SOLEIL SYNCHROTRON

FOR **BIOLOGISTS**

PROXIMA-1
PROXIMA-2A

MX Beamlines

and POLARIS

cryoEM

ORGANISMS

TISSUES

CELLS

ORGANELLES

COMPLEXES

PROTEINS

ATOMS

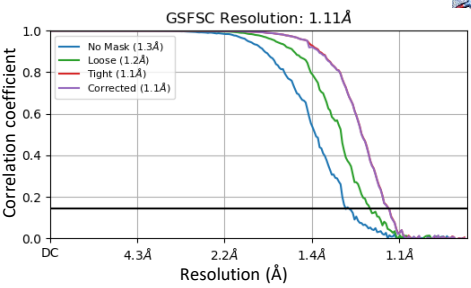
POLARIS

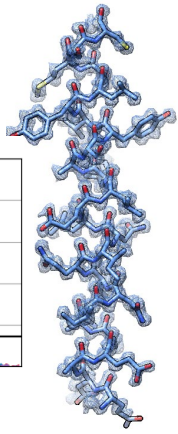
Titan KRIOS G4

- 300 keV, cold FEG
- SELECTRX-X energy filter
- Falcon 4i camera
- Fringe free illumination
- Autoloader (12 grids)
- To be used for **SPA and cryoET**
- Control via EPU and Serial-EM
- For cryoET, single rotation sample stage (+/- 70°)

Measured performances

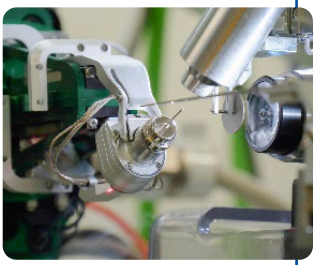
Fourier Shell Correlation and docking on apoferritin





PROXIMA-1 & PROXIMA-2A CHARACTERISTICS

- X-ray wavelength tunability for MAD and SAD phasing or metal identification - Energy range 6-18 keV
- Beamline control via MXCuBE software - including automatic loop centering and tools for X-ray centering, helical scans, grid scans, X-ray dose estimation, ...
- Multi-axis goniometry
- Fast beamline alignments
- Under cryogenic conditions, a full data set can be acquired within five minutes.



Experiments

On site | Remote | Mail-In

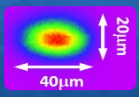
DATA PROCESSING

- Manual and automatic data processing is available on both beamlines
- Support from beamline scientists for experiments and data processing as well as phasing & modeling with SAD, MAD & AlphaFold
- Data visualization via ISPyB/EXI2
- Data retrieval via external hard drives or GLOBUS (remote data access service)
- Online and on-site tutorials available

SPECIFICITY

PROXIMA-1

Parallel beam



- Collimated 40 x 20 µm²
- Robotic sample changer with cryogenic Dewar capacities of three unipucks (upgraded to a larger capacity soon) using SPINE compliant pins
- SMARGON Multi-axis goniometer
- Eiger X 16M X-ray area detector (data collection frame rates of 120 Hz)

PROXIMA-2A

µ focus beam

- Microfocus 10 x 5 µm²
- Robotic sample changer with cryogenic Dewar capacities of nine unipucks using SPINE compliant pins
- MD3 Multi-axis goniometer (to be commissioned in 2025)
- Eiger X 9M X-ray area detector (data collection frame rates of 238 Hz)
- Humidity controller (REX-HC1) for crystal dehydration experiments
- **Global Phasing Ltd (GPhL) workflows** for improved X-ray data collection strategies and electron density map quality

- **The CRIBLEUR plate screener** for room temperature X-ray data collection from crystals in SBS-format plates, micro-fluidic chips, capillaries, ... and also from plate sandwiches for screening membrane protein crystals in lipid cubic phases.

REFERENCES

- Chavas LMG, et al. PROXIMA-1 beamline for macromolecular crystallography measurements at Synchrotron SOLEIL. J Synchrotron Radiat. (2021)
- Duran D. et al. PROXIMA-2A – A New Fully Tunable Microfocus Beamline for Macromolecular Crystallography. J Phys. Cof. Ser. (2013)
- Jeangerard D. et al. From Plate Screening to Artificial Intelligence : Innovative developments on PROXIMA-2A at Synchrotron SOLEIL. Proceedings of the 10th MEDSI, WEPH36 (2018)

More information on PROXIMA-1 & PROXIMA-2A publications web pages

PROXIMA-1

PROXIMA-2A

COMPLEMENTARY BEAMLINES

SWING-BioSAXS:

- Determine or confirm the conformation of the macromolecule **in solution**
- Probe **the oligomerization state** under various conditions
- Probe **large conformational changes** induced by environmental conditions (pH, temperature, salts, cofactors, ...)

DISCO-SRCD:

- Measure the **thermostability** of the protein (prior crystallization screens)
- Characterise the **Secondary structure content**
- Probe **for cofactor/ligand/lipid bilayer induced conformational changes**

CONTACT

Pierre Legrand
PROXIMA-1 Beamline & POLARIS Manager
pierre.legrand@synchrotron-soleil.fr
+33 (0)1 69 35 96 60

William Shepard
PROXIMA-2A Beamline Manager
william.shepard@synchrotron-soleil.fr
+33 (0)1 69 35 81 80

Health & Well-Being at SOLEIL

Link to the web page

@HelioBio_SOLEIL

SOLEIL's Health and Well-being Scientific Section is composed of 30 scientific experts from different fields. Through collaborative and science-driven approaches, the Section offers the community a coherent portfolio of state-of-the-art techniques to serve scientific and societal health-related challenges.

L'Orme des Merisiers - Départementale 128
91190 Saint-Aubin - FRANCE
www.synchrotron-soleil.fr