

GROUP NO: 4

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INTRODUCTION

There are 3 structures implicated in generating the contraction of the skeletal muscle:

1. Motor neuron
2. Motor end plate
3. The skeletal muscle fiber

Among these structures, only the motor neuron never gets tired. It is practically infatigable. The other 2 structures develop tiredness but due to other reasons, of course. The neuromuscular synapse gets tired due to the depletion of the neurotransmitter. The muscle fatigues due to accumulation of metabolites in the structure and depletion of the energetic substratum.

OBJECTIVE

To demonstrate the fact that the neuromuscular junction gets tired before the muscle does.

Principle:

Application of a series of electrical stimuli on the motor neuron of a skeletal muscle, while recording the resulting myogram, until the muscle does not contract anymore. After this, electrical stimuli is then applied on the muscle.

METHODOLOGY

Part I

1. Push the "indirect stimuli" button so that the electrical stimuli will be applied on the motor neuron (and not on the muscle itself)
2. Click the right button to apply stimuli
3. Observe the myogram closely noting the decrease in the amplitude of the contractios
4. Click the clear screen.

Part II

5. Switch to the "direct stimuli" by pressing on the button so that the electrical stimulation will be directly on the muscle.
6. Click the right button to again, apply a complex a stimuli.
7. Again, observe the myogram until the muscle stops contracting.

DISCUSSION QUESTIONS

1. Describe your observations on the myogram in the 1st part of this exercise. What does the cessation of contraction mean? What could be the possible reason for this?

Cessation means a pause or a stop of an action.

therefore, the cessation of contraction would mean that there is a pause or stop of the contraction of muscles.

The effect in applying the stimulus directly to the nerve is faster than applying it on the muscle.

Therefore, the nerve will tire faster this is possibly because an inhibition that takes place faster when the stimulus directly sent to the nerves and does not need to travel as such as from muscle to nerve.

2. Describe your observations on the myogram in the 2nd part of this exercise. What does the cessation of contraction mean? What are the possible mechanisms of this?

It takes longer for the muscle to get tired when the stimulus was applied to it

Probably because the stimulus still takes its time to travel from muscle to nerve.

3. What difference have you noticed between the myograms when stimulus complex is applied directly and indirectly? What can you conclude with this observation?

The indirect stimuli can only be applied to motor neurons which cause the muscle to lack in its contraction. While the direct stimuli does not impose stress to the muscle.

VPHY 50: General Physiology Laboratory Exercises
