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ORAL ABSTRACT PRESENTATIONS

SESSION TITLE: MOLECULAR ORGANIZATION OF CELLS AND ORGANELLES

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Abstract OR-7: Condensation of Nucleoid in Bacteria as a Result of Starvation

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Background: Living organisms survive in constantly changing environmental conditions due to universal strategies of adaptation to various stresses based on structural, biochemical, and genetic rearrangements. One of adaptive strategies utilized in bacterial cells involves the protection of the nucleoid from unfavorable factors via binding of DNA to specific histone-like proteins. This strategy leads to the condensation of DNA in complexes with Dps (DNA-binding protein from starved cells), which has been discovered in starved for up to 48 hrs cells of the *E. coli* bacterium

Methods: Electron microscopy and X-ray diffraction of synchrotron radiation studies were used to reveal distinct forms of nucleoid condensation in dormant *E. coli* cells that were starving for longer period – up to 7 months.

Results: We have found and described not only previously detected forms of nucleoid condensation: quasi-nanocrystalline, quasi-liquid crystalline and spore-like, but also observed a new type of nucleoid condensation in dormant cells - folded nucleosome-like.

Conclusion: According to the recognized concept of a bacterial population as a multicellular organism, their heterogeneity allows to respond flexibly to the environmental changes and to survive in stressful situations. Heterogeneity is the reason why we observed several types of nucleoid condensation in dormant *E. coli* cells. Heterogeneity of dormant cells increases the ability of the whole population to survive under various stress conditions. Results, observed here, shed a new light both on the phenomenon of nucleoid condensation in prokaryotic cells and on the general problem of developing a response to the stress.

Key Words: stress • nucleoid • condensation • structure

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