Antimicrobials, Multiple Drug Resistance & Antibiotics Resistance

4th International Conference on Antibiotics R&D, B2B

April 20-21, 2018 Las Vegas, USA



Akira Kaji

University of Pennsylvania, USA

The major action of Ribosome Recycling Factor (RRF) is to release mRNA from spent ribosomes- Use of this reaction for quick screening of specific antibiotic against RRF

Protein synthesis has four steps, initiation, elongation of peptide chain, termination and the recycling of the spent ribosomes, mRNA and tRNA. The last step was discovered by our laboratories and catalyzed by a unique protein called ribosome recycling factor (RRF). The recycling step consists of three reactions, release of mRNA, tRNA and splitting of ribosomes. With the use of fluorescent labeled mRNA similar to the natural mRNA and labeled tRNA, we demonstrate *in vitro* that the major action of RRF is to release of mRNA and not the splitting of ribosomes into subunits. This corrects the general misconception that the major action of RRF is to split the ribosomes into subunits. The order of events with the naturally occurring substrate of RRF, the chain of events is release of tRNA, mRNA followed by the splitting of ribosomes. The release of mRNA is not dependent on the splitting of ribosomes. The *in vitro* results are supported by *in vivo* experiments where we used the translational coupling followed by the reporter gene expression (beta galactosidase expression). Using the basic reaction of RRF, release of ribosomes from mRNA, we developed a new screening system for the inhibitor of RRF. In this system, the inhibition of RRF reaction, makes ribosome stay on the mRNA at the termination codon, but start translating downstream which is linked to GFP. We show that this screening method functions by the use of known specific inhibitor of RRF, low concentration of fusidic acid. The assay method is simple and can be performed in 96 hole plate overnight. We look forward to finding collaborators who has access to the collection of possible inhibitors.

Biography

Akira Kaji has completed his PhD from The Johns Hopkins University followed by Post-doctoral training with Steven Kuffler at Johns Hopking Medical School followed by Sidney Colowick at Vanderbuilt University, and David Novelli at OakRidge National Laboratory. He then became Faculty Member of University of Pennsylvania where he remains as an Active Professor. He has published more than 230 papers in reputed journals

kaji@pennmedicine.upenn.edu

Notes: