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NerveSim V2.0.0

Nerve Action Potential Simulation

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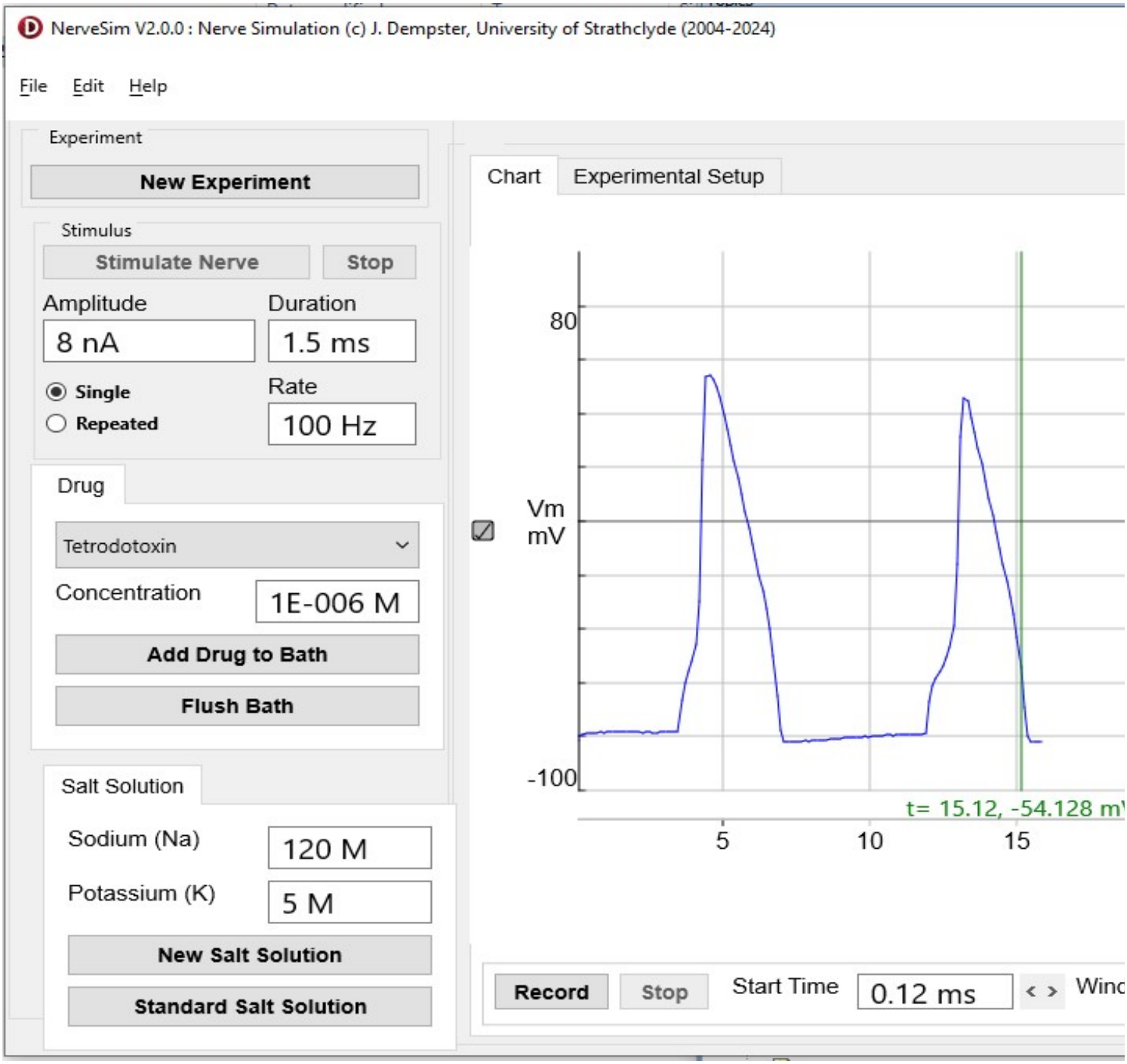
NerveSim is a simulated experiment for investigating the effects of drugs and the ionic composition (Na, K concentrations) of the bathing solution on the nerve action potential. Drugs (tetrodotoxin, lidocaine, 4AP) can be applied to the to bath and the concentration of the Na and K ions changed.



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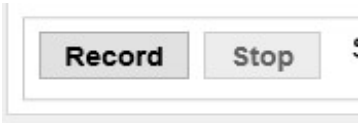
To start a new experiment:

1. Click the **New Experiment** button.

2.Click the **Record** button to start the simulation running. (**Stop** stops the recording)



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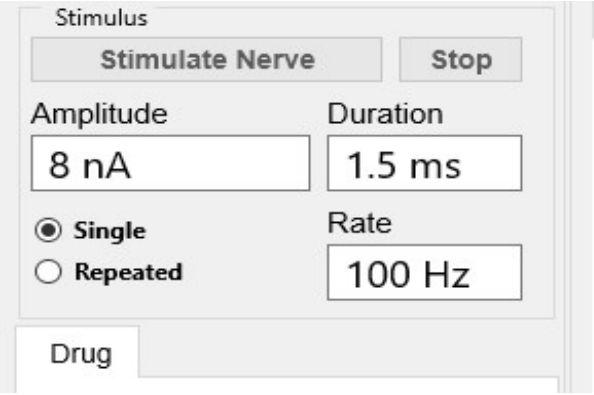
To stimulate the nerve by injecting electrical current:

1. Enter the amplitude (nA) of the stimulus current into the Stimulus **Amplitude** box.

2. Enter the duration (ms) of the stimulus current pulse into the Stimulus **Duration** box.

3. Select the **Single** option to apply one stimulus only or the **Repeated** option to apply stimuli at regular intervals (enter the the stimulus repeat rate (Hz) in the **Rate** box).

4. Click the **Stimulate Nerve** button to apply the stimulus/stimuli.



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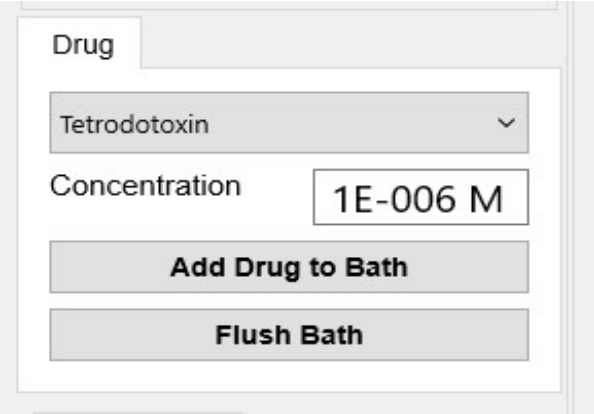
To add a drug to the bath:

1. Select the type of drug to be applied from the **Drugs** list.

2. Enter the concentration (in M/litre) of the drug to be added in the **Concentration** box.

3. Click the **Add Drug to Bath** button to add the drug to the bath.



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To change the concentration of sodium or potassium ions in the bath:

1. Enter the new sodium ion concentration (in mM/l) in the **Sodium (Na)** box.
2. Enter the new potassium ion concentration (in mM/l) in the **Potassium (K)** box.
3. Click the **New Salt Solution** button to change the salt solution in the bath to the new solution.

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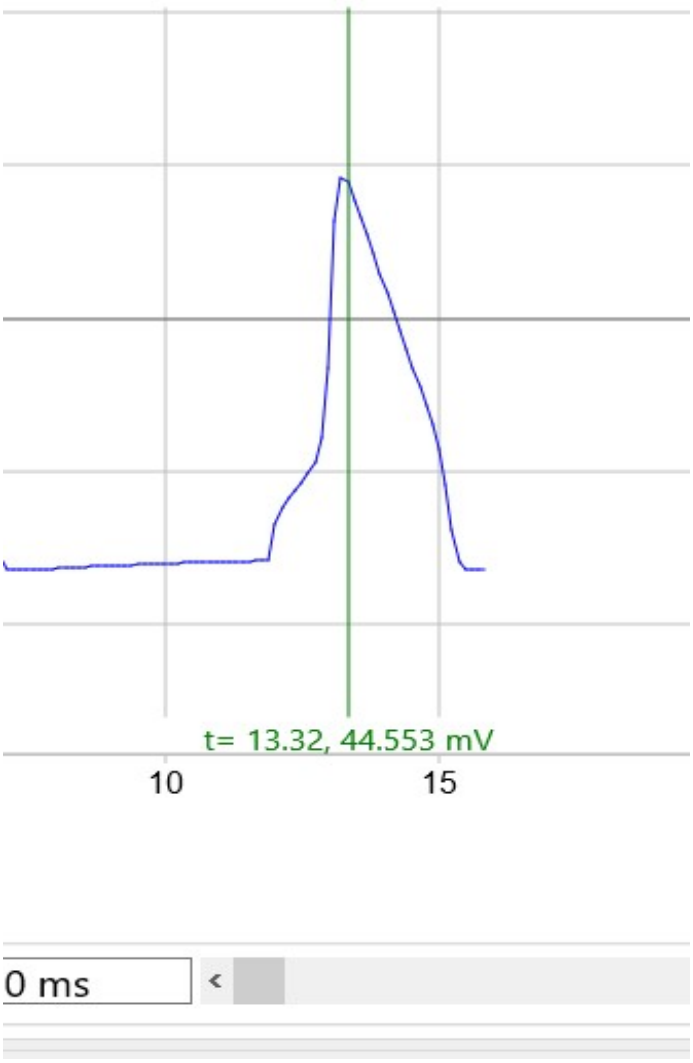
To measure the membrane potential recording:

1. Click the **Stop** button to stop recording.

2. Using the scroll bar at the bottom of the chart recorder display, select a section of the recording containing the tissue contraction to be measured.

3. Drag the measurement cursor on the chart display to the point on the recording trace to be measured. The membrane potential at the cursor point (in units of mV.) is displayed below the cursor.



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To print a copy of the displayed recording on a printer, select **Print** from the **File** menu.

To select a specific printer or change printer settings, select **Printer Setup** from the **File** menu.

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Copy Data: To copy the data points of the displayed recording to the Windows clipboard for pasting into a spreadsheet or graph plotting program, select **Copy Data** from the **Edit** menu.

Copy Image: To copy a picture of the displayed recording to the Windows clipboard for pasting into a Word document or a PowerPoint presentation, select **Copy Image** from the **Edit** menu.

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Saving a recording to file: To save the recording for the current experiment to a data file, select **Save Experiment** from the **File** menu and enter the name of a new data file.

Loading an existing recording from file: To load a previously saved recording from a data file, select **Load Experiment** from the **File** menu and enter the name of the data file.