

## BP 36: Plenary Talk

Time: Wednesday 8:30–9:15

Location: HSZ 01

**Plenary Talk**

BP 36.1 Wed 8:30 HSZ 01

**Characterization of Biological Photoreceptors in Space and Time** — •PETER HEGEMANN — Humboldt-Universität zu Berlin

Biological sensory photoreceptors are families of proteins that can be studied with unprecedented precision in space and time. Excited state dynamics, chromophore isomerization and electron transfer reactions, as well as inactivation processes are studied on rhodopsins with retinal chromophores or LOV and BLUF-proteins with flavin chromophores by UV/Vis, Raman and IR spectroscopy on fs to ps time scales. Proton transfer reactions, hydrogen-network changes and structural changes

can nowadays also be studied on fs to second time scales, whereas ion transport or catalytic activities are monitored on microsecond to second scales by biochemical or electrical methods. By employment of these technologies in conjunction with protein engineering and theoretical calculations my group in collaboration with many colleagues has deciphered or at least enlightened the reaction mechanism of light-gated ion channels, light-driven pumps, and photo-activated guanylyl/adenylyl cyclases. These proteins are widely applied in the neurosciences for activation or deactivation of selected neurons in large neuronal networks as the animal brain (Optogenetics).