AARHUS UNIVERSITY
DEPARTMENT OF MOLECULAR BIOLOGY AND GENETICS

DANDRITE
Danish Research Institute of Translational Neuroscience
Nordic EMBL Partnership for Molecular Medicine

Thursday 4 May 2023

14.15 – 15.00

Venue:
Room 1870-816 (faculty club)
Dept. Molecular Biology and Genetics, Aarhus University

Seminar by:

João Guerra

New postdoc in Poul Nissen's group

The importance of a tail: Controlled modulation of the conformational dynamics of a Dps protein from *Deinococcus grandis*

In this seminar, João Guerra will present his past research done during his PhD studies in the Molecular Biophysics Group, at NOVA University of Lisbon, Portugal

Abstract

Dps proteins are small multifunctional nanocages expressed by Bacteria as defense mechanisms against acute oxidative stress, ionizing radiation and other starvation-induced stresses. Dps protect bacterial DNA from damage by removing precursors of reactive oxygen species from solution or by direct DNA binding and condensation. Their DNA-binding properties are related to their disordered N- and C-terminal tail extensions which act as contact points between the protein and DNA. Despite sharing a conserved homododecameric spherical cuboid structure, the several hundred Dps sequences deposited so far reveal a remarkable diversity in N- and C- terminal tail length and residue composition. This work focused on probing the conformational dynamics of a Dps from the radioresistant extremophile bacterium *Deinococcus grandis*. The goal was to better understand the relationship between protein conformation and its DNA-binding properties using an array of biochemical and biophysical techniques such as Size-Exclusion Chromatography, Dynamic Light Scattering, Synchrotron Radiation Circular Dichroism, Mössbauer Spectroscopy and Small Angle X-ray Scattering. Overall, our results point towards the existence of a novel regulatory process for Dps-DNA binding activity, driven by relevant modulators of N-terminal tail conformation.

Hosted by: Prof. Poul Nissen,