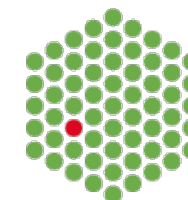


ID30B at the ESRF

Andrew McCarthy (EMBL) &
Christoph Mueller-Dieckmann (ESRF)

<http://www.esrf.eu/id30b>



ID30B – A versatile MX beamline (re-opened August 2020)

Characteristics

- ESRF-EBS Source: 1 x 2.3 m U35
- Tunable (6-20 keV)
- Beamsize: $\sim 30 \mu\text{m}^2$
- Flux: $\sim 3 \times 10^{13}$ ph/sec (~ 15 MGy/s)
- Recommend EDNA characterisation but if you must:
 - 0.1° oscillation; 20 ms exposure; 1-5% transmission

Experimental setup

- MD2-S (MK3 and Plate manipulator heads)
- FlexHCD sample changer (SPINE and Unipuck)
- PILATUS3 6M (1000 μm Si sensor)
- Software
 - BLISS v1.9 (beamline control)
 - MxCuBE3
 - Beamline Expert System (inhouse automation WFs)
 - Extended ISPyB (Exi)



ID30B – Monochromator interventions (Oct 2020 – Oct 2021)

Tunable (6-20 keV)



- Increased stability
- Energy change easy
- X-ray fluorescence detector
- Si stripe for low energy (<7 keV)
- 1000 μm Si sensor for 20 keV (high resolution)

ID30B – Now available

Beam characteristics

- Energy range (6-20 keV)
- Variable beamsize
 - $30 \mu\text{m}^2 \sim 3 \times 10^{13}$ ph/sec (~ 15 MGy/s)
 - $20 \mu\text{m}^2 \sim 1 \times 10^{13}$ ph/sec (~ 11 MGy/s)
 - $10 \mu\text{m}^2 \sim 7 \times 10^{12}$ ph/sec (~ 8 MGy/s)

Experimental setup

- 6xSPINE and 17xUnipuck
- MK3 – crystal realignment
- *In situ* – Crystallisation plates ($20 \mu\text{m}^2$)
- Dehydration/RT experiments

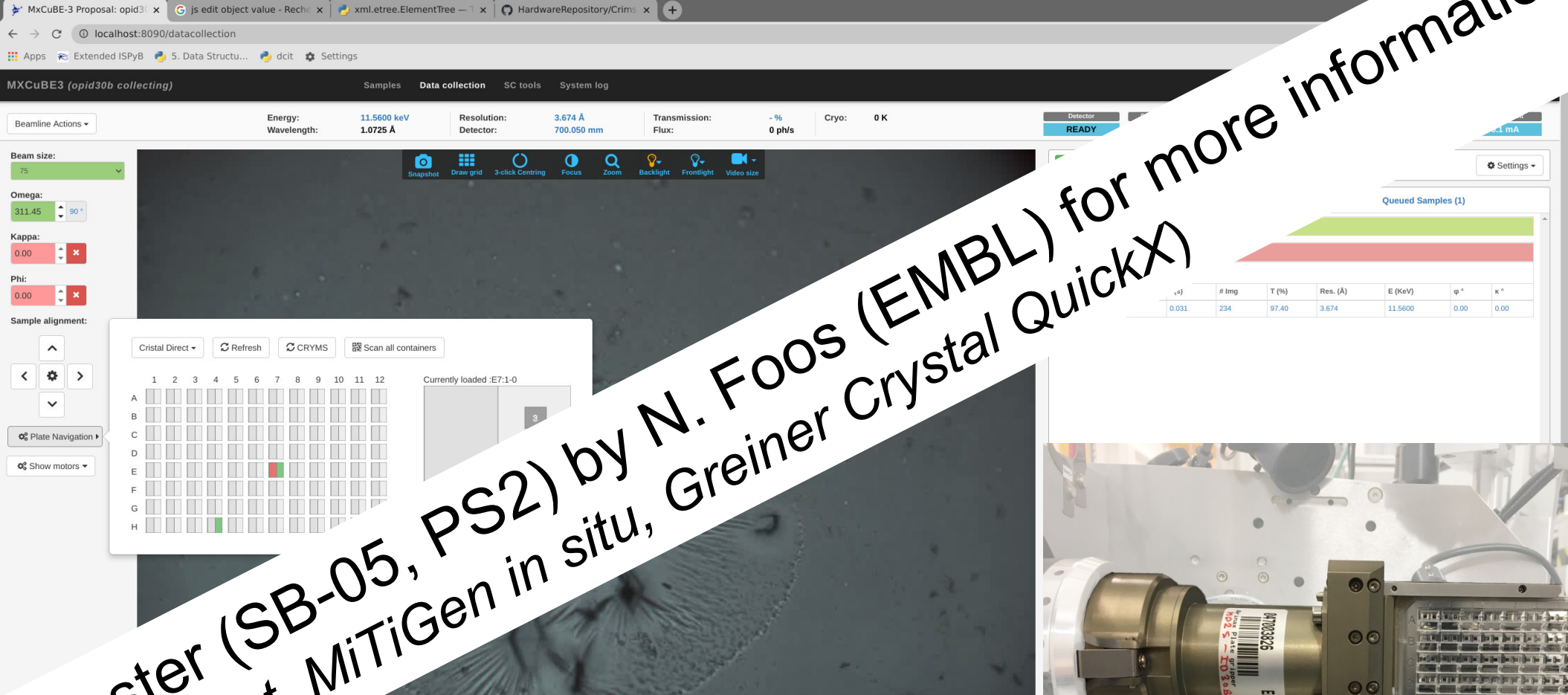


Automation

- MXPress workflows (see D. Nurizzo & M. Bowler talk this afternoon)



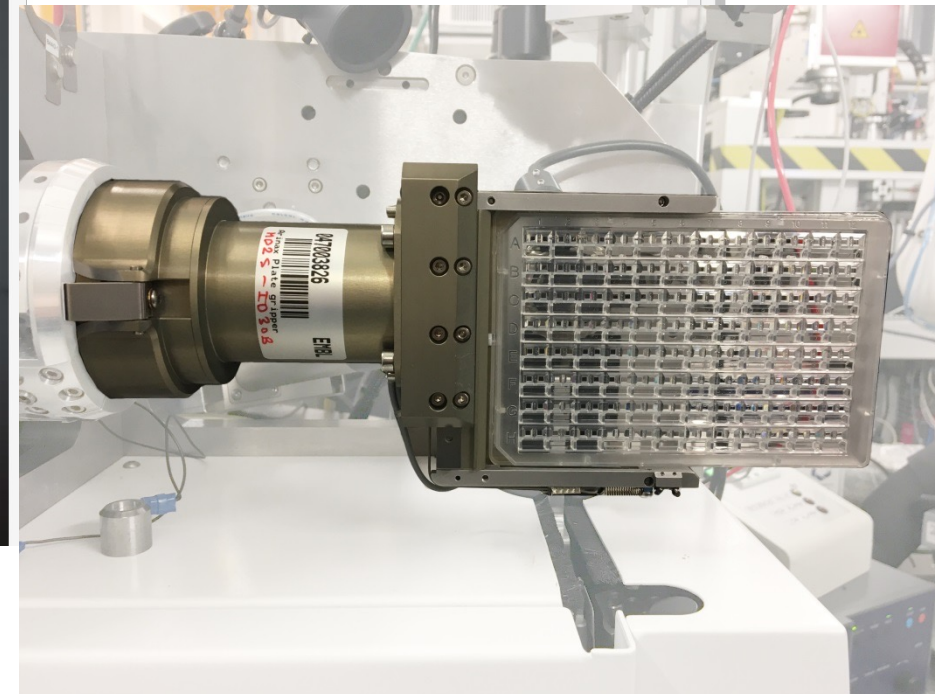
ID30B – Plate manipulator integration into MxCuBE3



The screenshot displays the MxCuBE3 control interface. At the top, the status bar shows "MXCuBE3 (opid30b collecting)". The main panel includes a "Beamline Actions" dropdown, a status bar with parameters: Energy: 11.5600 keV, Wavelength: 1.0725 Å, Resolution: 3.674 Å, Detector: 700.050 mm, Transmission: -%, Flux: 0 ph/s, Cryo: 0 K, and a "Detector READY" indicator. The left sidebar contains controls for Beam size (75), Omega (311.45), Kappa (0.00), and Phi (0.00). Below these are "Sample alignment" controls and a "Plate Navigation" section with a grid of 12 columns and 8 rows (A-H). A "Cristal Direct" window is overlaid on the grid, showing a grid of 12 columns and 8 rows with a "Currently loaded: E7:1-0" label. A "Queued Samples (1)" table is visible on the right side of the interface.

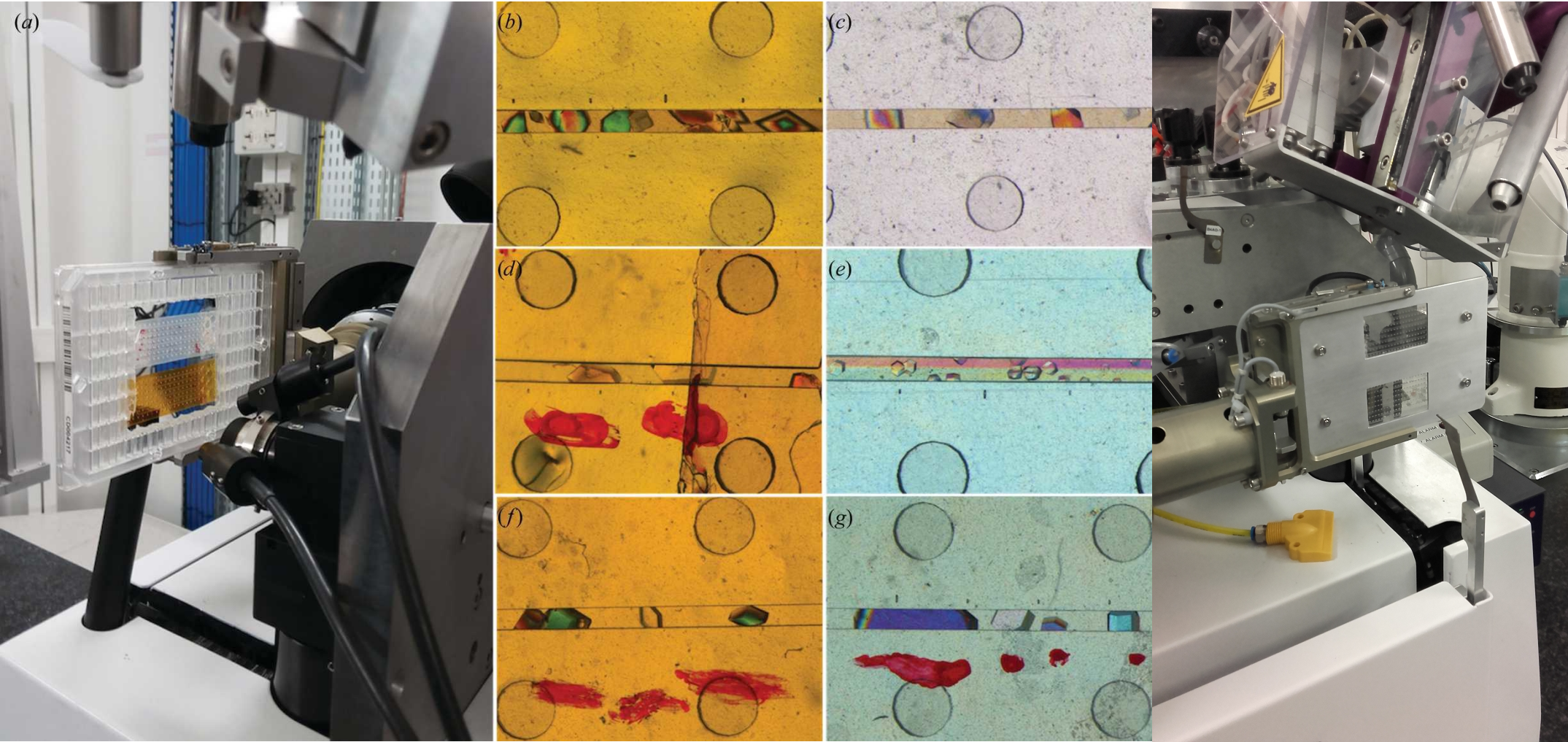
(s)	# Img	T (%)	Res. (Å)	E (KeV)	ϕ^*	κ^*
0.031	234	97.40	3.674	11.5600	0.00	0.00

See poster (SB-05, PS2) by N. Foos (EMBL) for more information
(Crystal Direct, MiTiGen in situ, Greiner Crystal QuickX)

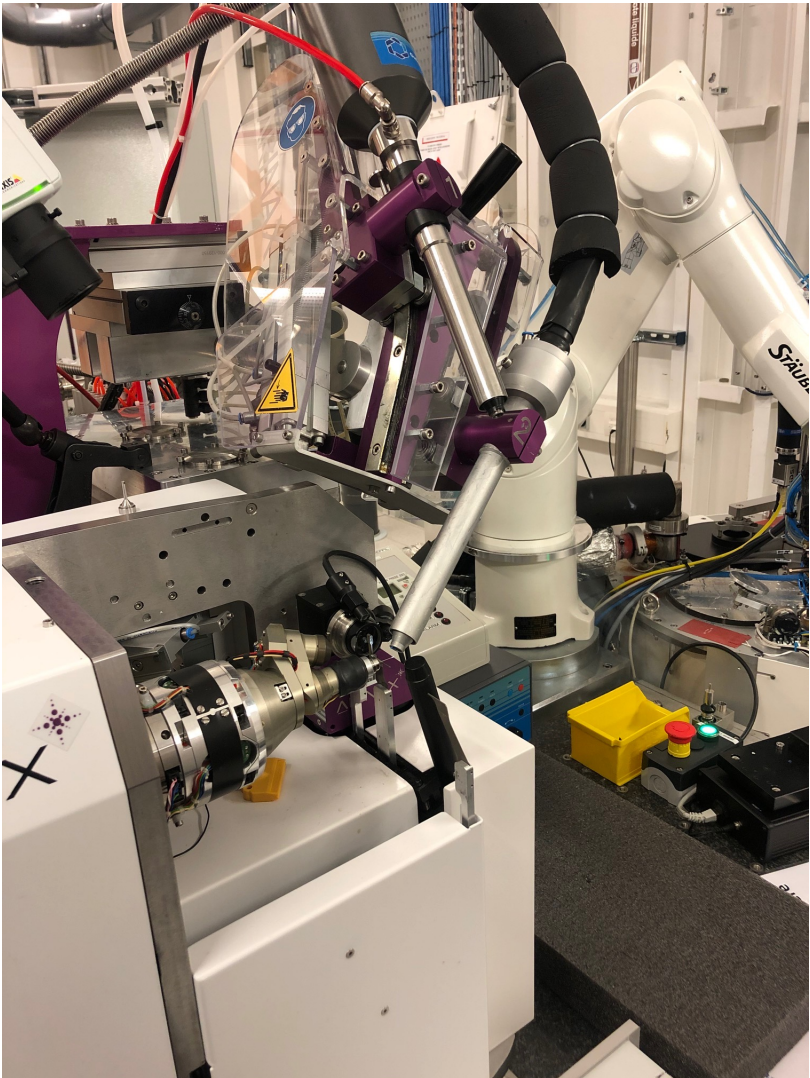
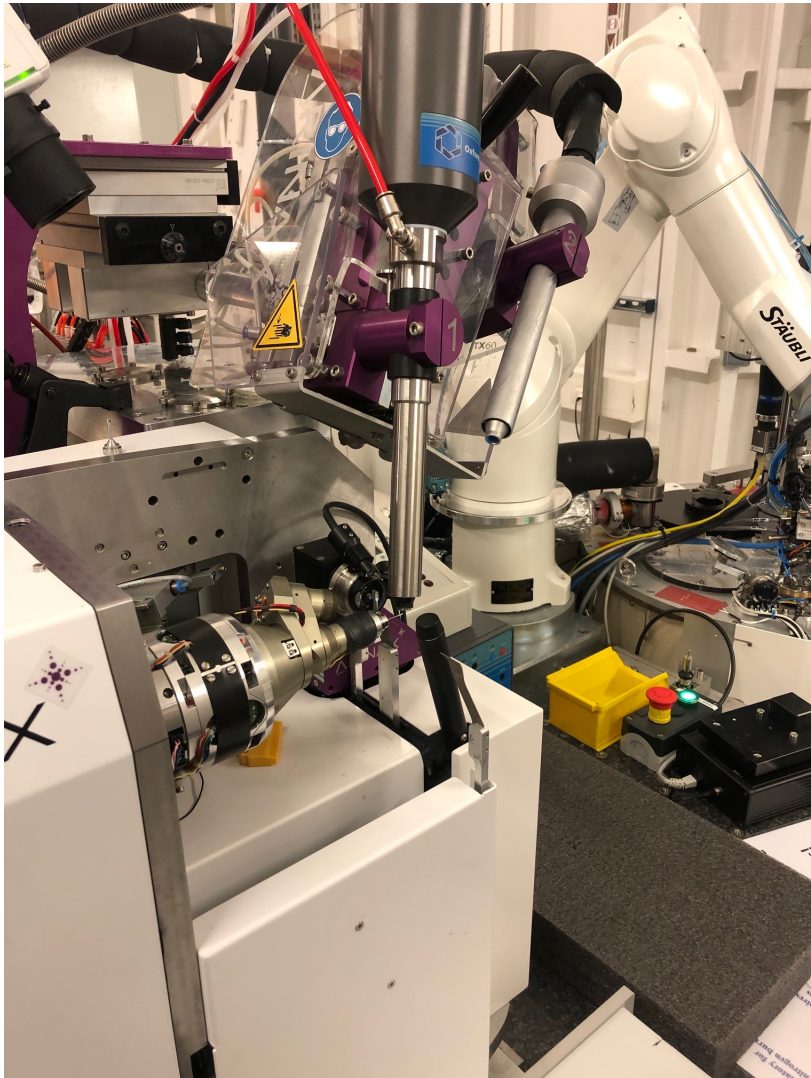


Nicolas Foos and Jean Baptiste Florial (EMBL)

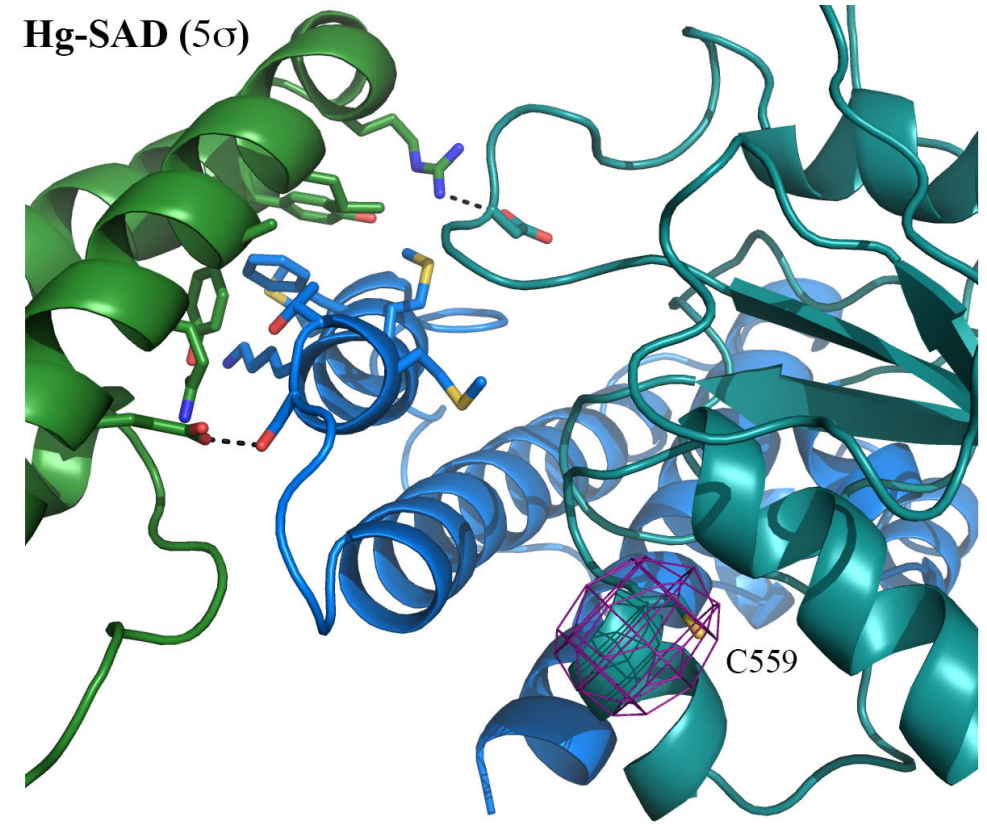
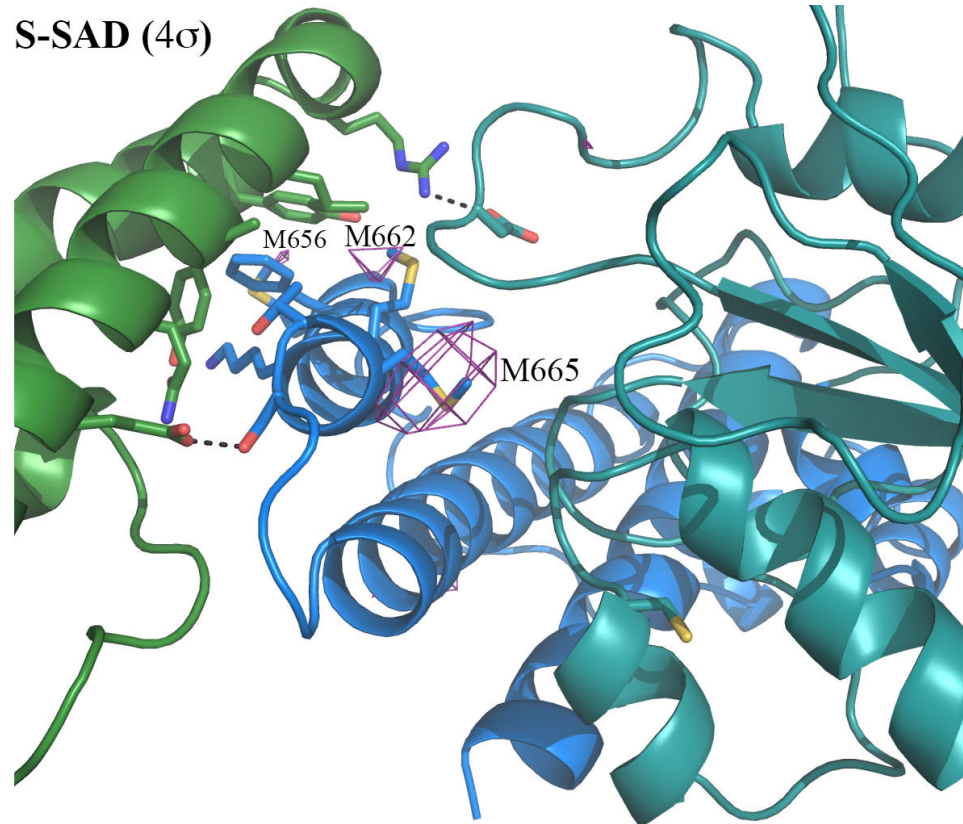
ID30B – Plate manipulator facilitates microfluidic chip data collection (Estelle Mossou)



ID30B – Dehydration device available



ID30B – Recent highlight



ID30B – Coming soon

Beam characteristics

- Variable focused beamsizes:
 - Explore possibility of 2D lenses (H x V)

Experimental setup

- Further improve *in situ* data collection
- Global Phasing Crystal re-alignment in MxCuBE³
- Implement Raman spectroscopy (icOS)



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