

Immunity to community: applying coral immune concepts to understanding reef declines

Corals are a prime example of an ecologically important organism that requires in-depth study of their immune system due to urgent environmental needs. Globally coral reefs are threatened by increased global temperatures and disease outbreaks. Currently there are many diseases affecting reefs world-wide, white plague and pox outbreaks have waxed and waned, and currently Stoney Coral Tissue Loss is critically affecting Caribbean reefs. Studying coral defenses in response to these diseases has improved our understanding not only of the coral immune system but the differing capabilities of different species to stay healthy. The coral immune system is complicated by the involvement of a stable microbiome and an intracellular algal cell and the interaction between these partners has only begin to be elucidated. Work in the Mydlarz lab has outlined the immune response to active infections in several main reef-building coral species and we can identify the several different approaches that disease resistant corals use to deter infections such as investment in the extracellular matrix and mucus, while disease susceptible corals tend to overstimulate inflammatory responses.