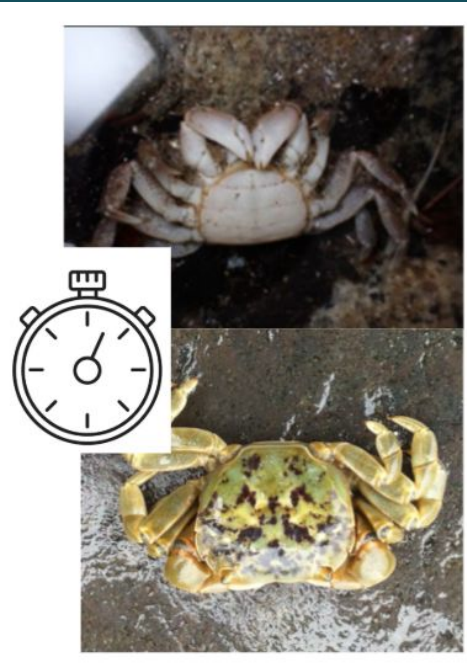


# Marine Invertebrate Caffeine Exposure

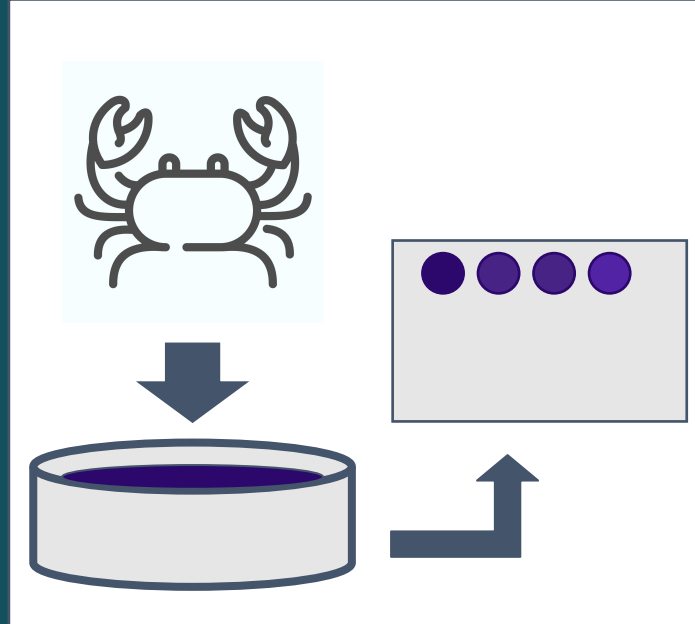
**Research question:** How do different environmental concentrations (5ug/L, 10ug/L, and 15ug/L) of caffeine facilitate physiological stress responses in *Hemigrapsus oregonensis*?

Null hypothesis: Different environmental concentrations of caffeine will have no effect on the physiological stress response

Alternative hypothesis: Higher environmental concentrations of caffeine will have an increased effect on the physiological stress response



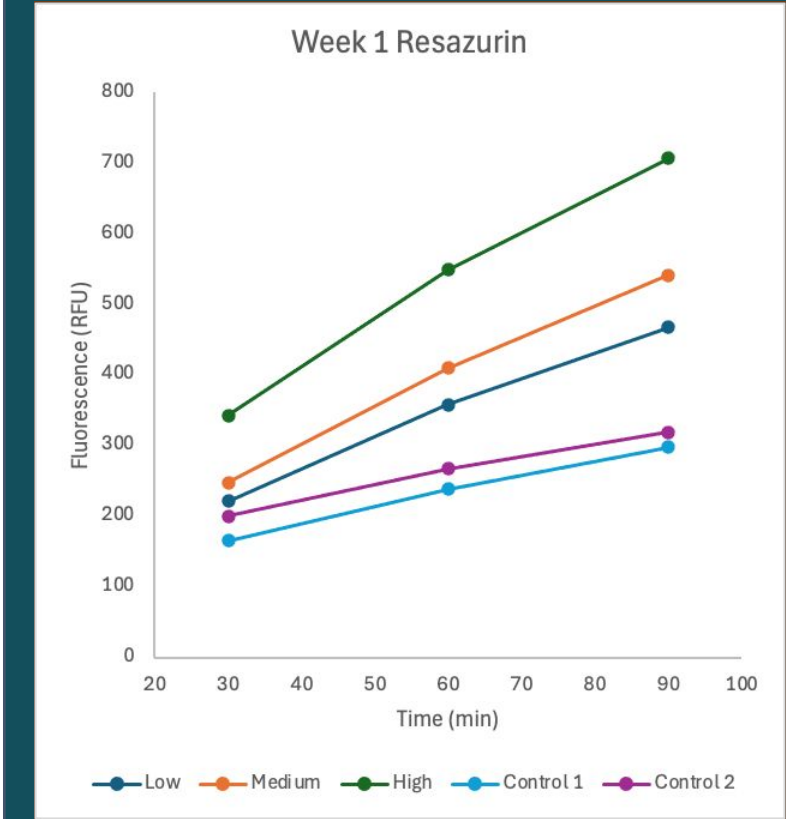
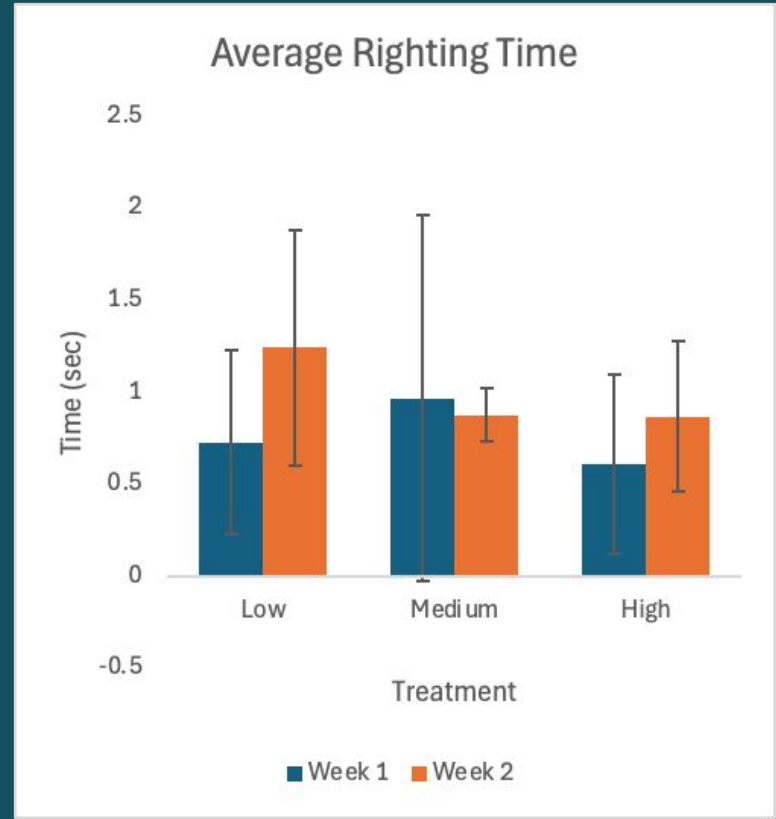
Measured amount of time it took crabs to right themselves after being placed upside down.



Weigh and place crabs in resazurin chamber and take a sample every 30 mins to record O<sub>2</sub> consumption.



Hemolymph extracted from crabs and Lactate and BCA protein assays are run.



**Hemolymph results  
haven't yet been  
provided**

Average the righting time from Week 1 and Week 2, comparing these values throughout different treatments.

Normalize based on weight, run linear regressions

Run ANOVA test comparing the average BCA and Lactate values across treatments