

Study of Late nuclear pre-60S ribosomes in Yeast with the help of Cryo-EM

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Abstract:

With the development of detector technology and powerful algorithms for image processing recently, the resolution of structure reconstructed by Cryo-electron microscopy (Cryo-EM) of single-particle approach has reached the near-atomic level which makes Cryo-EM the most effective and powerful method to study multiple functional mixtures of interested macromolecule and characterize the molecular mechanism and cellular processes nowadays. Low yield, mixed states isolated by tandem affinity purification (TAP) method in physiological expression level motivate Cryo-EM to be the most suitable technique to capture and investigate intermediates in their natural hydrated environment during the maturation systems. Ribosomes biogenesis is an extremely sophisticated process regulated by hundreds of trans-acting factors and is closely tied to the growth and proliferation of cells. Mutations in some of these factors can cause dysregulation of ribosome assembly and may lead to several human diseases named ribosomopathies. However, the function and structure of most of these assembly factors in eukaryotes remain unclear. Therefore, identifying these positions in assembling ribosomes will provide a framework for their potential roles during assembly and serve as a platform for more comprehensive dissection of their function. Here I will choose pre-60S ribosomal subunit structures analysis purified with epitope-tagged assembly factor Nog2 as an example to show how Cryo-EM works for the mechanism exploration of ribosome biogenesis.

Brief Biography

Prof. Shan Wu is a Professor of State key laboratory of biocatalysis and enzyme engineering and school of Life Sciences in Hubei University. Her research mainly focuses on analyzing the high-resolution structures of large complexes by three-dimensional reconstruction of cryo-electron microscopy, and answering the functional mechanism of macromolecular machines with the aid of genetics, cell biology and biochemical molecular biology. In recent five years, she has published more than 9 SCI papers in high ranking journals including *Nature*, *Science*, *Nature Structural & Molecular Biology*, *Nano Letters*, *RNA*, *Protein Science* et al.

Brief CV**Shan Wu, Professor / Ph.D.**

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Education:

B.S. Biology and Chemistry, Central China Normal University, Wuhan China, 2013

Ph.D. Biology, Tsinghua University, Beijing China, 2018

Professional Career:

2019-Present: Hubei University, Wuhan China, Professor

Research Interests:

1. Function of biomacromolecule in living cells
2. Mechanism of immune-related enzymes
3. Cryo-EM methodology

Selected publications

1. Wu, S*. et al. *Nature*, 2016, 534:133-137.
2. Wu, S*. et al. *Protein Sci*, 2017, 26:103-112.
3. Wang, JZ*, Wang J*, Hu MJ*, Wu S. et al. *Science*, 2019, 364.
4. Ma, CY*, Wu, S. et al. *Nat Struct Mol Biol*, 2017, 24:214-220.