Structural and biochemical characterization of iron-sulphur cluster containing helicases from pathogenic bacteria

Sintayehu M. Shenkutie [1] and Silvia Onesti [1]

Structural Biology Laboratory, Elettra - Sincrotrone Trieste, Italy[2]

DNA helicases are essential enzymes for various cellular processes, including DNA replication, repair, and recombination. They are characterized by their DNA binding, ATP hydrolysis, strand separation, and translocation activities. Iron-sulphur helicases, such as DinG, play a crucial role in maintaining genomic integrity. *Mycobacterium tuberculosis*, responsible for tuberculosis (**TB**), and *Neisseria meningitidis*, causing meningococcal disease, are major health concerns in Sub-Saharan Africa. Given the prevalence of drug-resistant tuberculosis and meningococcal disease, targeting DinG from *Mycobacterium tuberculosis* (**MtDinG**) and *Neisseria meningitidis* **(NmDinG)** offers a promising strategy for developing novel antimicrobial agents. This presentation will discuss our ongoing efforts to characterize these helicases, including preliminary findings from protein production, purification, crystallization screening, as well as biochemical/biophysical studies. Our ultimate goal is to establish helicases as potential drug targets and develop novel inhibitors to combat these diseases.