Laboratory 9 – Muscle Physiology

Purpose:

In this lab we will be testing the performance of skeletal, cardiac, and smooth muscle. Although all muscle cells are similar in their abilities to depolarize and contract, they differ in their degree of innervation, rate and duration of contraction, fatigue rate, and response to neurotransmitters.

9-D: Demonstration of the electromyograph (EMG)

Procedure:

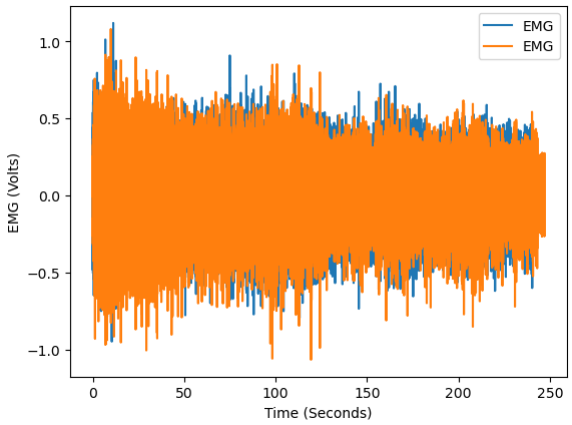
1. Set up the IWX/214 unit
2. Change the settings to the proper file
3. Remove all jewelry from his/her arm and wrist. Use an alcohol swab to clean the regions of skin on the forearm you are going to use
4. Lace the electrodes from proximal to distal on the forearm in the following order: +2, -2on the posterior and +1, -1 and ground on the anterior.
5. Record an EMG of the muscles of the forearm illustrating agonistic and antagonistic muscle activity
6. The Mark box to the right of the Mark button. Click the red "Rec" button to begin the recording; then, press the Enter key on the keyboard to mark the beginning of each activity.

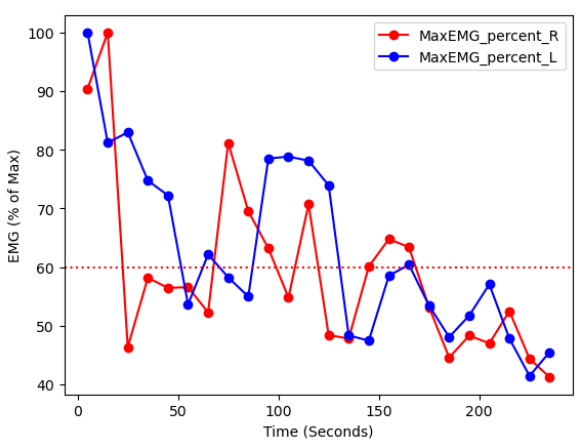
9-E: The effect of oxygen supply on skeletal muscle activity

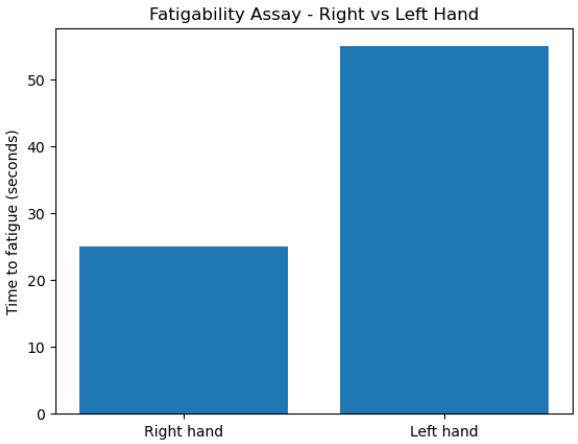
Procedure:

1. Firmly squeeze a tennis ball as rapidly as possible with your non-dominant hand until you feel fatigued and can no longer squeeze it.
2. Have a partner attach a sphygmomanometer cuff to your dominant arm and inflate it to 150mmHg, or 10 mmHg above your normal systolic pressure, if you know your blood pressure values
3. Repeat the squeezing exercise with your dominant arm. Record the time duration of this effort.
4. . Evaluate the differences between the two duration measurements obtained in terms of energy demands of skeletal muscle and fatigue

Results:







Discussion:

In this lab we compared the muscle contraction from our right arm to our left arm, which as shown above, the left arm has higher arm fatigue than the right. To test this out we had to connect ourselves to the EMG, remove any Jewlery that may affect the results and squeeze a tennis ball until we were too tired to continue. In the other section we had to test the reaction time, which is something that is possibly easier for some people. For the reaction time, we had to have our partners press the enter key. After our partner pressed the enter key, we had to have a fast twitch reaction and press the red button that is provided to us.

Conclusion:

In conclusion, I have a better understanding of the differences between the cardiac, skeletal, and smooth muscle. Skeletal muscle is the one that helped us have the fast reaction we had when we saw the square that popped up when our partner pressed the enter key, unlike smooth muscle. Smooth muscle is involuntary muscle contraction, which is responding to a stimuli.