

Module 8 LO5

Types of Muscle Fibers

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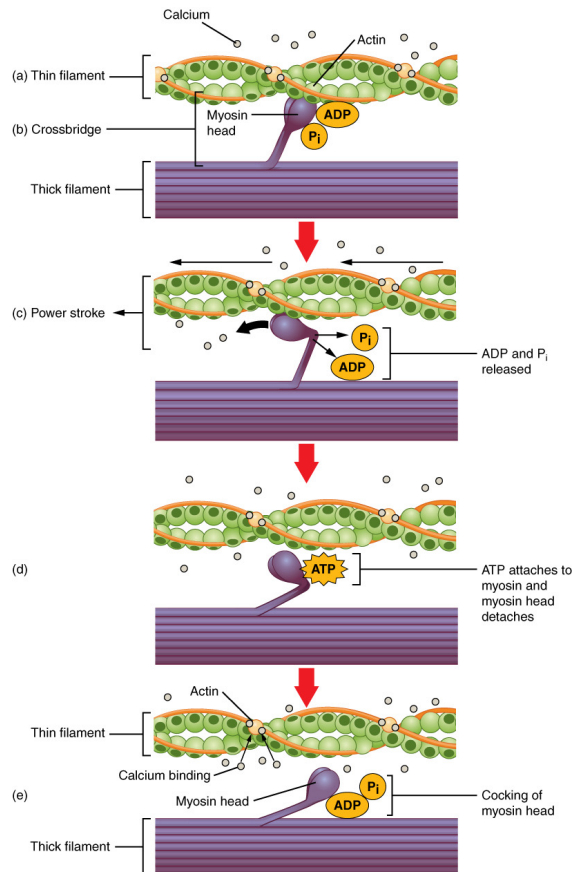
[Video Recording Link](#)

5. Types of Muscle Fibers

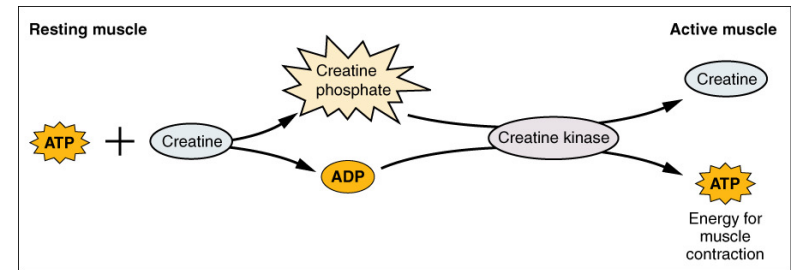
- Criteria
 1. How fast some fibers contract relative to others
 2. How fibers produce ATP
- A. Slow oxidative (SO) fibers
 - Fibers contract slowly
 - Use aerobic respiration (oxygen and glucose)
 - High resistance to fatigue
- B. Fast Oxidative–Glycolytic (FOG)
 - Fibers contract fast
 - Use primarily aerobic respiration, may switch to anaerobic respiration
 - Moderate resistance to fatigue
- C. Fast glycolytic (FG) fibers
 - Fibers contract fast
 - Use primarily anaerobic glycolysis
 - Low resistance to fatigue

Contraction Speed and Fatigue Resistance

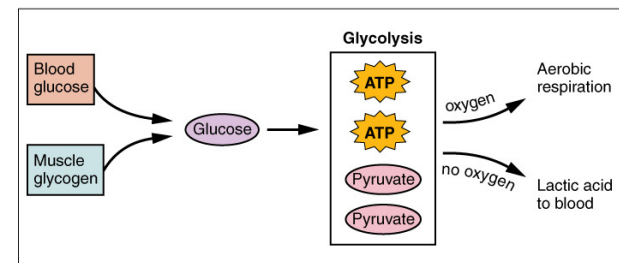
- Contraction speed
 - Hydrolyzes of ATP



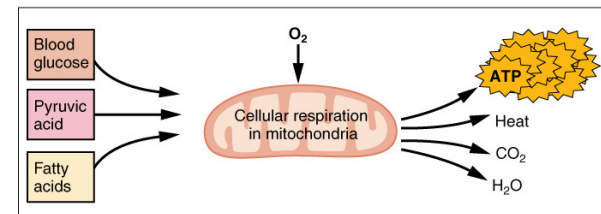
- Fatigue resistance
 - Amount of ATP produced



(a)



(b)



(c)

Muscle Fiber Characteristics

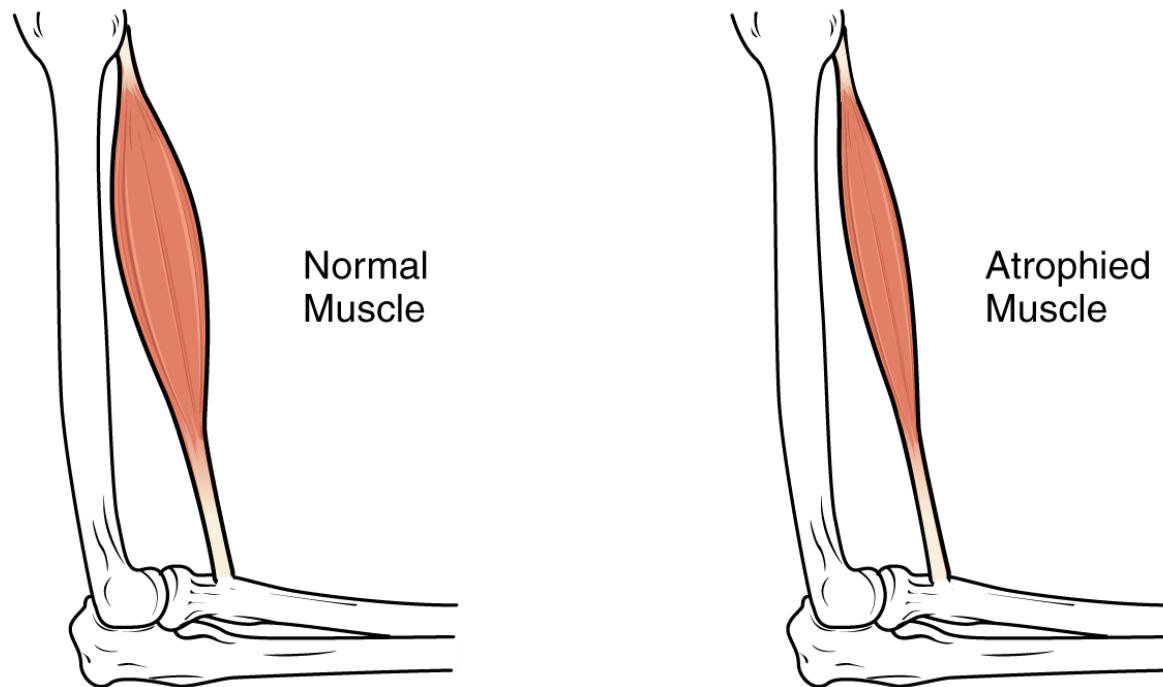
Characteristic	Slow Oxidative (SO) Fibers	Fast Oxidative–Glycolytic (FOG)	Fast Glycolytic (FG) Fibers
Fiber diameter	Smallest.	Intermediate.	Largest.
Myoglobin content	Large amount.	Large amount.	Small amount.
Mitochondria	Many.	Many.	Few.
Capillaries	Many.	Many.	Few.
Color	Red.	Red-pink.	White (pale).
Capacity for generating ATP and method used	High capacity, by aerobic respiration.	Intermediate capacity, by both aerobic respiration and anaerobic glycolysis.	Low capacity, by anaerobic glycolysis.
Rate of ATP hydrolysis by myosin ATPase	Slow.	Fast.	Fast.

Muscle Fiber Characteristics (continued)

Characteristic	Slow Oxidative (SO) Fibers	Fast Oxidative–Glycolytic (FOG)	Fibers Fast Glycolytic (FG) Fibers
Contraction velocity	Slow.	Fast.	Fast.
Fatigue resistance	High.	Intermediate.	Low.
Creatine kinase	Lowest amount.	Intermediate amount.	Highest amount.
Glycogen stores	Low.	Intermediate.	High.
Order of recruitment	First.	Second.	Third.
Location where fibers are abundant	Postural muscles such as those of the neck.	Lower limb muscles.	Upper limb muscles.
Primary functions of fibers	Maintaining posture and aerobic endurance activities.	Walking, sprinting.	Rapid, intense movements of short duration.

Physical Training

- Alters skeletal muscle appearance
- Produces changes in muscle performance



Endurance Exercise

- **Marathoners**
 - Long-distance runners have a large number of SO fibers and relatively few FO and FG fibers.



Resistance Exercise

- **Body builders**
- Have large numbers of FOG fibers and relatively few FO and SO fibers

