

Methodological development and implementation of fast quantitative hard X-ray fluorescence multi-length-scale tomography for next-generation X-ray imaging at the NANOSCOPIUM beamline of SOLEIL synchrotron and its application to study physico-chemical processes involved in the pathologic calcifications

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This thesis focuses on advancing scanning hard X-ray fluorescence tomography for 3D quantitative imaging in complex systems at the NANOSCOPIUM beamline. It offers insights into elemental distribution with high spatial resolution. Collaborating with NANOSCOPIUM, APHP (Assistance publique – Hôpitaux de Paris), and the ICP (Institut de Chimie Physique), the application study focuses on urolithiasis. Specifically, it delves into the formation of Randall's plaques (RP) in renal papillae. Recent mesoscale studies suggest a correlation between trace elements like Zinc and RP formation. To elucidate Zn's role, a crucial aspect involves a few-hundred-nanometer resolution 3D study of Zn concentration. The developed fast quantitative XRF tomography enables the investigation of multiple samples, enhancing our comprehension of physico-chemical processes in pathology relationships.

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Vous êtes cordialement invités au pot qui suivra

THÈSE