

MUSCLES

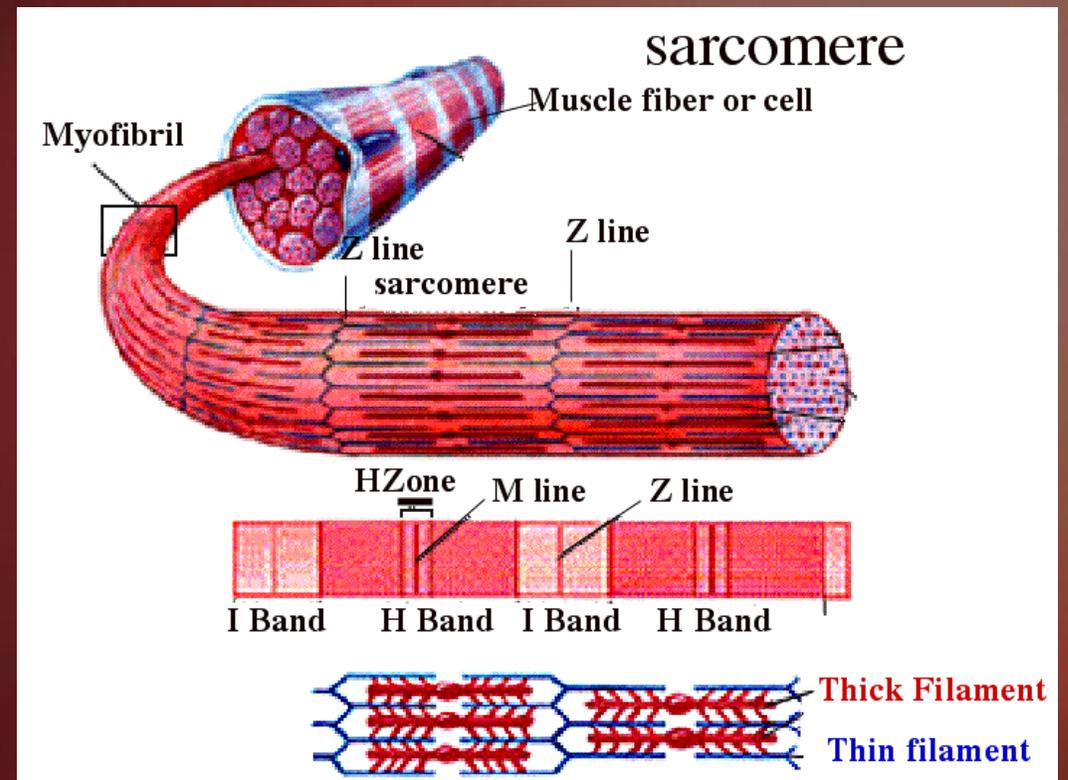
LET'S GET STARTED!

- 1 kg mass test – let's play!
- There are **639** muscles in your body.
- Muscles make up **40%** of your weight.

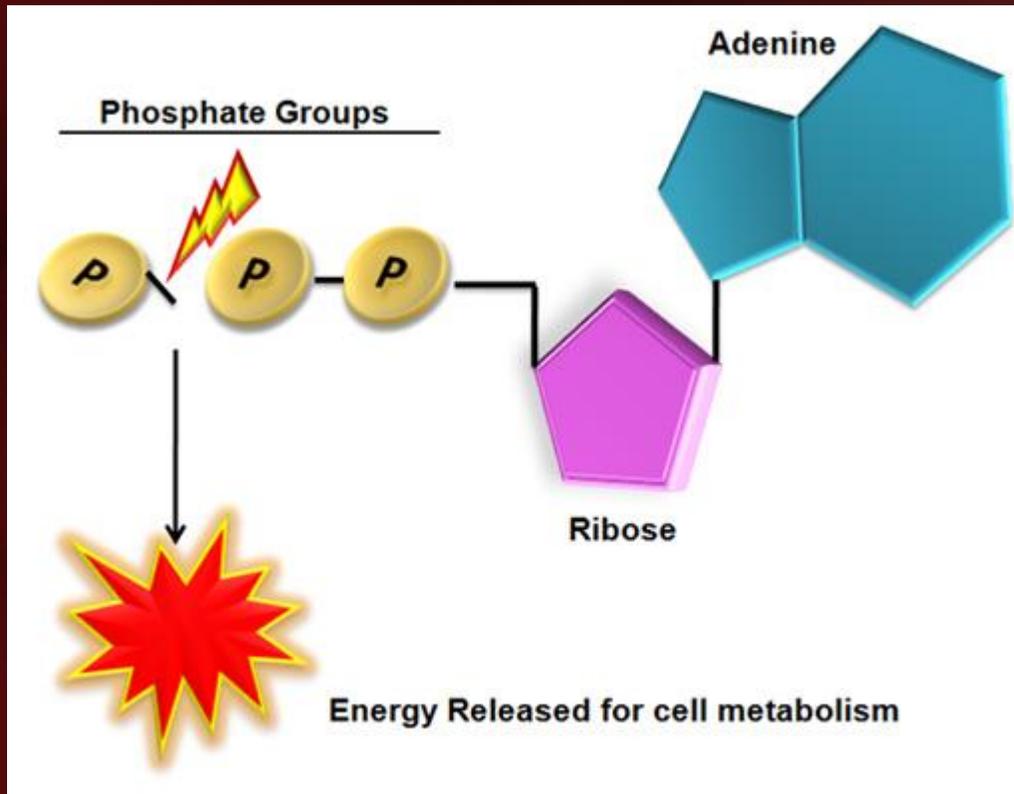


MUSCLE CELLS

- Each muscle is made from 100-1000 muscle cells known as **fibers**
- Muscle fibers are made of 2 proteins: **actin** and **myosin**
- When you flex, actin and myosin combine to form a protein complex which results in shortening of fibers and the muscle **contracts**.



HOW MUSCLES USE ENERGY



- Muscles get their energy from **ATP** (Adenosine Tri-Phosphate)

1. ANAEROBIC EXERCISE

- When your body needs energy quickly, it uses **phosphocreatine** to make more ATP. This will only work for a few seconds until it runs out. Then the body switches to using **glycogen**. This produces a bi-product called **lactic acid**, which makes your muscles burn. After 10 min, the glycogen runs out.

- Examples: Hockey, Football
volleyball hit, sprint



2. AEROBIC EXERCISE

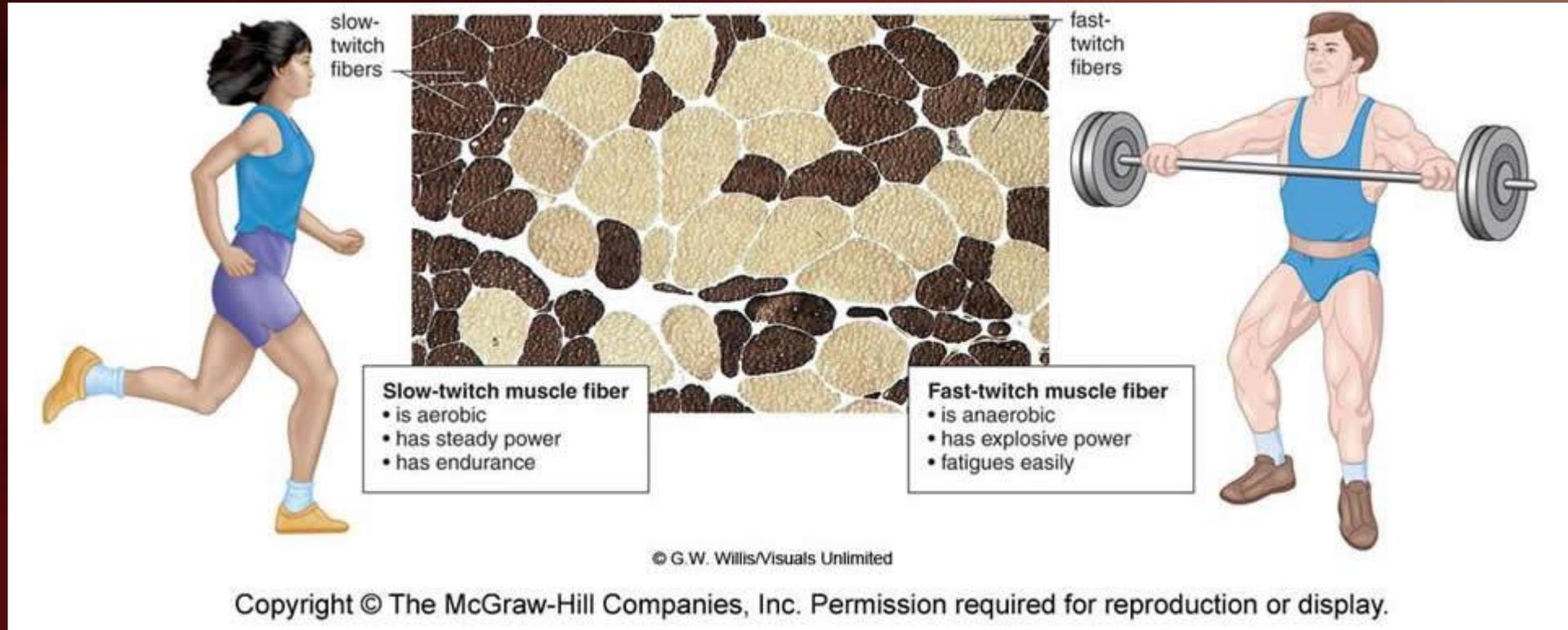


- When your body needs energy long-term, it can use **oxygen** to break down glycogen, which produces **carbon dioxide** and **water**. Again, this only lasts so long. The final method of getting energy is using oxygen to break down **fat** and **carbs** in your body.

• Examples: soccer, basketball
triathlon, cycling

2 TYPES OF MUSCLE FIBERS

- 1. Fast Twitch: specialize in **anaerobic** exercise.
- 2. Slow Twitch: specialize in **aerobic** exercise.



2 TYPES OF MUSCLE FIBERS

- Most muscles are made of both, but there's usually more of one than the other.
- Example: Chicken
 - White meat = fast twitch
 - Dark meat = slow twitch



2 TYPES OF MUSCLE FIBERS

Some animals have specialized muscles, like a cheetah (almost entirely fast twitch)

You cannot change what kind of muscle you have, but **you can develop one kind more than the other**

Example:

Usain Bolt – 85% fast twitch

Lance Armstrong – 92% slow twitch



HOW MUSCLES GROW



- You can't change the # of muscle cells you have, you can only make them **thicker**. When you work out, your muscles **tear** slightly and **rebuild** themselves stronger than they were before. That's why you often feel **sore** the next day.