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Approaches for following X-ray induced reactions in crystallo

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Robin Owen¹, Danny Axford¹, Ali Ebrahim^{1,2}, Selina Storm¹, Hiroshi Sugimoto³, Kensuke Tono³, Shigeki Owada³, Tadeo Moreno-Chicano², Richard Strange², Jonathan Worrall², Ivo Tews³ & Michael Hough²

¹Diamond Light Source, Harwell Science and Innovation Campus, Didcot, Oxfordshire, OX11 0DE, UK

²School of life Sciences, University of Essex, Wivenhoe Park, Colchester, Essex, CO4 3SQ, UK

³Spring8/SACLA, Harima Campus, Hyogo, Japan.

⁴Biological Sciences, University of Southampton, Institute for Life Sciences, Southampton, SO17 1 BJ, UK

robin.owen@diamond.ac.uk

The development of serial crystallography has been driven by XFELs but is now firmly established at high-brilliance synchrotron sources. Serial crystallography provides a means of efficiently collecting diffraction data from crystals held at ambient temperatures, providing access to more physiological environments and helping make structural transitions directly observable. Data collection at room temperature comes, however, with a price in the form of the rapid onset of radiation damage and greatly reduced crystal lifetimes. While this drawback can be addressed in part through the use of serial approaches, significant challenges for the experimenter remain.

I will describe fixed target serial delivery methods developed and implemented at SACLA and Diamond, illustrating the gains that can be realised using a multi-faceted approach at different, complementary, sources as well as some of the challenges both met and remaining.

Primary author: Dr OWEN, Robin (Diamond Light Source)

Presenter: Dr OWEN, Robin (Diamond Light Source)

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