

*Abstract* - For years, researchers have studied impedance changes in neural tissue resulting from increased neuronal activity. Here, we explore this relationship using voltages recorded on a 60-channel micro-electrode array. Specifically, we show that increased action potential firing events (spikes) produced changes in the average impedance of the tissue. In each trial, changes in the amplitude of a sinusoidal carrier wave caused by an injected subthreshold current were analyzed in order to determine these impedance changes. Higher frequency data, obtained after the carrier wave was removed, were analyzed to determine the location and frequency of spike events. We here validate the utility of the 60-channel micro-electrode array for this purpose and outline future, more detailed experiments.

*Keywords* - impedance, micro-electrode array, *Aplysia*, neuron, abdominal ganglion