

X-ray Microprobe Applications to Life Science

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X-ray fluorescence microscopy and microspectroscopy with 0.15- μm spatial resolution and unprecedented capabilities have been developed and applied to problems in life sciences. In addition to the intrinsic advantages of x-rays for elemental mapping, chemical state imaging, and phase contrast imaging, the unprecedented capabilities result mainly from the combination of the high-brilliance synchrotron radiation sources and high-performance x-ray microfocusing optics. In this presentation, we report experimental results in the study of several important problems in life science, such as the function of metallic ions in cells, the symbiotic relationship between mycorrhizal plant roots and fungi, the evaluation of anticancer agents, the determination of mesoscopic structure of DNA-membrane self-assemblies, and the dynamics of blood platelet in solution.