

**HIGH RESOLUTION SYNCHROTRON ABSORPTION
MICROTOMOGRAPHY AND MICROBEAM DIFFRACTION STUDY OF THE
MINERAL PHASE MICROSTRUCTURE IN SEA URCHIN TEETH**

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The teeth of sea urchins are very complex, self-renewing biocomposites and achieve a high degree of functionality by combining strengthening and toughening strategies often employed in artificial composites. Very high resolution synchrotron (x-ray absorption) microCT (micro-computed tomography) with voxels (volume elements) smaller than 2 μm was used to map the microstructure within sea urchin teeth. A 20 μm synchrotron x-ray beam was used to map the mineral phase via transmission x-ray diffraction. The results of these complementary techniques are compared to each other as well as to results obtained via histochemical and immunohistochemical staining. The advances in understanding the functionality of sea urchin teeth are outlined and illustrate how using multiple x-ray modalities are synergistic.

Permission is granted to post the abstract on the DXC website.

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Oral presentation preferred. This should go with the synchrotron radiation talks.

We anticipate publishing in Advances in X-ray Analysis.