

Scientists unlock genetic mystery: Why corals reject life-saving algae

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Credit: Florida International University

Algae can help corals adapt to warming seas but scientists have discovered they have relationship issues. It's complicated.

Algae can take shelter within the [coral](#), flourish and provide food for the coral. It's a [symbiotic relationship](#) that has existed as long as corals have been in the sea. But the [algae](#) that finds comfort in more shallow corals today can't handle [warming](#) waters.

Durusdinium trenchii can do all this and take the heat. It just can't do it fast enough. Researchers at FIU have discovered why—it cannot overcome the immune response of corals. The FIU research team also found this particular algae cannot open all the genetic gates in coral cells to make a fruitful relationship.

Without algae, corals turn white.

"When they become bleached for long period of time, corals are more susceptible to diseases," said, Emmanuel Medrano, the lead author of the study and FIU biological sciences alumnus who conducted the research as an undergraduate student. "This leads to breakdown of coral reef health, which affects the diversity of marine species and fisheries."

Corals could avoid a potential knockout punch at the hands of warming seas if scientists can help *D. trenchii* bypass the immune response of corals and open those genetic gates.

Preventing corals from bleaching events is crucial to reversing the global trend of coral reef loss.

Marine sciences associate professor Mauricio Rodriguez-Lanetty, who directs the lab where the research was conducted, hopes his team can manipulate these mechanisms to help the new micro algae engage in a more stable symbiosis. They are currently investigating whether it's possible to modify the genes of *D. trenchii* so it has an easier time flourishing in corals or whether it's possible to alter the genes of corals to favor *D. trenchii*.

The study was published in the journal *Frontiers in Microbiology*.

More information: Emmanuel Medrano et al. Proteomic Basis of Symbiosis: A Heterologous Partner Fails to Duplicate Homologous Colonization in a Novel Cnidarian– Symbiodiniaceae Mutualism, *Frontiers in Microbiology* (2019). [DOI: 10.3389/fmicb.2019.01153](https://doi.org/10.3389/fmicb.2019.01153)

Provided by Florida International University

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