

# Immunity could be key to addressing coral crisis

9 July 2018, by Alan Williams



Credit: University of Plymouth

Coral reefs support a quarter of all marine life, feed hundreds of millions of people and contribute vastly to the global economy. But they are dying in mass bleaching events, as climate change warms our oceans and breaks down vital relationships between corals and energy-providing algae.

A new commentary, published in *Nature Communications Biology*, provides hope that a shift in research focus towards coral immunity will support [reef](#) conservation and restoration efforts.

Dr Caroline Palmer, Visiting Research Fellow at the University of Plymouth, has spent more than a decade examining coral health from an immunological perspective.

In particular, she has identified coral immune mechanisms and sought to understand what enables some corals to survive while others die. This led Dr Palmer to discover that corals with higher immune defences are less likely to become diseased or to bleach.

In her latest work, she expands on this observation, drawing on a theory from insects that explains how corals might coexist with specific microorganisms, as a holobiont, while resisting infection or other disturbances.

Dr Palmer also presents a model of coral susceptibility, whereby investing in immunity enables coral, with its microorganisms, to tolerate more damage before initiating an immune response. This model describes how coral tolerance may vary among corals indicating their susceptibility to disturbances, such as bleaching events.

Dr Palmer first started examining the immune systems of reef-building corals more than a decade ago, and her PhD was the first research to look at the subject in depth. But she says that coral immunity remains an under-studied area of research.

Coral bleaching, on the other hand, has been a research focus for decades, though is often considered distinct from immunity – Dr Palmer, however, suggests it is a component of coral holobiont immunity.

Dr Palmer also proposes an immunological model by which corals may increase their tolerance to adverse conditions – suggesting a way coral may adapt to new, more extreme, conditions.

Dr Palmer, who is currently Lead Scientist on the [Seeking Survivors](#) project examining coral health in Costa Rica, added:

"Coral biologists are racing to conserve [coral reefs](#) before it's too late. There is currently a lot of interest in creating more tolerant corals through genetic engineering and of restoring reefs by targeting more resilient corals. I fully support these approaches, but believe understanding what drives [coral](#) health will be key to their success."

Provided by University of Plymouth

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