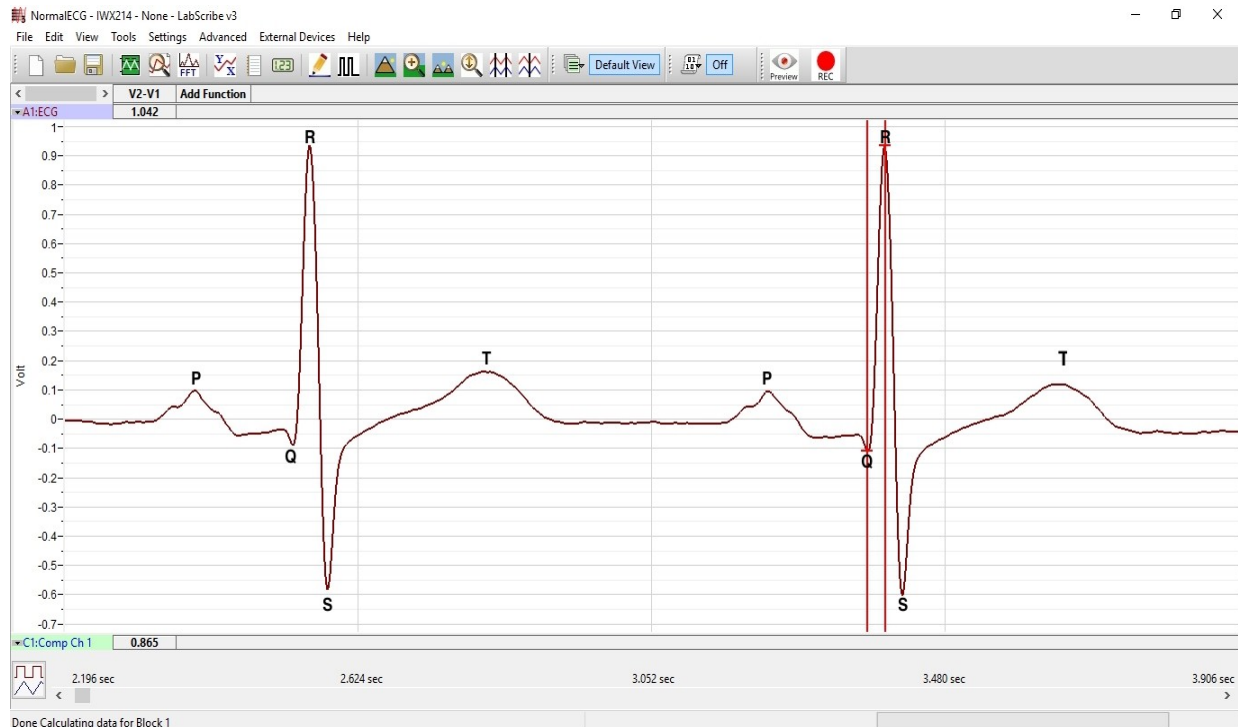


# Experiment HH-1: The Electrocardiogram and Peripheral Circulation

## Background

The cardiac cycle involves the sequential contractions of the atria and the ventricles which are triggered by action potentials in the myocardial cells. The combined electrical activity of the myocardial cells produces electrical currents that spread through the body fluids. These currents are large and detectable by recording through electrodes placed on the skin. The regular pattern of signals produced by the heart is called the electrocardiogram or ECG.



*Figure HH-1-B1: ECG recording displayed in the Main window with labels showing the P, QRS, and T waves.*

The components of the ECG are correlated to electrical activity in the atria and ventricles such that:

- Atrial depolarization produces the P wave.
- Atrial repolarization and ventricular depolarization produce the QRS complex.
- Ventricular repolarization produces the T wave.

The depolarization of the myocardial cells in the ventricle causes the ventricles to contract and force blood into the major arteries of the circulatory system in a pulsatile manner. The pulses of blood moving in arteries can be recorded using a device known as a plethysmograph.

In this experiment, you will record a single lead ECG and the pulse wave in the finger of a subject simultaneously. This exercise will demonstrate the time delay that occurs between the electrical events in the heart and mechanical events in the circulatory system. You will also examine the effects of temperature on peripheral circulation.