Closing the gap between the comprehension of biological systems at the Ångström and micron scale. The chances offered by integrating synchrotron x-ray diffraction, spectroscopic and imaging techniques.

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The dream of every structural biologist is to achieve the possibility to directly watch molecules interacting and functioning within a living cell. This goal, if ever possible, is far from reach. Conventional protein crystallography and XAS and NMR spectroscopy provide beautiful views of protein, protein complexes and extremely accurate information about the structure of single particles and on how metal ions interact with proteins.

In the last few years astonishing progress has been made in describing biological processes by combining x-ray fluorescence microscopy (XFM) with *in-situ* XAS spectroscopy and optical microscopy on micro- and nano-focus beamlines and to correlate these with atomic resolution structures, when available. 3D-imaging of organisms or cells can be obtained by using x-ray microtomography. More recently, the advent of XFELs has allowed structure determination from protein nanocrystals, time-resolved studies of protein dynamics on femtosecond to microsecond time scales and also the imaging of individual living cells at nanometer resolution. The lecture will provide an overview of these exciting new tools available to structural biologists and perspectives about the synergistic use of different available synchrotron techniques to deepen our understanding of biological systems.