complex consisting of a core particle (CP) to which the regulatory particle (RP) and different accessory proteins can bind. In the context of quality control in proteasome function, we identified a conserved HEAT-like repeat protein, namely Blm10. Our studies in yeast showed that Blm10 acts as a scaffold protein during the assembly of proteasome core particles and binds inappropriately opened CP which would otherwise admit uncontrolled access to the proteolytic cavity. Currently, we are investigating a possible function of Blm10 as an adaptor protein in nucleocytoplasmic transport of CP.

CP are primarily nuclear in proliferating yeast cells, but are sequestered into motile cytosolic clusters (MCC) in non-dividing cells. These clusters resolve rapidly when cells resume proliferation. We found that not only the sequestration of CP into MCC depends on Blm10, but also the uptake of CP back into the nucleus upon the resumption of cell growth. Since precursor complexes of CP are not available in non-dividing yeast cells and pre-assembled CP are not recognized by import receptors, a protein is required that acts as an adaptor for nuclear import of pre-assembled CP. Therefore, we propose that Blm10 shuttles pre-assembled CP into the nucleus, allowing there rapid reactivation of proteasomal proteolysis.

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