The effects of increased temperature on *Karenia brevis* and *Symbiodinium microadriaticum*

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As global temperatures increase, so do the potential impacts on phytoplankton communities. To understand the potential effects of climate change on harmful algal blooms (HAB) and coral bleaching, heat stress will be applied to two model species; *Karenia brevis*, a toxic HAB species, and *Symbiodinium microadriaticum*, the coral symbiont. We will investigate the potential role of heat stress in oxidative stress and programmed cell death (PCD). *K. brevis* and *Symbiodinium* are both dinoflagellates and previous studies have documented that *Symbiodinium* experiences an increase in ROS levels in response to heat stress. Therefore, we hypothesize that *K. brevis* and *Symbiodinium* will both exhibit increased levels of reactive oxygen species (ROS) and metacaspase protein expression during heat stress when compared to control conditions. Since ROS production and metacaspase proteins are hypothesized to be involved in the heat stress response, we will examine ROS levels and metacaspase protein expression levels in *K. brevis* and *Symbiodinium* using flow cytometry and western blot methods. This experiment will allow us to determine if heat stress does in fact cause an elevation of ROS and metacaspase protein expression levels suggesting an induction of oxidative stress and PCD. This project will provide insight into how climate change may shape coastal phytoplankton species.

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