**Love Flirting, and Death in the Muscle Lab: Muscle Types, Structure, and Fatigue**

*Graded out of 23pts*

*\*Note – Due to the data being provided to you the point values of some questions have been changed. Changes are indicated with red text.\**

Watch the video at the following link for an overview of the 3 muscle types. <https://youtu.be/Fyqj_9eiC_Q>

Use the information from the video to identify characteristics of each muscle type

**Table 1.** Characteristics of Types of Muscle Tissues(1 pt)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Muscle Tissue Type** | **Voluntary or Involuntary** | **Cell Characteristics (shape, branching, striation)** | **Act as unit or separate cells?** | **Controlled by nervous/endocrine system?** |
| Cardiac | Involuntary |  | Single unit | Nervous |
| Smooth | Involuntary |  | Single unit | Nervous and endocrine |
| Skeletal | Voluntary |  | Separate cells | Nervous |

**Part 1: Drawings**

Skeletal Muscle (2 pts)

1. Label the image

Total magnification:\_\_\_\_\_\_\_\_\_ (i.e., you would use the highest magnification)

Cardiac Muscle (2 pts)

1. Label the image

Total magnification: \_\_\_\_\_\_\_\_\_\_\_ (i.e., you would use the highest magnification)



Smooth Muscle (2 pts)

1. Label the image

 Total magnification: \_\_\_\_\_\_\_\_\_\_\_ (i.e., you would use the highest magnification)



**Part 2**

**Table 2** Hand Fatigue Test Data

|  |  |  |
| --- | --- | --- |
| **Trial** | **Number of Tennis Ball Squeezes** | **Mean Force (N)** |
| 1 |  | 69 |
| 2 | 186 | 56 |
| 3 | 171 | 50 |
| 4 | 155 | 42 |

1. For each of the three types of muscle cells, choose a structural feature unique to that type, and explain how it suits the function of that cell. (4 pts)

Cardiac -

Skeletal -

Smooth -

1. Consider your data from Part 2 that you recorded in Table 2. Was the test subject able to keep the same mean force for all four trials? Explain. Cite your data (3 pts)
2. If fatigue occurred, what substances were probably building up in the muscles during Part 2, and why? (3 pts)
3. Explain how fatigue protects cells. (3 pts)
4. What kind of metabolism was mainly used to provide energy for the contractions in Part 2? Explain your reasoning. (3 pts)