

琉球大学学術リポジトリ

共焦点ライブイメージング法によるサンゴ礁石灰化生物の生物鉱化過程の可視化

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論 文 要 旨

論 文 題 目

Live confocal imaging techniques for visualizing biomineralization processes in reef building marine calcifiers

Abstract

The ocean is full of organisms known as marine calcifiers that use dissolved ions in seawater to construct their shells and skeletons. Among various calcifiers known today, one of the most studied for the mechanism of calcification of marine organisms are the scleractinian corals and single-celled amoeba called foraminifera, which contribute to form coral reef structure. However detailed calcification mechanisms are largely unknown especially at the cellular level. In this dissertation, I describe several applications of live confocal imaging techniques to reveal the calcification dynamics in corals and foraminifers with special interests in the calcium precipitation processes at calcification sites.

The major findings of this dissertation are; (1) spatiotemporal dynamics of calcification in aposymbiotic primary polyps of a coral, *Acropora digitifera*, (2) primary polyps of coral that have an ability to regulate internal pH at the calcification site more dynamically, suggesting potential pH-sensing and regulating mechanisms that underlie the coral calcification processes, and (3) fine imaging of cytoplasm and dynamics of intracellular ion composition in symbiotic porcelaneous large foraminifer, *Amphisorus kudakajimensis*.

My observational data provides spatial and temporal information on dynamic events with adequate resolutions during calcification in live tissues. Based on these findings, I discuss the calcification processes in corals and foraminifers.

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