Chapter 7
The Muscular System - Part 2

FUNCTIONS OF SKELETAL MUSCLE

A. Functions

1. **Movement**
2. **Posture** or muscle tone
3. **Heat** production

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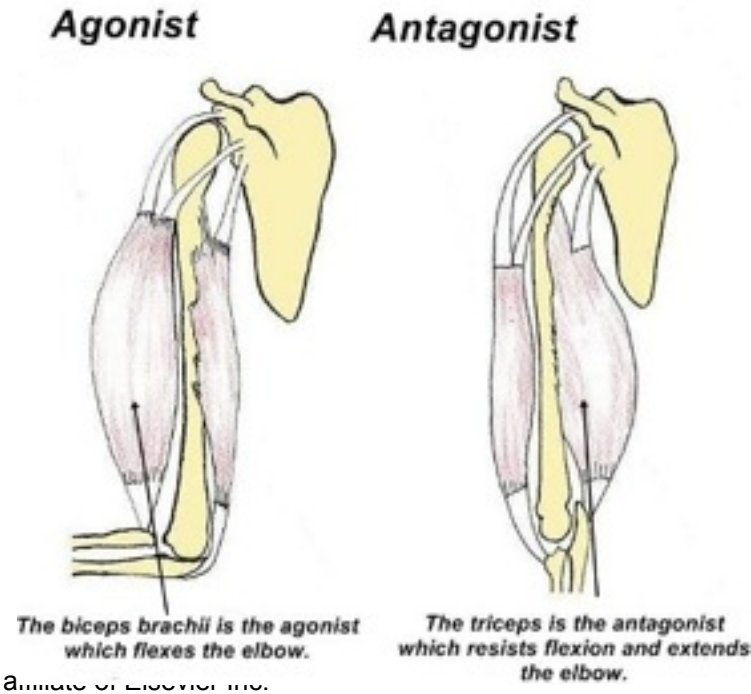

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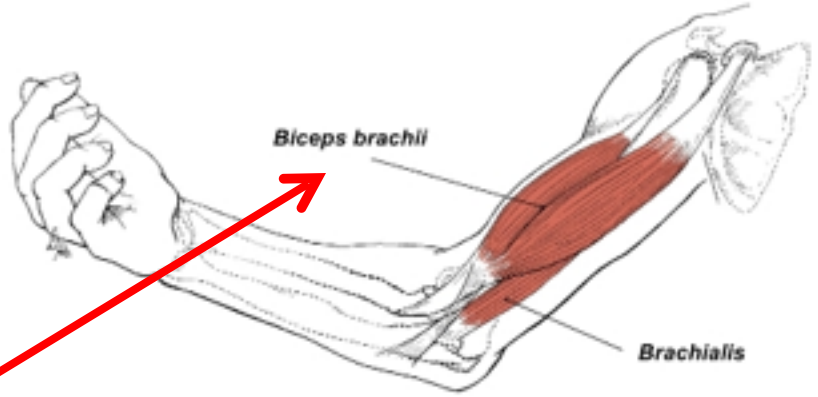

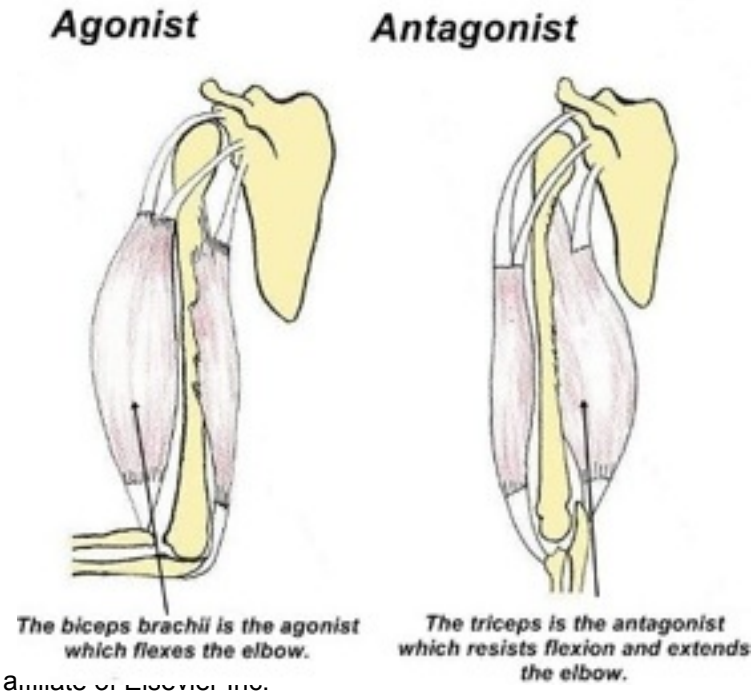

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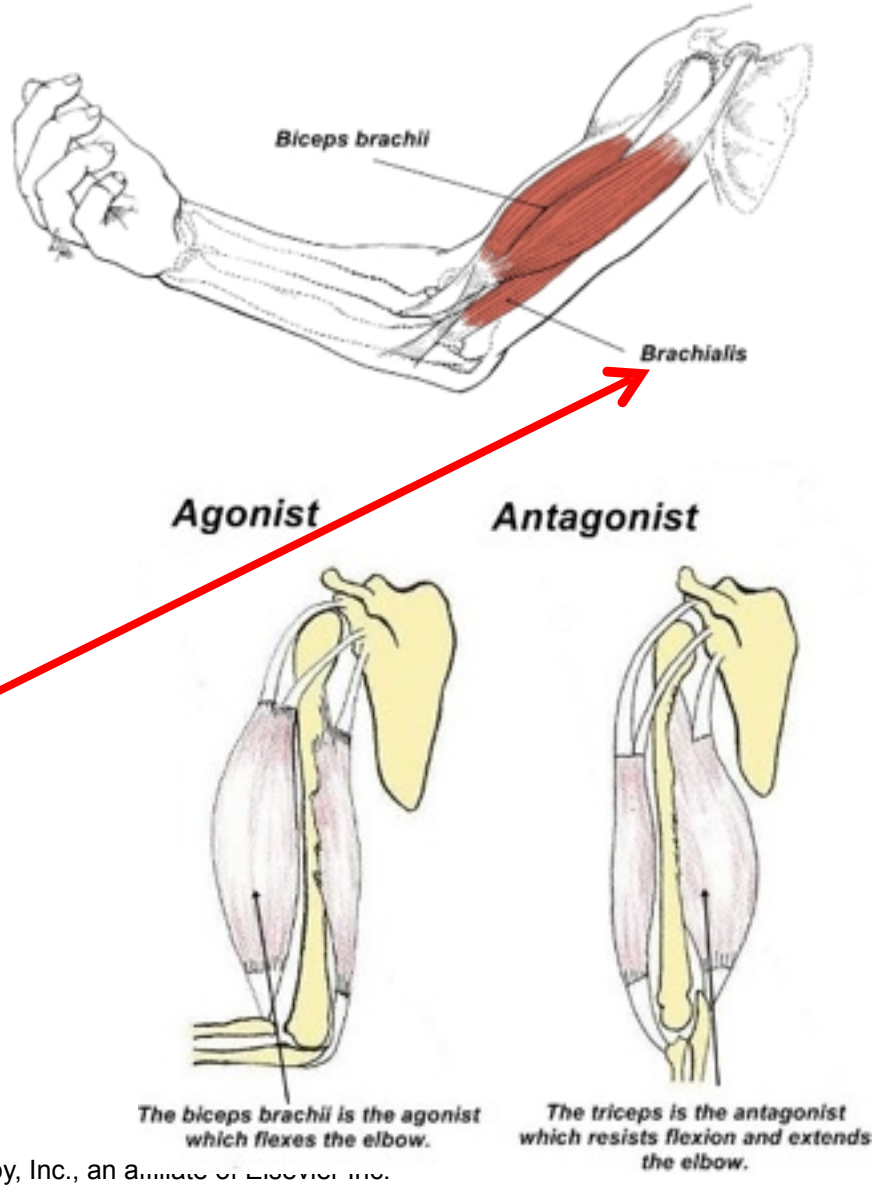

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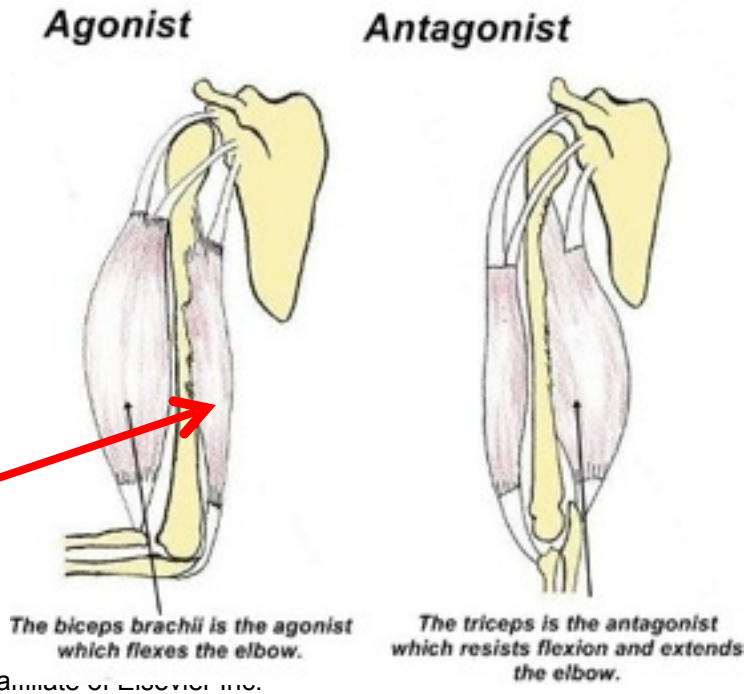

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   c. Skeletal muscle tone maintains good posture by counteracting the **pull of gravity**

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   b. **Contraction** of muscle fibers produces most of the heat required to maintain normal body temperature

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   3. Repeated muscular contraction depletes **cellular ATP** stores and outstrips the ability of the blood supply to replenish **oxygen** and **nutrients**

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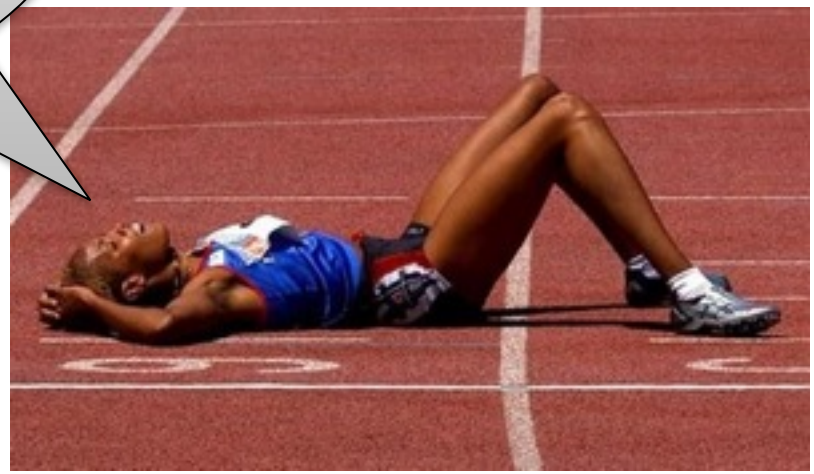
"Good… example of… homeostasis…. whew…."



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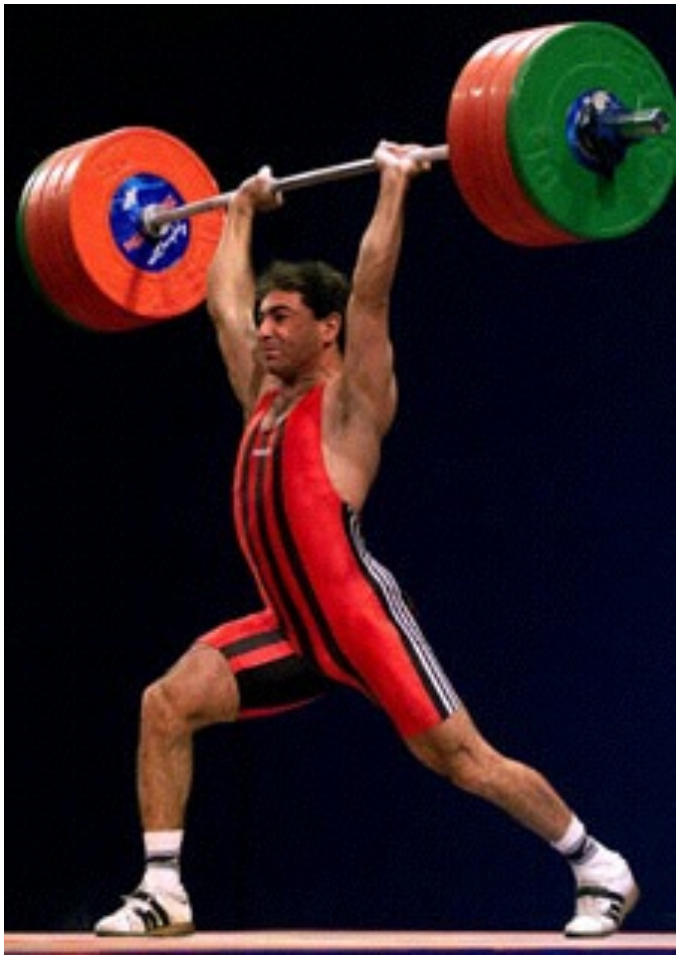

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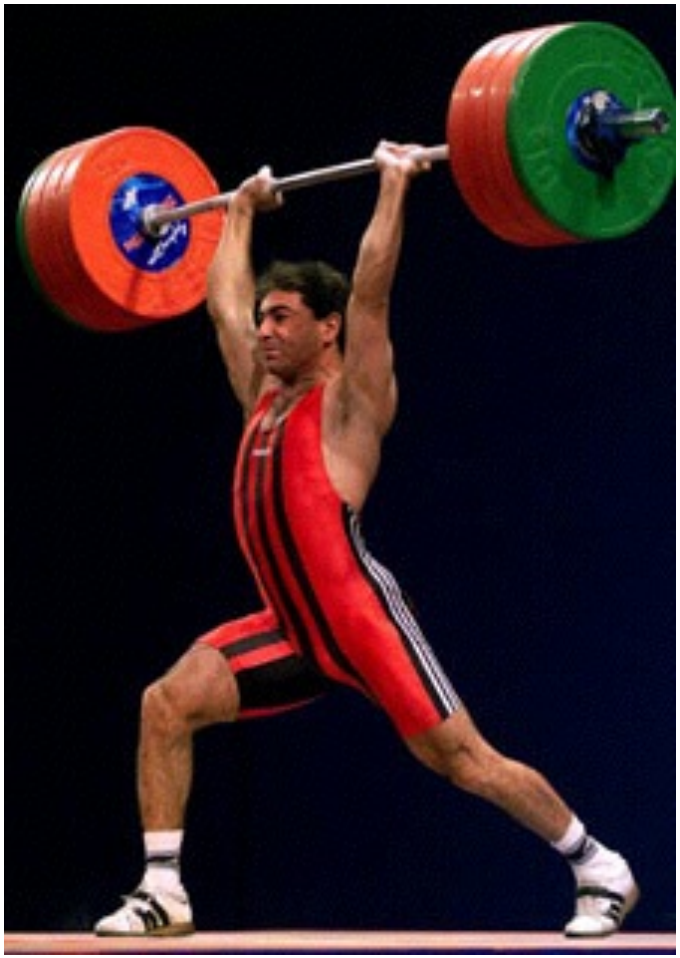

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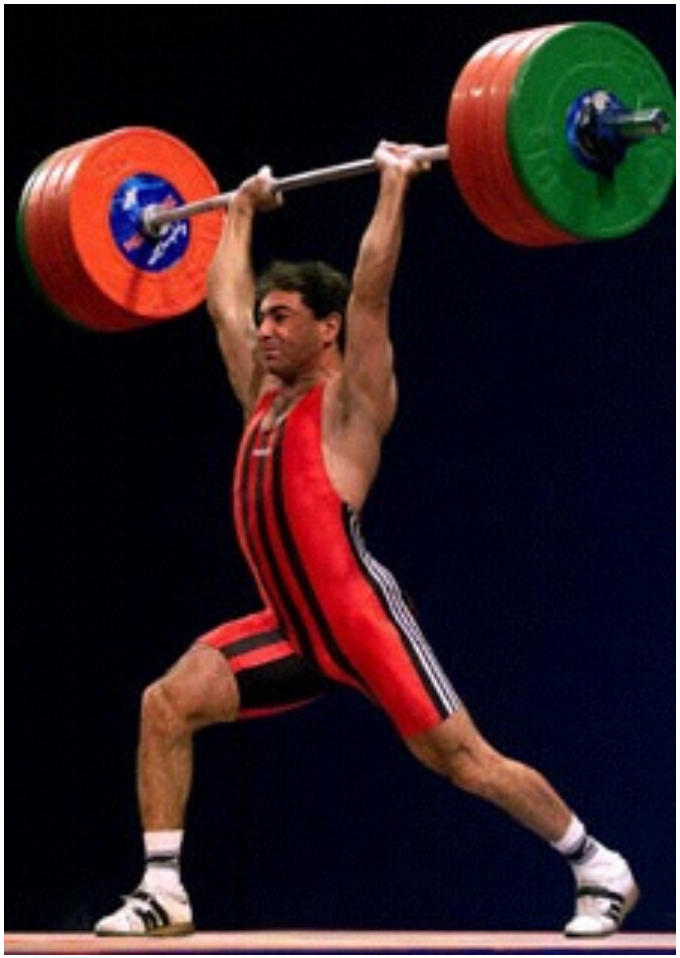

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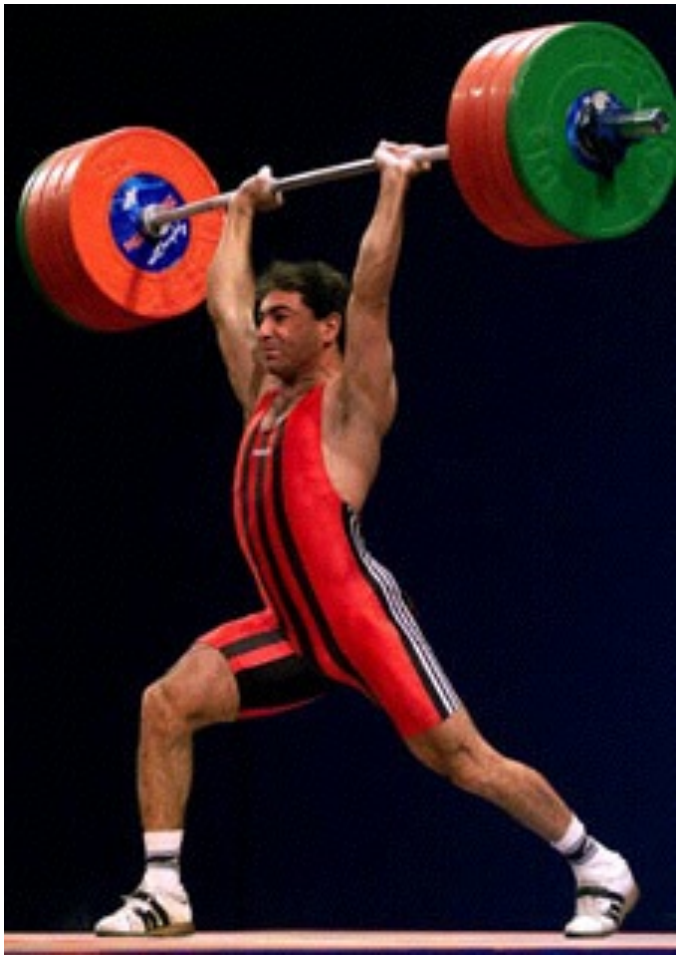

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   3. Used for **posture** and occasional brief, powerful contractions (**jumping**)

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3. **Respiratory**, circulatory, **nervous**, muscular, and **skeletal** systems play essential roles in producing normal movements
4. Multiple sclerosis, brain hemorrhage, and spinal cord injury are examples of how **pathological** conditions in other body organ systems can dramatically **affect** **movement**

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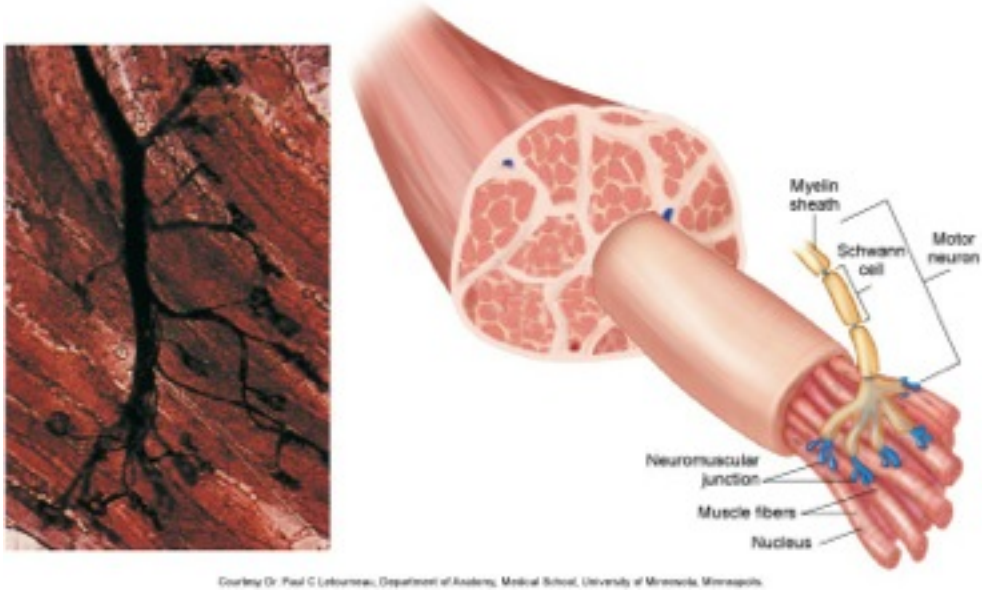
1. **<u>Stimulation</u>** of a muscle by a nerve **<u>impulse</u>** is required **<u>before</u>** a muscle can shorten and produce movement



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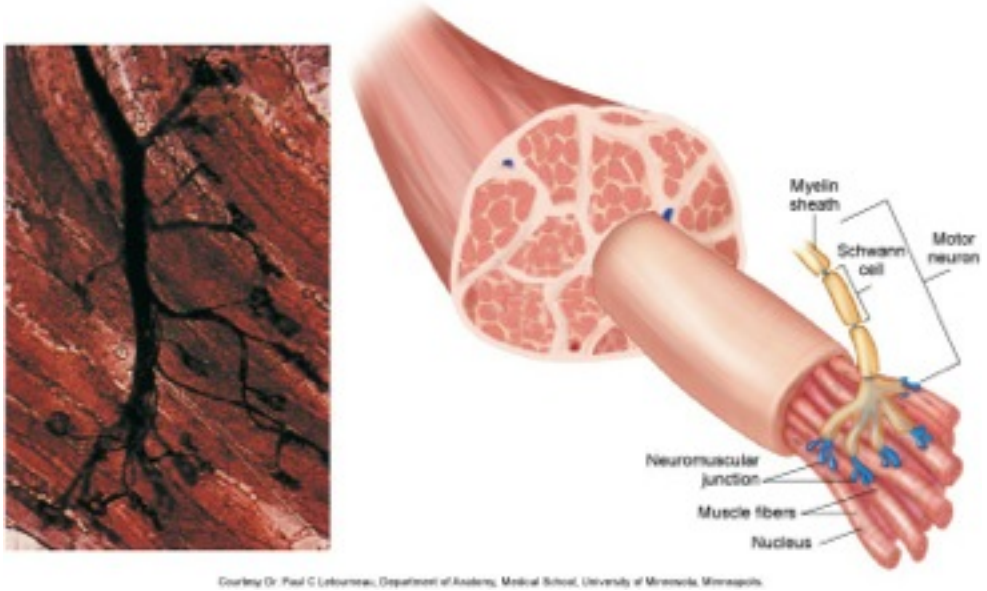
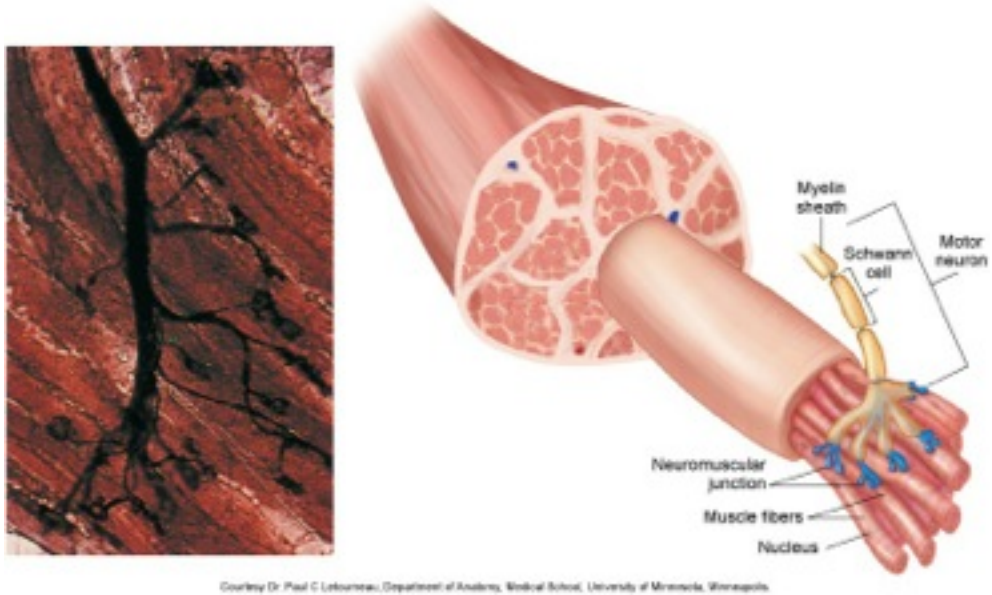
2. A **motor neuron** is the specialized nerve that transmits an impulse to a muscle, causing **contraction**



MOTOR UNIT

3. **Neuromuscular** junction (NMJ)—point of contact between a nerve **ending** and the muscle **fiber**



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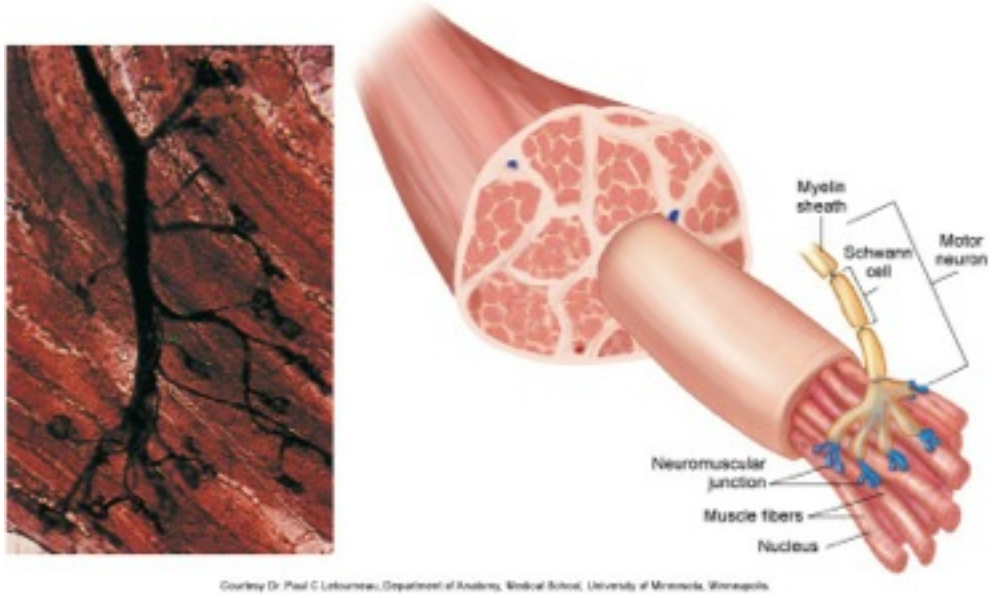

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   b. **Different** motor units responding to different **threshold** stimuli permit a muscle as a whole to execute contractions of **graded** force

TYPES OF SKELETAL MUSCLE CONTRACTION

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   b. **Tetanic** contractions are **sustained** muscular contractions caused by stimuli hitting a muscle in rapid **succession**

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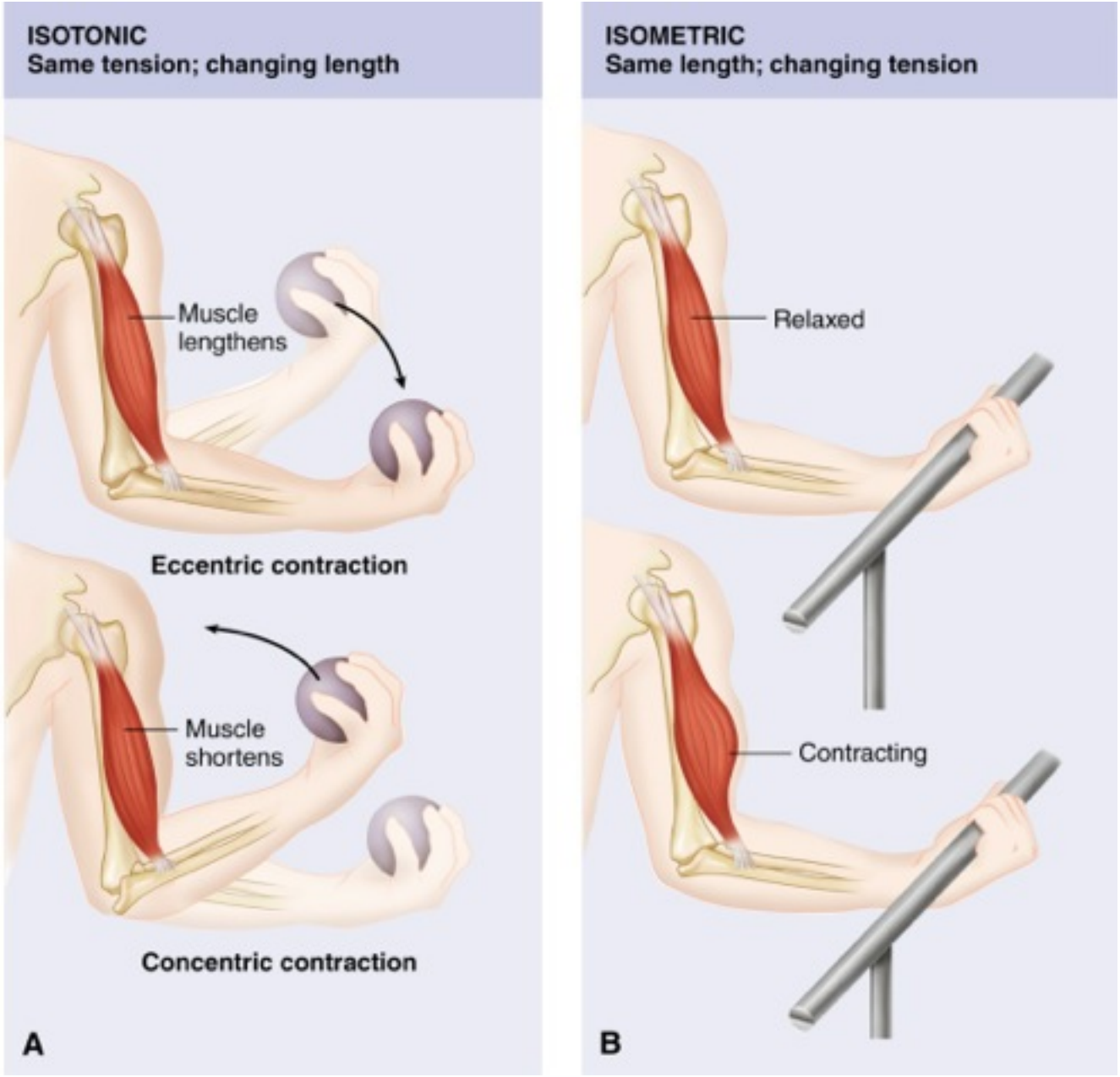
   b. Most types of **body movements** (walking, running, etc.) are produced by isotonic contractions

TYPES OF SKELETAL MUSCLE CONTRACTION (cont.)

3. **Isometric** contractions
   a. Contractions that **do not** produce movement; the muscle as a whole does not **shorten**
   b. Although no movement occurs, **tension** within the muscle **increases**



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   b. Regular **exercise** increases muscle size, called ***hypertrophy***

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