Co-translational assembly of proteasome subunits in NOT1-containing assemblysomes

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Abstract

The assembly of large multimeric complexes in the crowded cytoplasm is challenging. Here we reveal a mechanism that ensures accurate production of the yeast proteasome, involving ribosome pausing and co-translational assembly of Rpt1 and Rpt2. Interaction of nascent Rpt1 and Rpt2 then lifts ribosome pausing. We show that the N-terminal disordered domain of Rpt1 is required to ensure efficient ribosome pausing and association of nascent Rpt1 protein complexes into heavy particles, wherein the nascent protein complexes escape ribosome quality control. Immunofluorescence and in situ hybridization studies indicate that Rpt1- and Rpt2-encoding messenger RNAs co-localize in these particles that contain, and are dependent on, Not1, the scaffold of the Ccr4-Not complex. We refer to these particles as Not1-containing assemblysomes, as they are smaller than and distinct from other RNA granules such as stress granules and GW- or P-bodies. Synthesis of Rpt1 with ribosome pausing and Not1-containing assemblysome induction is conserved from yeast to human cells.

Reference


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Figure 4