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## Whole transcriptome analysis reveals changes in expression of immune-related genes during and after bleaching in a reef-building coral

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### Abstract

Climate change is negatively affecting the stability of natural ecosystems, especially coral reefs. The dissociation of the symbiosis between reef-building corals and their algal symbiont, or coral bleaching, has been linked to increased sea surface temperatures. Coral bleaching has significant impacts on corals, including an increase in disease outbreaks that can permanently change the entire reef ecosystem. Yet,

**KEYWORDS**

little is known about the impacts of coral bleaching on the coral immune system. In this study, whole transcriptome analysis of the coral holobiont and each of the associate components (i.e. coral host, algal symbiont and other associated microorganisms) was used to determine changes in gene expression in corals affected by a natural bleaching event as well as during the recovery phase. The main findings include evidence that the coral holobiont and the coral host have different responses to bleaching, and the host immune system appears suppressed even a year after a bleaching event. These results support the hypothesis that coral bleaching changes the expression of innate immune genes of corals, and these effects can last even after recovery of symbiont populations. Research on the role of immunity on coral's resistance to stressors can help make informed predictions on the future of corals and coral reefs.

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climate change, thermal stress, coral bleaching, symbiosis dissociation, transcriptomics, immune system

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