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The complexity of circadian clocks in symbiotic corals

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Most living organisms distinguish day from night, and are able to measure the respective duration of these periods. In Anthozoans (corals and sea-anemones), which exhibit periodic biological activities (e.g., tissue expansion and contraction, calcification, spawning, etc) that appear to be synchronized by environmental light/dark cycles, the mechanism for photoperiodic time measurement is unclear. Circadian regulation of plant-animal endosymbioses is complicated by a diversity of internal and external cues. Recently it was discovered that stress-related genes in corals are coupled to the circadian clock, anticipating major changes in the intracellular milieu. In this regard, numerous chaperones are "hard-wired" to the clock, effectively preparing the coral for the consequences of oxidative protein damage imposed by symbiont photosynthesis, including synexpression of antioxidant genes being light-gated. Conversely, central metabolism appears to be regulated by the hypoxia-inducible factor system in coral. These results reveal the complexity of endosymbiosis as well as the plasticity regulation downstream of the circadian clock.

Ospite di:

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