

セミナーのお知らせ

Investigating the flux of newly synthesized proteins through the network of co-translationally acting factors

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場所：薬学部A館2階第2会議室（エレベーター側）



Protein synthesis integrates multiple tightly regulated mechanisms ensuring that nascent polypeptide chains are correctly processed, targeted and folded. These include co-translationally acting factors, some of which bind ribosomes, that mediate spatially and temporally orchestrated protein maturation steps, and mRNA-encoded local translation speed variations which appear to guide these processes. We use ribosome profiling to dissect co-translational interactions of nascent chains involved in protein maturation. In *E. coli*, the SRP selectively targets inner membrane proteins to the membrane, whereas the chaperone trigger factor (TF) associates primarily with cytosolic, periplasmic and outer membrane proteins, indicating nascent chains are triaged between SRP and TF pathways. The Hsp70 chaperone DnaK interacts in concerted action with TF, typically with longer nascent chains and reflecting domain boundaries of the emerged nascent chains. We also find evidence that assembly of protein complexes initiates co-translationally once the domain interfaces of the interacting polypeptides are exposed. The organization of the subunit-encoding genes in operons enhances the efficiency of assembly and reflects the directionality of co-translational interactions.

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2. Shieh YW, Minguez P, Bork P, Auburger JJ, Guilbride DL, Kramer G, Bukau B. Operon structure and cotranslational subunit association direct protein assembly in bacteria. *Science* Nov 6;350(6261):678-80. (2015)
3. Kramer G, Guilbride DL, Bukau B. Cell Biology. Finding nascent proteins the right home. *Science* Apr 10;348(6231):182-3. doi: 10.1126/science.aab1335. (2015)

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