



**The application of Free Electron Lasers to Biology: Playing with retinal proteins and GPCRs**

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**Abstract**

The application of X-ray Free Electron Lasers is developing rapidly. PSI has engaged in several successful beamline proposals at LCLS, the FEL in Stanford. The teams have developed solid support structures and were able to measure and evaluate diffraction from two-dimensional protein crystals.

Together with several international groups we have used fast liquid jets for serial femtosecond protein crystallography. For membrane proteins a PSI lead team has explored slow material saving gel jets. They have carried out pump probe experiments on retinal protein crystals using femtosecond pump lasers. With fast jets and slower Lipidic Cubic Phase jets. All these methods will in the future enable us to study membrane protein dynamics.