

**Topic: Muscle Contraction**  
**Class: B.Sc Part –III (Hons.)**  
**Paper- V**  
**Group – B**

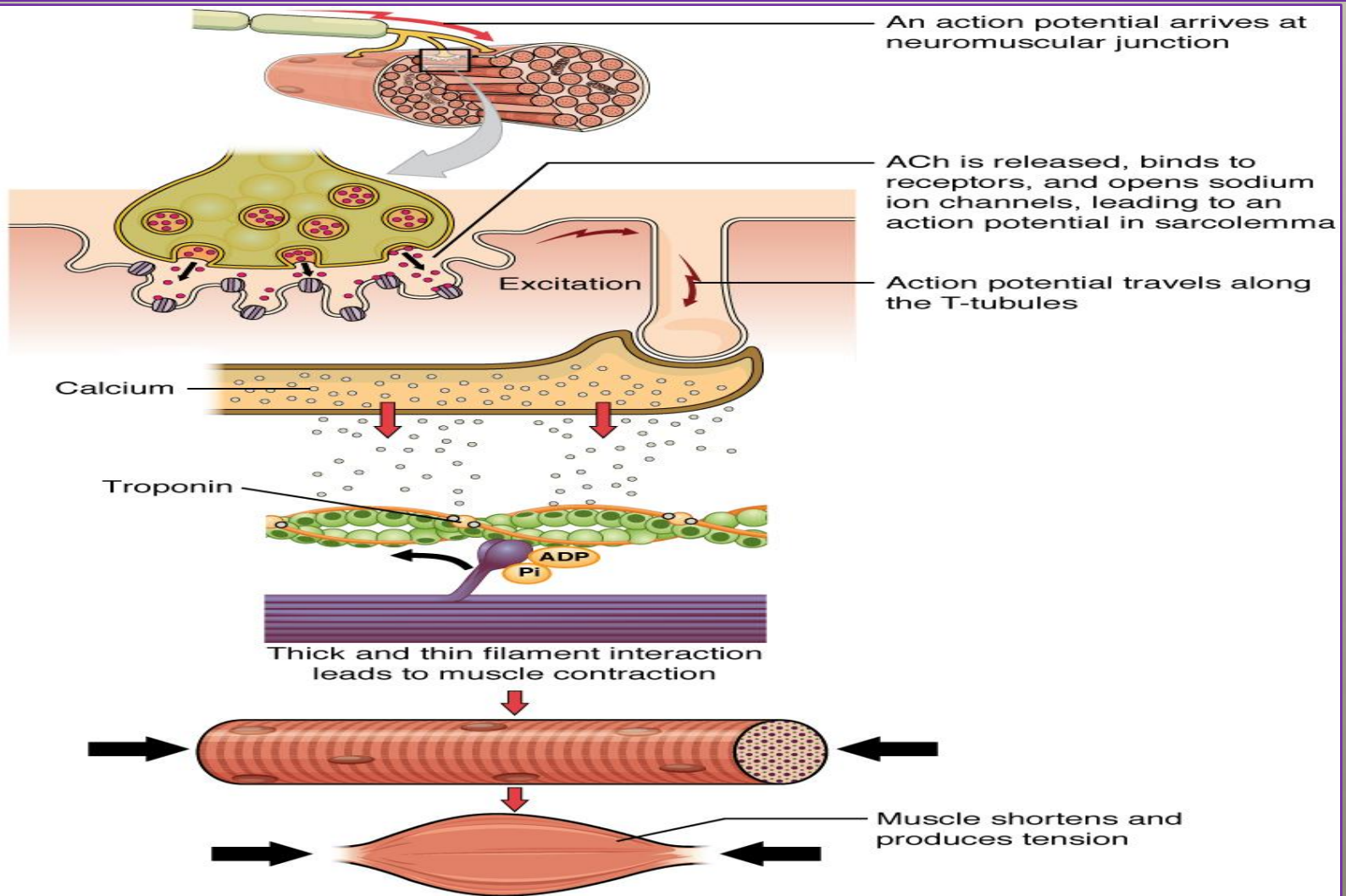
**Faculty Name : Dr. Kumari Sushma Saroj**

**Department: Zoology**

**College: Dr. L. K. V. D College, Tajpur, Samastipur**

# Muscle contraction flow chart

## Contraction Phase



# Resting state

- Motor nerve action potential arrives at motor end plate
- Acetylcholine released, sarcolemma and membranes depolarized ( $\text{Na}^+$  flux into fiber)
- Action potential transmitted via T-tubules to SR
- $\text{Ca}^{++}$  released from SR terminal cisternae into sarcoplasm

- $\text{Ca}^{++}$  bound by troponin
- Myosin ATPase activated and ATP hydrolyzed
- Tropomyosin shift from actin binding site
- Actin-myosin crossbridge formation
- Repeated formation & breaking of crossbridges resulting in sliding of filaments and sarcomere shortening

# Relaxation Phase

- Cholinesterase released and acetylcholine breakdown
- Sarcolemma & T-tubules repolarized
- SR  $\text{Ca}^{++}$  pump activated &  $\text{Ca}^{++}$  returned to SR terminal cisternae
- Actin-myosin crossbridge formation terminated
- Return of tropomyosin to actin binding site
- $\text{Mg}^{++}$  complex formed with ATP
- Passive sliding of filaments
- Sarcomeres return to resting state