Molecular Characterization of Free-living and Endosymbiotic *Symbiodinium* in *Aiptasia pulchella*

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Abstract

Sustaining *in vitro* cultures of endosymbiotic dinoflagellates in the genus *Symbiodinium* is compulsory to assess the omics question related to *Symbiodinium* function and *Symbiodinium* dependent host fitness. In this study, we successfully culture the *Symbiodinium* (clade B) resided in *Aiptasia pulchella*. It showed that health rate of sea anemone was observed by the present of abundant *Symbodinium* occupied in sea anemone tentacle and body. Furthermore, transmission electron microscopy (TEM) revealed the *Symbiodinium* has different shape and density in healthy and unhealthy condition inside Sea anemone. Endosymbiotic dinoflagellates were isolated in different percentage of percoll gradient to obtain pure *Symbiodinium* reside in the tentacle. Surprisingly, a continuous cultivation for 2 months of endosymbiotic *Symbiodinium* indicated the survival and adaptation of *Symbidoinum* in free living condition. Furthermore, transmission electron microscopy (TEM) and Nile red staining all confirmed that the newly form of free-living *Symbiodinium* was different with the freshly isolated.