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Impact of Salts on Structural Dynamics of Photoactive Yellow Protein SANDIP KALEDHONKAR, LORAND KELEMEN, AIHUA XIE, Department of Physics, Oklahoma State University, Stillwater, OK, USA, XIE LAB TEAM — Water is essential for protein functions. Solutions with high salt concentration change the stability and solubility of proteins. Despite extensive studies, it remains unclear how salts alter the properties of proteins. We report the effects of different salts on the structural dynamics of photoactive yellow protein (PYP) which is an excellent model system. Time-resolved infrared difference spectroscopic technique is employed to capture the dynamic structural development of this protein upon light stimulation. Our data show that high salt concentration alters the proton transfer pathway and suppress protein conformational changes. We test different models to elucidate how high concentration salts change the structural response of PYP during its light sensing photocycle. The knowledge gained may be applicable to understand the other effects of salts on proteins, which is known as Hofmeister series.

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