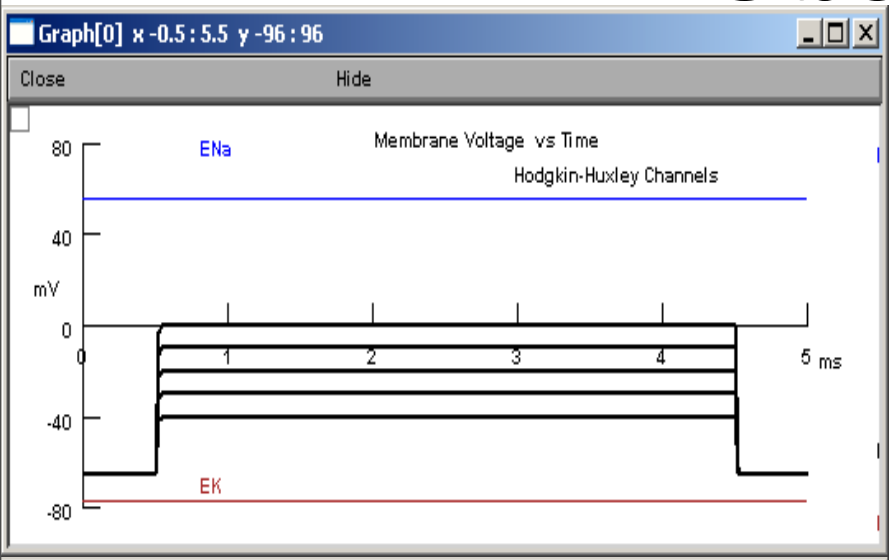
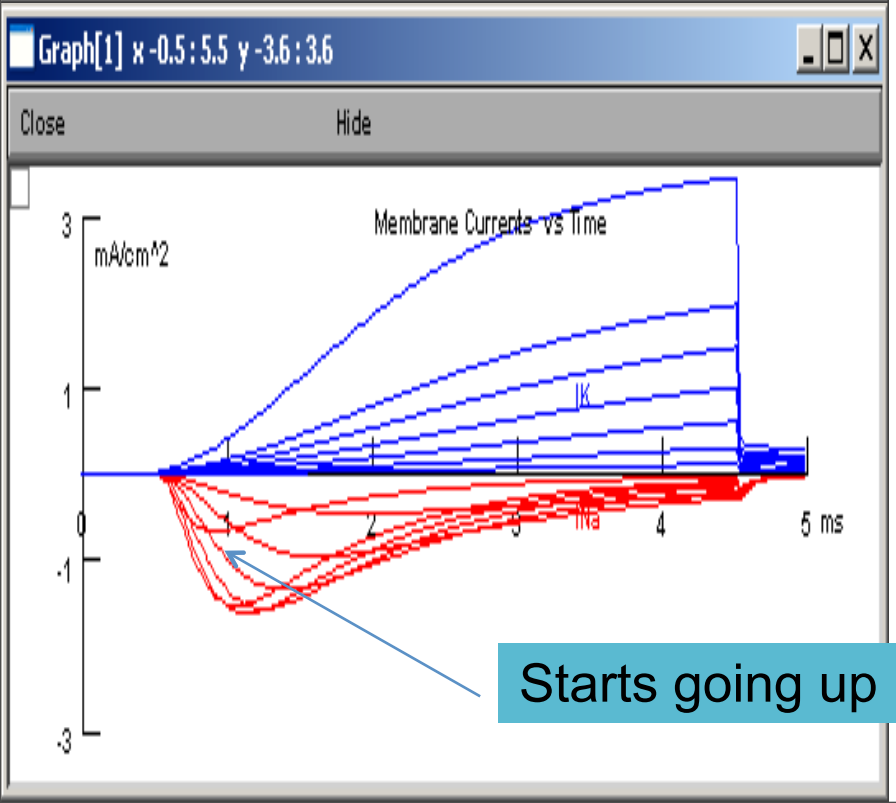
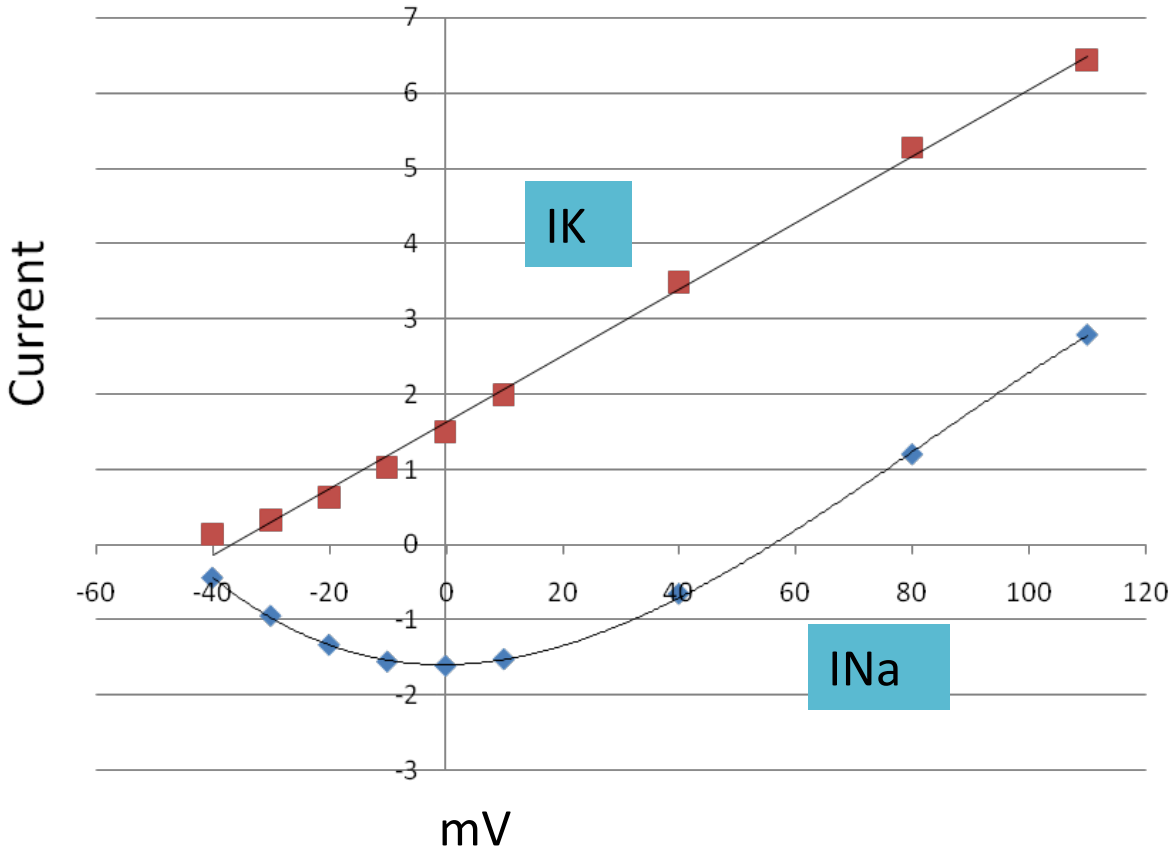
Lab J

With Bonus

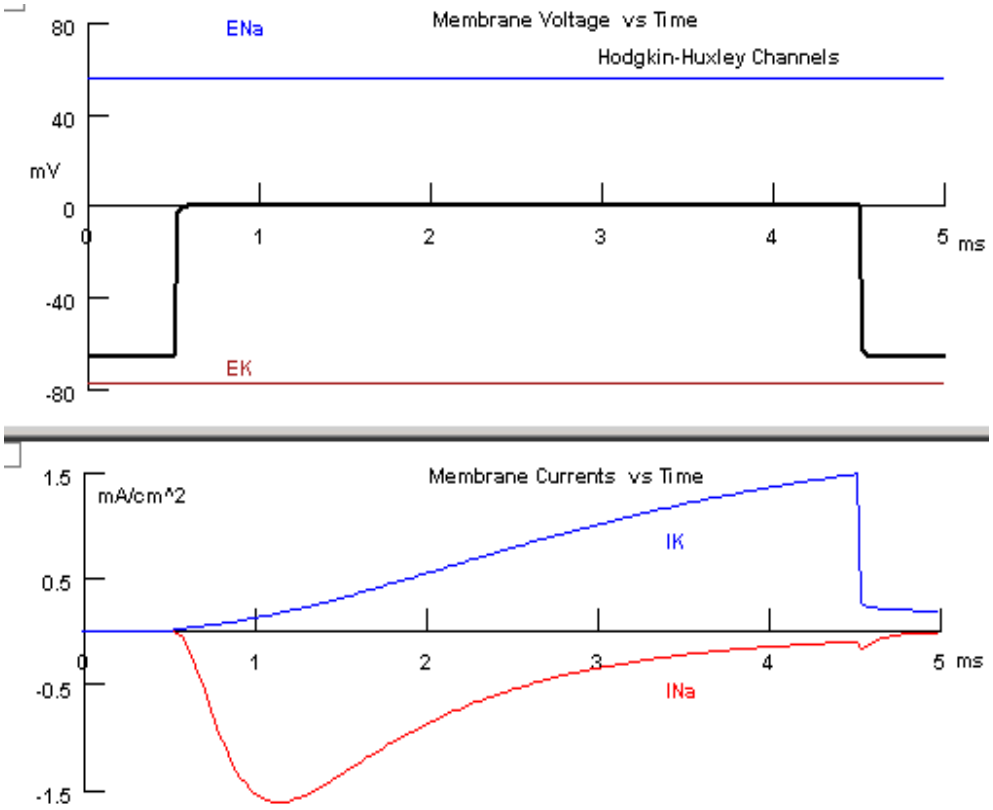
Observation 1

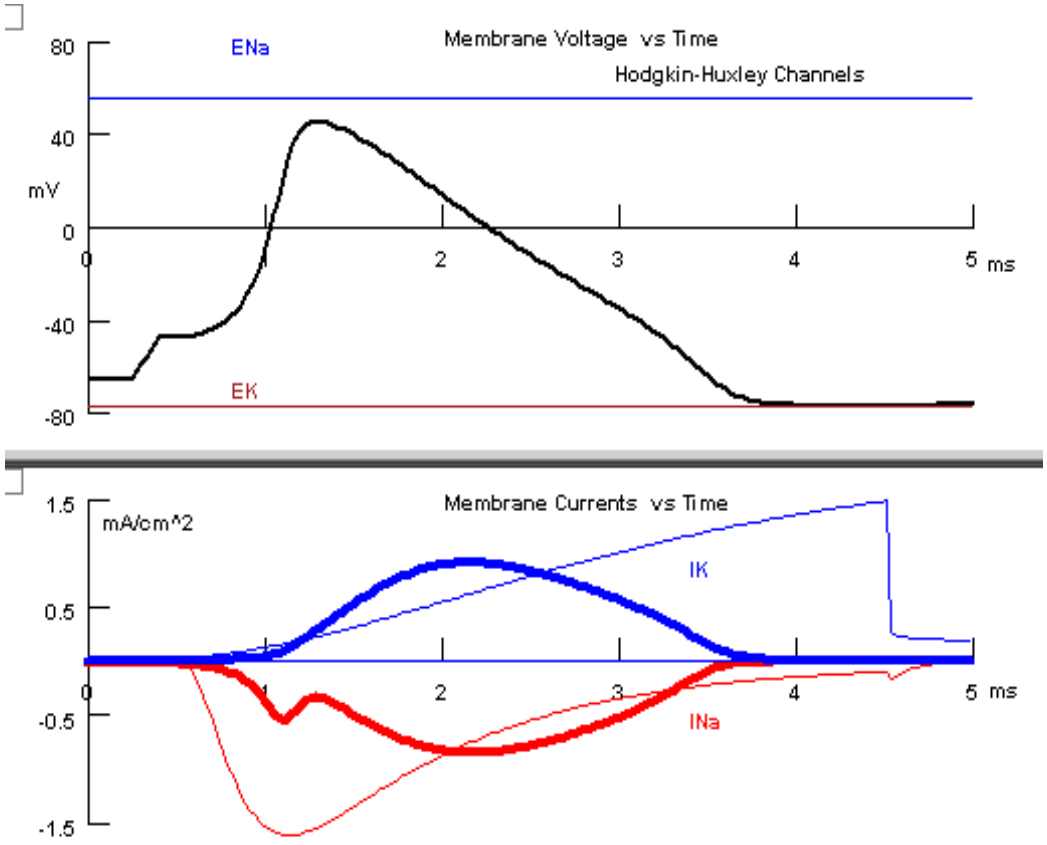






Different behavior of K current and Na current- While I_K has a steady outward current, I_{Na} has a peak inward current and then it decreases.

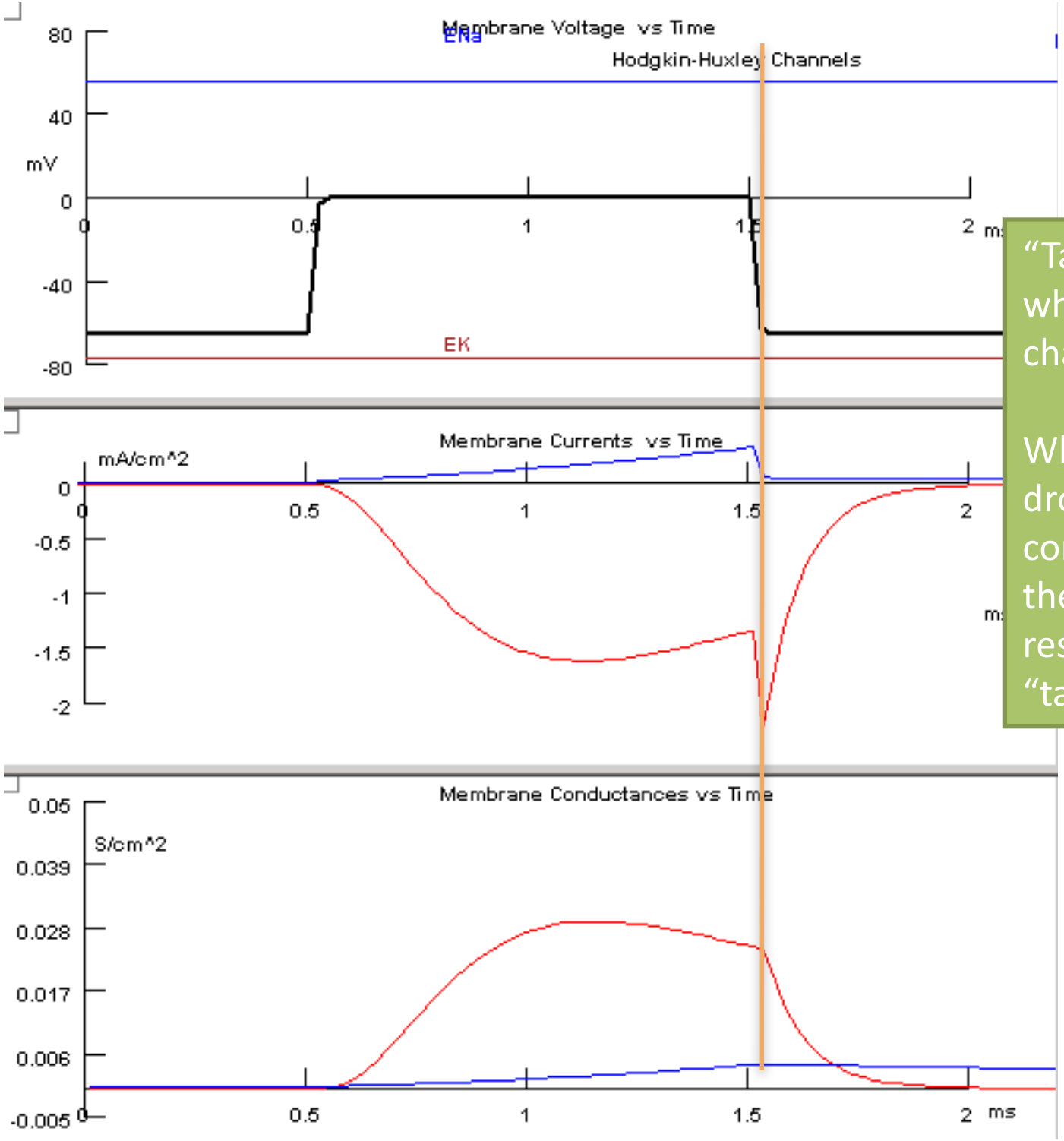




Vclamp

Iclamp (thick line)

The Vclamp changes the membrane voltage of the neuron much quicker than the Iclamp, so the neuron's response is much greater for the Vclamp.



"Tail Currents" - the current when the Vclamp is off and channels are closing

When the voltage suddenly drops back to -65 mV, the conductance is still high, so the increase in driving force results in the peak of the "tail" (see orange line).

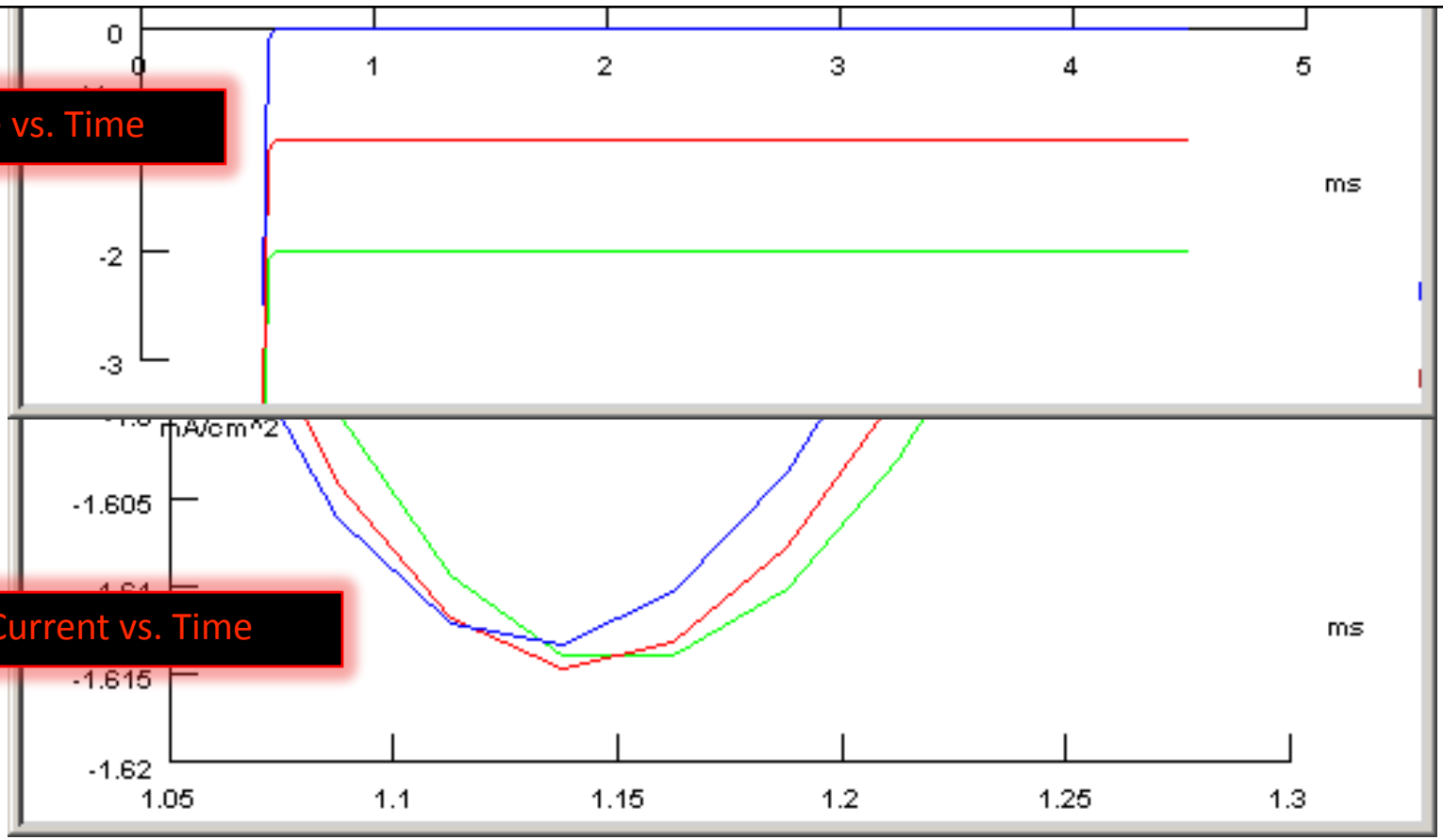
Bonus: Maximum Current for Na

- Since the value of the membrane current is a function of both the driving force (V-ENa) and membrane conductance (gNa), I decided to try to figure out what testing amplitude for the voltage clamp would yield the greatest maximum Na current.
- Initial Conditions:
  - Membrane Potential = -65 mV
  - Temperature = 6.3 degrees Celsius

Bonus: Maximum Current for Na

- Given the initial conditions stated above, the maximum current for Na for a voltage clamp occurs with a pulse that depolarizes the membrane to -1 mV and is about 1.6146 nA/cm^2
- The driving force of Na (V-ENa) for this voltage is about 56.45 mV

Membrane Voltage vs. Time



Na Membrane Current vs. Time