

# Magical Proton Usage on Calcification of Ammonia "beccarii" -Acidify Environment to Realize Favorable pH at Calcification Site-

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The physiological processes responsible for calcification in foraminifera are poorly understood despite their contribution to oceanic CaCO<sub>3</sub> production. Here we show that calcification is driven by rapid transformation of bicarbonate to carbonate inside the cytoplasm, achieved by active outward proton pumping. We furthermore show that a V-type H<sup>+</sup> ATPase is responsible for the proton flux and thereby, calcification. External transformation of bicarbonate into CO<sub>2</sub> due to the proton pumping implies that biomineralization does not rely on availability of carbonate ions, but total dissolved CO<sub>2</sub> in perforate foraminifera may not reduce calcification, thereby potentially maintaining the current global marine carbonate production.

キーワード：バイオミネラリゼーション、炭酸カルシウム、pH

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