

Why Biomedical X-Ray Fluorescence Imaging needs a Synchrotron

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In biology and medicine, optical fluorescence is a well-established research tool, but can only provide a severely limited imaging depth. To overcome this depth limitation, X-ray Fluorescence Imaging (XFI) is based on the excitation of fluorescence in the X-ray photon energy range, where the attenuation in tissue is less strong. A typical envisaged application of XFI is early tumor-diagnostics, where gold-nanoparticles functionalized with antibodies are tracked. However, until recently XFI was regarded as unsuited for large objects such as humans due to the intrinsic large background from Compton-scattering, which also affects pre-clinical studies. This problem has been solved, which opens up the path towards future applications of XFI. In this talk I will focus on the question why biomedical XFI requires a synchrotron beamline.

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