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Ribosome recycling is catalyzed by RRF which moves inter-subunits space like tRNA using the energy of GTP

Akira Kaji

University of Pennsylvania, USA

Abstract

Ribosome recycling is the fourth step of protein synthesis. It is the step where ribosomes which completed one round of translation will be "recycled" to begin a new round of translation on a new mRNA. In bacteria, there is ribosome recycling factor (RRF) to catalyze this step. This factor has near perfect structural similarity to tRNA. It binds to A/P site of the ribosome. RRF moves through the inter-subunits space of ribosomes in a similar fashion to tRNA justifying RRF's structural similarity to tRNA. GTP is used to convert the RRF configuration of domain II from IIa to IIb as well as moving RRF from its initial binding site to the position closer to the P site. When RRF reaches the P-site, it splits 70S ribosomes into subunits. The correct order of events are: 1) release of tRNA, 2) release of mRNA, 3) followed by the splitting of the 70S ribosome of the post-termination complex (PoTC). Our recent evidence show that the behavior of ribosome at the termination triplet toward RRF is strongly influenced by near-by Shine Dalgarno Sequence. The earlier wrong concept that RRF splits ribosomes but does not release mRNA was now corrected using ORF of various lengths expressed *in vivo*. The existing confusion about the nature of PoTC is resolved by the use of cryo-electron microscopy accompanied by biochemical characterization of the complex. The ribosome of PoTC has one tRNA at the P/E or P/P site with mRNA.

Biography

Akira Kaji has completed his Ph.D in 1958 at The Johns Hopkins University and did postdoctoral studies from various places including the Rockefeller Institute in New York. He is a professor of Microbiology at Univ. of Pennsylvania. He has published more than 200 papers in reputed journals.