

Shell formation of foraminifera -marine unicellular calcifiers-

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Foraminifers are unicellular eukaryotes that mainly live in the ocean. Calcareous foraminifera forms a shell of calcium carbonate. Calcareous shells are stored in sediments for long periods and are therefore used as geological records as environmental indicators. However, the processes required for foraminifer shell formation have not been well studied. Therefore, we investigated how calcium and carbonate ions are taken up by biological processes at the site of calcification. It also shows the microstructure of the calcified site where the shell formation process proceeds. In this study, after optically observing the shell formation process, fluorescence imaging was performed to record the environment inside and outside the calcification site. Besides, the morphology of the shell formation site was described in detail by electron microscopy, revealing the relationship between the cytoplasm and calcareous structure. For decades, these relationships have been largely ignored. By obtaining samples at various stages during shell formation through laboratory culture experiments, we were able to study the mechanism of chamber formation.

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