

Name: _____

Ex 18B: Neurophysiology of Nerve Impulses
Computer Simulation Data Sheet
Bio 2402 Lab: PhysioEx

Ziser, 2001

Activity 1: Electrical Stimulation:

Do you see any kind of response on the first oscilloscope screen?

What was the threshold voltage: _____

How does the tracing at increased voltage compare to the one at threshold voltage, Why?

What was the maximal voltage: _____

What is occurring at this maximal voltage?

Activity 2: Mechanical Stimulation:

What do you first see on the oscilloscope run?

How does this tracing compare with the ones you got in activity 1?

Activity 3: Thermal Stimulation:

What happens in the first test?

How does this trace compare to the trace that was generated with the unheated glass rod?

What explanation can you provide for this?

Activity 4: Chemical Stimulation:

1. Does the addition of sodium chloride generate an action potential ? _____
2. Using your threshold setting, stimulate the nerve.
Does this tracing differ from the original threshold tracing in activity 1? _____
3. Does the addition of hydrochloric acid generate an action potential? _____
5. Using your threshold setting, stimulate the nerve.
Does this tracing differ from the original threshold tracing in activity 1? _____

Based on these activities (1-4) what specific kinds of stimuli can elicit an action potential?

Activity 5: Testing the Effects of Ether:

What sort of trace do you first see?

What has happened to the nerve?

How long does it take the nerve to return to normal?

Activity 6: Testing the Effects of Curare:

What effects on the action potential is noted, explain?

What do you think would be the overall effect of curare on the organism?

Activity 7: Testing the Effects of Lidocaine:

Does it generate a trace? _____

Stimulate the nerve at the threshold voltage. What sort of tracing is seen?

Why does lidocaine have this effect on nerve fiber transmission?

Activity 8: Measuring Nerve Conduction Velocity

At what threshold voltage do you first see an action potential? _____

Record your data in the table below:

Nerve	Earthworm (small nerve)	Frog (medium nerve)	Rat nerve 1 (medium nerve, unmyelinated)	Rat nerve 2 (large nerve, myelinated)
Threshold voltage				
Elapsed Time				
Conduction Velocity				

Which nerve in the group has the slowest conduction velocity?

What was the speed of the nerve?

Which nerve in the group of four has the fastest conduction velocity?

What was the speed of the nerve?

What is the relationship between nerve size and conduction velocity?

Based on the results, what is your conclusion regarding conduction velocity and whether the nerve is myelinated or not?

What is the major reason for differences seen in conduction velocity between the myelinated nerves and the unmyelinated nerves?

Printing your Data: When you have finished, print your data for at least one activity and attach it to this report.