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POSTER ABSTRACT PRESENTATIONS

**SESSION TITLE: STRUCTURE AND FUNCTIONS OF THE TRANSCRIPTION AND TRANSLATION
APPARATUS OF THE CELL**

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**Abstract P-21: The Investigation of *S.aureus* Ribosome-Binding Factor A
Localization on the 30S Ribosomal Subunit by Cryo-Electron Microscopy**

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Background: Ribosome biogenesis is a complex process of ribosomal RNA and protein binding. Bacterial ribosome maturation and components involved in it are especially interesting, because they are widespread targets for antibiotics. A number of special protein factors facilitating the maturation of the 30S small ribosomal subunit are known. One of them is a ribosome-binding factor A (RbfA). This is a small (~14 kDa) protein with KH-domain organization distinguishing RNA binding proteins. Recent cryo-EM reconstruction of *E.coli* 30S-RbfA complex indicates that RbfA binds to 30S subunit on the central decoding region and promotes the switch from the immature state of h28 (neck) to mature state. RbfA interacts with 3'-end of 16S rRNA on mRNA exit channel and stabilizes the conformation of the region between h28, h44/h45 linker and 3'-end.

Methods: Pure *S.aureus* RbfA was obtained by homologous expression in *E.coli* BL21 strain followed by Ni-NTA and gel filtration. The 30S subunits were obtained by dissociation of the *S.aureus* 70S ribosomes in a sucrose gradient (0-30%). We performed 30S subunit and RbfA complex reconstitution, sample and grid preparation. Data was collected on Talos Arctica, Falcon 2 detector (FEI Company/Thermo Fisher).

Results: The 30S-RbfA complex density map with average resolution $\sim 3.5 \text{ \AA}$ (FSC=0.143) was obtained. In comparison with the free subunit map (EMD 23052) we observed an extra density on the neck region near the decoding center region.

Conclusion: Obtained data is correlated with recent structural results of the homologous *E.coli* RbfA. We consider that *S.aureus* RbfA binds to the 30S subunit at the same region. The next step of our structural research is building the model of *S.aureus* 30S-RbfA complex.

Key Words: ribosome • 30S subunit biogenesis • RbfA • protein translation

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