

# EXPERIMENT 1

## Effects on muscle of nerve stimulation at different intensities and frequencies

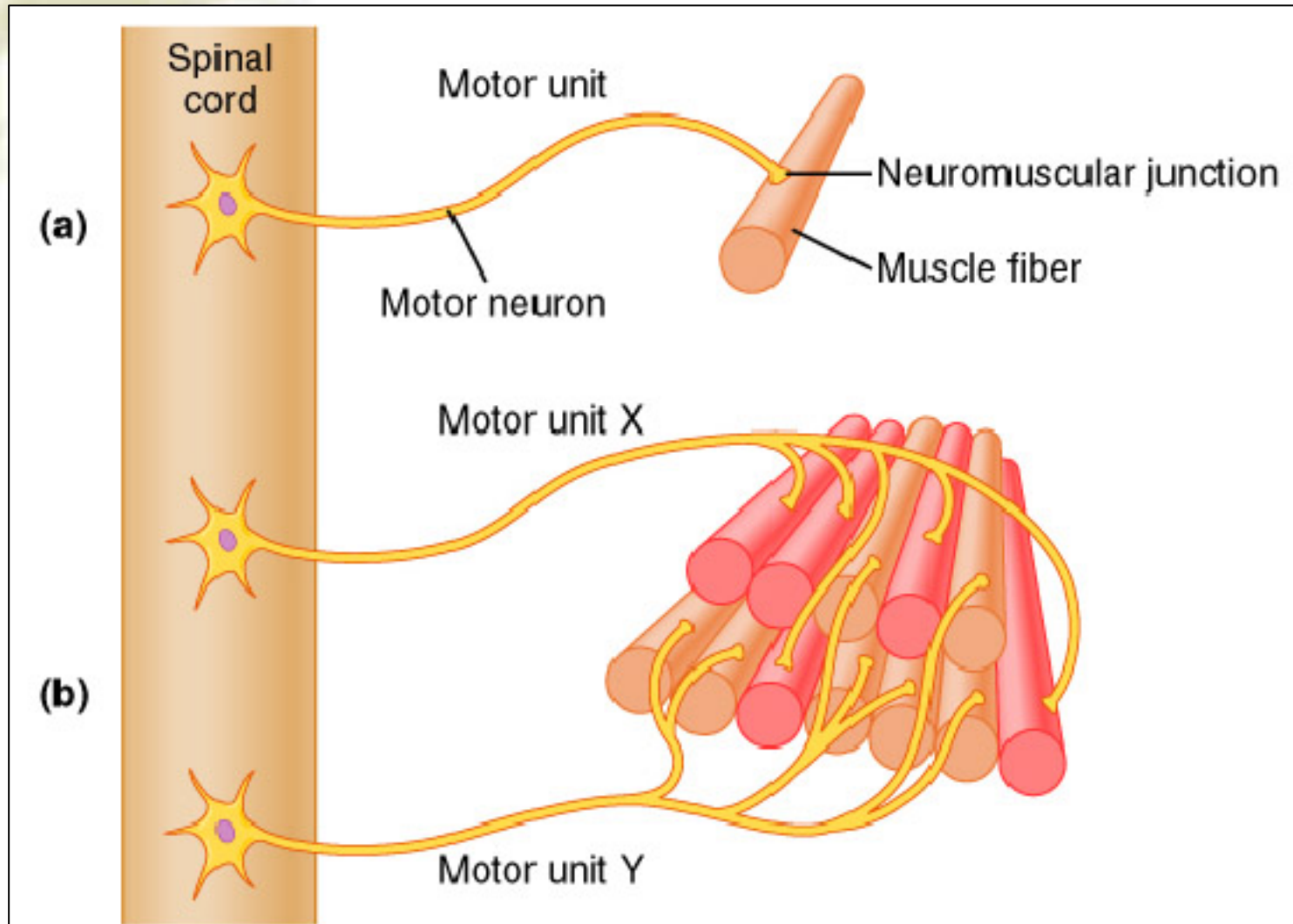
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*Dept. of Physiology, Zhejiang University School of Medicine*

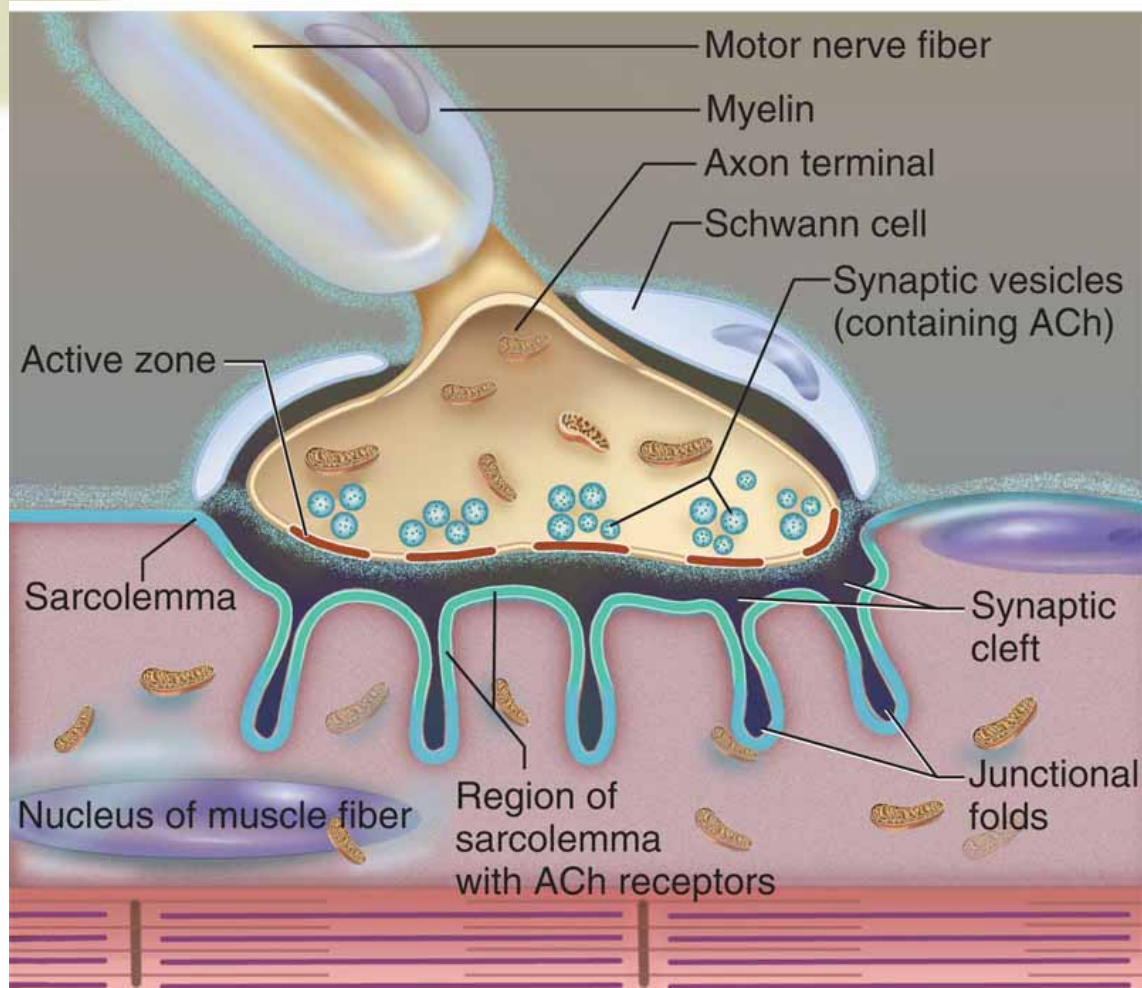
*bchenyy@zju.edu.cn*

# Introduction

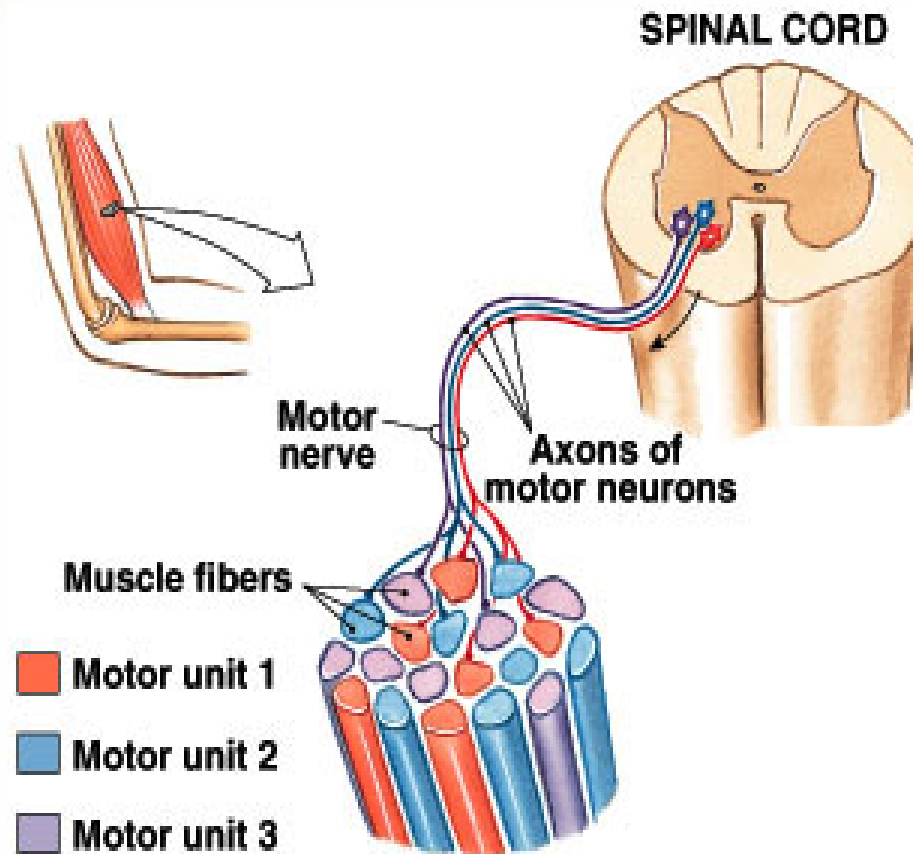
## ❖ Motor unit



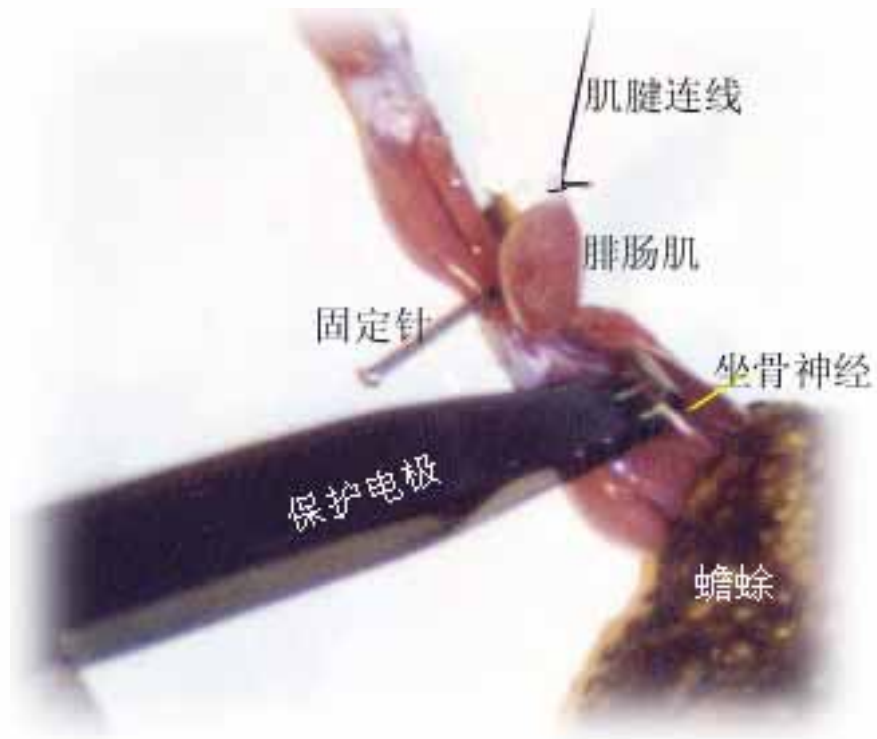
## ❖ Neuromuscular Junction



## ❖ Graded contractions



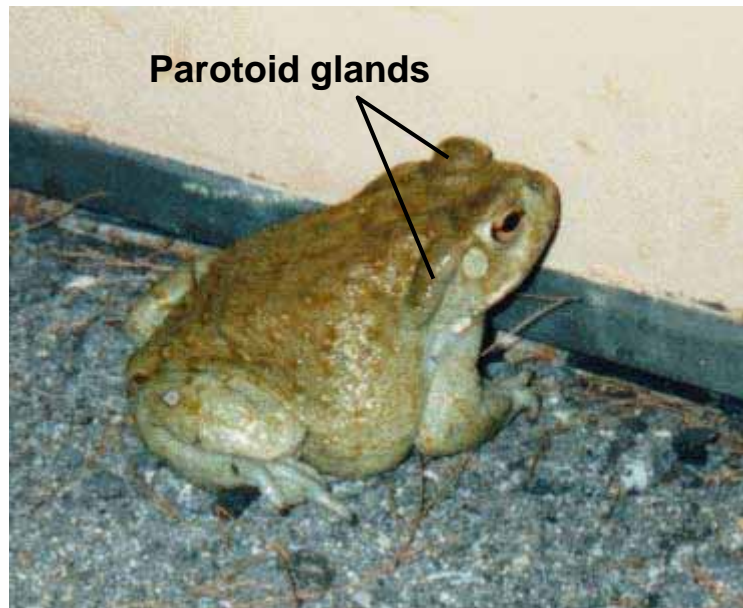
## ❖ nerve-muscle preparation



# Objectives

- ❖ **To make a sciatic nerve & gastrocnemius (SNG) preparation**
- ❖ **To measure the effects of different stimulus intensities on the muscle response**
- ❖ **To measure a single twitch, incomplete tetanus and complete tetanus**

## ❖ Experimental animal: Toad

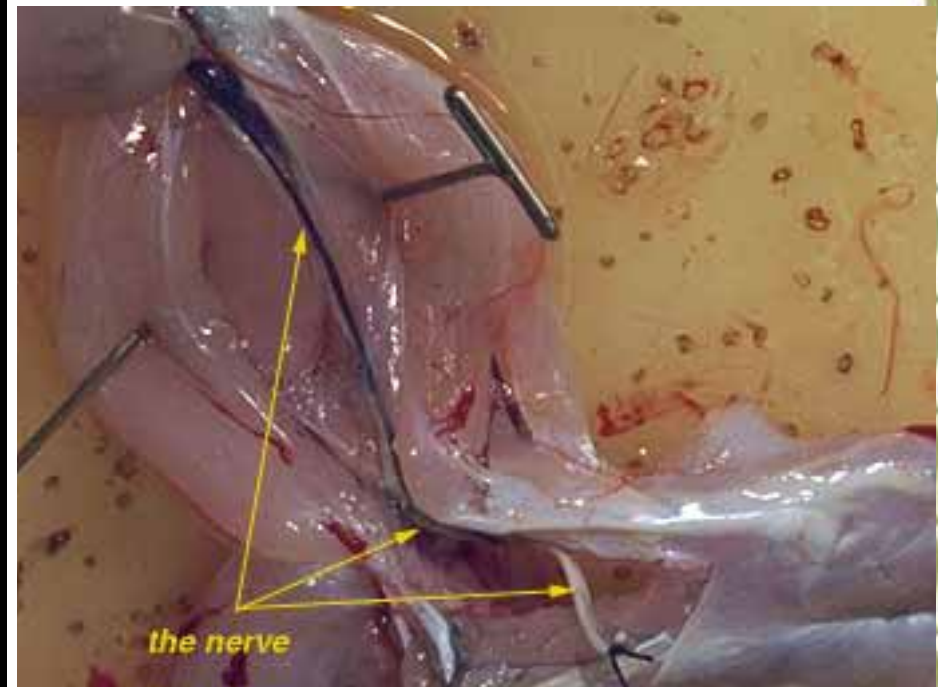
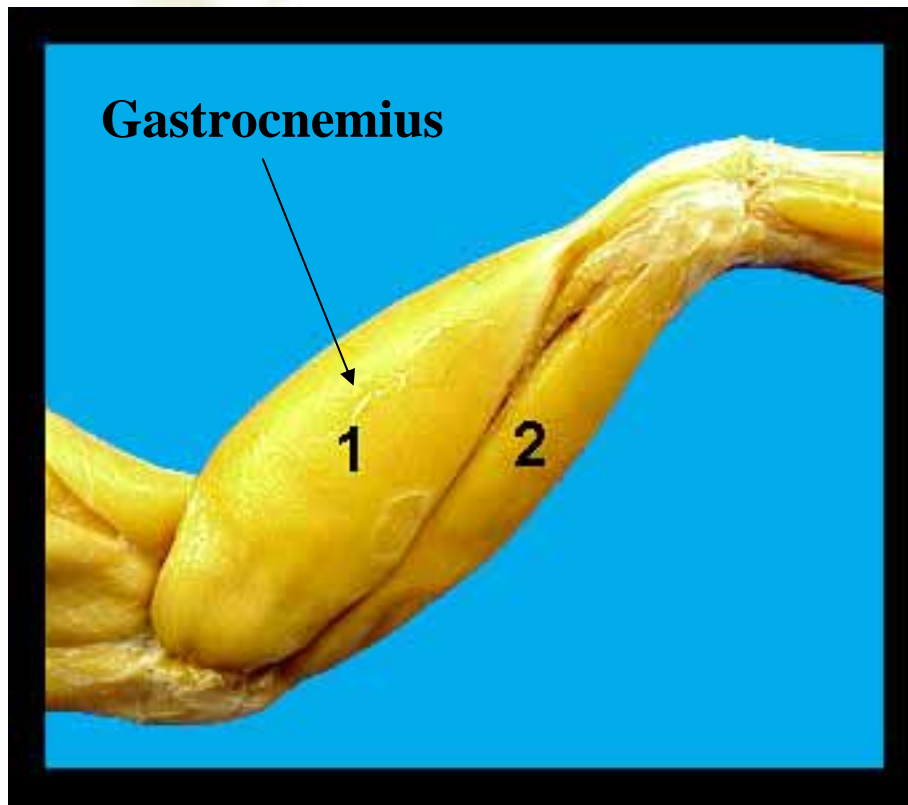


# Nerve-Muscle Preparation

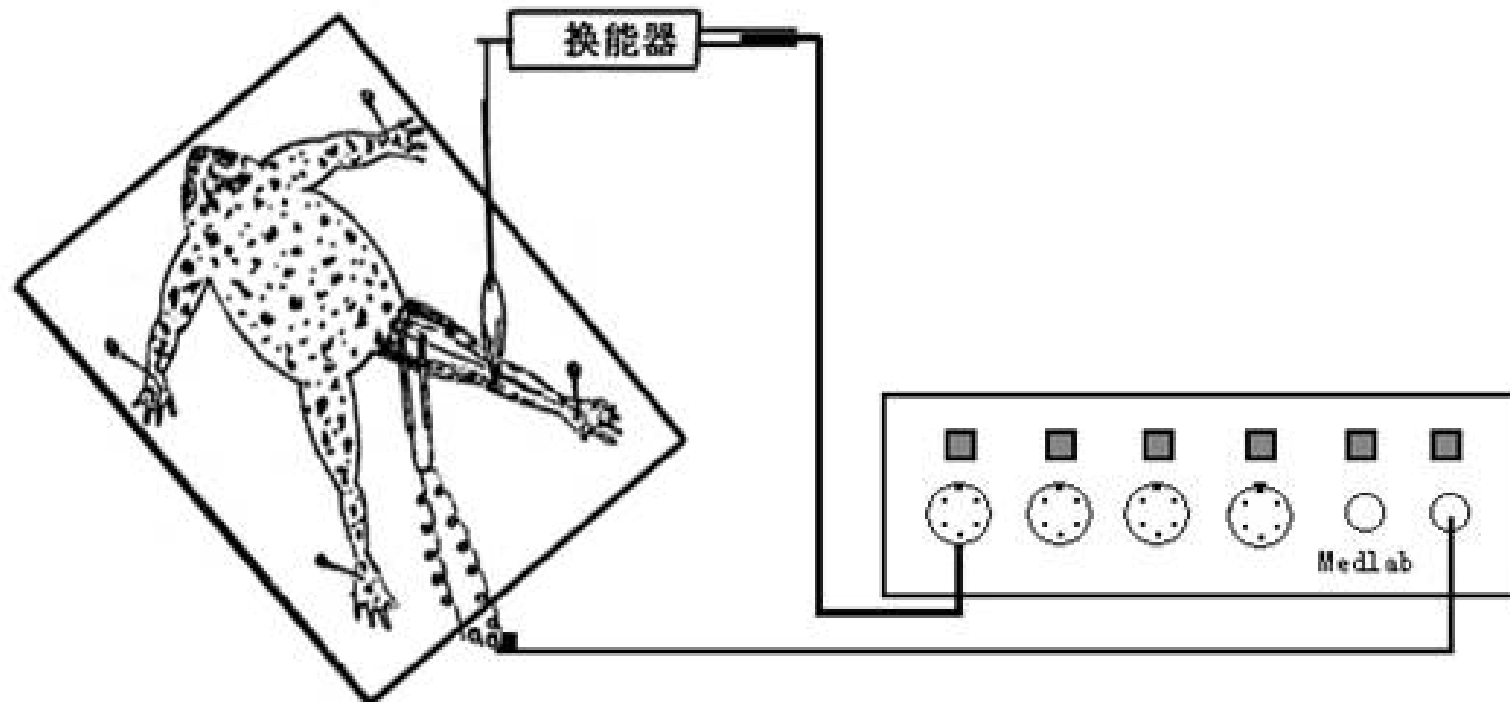
- ❖ Pith the toad
- ❖ Peel the skin of one leg
- ❖ Fix the frog on the frog board with the dorsal surface uppermost



- ❖ Identify and separate the gastrocnemius muscle and the sciatic nerve



- ❖ Hold knee in place
- ❖ Tie the thread to the force transducer
- ❖ Place the stimulating electrode

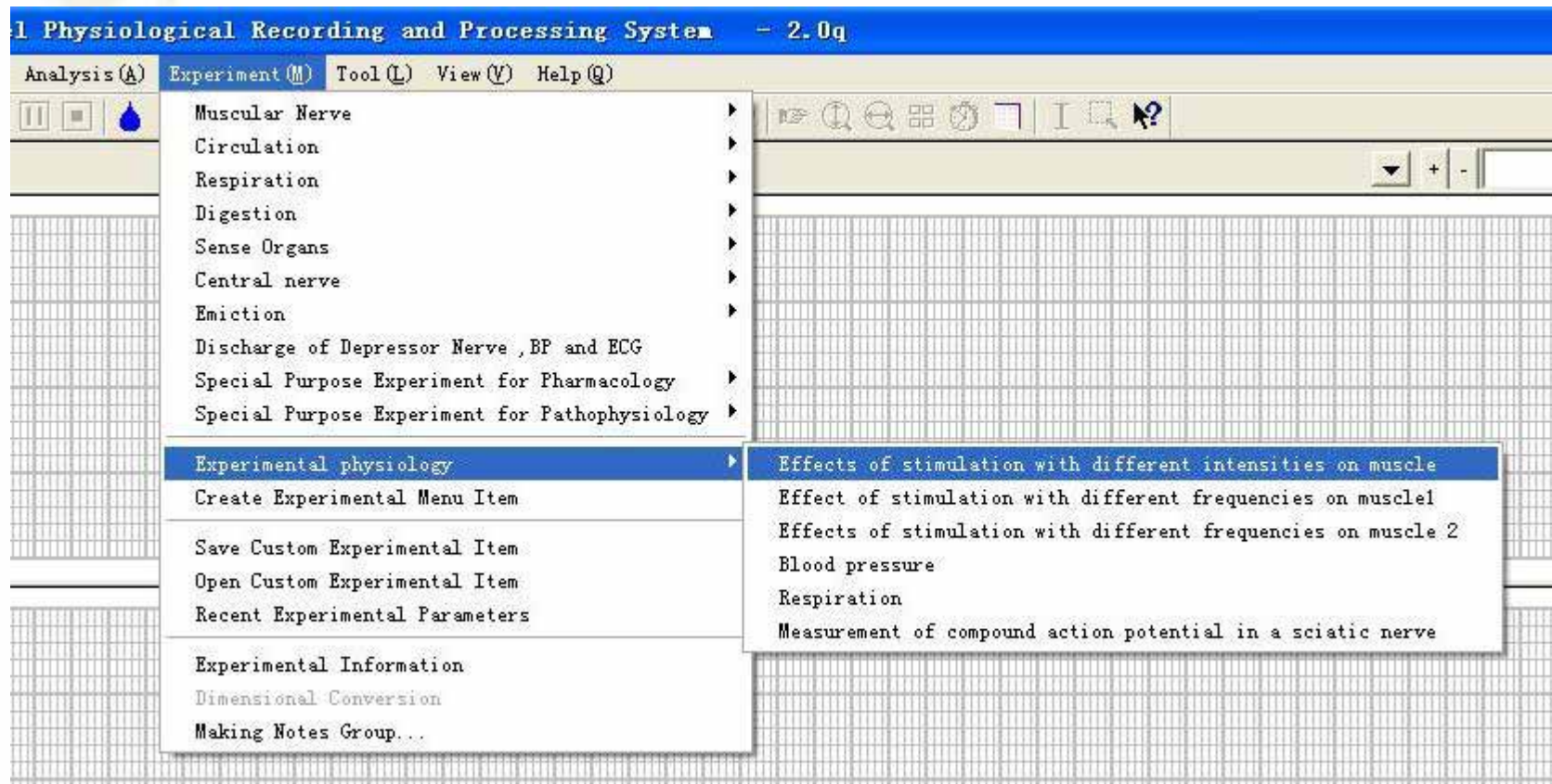


# Start the software

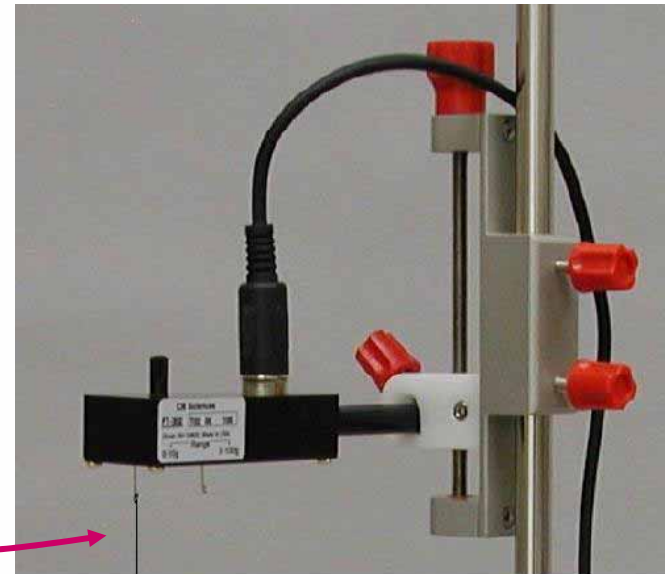
- Click on the **“RM6240USB2.0q(I)(English)”** icon on the Desktop

# Exercise 1: effect of stimulus intensity on twitch amplitude

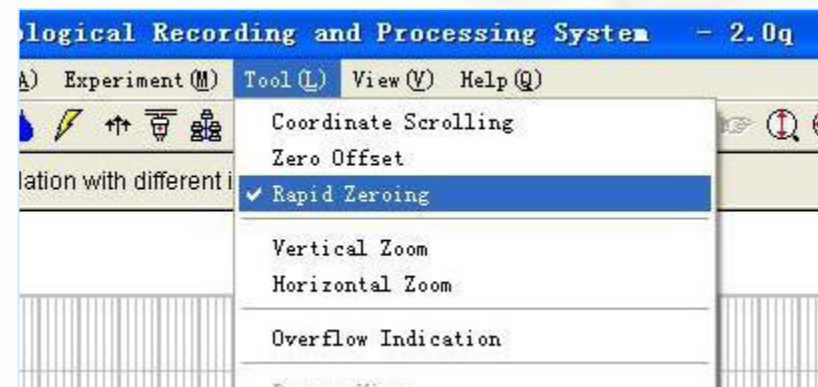
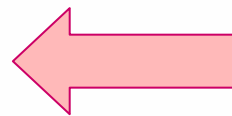
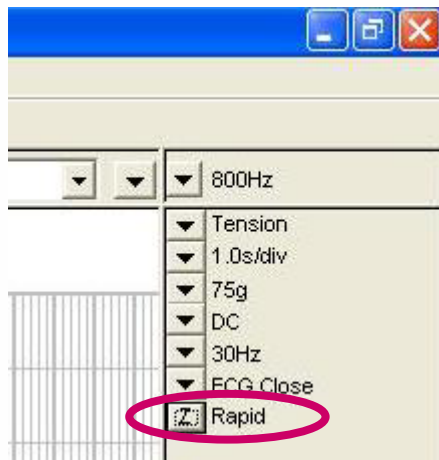
## ❖ Configure



# Zeroing



loose



❖ **begin the recording**



❖ **Set the preload to ~2g**

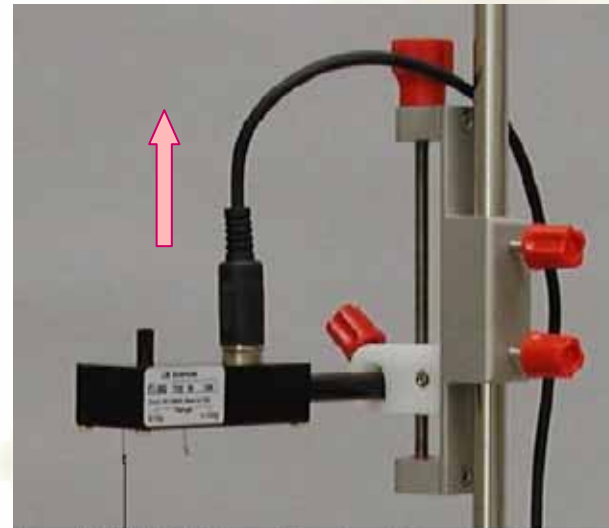
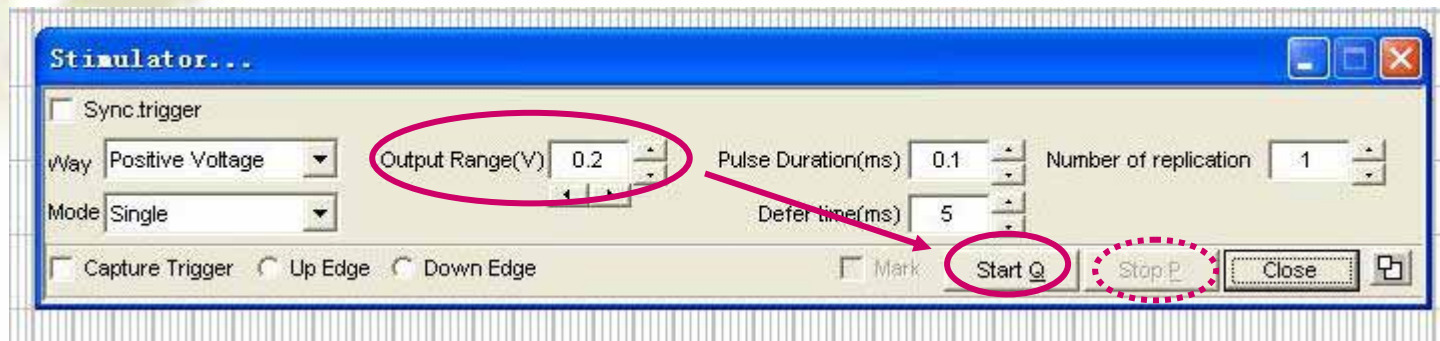
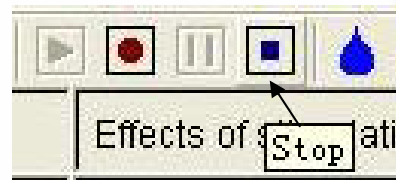


Figure 4-3: FT-302 held in a muscle tension adjuster on a ringstand.

❖ increase the stimulus voltage



❖ Stop and save the recording trace

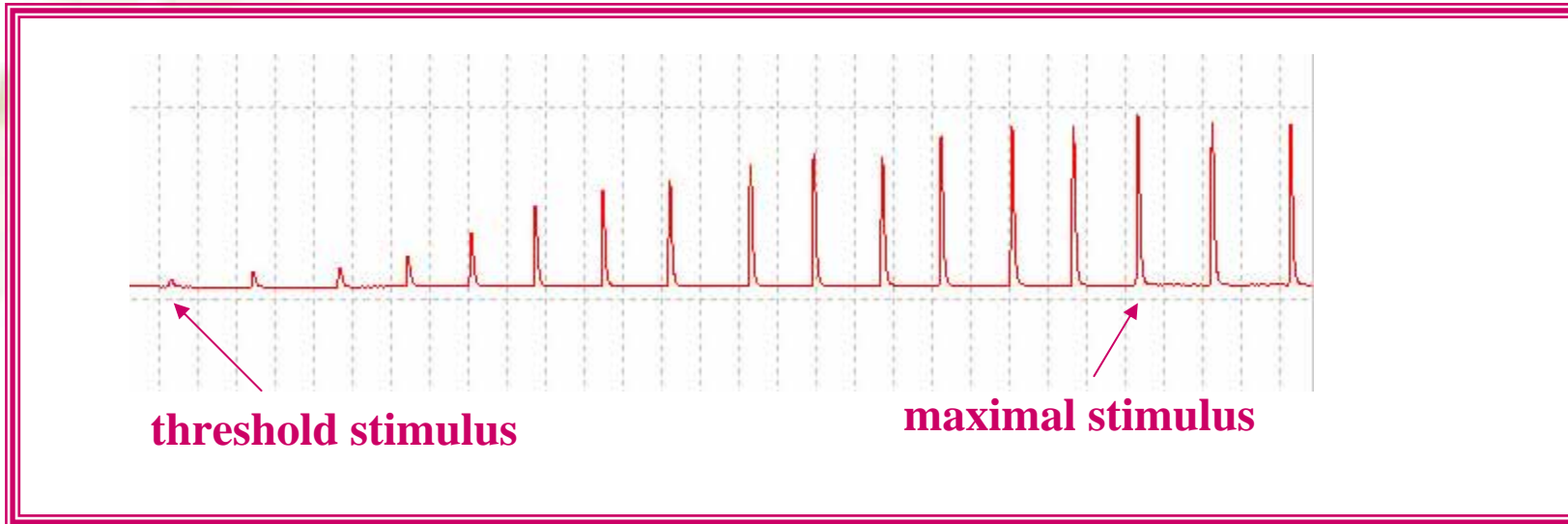


# Data analysis



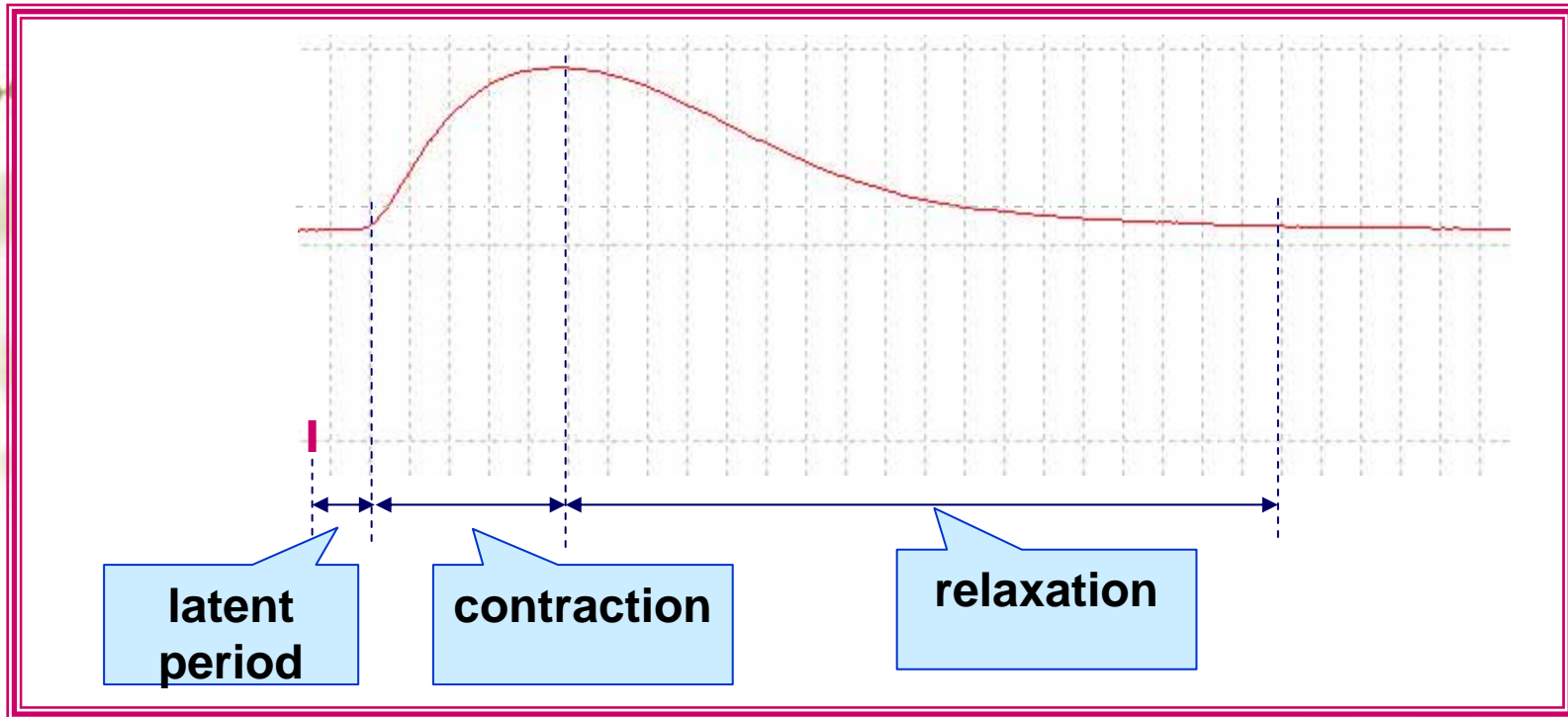
Regional Measurment

Cancel Scribe Line



❖ **Measure the following values:**

	Intensity stimulus (V)	Tension of contraction (g)
<b>Threshold intensity</b>		
<b>Maximal intensity</b>		

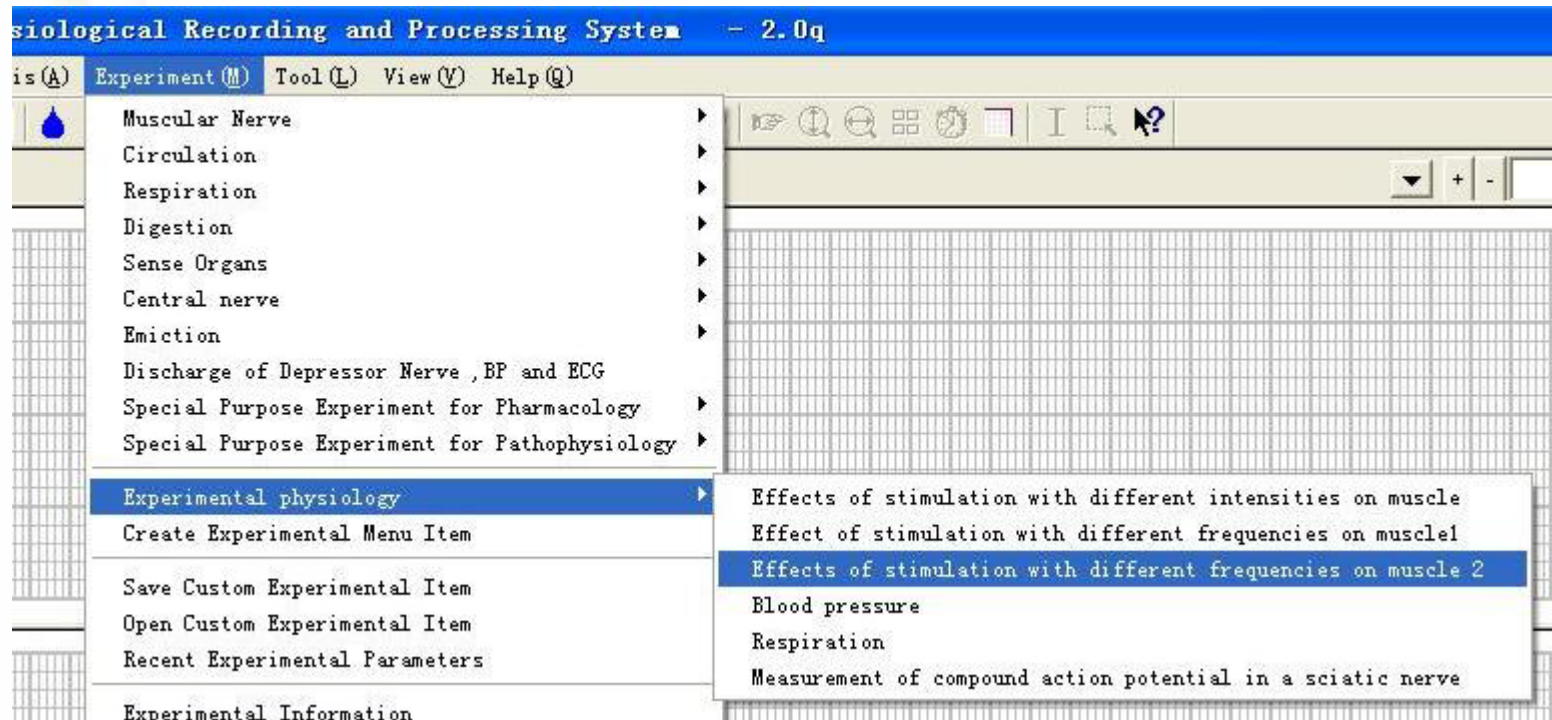


- ❖ Record the following values in a single twitch induced by maximal stimulus :

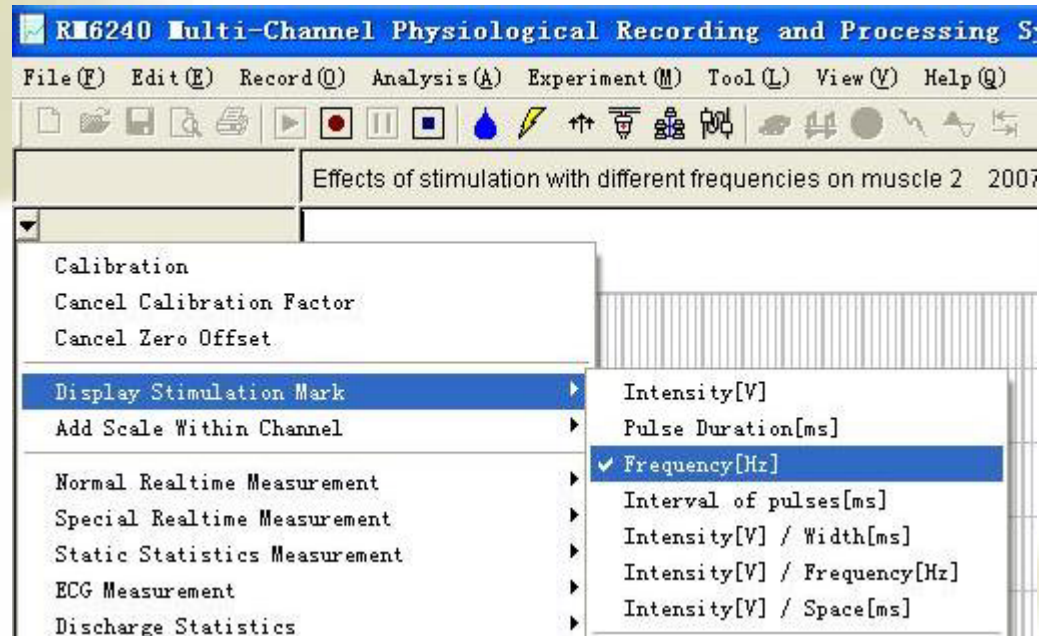
	Duration (ms)
Latent period	
Contraction	
Relaxation	

# Exercise 2: effect of stimulus frequency on twitch amplitude

## ❖ Configure



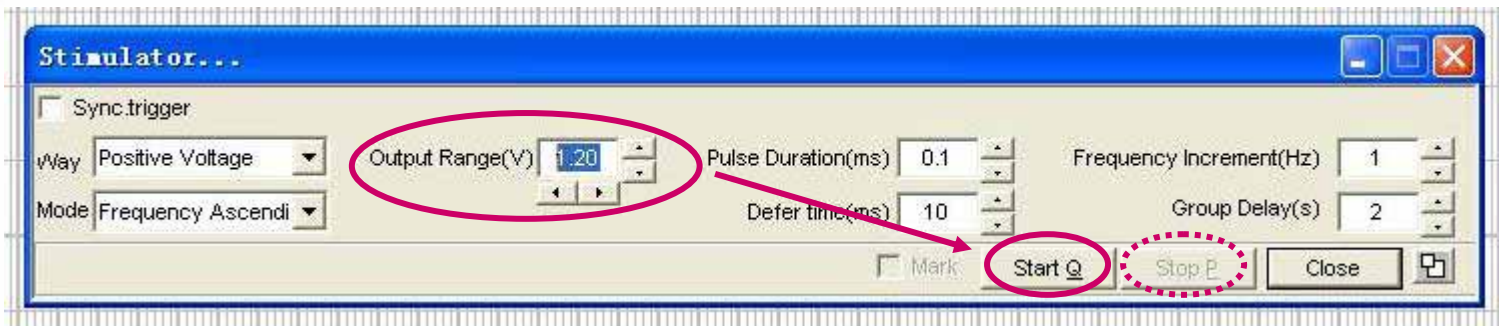
## ❖ Display the stimulation mark



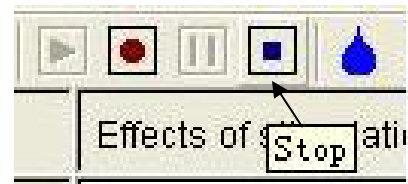
## ❖ begin the recording



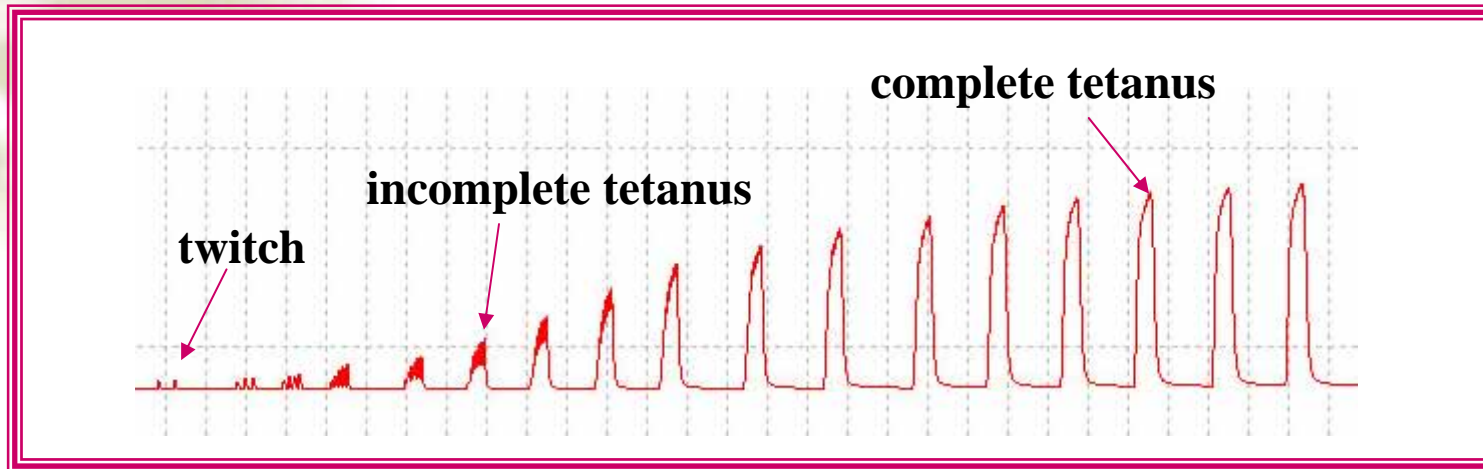
- ❖ Set the stimulus intensity to the lowest value that will give strong contraction in the exercise 1



- ❖ Stop and save the recording trace



# Data analysis



❖ **Determine the following values:**

	Frequency of stimulus (Hz)	Tension of contraction (g)
Single twitch		
incomplete tetanus		
complete tetanus		

# Tips

1. Avoid stretching or otherwise damaging the nerve
2. Keep the tissue moist with ringer's solution

