Goldschmidt 2023 Abstract
https://doi.org/10.7185/gold2023.17876

Contrasting biomineralisation strategies in the cold-water coral *Desmophyllum dianthus* revealed by correlative geochemical imaging

CHRISTOPHER D STANDISH[1], GAVIN L FOSTER[1], JACOB P KLEBOE[2], THOMAS B CHALK[3], SUMEET MAHAJAN[2], ANDY MILTON[4], TESSA PAGE[4] AND JOSEPH A. STEWART[5]

[1]University of Southampton
[2]Department of Chemistry, University of Southampton
[3]CEREGE
[4]Ocean & Earth Sciences, University of Southampton
[5]University of Bristol

Presenting Author: C.D.Standish@soton.ac.uk

Scleractinian corals are important reef builders and ecosystem engineers, but despite many decades of study the mechanisms of biomineralisation remain hotly debated. Here we apply a range of correlated imaging modalities to the skeleton of the deep-sea coral *Desmophyllum dianthus* to better elucidate the controlling mechanisms. Our highly spatially resolved geochemical images reveal that the centres of calcification (CoCs), where new skeletal growth is initiated, have higher organic content, higher Mg, Li, and Sr, and lower U, B, and $\delta^{11}B$, compared to the fibrous deposits associated with skeletal thickening, which themselves display cyclical banding in the majority of elements and $\delta^{11}B$. These contrasting patterns suggests the dominant mechanisms of biomineralisation vary between structural components with crystal growth via particle attachment of amorphous calcium carbonate (ACC) being most important for the COCs and crystal growth by ion attachment dominating for the fibres.