

Seminar Announcement

(Department of Biological Sciences & Office of Life Sciences, NUS)

Structural Studies on Ribosomal Modifying Enzymes

Ribosome is the protein producing machinery in the cells. During the maturation or assembling of ribosome there are several modifications carried out involving a number of specific enzymes. Most of these modifications are essential for the normal functioning of the ribosome. The most common modifications in the ribosome are the pseudouridination and methylation, catalyzed by pseudouridine synthases and methyltransferases. Pseudouridine (5- β -D-ribofuranosyluracil, "U") is the most commonly found modified base in RNA. Overall 7% of the total uridines are converted into pseudouridines. Conversion of uridine to U is performed enzymatically in both prokaryotes and eukaryotes by pseudouridine synthases (E.C.4.2.1.70). In higher eukaryotes these enzymes are implicated in various diseases. We have determined the crystal structures of two U-synthases from E.coli as a model organism. RluD has been known to be responsible for modifying uridine residues to U specifically at positions 1911, 1915 and 1917 within 23S rRNA, while RsuA has been known to modify specifically the uridine at the position 516 of the 16S rRNA. RluD has been shown also to possess a second function independent of U-synthesis that is related to the proper assembly of the 50S ribosomal subunit (Chaperon function). Both RsuA and RluD are monomeric enzymes consisting of a N-terminal S4-like domain (~60 residues) connected to a catalytic module (~170 – 250 residues) by a flexible polypeptide linker. Both RluD and RsuA, as well as other U synthases, TruA and TruB, share a common overall α/β fold for their catalytic modules, suggesting a common evolutionary origin despite a lack of overall sequence identity among the four family of enzymes. Thus, we can conclude that similarities in structures are related to their common function, while the differences in their sequences are related to their enzyme specificities.



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Date: 5 Mar 2004, Fri
Time: 4 pm
Venue: LT 20
Host: A/P R M Kini

All are welcome

