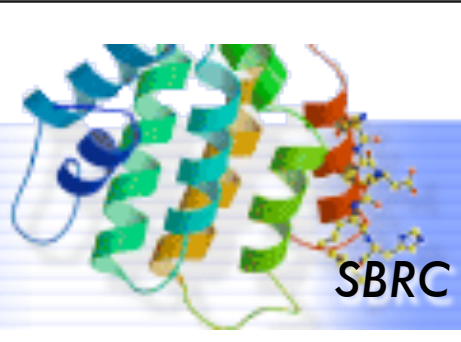


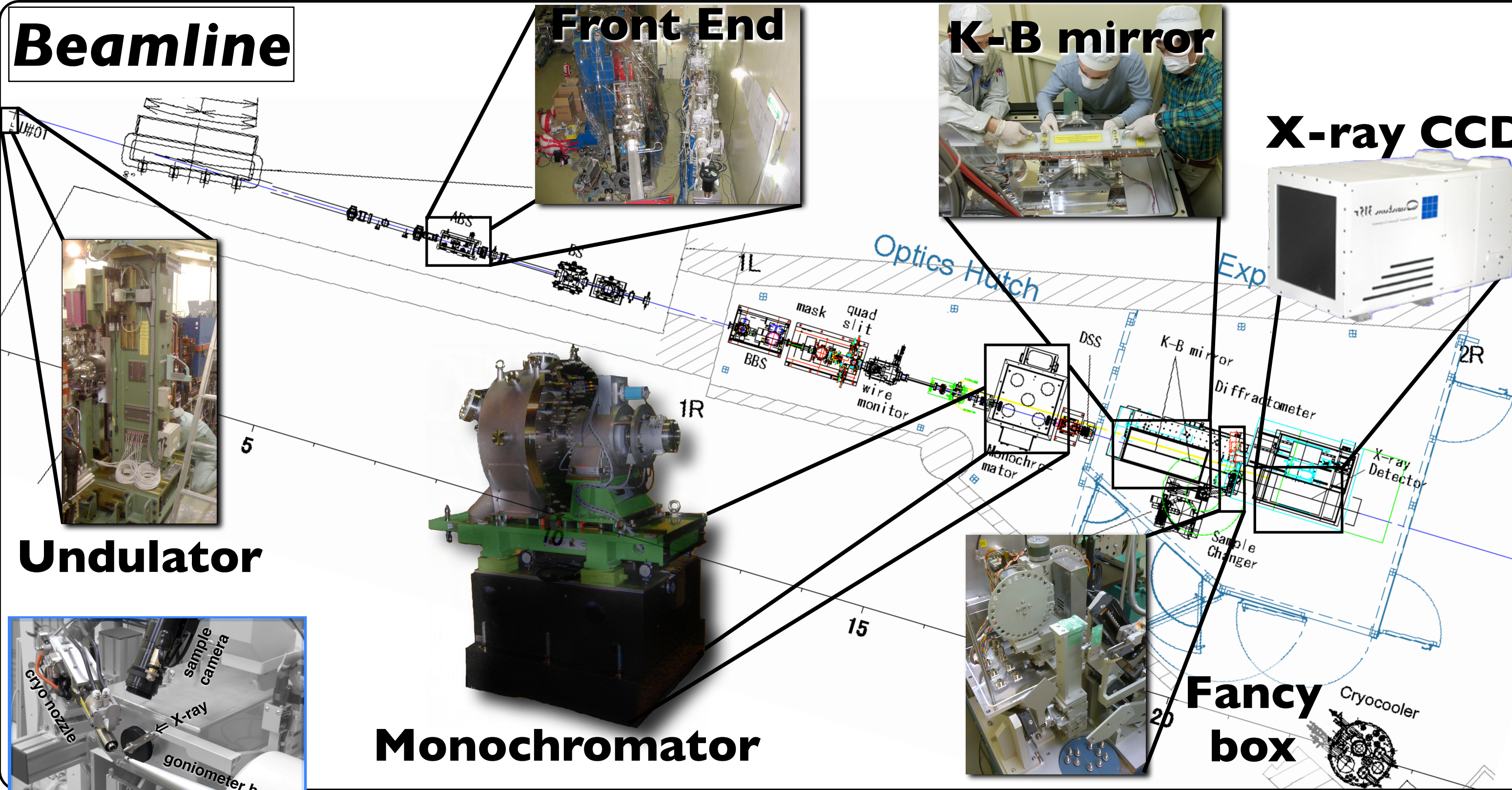


Structural Biology at the Photon Factory



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At the Photon Factory (PF), the Structural Biology Research Center (SBRC) currently operates five beamlines dedicated to protein crystallography, including four insertion device (BL-5A, BL-17A, AR NW12A, AR NE3A) and one bending magnet beamlines (BL-6A). The optic for three of the beamlines was designed to provide monochromatic beam of energies from 6 to 17 keV, in an environment ideal for high-throughput crystal screening, data collection and analysis. These beamlines, BL-5A, AR NW12A and the newly built AR NE3A, deliver a measured flux ranging from 1.5×10^{11} to 8.0×10^{11} photons/sec of 12 keV photons on the sample. Together with improvements in the automation of the beamline control, notably through the implementation of sample exchange systems and automatic sample centering, a fully automated data collection and processing system was optimized to allow data acquisition of more than 150 data sets per day in a routinely manner. To complement BL-17A as an additional microfocus beamline, the short-gap undulator beamline BL-1A is now under construction and will be opened for users in April 2010. BL-1A will deliver brilliant lower energy beam at around 4-5 keV, ideally optimized for sulphur single-wavelength anomalous dispersion (S-SAD) experiments. In this poster, I will present a brief summary of the beamline designs and the challenges facing the new developments, some innovation highlights, and I will try to emphasize through case studies the impact that have such state-of-the art beamlines on the biological studies at SBRC.



Structural biology

Drug development against influenza virus

Crystallization robot PXS
Mounting robot PAM

Signal regulation based on Ubiquitin

TNF- α , IL-1 β , TRAF2, MyD88, RIP1, TRAF6, LUBAC, NEMO, IKK α/β , poly-Ub, I κ B, NF κ B, DNA

Crystal mounting
X-ray analysis
Sample preparation
Life cycle of structural biology

Software
Centering
MCA
EXAFS
UGUI
Strategy
CCD ADSC
Data analysis

For further readings:
Structure 18, 138-147 (2010)
J Mol Biol (2009)
Cell 136, 1098-109 (2009) ...

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