Elevated pCO_2 Alters Physiology and Gene Expression in Harmful Algal Bloom Species *Heterosigma akashiwo*

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Ocean acidification, a decrease in ocean pH resulting from anthropogenic CO_2 emissions, is likely to impact individual marine organisms as well as entire communities and food webs. While some primary producers have been shown to grow better in elevated pCO_2, little is known about how *Heterosigma akashiwo*, a raphidophyte capable of forming harmful algal blooms (HABs), will be affected by the seawater's shifting carbonate chemistry. In this study, *H. akashiwo* were grown at a range of pCO_2 levels (from 200 to 1000 ppmv) and monitored for changes in growth rates, H_2O_2 production, and gene expression. Results indicated that *H. akashiwo* may grow fastest under pCO_2 between 600 and 900 ppmv, while growth rates decreased when pCO_2 exceeded 900 ppmv. H_2O_2 per cell also increased as growth rates increased. Preliminary analysis of gene expression changes revealed that many genes associated with photosynthesis and metabolism were up-regulated under elevated pCO_2. While further analysis is needed to support these findings, changes in *H. akashiwo* growth rates and H_2O_2 production may have profound implications for bloom development in coastal systems under future ocean conditions.