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TITLE

Ribosome Recycling in Prokaryotes and Eukaryotes; Good Target of Anti-fungal and Anti-bacterial Agents.

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Protein synthesis consists of four steps; initiation, elongation, termination and recycling. The fourth step was discovered by us is essential for life. It is the step where spent ribosomes, mRNA and tRNA are recycled for the next round of translation. After the termination of protein synthesis, the completed peptide chain is released from tRNA and the complex consisting of mRNA, ribosomes, and tRNA remains. This complex is called post-termination complex (PoTC). For recycling, the PoTC has to be disassembled into its components. For the recycling in prokaryotes, a dedicated factor called ribosome recycling factor (RRF) discovered by us is involved together with EF-G (a factor known to move ribosomes on mRNA during the elongation step). We will show an intermediate of disassembly observed with cryo-electron microscopy. Since humans have no RRF in cytoplasm, this can be a good target of anti-bacterial agents. In fungi, we showed that eEF3, a yeast specific elongation factor and ATP is solely responsible for this step. In this talk, we show that the disassembly occurs in step-wise. We humans do not have equivalent of eEF3 and do recycling in yet unknown way without involving eEF3. Therefore it is good target for antifungal agents. This is supported by CBRI.

Biography

Akira Kaji has made three important discoveries. 1) Binding of specific tRNA to the complex of mRNA/ ribosome. This finding was essential for determination of genetic code. 2) Discovery of Leucyl/ Phenylalanyl tRNA(Leu/Phe) protein transferase in prokaryotes and arginyl tRNA(ATE1) protein transferase in eukaryotes which are very crucial in post-translational modification of proteins. 3) Ribosome recycling in prokaryotes and eukaryotes. This fourth step of protein synthesis is essential for the fundamental reaction of life. Akira Kaji is a professor of University of Pennsylvania. Hideko Kaji is a professor at Thomas Jefferson University.