



ESRF

Experiment title: Investigation of structural changes in dimeric hemoglobin from clam *Scapharca Inaequalis* by ns time-resolved crystallography.

Experiment number:
LS 839

Beamline:

ID9

Date of experiment:

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Date of report:

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Shifts:

9 sb

Local contact(s):

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Report:

The preliminary Laue ns time-resolved experiments in June 97 on this dimeric hemoglobin demonstrated feasibility of the studies. We collected ~70% complete data sets to 1.7Å resolution that yielded $R_{\text{merge}}(\lambda) = 13\%$ and the overall redundancy of 6.0. The Laue data agreed very well with the conventional laboratory-derived monochromatic data, with a correlation coefficient of 0.98 and $R_{\text{mono/Laue}} = 45.2\%$. The difference electron density map derived from the HbI-CO and the HbI* data at 5ns laser/X-ray delay time, clearly shows a significant photolysis at both hemes and an iron displacement from the heme plane.

During the September 97 experiment we collected a series of data sets in the single bunch mode with the following laser/X-ray delay times: 2.1 ns, 5.5 ns, 52.8 ns, 91.8 ns, 186 ns, 278.55 ns, 597.3 ns and 992ns. The data processing is in progress. We expect that this new data will allow us to examine the time evolution of tertiary and quaternary structural changes and elucidate the kinetic basis for the cooperativity mechanism in this molecule.

Since we are still processing September 97 data, we are not requesting beamtime in this reviewing cycle.