

New micro-beam beamline at SPring-8, targeting at protein micro-crystallography

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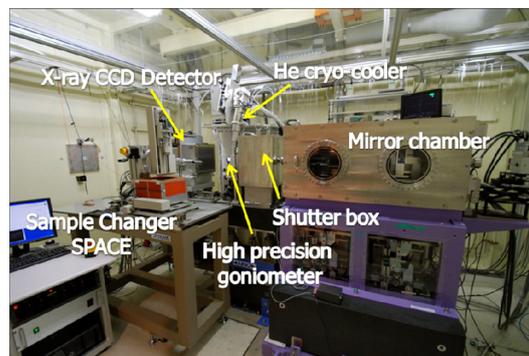
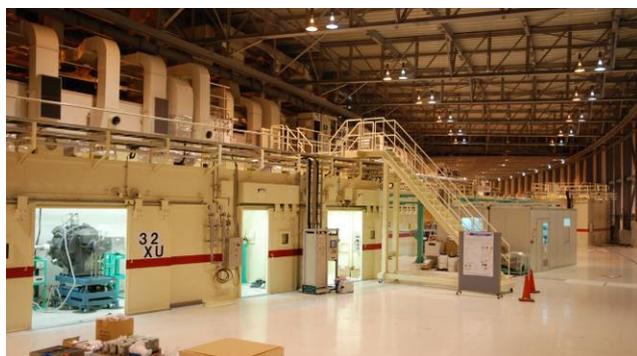
Structure determination with protein crystallography is often prevented by the small size of the crystals. However proteins involved in important target of current crystallography, such as membrane proteins or protein supra-complexes, tend to show difficulties in growing their crystal size. Therefore, demands for achieving protein micro-crystallography are getting larger. In order to realize the protein micro-crystallography, development of beamline optics and data collection system to provide high signal to noise ratio (S/N) data from weak diffractions should be essential.

At SPring-8, a new undulator beamline dedicated for protein micro-crystallography, named RIKEN Targeted Proteins Beamline (BL32XU), has been constructed, which started user operation in May 2010. The beamline is designed to provide the brilliant micro-beam to collect high-quality data from micro-crystals. The small sized and highly brilliant X-ray beam with the size of a micrometer provides high S/N data by increasing reflection intensities and reducing background scattering.

An in-vacuum undulator and K-B mirrors fabricated with Elastic Emission Machinery (EEM) technique have been equipped for the light source and the micro-focusing optics, respectively. The result of beamline commissioning showed the minimum beam size at sample position corresponds to $0.9 \times 0.9 \mu\text{m}^2$ with 6.2×10^{10} photons/sec/ μm^2 . At end station, high-precision diffractometer, high-efficiency area detector and sample auto-changer have been installed, and R&D for the sample environment suppressing background scattering are in progress.

We will report the present status and some initial results of BL32XU in this presentation. From October 2010, the beamline will be opened for public users

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Photographs of the total view of BL32XU and the experimental station.

Reference

- [1] http://www.tanpaku.org/e_index.html