A Game of Operation: Investigating the Modulatory Effects of Myosuppressin Isoforms on the Homarus Cardiac Ganglia

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The nervous system is responsible for manipulating our behaviors, like from walking to running. These changes are the result of generated rhythmic movements controlled by central pattern generators (CPGs). For example, the Homarus americanus cardiac ganglion (CG), a central pattern generator, is responsible for the American lobster heartbeat. The Homarus CG is a simple model system for investigating the underlying mechanisms in generating rhythmic movements such as the heartbeat, as it contains only nine neurons and does not require outside sensory input to function. This is incs77.85 606.34 Tm 0 g 0 G 11.l0 61]g

full ¶and myosuppressin no pGlu¶isoforms to significantly increase burst duration, and decrease burst cycle frequency in the Homarus CG. Conversely, the nonamidated myosuppressin isoform does not significantly affect burst cycle frequency, but has revealed a slight decrease in burst duration instead (n=13). With this, experimental data has also confirmed that the number of action potentials spikes is positively correlated with the burst duration as shown below. In order to deduce how these isoforms cause these behavioral changes, this project is now beginning to analyze how these isoforms interact with the CG on a cellular level, and will be continued this Fall. Moreover, while also increasing both sample size and varying the concentrations of the myosuppressin isoforms, I hope to discern how these chemical modifications alter biological behavior, and how simple networks such as the Homarus CG, generate rhythmic movements such as the lobster heartbeat.

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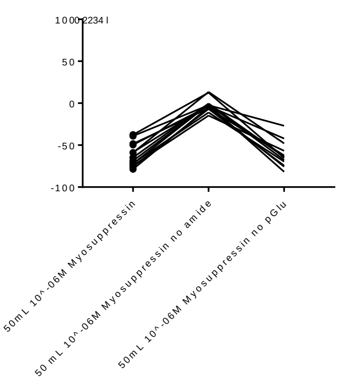

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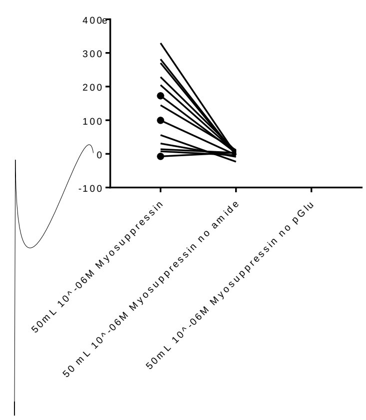

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