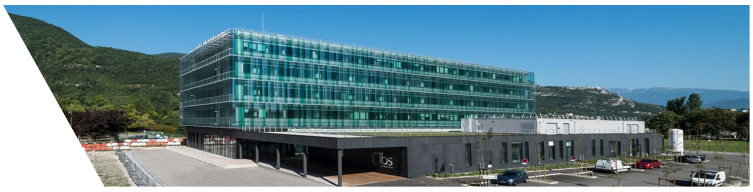

PhD thesis project (3 years - starting October 2021)

Understanding and improving the properties of fluorescent proteins by light-NMR

Photo-transformable fluorescent proteins (PTFP) are crucial markers for an increasing range of applications in advanced fluorescence microscopy and biotechnology, but their subtle photophysical behavior remains largely suboptimal. Thus, there is a strong need for enhanced variants optimized for particular applications. PTFPs engineering most often exploits structural information available from X-ray crystallography, missing essential information on PTFP's conformational dynamics that typically drive photophysical properties. This PhD project will establish solution NMR spectroscopy combined with in-situ sample illumination as a new paradigm for fluorescent protein research, contributing atomic-resolution information on photodynamics, under various experimental conditions, in cellular environments, and over a wide range of time scales.

Relevant recent publications:

De Zitter, E., D. Thédié, et al. (2019) Mechanistic investigation of mEos4b reveals a strategy to reduce track interruption in sptPALM. *Nat. Methods*. 16: 707–710.

Christou, N.E., and B. Brutscher. (2018) BEST and SOFAST experiments for resonance assignment of histidine and tyrosine side chains in 13C/15N labeled proteins. *J. Biomol. NMR*. 72: 115–124.

Christou, N.-E., Ayala, I., Giandoreggio-Barranco, K. Byrdin, M. Adam, V., Bourgeois, D., and Brutscher B. (2019) NMR reveals light-induced changes in the dynamics of a photoswitchable fluorescent protein. *Biophys. J.*, 117: 2087-2100.

Grenoble is situated in the middle of the beautiful French Alps, and the IBS provides a unique environment for state-of-the-art integrated cellular and structural biology (http://www.ibs.fr/). The PhD work will be carried out in collaboration with 2 research groups at IBS headed by D. Bourgeois (PIXEL) and B.Brutscher (NMR).

Candidates should have a master in either physics, chemistry, or molecular biology.

There is no secured funding for this position. The candidate is expected to apply for a doctoral contract at the Physics Doctorate School (Grenoble) and the CEA (France).
If you are interested, please send a CV, and a motivation letter to B. Brutscher (**bernhard.brutscher@ibs.fr**)