

MS09-2-4 New opportunities for integrated structural biology at fourth-generation synchrotron sources
#MS09-2-4

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Abstract

A proposal for a high brilliance upgrade to the SOLEIL synchrotron radiation source is expected to increase the beam brightness by > 50 times on beamlines used for life sciences. At the same time revolutions in Cryo-electron microscopy and the prediction of protein folds, and accessible super resolution microscopy techniques have changed the way we look at an integrative approach. The combined expertise of the life sciences beamline teams at SOLEIL form the HelioBiology section, which has been, for the last 4 years, developing a post-upgrade approach to structural biology. This approach will be presented, paying particular attention to facilities that are novel to SOLEIL including in-vivo crystallisation [1], microfluidic devices and their synchrotron applications [2], and concrete efforts towards an integrated approach to structural problems including the addition of new methods, such as cryo-electron microscopy and soft X-ray end cryo-electron tomography. Recent examples will illustrate opportunities for integrated studies at SOLEIL and elsewhere, and some potential evolutions discussed. This work is presented on behalf of the members of the HelioBio scientific section at SOLEIL (<https://www.synchrotron-soleil.fr/en/research/house-research/biology-health-heliobio>).

References

- [1]. Banerjee, S., Montaville, P., Chavas, L.M.G., Ramaswamy, S. "The New Era of Microcrystallography" *Journal of the Indian Institute of Science.*, 98(3): 273–281. (2018).
- [2]. Chaussavoine, I., Beauvois, A., Mateo, T., Vasireddi, R., Douri, N., Priam, J., Liatimi, Y., Lefrançois, S., Tabuteau, H., Davranche, M., Vantelon, D., Bizien, T., Chavas, L.M.G., Lassalle-Kaiser, B. "The microfluidic laboratory at Synchrotron SOLEIL" *Journal of Synchrotron Radiation.*, 27(1): 230-237. (2020).