

# Poster Presentations

**[MS1-P01] Coherent Diffraction Imaging for Spherical Biological Particles.** Atsushi Nakagawa<sup>1</sup>, Akifumi Higashiura<sup>1</sup>, Kenji Iwasaki<sup>1</sup>, Marina Murakami<sup>1</sup>, Eiki Yamashita<sup>1</sup>, Kazuki Takeda<sup>2</sup>, Yu Hirano<sup>2,3</sup>, Yuya Hanazono<sup>2</sup>, Kiyofumi Takaba<sup>2</sup>, Masahito Hibi<sup>2</sup>, Yuriko Tomisaki<sup>2</sup>, Kunio Miki<sup>2</sup>.

<sup>1</sup>*Institute for Protein Research, Osaka University, Japan,*

<sup>2</sup>*Department of Chemistry, Graduate School of Science, Kyoto University, Japan,*

<sup>3</sup>*present address: Japan Atomic Energy Agency, Japan*

E-mail: atsushi@protein.osaka-u.ac.jp

X-ray Free Electron Laser (X-FEL) produces very short and extremely bright, coherent X-ray pulse, and the bright X-ray pulses can be used to obtain diffraction pattern, called speckle, from a single particle without crystals. This technique, coherent X-ray diffraction imaging (CXDI or CDI), has a capability to be applied to the structure determination of large macromolecular assemblies, such as viruses. SACLA (Spring-8 Angstrom Compact Free Electron Laser) is an X-FEL facility located in Spring-8 campus. It produces high brilliance and very short X-ray pulses at Angstrom region. The use of X-ray pulses from SACLA has a capability to determine high-resolution structure of viruses without crystals.

We recently started the project on the X-ray single particle analysis technique for structure determination of spherical-shaped biological macromolecular assemblies. This project aims to determine high-resolution structure of biological macromolecular assemblies that form spherical particle, such as viruses and chromatophores of photosynthetic bacteria. The samples were mounted on a membrane grid for electron microscopy and flash frozen in liquid ethane. The samples were mounted on the Kotobuki-chamber for cryogenic coherent diffraction imaging installed in the EH3 experimental hutch of BL3

at SACLA and diffraction data were collected with the MPCCD (Multi-port Charge Coupled Device) detector.

The concept of this project and the preliminary results of the CXDI experiments will be shown.

**Keywords:** CDXI; macromolecular assemblies; X-FEL