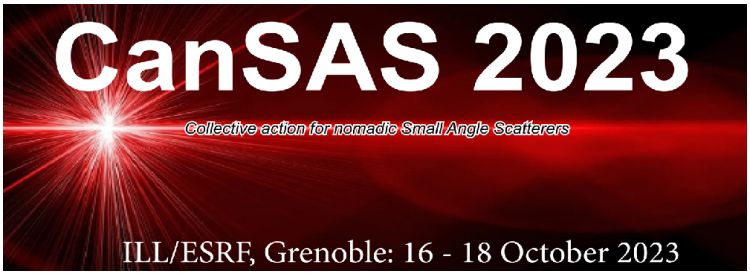

Contribution ID: **20** Type: **Talk**

BioSAXS Sample Environments at TPS 13A

Tuesday, October 17, 2023 12:30 PM (20 minutes)

The conformations and compositions of a proton-translocating pyrophosphatase Vigna radiata H+-PPase (VrP-Pase), stabilized by either detergent molecules or embedded in a lipid nanodisc in aqueous solution, are revealed using size exclusion chromatography coupled small-angle X-ray scattering (SEC-SAXS) with online UV-Vis absorption and refractive index (RI) detections. The integrated analysis of the scattering and optical data indicates that the large VrPPase dimer can be embedded successfully into the POPC nanodisc, with the transmembrane region immersed into the lipid aliphatic chains. The corresponding structural parameters of the protein-nanodisc complex
are determined using an analytical core-multishell elliptical cylinder model. After binding with imidodiphosphate (IDP) to mimic the substrate (PPi) binding, the VrPPase embedded in the nanodisc shows no obvious structural changes. Correspondingly, the detergent-solubilized tetramers display a relatively prominent structural response to the IDP binding. The combined measurements and analysis of the SEC-SAXS advance the understanding of the two types of membrane-protein complexes in terms of their compositions and structural features.

Presenter: SHIH, Orion (National Synchrotron Radiation Research Center)

Session Classification: Emerging sample-environments and methods