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Chromophoric Interaction in *Donghaeanadokdonensis* Rhodopsin

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Understanding the formation and structure of the light harvesting complex systems is the key for the conversion and storage of solar energy. Rhodopsin is a light sensitive protein which is used in visual photo-transduction. Microbial rhodopsins is a family of membrane proteins consist of seven trans-membrane alpha helixes with a retinal chromophore covalently bound to the protein. Xanthorhodopsin (XR), a retinal based proton pump membrane protein from *Salinibacter Ruber* which in addition to the retinal chromophore it contains also a salinixanthin carotenoid. Salinixanthin acts as a light-harvesting antenna and transfers approximately 40% absorbed quanta to the retinal. Therefore, salinixanthin plays an important role in the maximization of energy transfer efficiency. Here we report a new functional class of a microbial rhodopsin, derived from hot springs, a light-driven sodium ion pump, Donghaeanadokdonensis rhodopsin (DDR2). DDR2 is a retinal based membrane protein, which use retinal molecule to harvest the solar energy. Reconstitution of DDR2 with the salinixanthin is accompanied by characteristic changes in absorption spectra and the appearance of CD bands similar to those observed for XR, which is an indication of immobilization and twist of the carotenoid in the binding site. The results indicates that salinixanthin binds to DDR2 in a conformation similar to that in XR.

Biography:

Dr. Mihir Ghosh started his Ph.D in 2013 and received degree in 2015 from Visva-Bharati University (India), working on photophysics and non-radiative emissions of porphyrins. He was a Visiting researcher at Indian Institute of Technology, Kanpur, in 2015. Then he joined Indian Institute of Technology, Mandi, in 2015 as a postdoctoral fellow. Since 2016 he is a postdoctoral fellow in Weizmann Institute of Science, Rehovot, Israel. His research focus is molecular mechanism for the function of retinal protein.