

## Poster Presentation

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### *Future developments for macromolecular crystallography at the CLS*

P. Grochulski<sup>1</sup>, M. Cygler<sup>2</sup>, M. Fodje<sup>1</sup>, S. Labiuk<sup>1</sup>, J. Gorin<sup>1</sup>, K. Janzen<sup>1</sup>

<sup>1</sup>Canadian Light Source Inc., Saskatoon, Canada, <sup>2</sup>University of Saskatchewan, Department of Biochemistry, Saskatoon, Canada

The Canadian Macromolecular Crystallography Facility (CMCF) at the Canadian Light Source (CLS) is a suite of fully automated beamlines, 08ID-1 and 08B1-1 [1]. It serves over 60 Canadian groups plus academic and commercial users in the US. Besides remote data collection, we offer Mail-In service where data are collected by CMCF staff. Beamline 08B1-1 has been in operation since 2011 and beamline 08ID-1 since 2006. When beamline 08ID-1 was designed, over 10 years ago, small crystals were defined as having sizes of 50-100  $\mu\text{m}$ . Today, the most challenging experiments require more intense X-ray beams that can be focused to accommodate much smaller crystal sizes of less than 5  $\mu\text{m}$  with flux on the order of  $10^{11}$  photons/s. To reach these stringent parameters, a new more powerful source of X-rays will be required, which will be provided by a longer small-gap in-vacuum undulator (SGU). To accommodate the higher power levels and to focus X-rays to a smaller focal spot with a high degree of spatial and temporal stability, the existing X-ray optical elements need to be upgraded. The remaining components of the project include a 5-axis alignment table for improving alignment of small samples with the microbeam, a high-efficiency robotic sample-changer and a single-photon X-ray detector. Several options for the new design will be discussed. These developments are consistent with the current direction of structural biology research at the CLS [2]. Since 2006 over 225 (240) papers and 400 (444) PDB deposits reported data collected at beamline 08ID-1. Parentheses indicate the total number for the CMCF. Many of these have been published in very high impact journals such as N. Engl. J. Med., Nature, Cell, Science, PNAS, among others (<http://cmcf.lightsource.ca/publications/>).

[1] P. Grochulski, M.N. Fodje, S. Labiuk, et al. (2012), *J. Struct. Funct. Genomics* 13(2), 49-55., [2] P. Grochulski, M.N. Fodje, G. George. (2012), *Acta Physica Polonica A* 121(4), 866-870.

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