ESRF	**Experiment title:** Structural dynamics accompanying catalysis in a light activated enzyme as studied by time-resolved WAXS	**Experiment number**: LS-2592
Beamline: ID09	**Date of experiment**: from: 25/01/2017 to: 31/01/2017	**Date of report**: 05/03/2018
Shifts: 18	**Local contact(s)**: Matteo Levantino	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

David Farmer

Joyce Woodhouse

Eugenio de la Mora

Giorgio Schirò

Report:

Protochlorophyllide (Pchlide) oxidoreductase (POR) is one of the three known light activated enzymes that exist in Nature. The ternary NADPH:Pchlide:POR complex is stable in the dark and enzymatic activity is initiated by light in the 440-460 nm and 630-640 nm wavelength regions, providing a unique opportunity to study the structural dynamics involved in catalysis on a time-scale from nano- to milliseconds after laser-light triggering.

Based on the experience accumulated during the LS-2465 beamtime, during LS-2592 we were able to collect a full dataset in the micro-to milliseconds time scale. We got evidence of a clear evolution of a difference signal (Figure 1). An interpretation of the signal in terms of a protein structural change is currently ongoing.

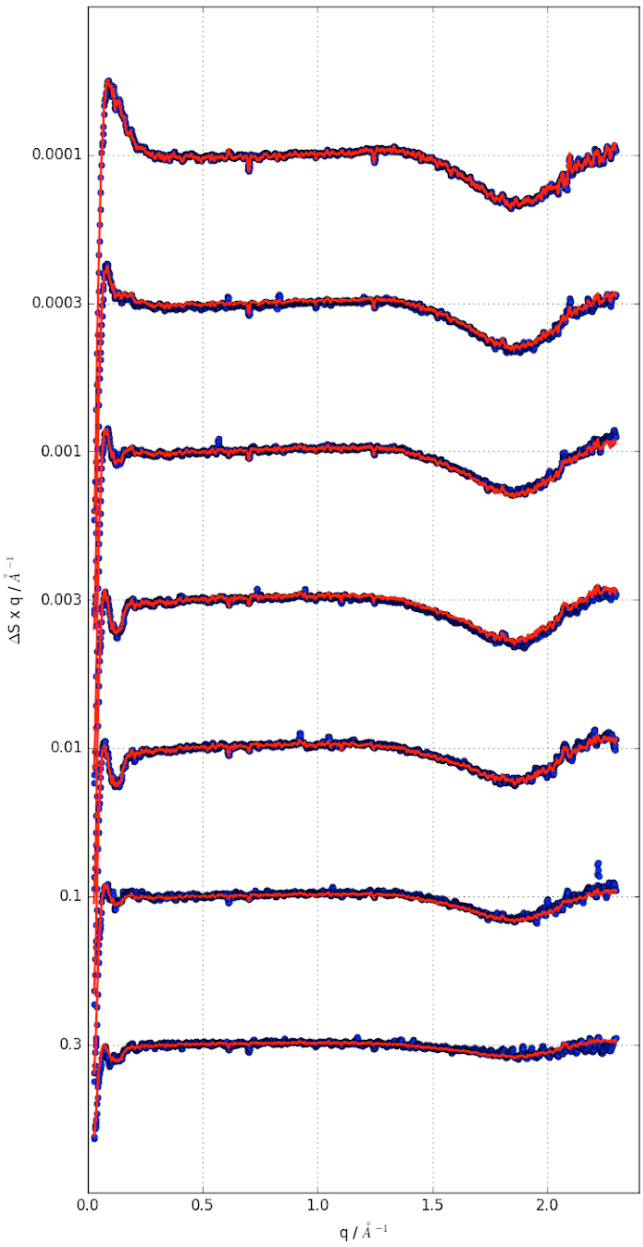

Figure 1. Laser induced changes of the X-ray scattering signal from 100 us (top curve) to 300 ms (bottom curve).