Activity: Testing Muscle Fibers

Muscle fibers are some of the biggest cells that are in the body. Their size is needed to contract powerfully when they are active. Muscle fibers also require large nutrient demands due to their jobs. Today we will test this.

In order to test this process we are going to strain different types of cells in your body and chart the changes in your body. Each different type of cell that is going to be tested will require us to take baseline readings from our body to understand the results.

**Procedure:**

Today we will start by figuring out our resting heart rate. In order to figure this out we need to have a moment of rest. During this moment of rest, there should be no moving, talking or releasing of energy.

1. Our resting heart rate will be a 20 second sample of our heartbeat. Find your resting heart rate and write it below.

Resting heart rate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Our resting breathing rate will be a 20 second sample of breaths. Find your resting breathing rate and write it below

Resting breathing rate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Intensity of breaths (scale 1-10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. We will perform the experiments that are listed below as a class. Before and after each experiment, be sure to take a 20 second heart rate and a 20 second breathing rate. This should relate the amount of oxygen that is being used by our body.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Activity | Beginning HR | Beginning BR | Ending HR | Ending BR | Beginning BR Intensity | Ending BR Intensity |
| Neural Stress |  |  |  |  |  |  |
| Hormonal Stress |  |  |  |  |  |  |
| Muscular Stress |  |  |  |  |  |  |

1. Take the data that you have collected and determine if the activities listed above use oxygen. If the activities have used oxygen, label what pathway your cells have used to get energy. If your activities did not use oxygen, label what pathway your cells used to get energy.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Activity | Increase or Decrease in HR | Increase or Decrease in BR | Increase or Decrease in Intensity | Pathway used |
| Neural Stress |  |  |  |  |
| Hormonal Stress |  |  |  |  |
| Muscular Stress |  |  |  |  |

Analysis:

1. Which activities raised your heart rate?
2. Which activities raised your breathing rate?
3. Which activities do you think caused a higher need for oxygen?
4. What activities do you think caused a higher need for energy?