European XFEL

SCIENCE SEMINAR

Friday, 26th August 2016

14:00

Campus Schenefeld, Main Building (XHQ), Room 1.173

"Intra-molecule Motion Analysis of Functional Proteins at Single Molecule Level Using Synchrotron X-ray"

by

Dr. Hiroshi Sekiguchi

Japan Synchrotron Research Institute (JASRI/SPring-8)

We have proposed a single molecule technique that utilizes short wavelength probes of X-rays to monitor the internal motions of a single protein. We call it diffracted X-ray tracking (DXT)[1,2] and it would be a powerful technique in biological science for detecting atomic-scale dynamic motion of the protein at the single molecular level at several tens of microseconds time resolution. In DXT, a target protein is labeled with a nanocrystal with a size of several tens of nanometers and the motions of the nanocrystal coupled with the protein's motions are recorded as the trajectories of the Laue spots from the nanocrystal.

At the seminar, we will present recent DXT results for dynamic motion of multimeric proteins [3-6] and discuss the method in the future.

References

1. Y. C. Sasaki et al., Phys. Rev. E 62:3843 (2000) DOI: 10.1103/PhysRevE.62.3843
2. H. Shimizu et al., Cell 132:67 (2008) DOI: 10.1016/j.cell.2007.11.040
3. H. Sekiguchi et al., PLoS ONE 8:e64176 (2013) DOI: 10.1371/journal.pone.0064176
4. K. Ichiyanagi et al., Rev. Sci. Instrum.84:103701 (2013) DOI: 10.1063/1.4819305
5. H. Sekiguchi et al., Scientific Reports 4:6384 (2014) DOI: 10.1038/srep06384
6. H. Kozono et al., Biophys. J. 108:350 (2015) DOI: 10.1016/j.bpj.2014.12.004

Host: Adrian Mancuso

European XFEL
Campus Schenefeld,
Holzkoppel 4,
22869 Schenefeld