



Contribution ID: 211

Type: **Poster**

The First Ambient Temperature Structure of Large Ribosomal Subunit from *Thermus Thermophilus*

Wednesday, May 17, 2023 4:00 PM (15 minutes)

The study presents the first observation of critical steps in protein synthesis at temperatures close to those in the human body using ultrafast and ultrabright X-ray free electron laser (XFEL) pulses. Over half of known antibiotics target prokaryotic ribosomes, the site of protein synthesis, and the large ribosomal subunit (50S) is specifically targeted by antibiotics such as macrolides and ketolides. The study determined the structure of 50S ribosomal subunit at ambient temperature, providing insight into how antibiotics interact with ribosomes and how peptide bonds are formed. This is a significant milestone as it's one of the largest structures determined using XFEL, with a record short beam time of 47 minutes. The use of serial femtosecond X-ray crystallography (SFX) will further advance our understanding of ribosome structure and function, leading to the development of new antibiotics.

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Modern Methods in Structural Biology and Dynamics

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Drug Discovery

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Session Classification: Drug Discovery