

Abstract Submitted
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Biomimetic growth of calcium oxalate crystals: synchrotron X-ray studies¹ AHMET UYSAL, BENJAMIN STRIPE, PULAK DUTTA, Northwestern University — Oriented crystals of calcium oxalate monohydrate (COM) form one of the major constituents of kidney stones in humans, and these crystals are also found in many plants. It is widely accepted that an organic matrix of lipids and proteins is involved in the crystallization of COM, though their role is not well-understood [1]. Langmuir monolayers of lipids on supersaturated aqueous solutions can be used to mimic the lipid-crystal interface during mineralization. We have studied nucleation and growth of COM crystals under heneicosanoic acid monolayers at the air-water interface. We used synchrotron x-rays in the grazing incidence geometry to determine the structure of the organic monolayer and the orientation of COM crystals *in-situ* during crystallization. We see that the (-101) faces of COM crystals are parallel to the organic matrix. There is a commensurate relationship between the heneicosanoic acid monolayer and the (-101) crystal face that may be responsible for the oriented growth. Evolution of the monolayer structure with time will be described. [1]S. R. Khan, Calcium Oxalate in Biological Systems, CRC Press, Boca Raton, 1995

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Ahmet Uysal
Northwestern University

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