

# Corals have a secret weapon against a warming climate

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Staghorn coral (*Acropora cervicornis*). Credit: Wikipedia, CC BY 2.5

Rising ocean temperatures are killing coral reefs, but researchers discovered corals have a secret buried in their genes that just might help them fight off seasonal changes in temperature.

For over two years, FIU Institute of Environment Ph.D. student Javier

Rodriguez-Casariago sampled reefs around Culebra Island, Puerto Rico to learn about their responses to the destruction caused by Hurricanes Irma and Maria. He did this work under the direction of FIU molecular biologist Jose Eirin-Lopez of the institute's CREST Center for Aquatic Chemistry and Environment and the Environmental Epigenetics Lab.

This project, funded by the National Science Foundation and part of a bigger initiative aimed at understanding the effects of hurricanes on [coral reefs](#), catapulted Rodriguez-Casariago to further research the adaptation responses of corals. For 17 months, he collected more than 200 Staghorn coral samples with former CREST undergraduate student Ivanna Ortiz Rivera and former CREST postdoctoral researcher Alex Mercado-Molina.

Together, they studied the corals across all four seasons. What they found was eye-opening. Depending on the season, corals modified the activity of their DNA in order to adapt to changes in temperature and other conditions. These epigenetic changes do not involve a change in DNA itself but can affect how genes are expressed.

Corals are very sensitive to temperature changes. A small change of at least 1 degree Celsius above the average summer maximum temperature is known to trigger deadly bleaching.

"This discovery opens up a research area around leveraging this epigenetic response to prevent coral bleaching under climate change conditions," Rodriguez-Casariago said.

This research was recently published in *Frontiers in Marine Science* and is the first in a series of publications related to the coral research being conducted in Culebra Island, Puerto Rico.

**More information:** Javier A. Rodríguez-Casariago et al. Genome-

Wide DNA Methylation Analysis Reveals a Conserved Epigenetic Response to Seasonal Environmental Variation in the Staghorn Coral *Acropora cervicornis*, *Frontiers in Marine Science* (2020). [DOI: 10.3389/fmars.2020.560424](https://doi.org/10.3389/fmars.2020.560424)

Provided by Florida International University

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