

# Physiology Lab Report #9-

## Lab 9: Muscle Physiology

### Purpose

- In this lab we studied the performance of different types of muscle: skeletal, cardiac, and smooth muscle. We found the differences in innervation, contraction rate, fatigue, and response to neurotransmitters. This lab allows us to gain a better understanding of muscle function and how it contributes to overall body movement.

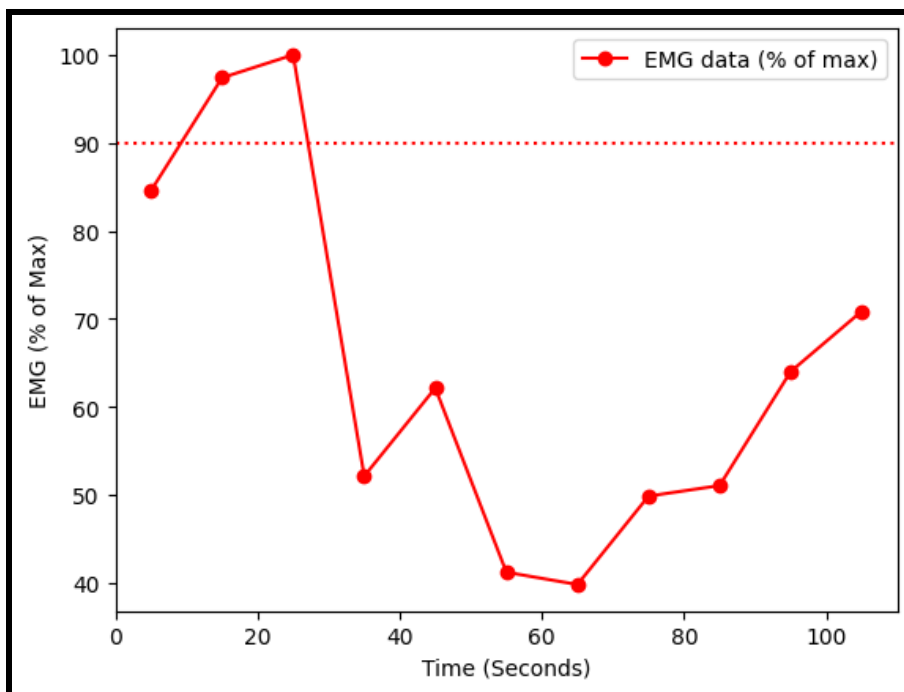
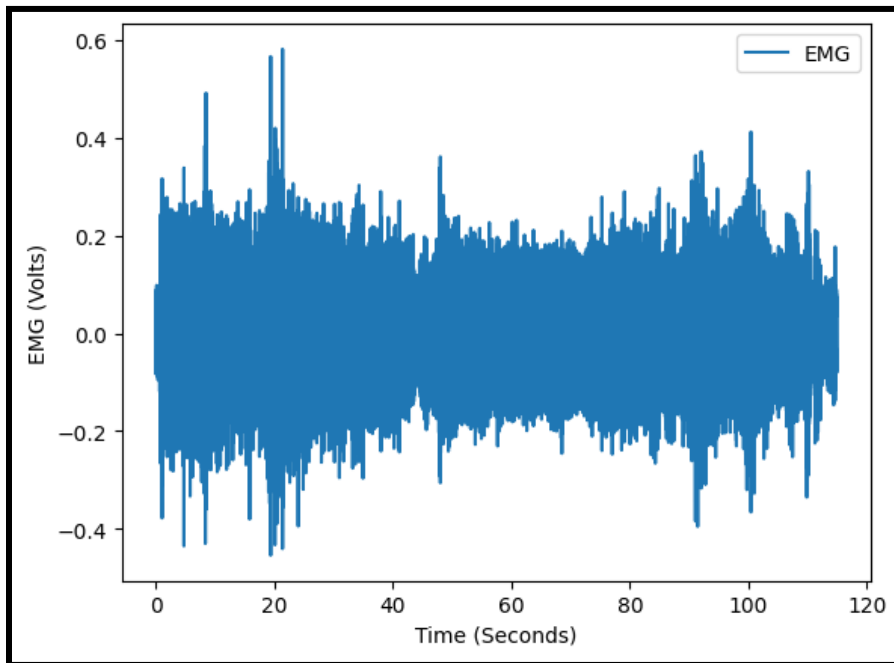
### Procedures

1. Begin by: Making sure the IWX/214 unit is plugged in and connected to the laptop via USB cable. Then, connect the C-AAMI-504 EEG cable to the isolated inputs of Channels 1 and 2 of the IWX/214. Ensure the color-coded lead wires are correctly inserted into the lead pedestal of the EEG cable. Insert the electrode lead wires into the matching sockets on the lead pedestal of the EEG cable. Turn on the laptop first and let it fully boot up before turning on the IWX/214 unit. Once the IWX/214 unit is on, you should see a red indicator light and may hear a USB chime from the laptop.
2. Open Labscribe3 and once it opens, a window will pop up saying "Hardware found IWX214:2008-1-24." and click "OK."
3. Look for the row that says "File Edit View Tools Settings Advanced External Devices Help." It should be the second row from the top. Click on the "Settings" tab in that row. In the drop-down window, click on the tab called "Human Muscle" Then you'll get to a drop-down list with the second tab from the top called "Antagonistic Muscle." Click on that tab and close the unnecessary PDF file that appears.
4. Then, ask your partner to remove all jewelry from their arm and wrist. Clean the regions of skin on the forearm that you're going to use using an alcohol swab. Let the area dry. Take a disposable electrode out of its plastic shield and apply it to the six designated locations.
5. After, put the electrodes on the forearm in this order: +2, -2 on the back and +1, -1, and ground on the front. Then, snap the lead wires onto the electrodes accordingly:
  - red "+1" lead is attached to the proximal electrode on the anterior surface
  - the black "-1" lead is attached to the distal electrode on the anterior forearm
  - green "C" lead (the ground) is attached to the remaining electrode on the anterior surface
  - the white "+2" lead is attached to the proximal electrode on the posterior forearm
  - brown "-2" lead is attached to the distal electrode on the posterior surface
6. The person hooked up to the electrodes must grab a tennis ball and grasp it as tight as possible until they can no longer hold it while recording an EMG of the muscles of the forearm illustrating agonistic and antagonistic muscle To record, click the red "Rec"

button to begin the recording; then, press the Enter key on the keyboard to mark the beginning of each activity.

7. Evaluate the amplitude and frequency of the EMG recordings. Identify the agonists, antagonists and synergists and click on the AutoScale tab and evaluate the data in a graph.

## Results



## **Discussion**

- In this lab we were able to see the different roles of muscles and the way they play out when it comes to movement. In this example my partner Dayana was the one to do the exercise with her hands. It was interesting to see that she continued to grow tired over time and almost gave up. The neat thing was that as she was giving up she felt her last push of energy and ultimately could not hold the tennis ball any longer. The spike in the electrical activity of her muscles was cool to see. It reminds me of when people give their last push if they run a race. Overall, this experiment allowed her to gain a better understanding of how her muscles work and how the electrical signals translate into contractions.

## **Conclusion**

- The basis of this experiment was for us to understand the basic functions of muscles and muscle movement. We learned about the agonist muscle which allowed for the movement and holding/gripping of the tennis ball. The antagonist muscles that opposed the grip and made it difficult to maintain the ball in the hand. Finally, the synergist muscles which allowed for stabilization while this experiment was occurring. This lab allowed us to gain a better insight on the way our muscles work together to perform tasks and their involvement in various movements.