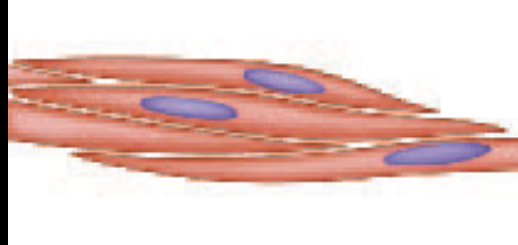
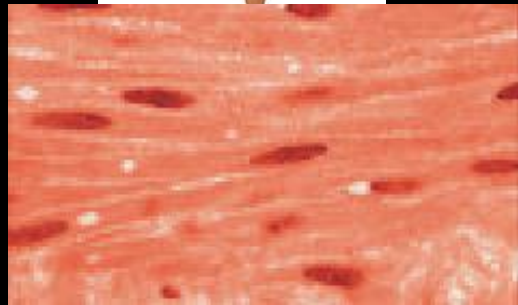
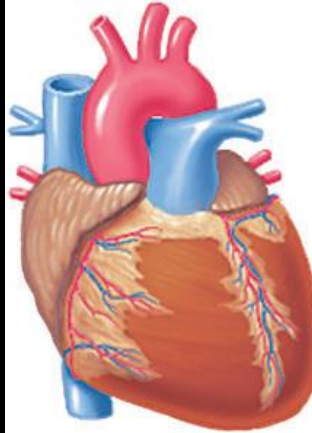


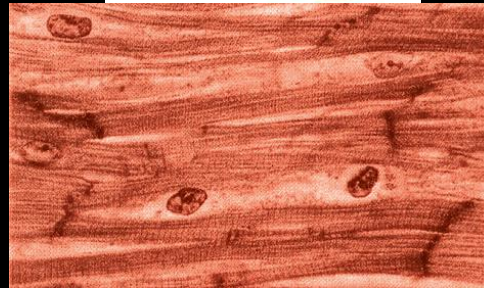
النسيج العضلي

Muscle tissue



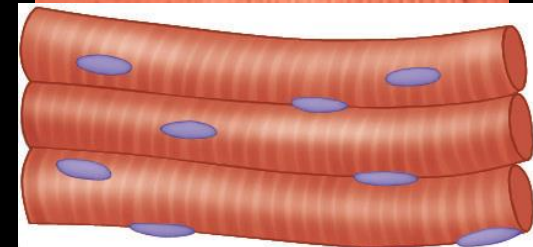
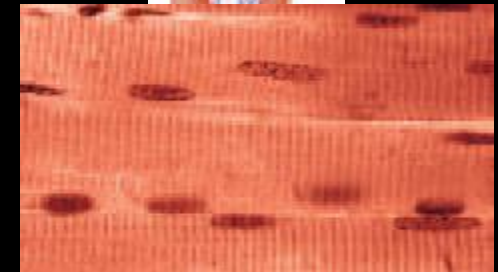
Smooth muscle

- Has spindle-shaped, non striated, uninucleated fibers.
- Occurs in walls of internal organs.
- Is involuntary



Cardiac muscle

- Has striated, tubular, branched, uninucleated fibers.
- Occurs in walls of heart.
- Is involuntary



Skeletal muscle

- Has striated, tubular, multinucleated fibers.
- Is usually attached to skeleton.
- Is voluntary

العضلات الهيكلية

Muscular Fiber

A fiber is the long, thin cell that, when organized by the hundreds into groups called fascicles, constitutes the muscles. It is shaped like an elongated cylinder. The amount of fiber present varies according to the function accomplished by each muscle. Fibers are classified as white, which contract readily for actions that require force and power, and red, which perform slow contractions in movements of force and sustained traction. Each muscle fiber contains in its structure numerous filaments called myofibers. Myofibers, in turn, have two classes of protein filaments: myosin, also called thick filaments, and actin, or thin filaments. Both kinds of fibers are arranged in tiny matrices called sarcomeres.

Specialization

The quantity of muscle fiber varies according to the size and function of the muscle. Also, the same muscle can combine white fibers (rapid contractions) and red fibers (slow contractions). Even though their percentages differ from one person to the next, the composition of the muscles of the upper limbs tends to be the same as that of the lower in the same person. In other words, the relation between motor neurons and muscle fibers is inscribed in a person's genes. Depending on the type of neuron that stimulates them, the fibers are differentiated into slow fibers (when the neuron or motor neuron innervates between five and 180 fibers) and rapid fibers (when the neuron innervates between 200 and 800 fibers). The neurons and the fiber constitute what is called a motor unit.

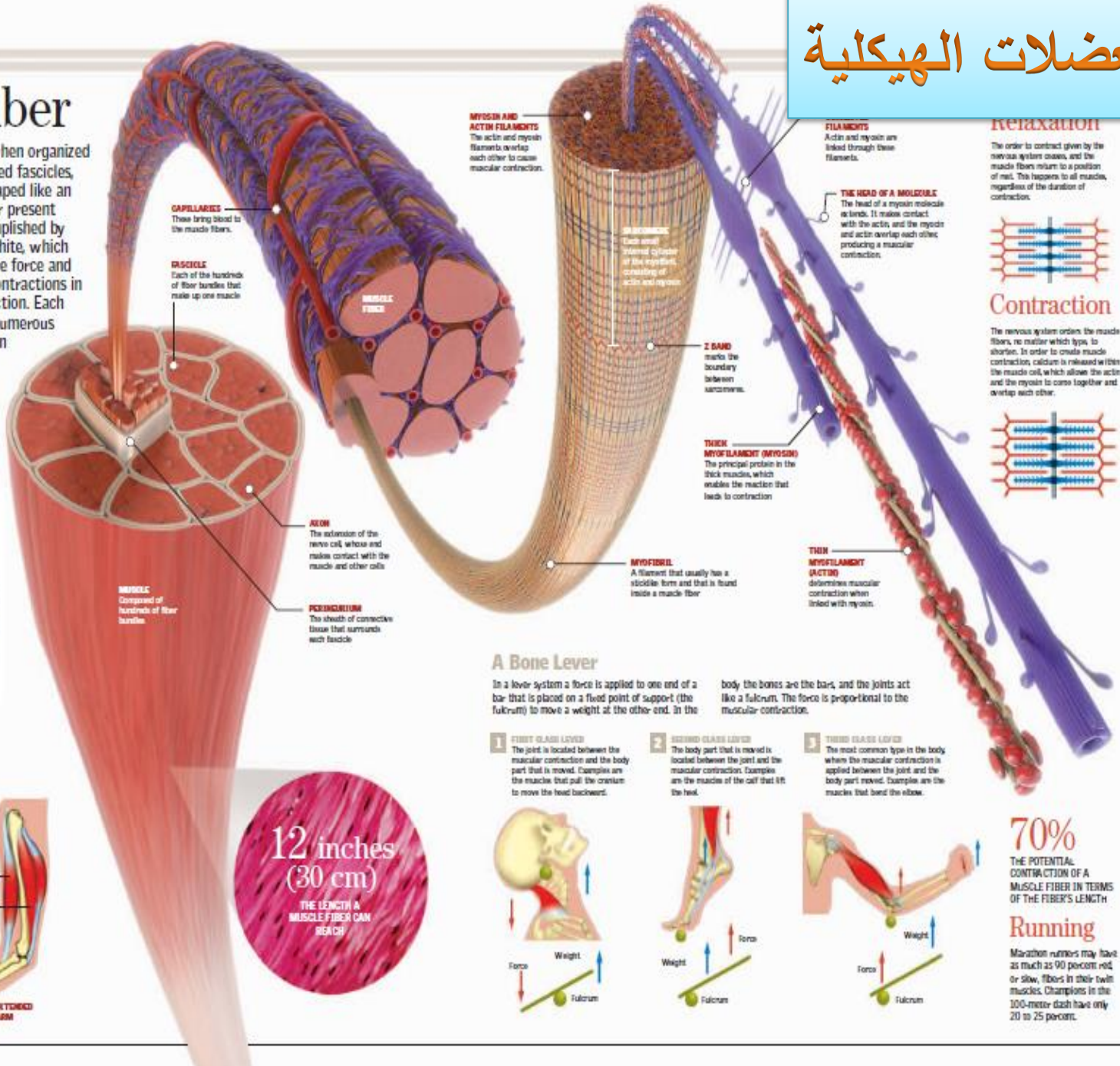
Opposites

The muscles contract or relax according to the movement to be accomplished. To make the brain's directive take effect, the muscles involved carry out opposing actions.



FLEXED ARM

EXTENDED ARM



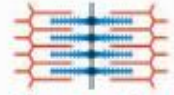
MYOSIN AND ACTIN FILAMENTS
The actin and myosin filaments overlap each other to cause muscular contraction.

FILAMENTS
Actin and myosin are linked through these filaments.

THE HEAD OF A MOLECULE
The head of a myosin molecule is called. It makes contact with the actin, and the myosin and actin overlap each other producing a muscular contraction.

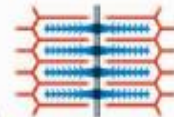
Relaxation

The order to contract given by the nervous system ceases, and the muscle fibers return to a position of rest. This happens to all muscles, regardless of the duration of contraction.



Contraction

The nervous system orders the muscle fibers, no matter which type, to shorten. In order to create muscle contraction, calcium is released within the muscle cell, which allows the actin and the myosin to come together and overlap each other.



A Bone Lever

In a lever system a force is applied to one end of a bar that is placed on a fixed point of support (the fulcrum) to move a weight at the other end. In the

body the bones are the bars, and the joints act like a fulcrum. The force is proportional to the muscular contraction.

- 1 FIRST CLASS LEVER**
The joint is located between the muscular contraction and the body part that is moved. Examples are the muscles that pull the cranium to move the head backward.
- 2 SECOND CLASS LEVER**
The body part that is moved is located between the joint and the muscular contraction. Examples are the muscles of the calf that lift the heel.
- 3 THIRD CLASS LEVER**
The most common type in the body when the muscular contraction is applied between the joint and the body part moved. Examples are the muscles that bend the elbow.



12 inches (30 cm)
THE LENGTH A MUSCLE FIBER CAN REACH

70%
THE POTENTIAL CONTRACTION OF A MUSCLE FIBER IN TERMS OF THE FIBER'S LENGTH

Running

Marathon runners may have as much as 90 percent red or slow fibers in their thigh muscles. Champions in the 100-meter dash have only 20 to 25 percent.

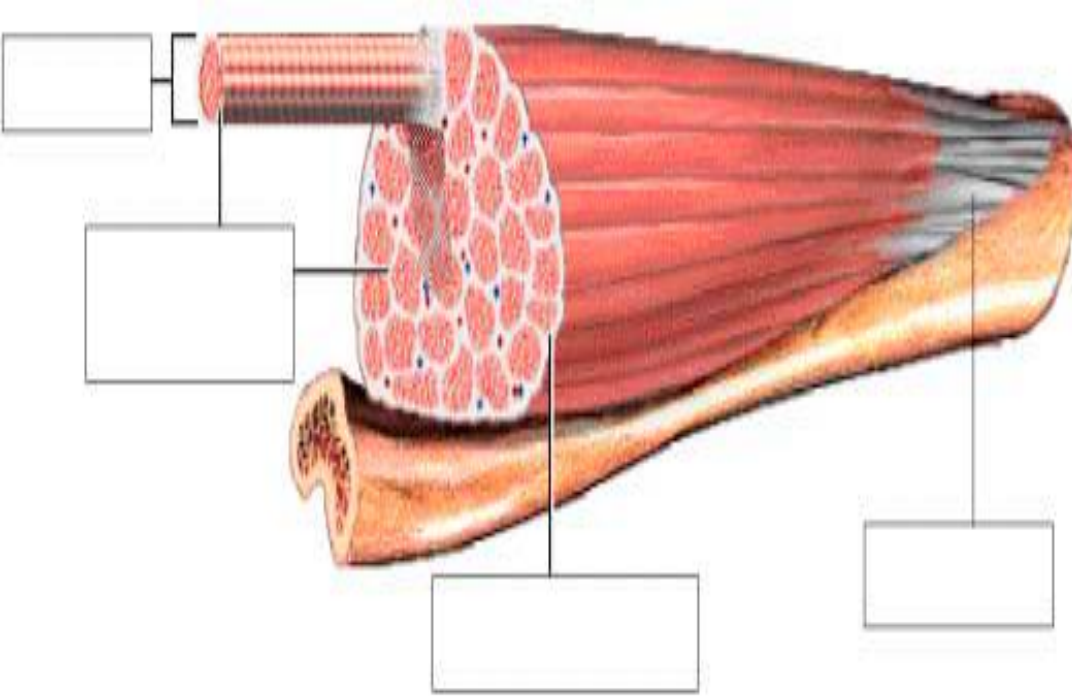
العضلات الهيكلية

لها لون وردي او قرنفلي في
الحالة الطبيعية وذلك يعود
بشكل جزئي للصبغات

والاوعية الدموية

وهناك المتغايرة في اللون

الحمرة والبيضاء والمختلطة



myofilaments



myofibril



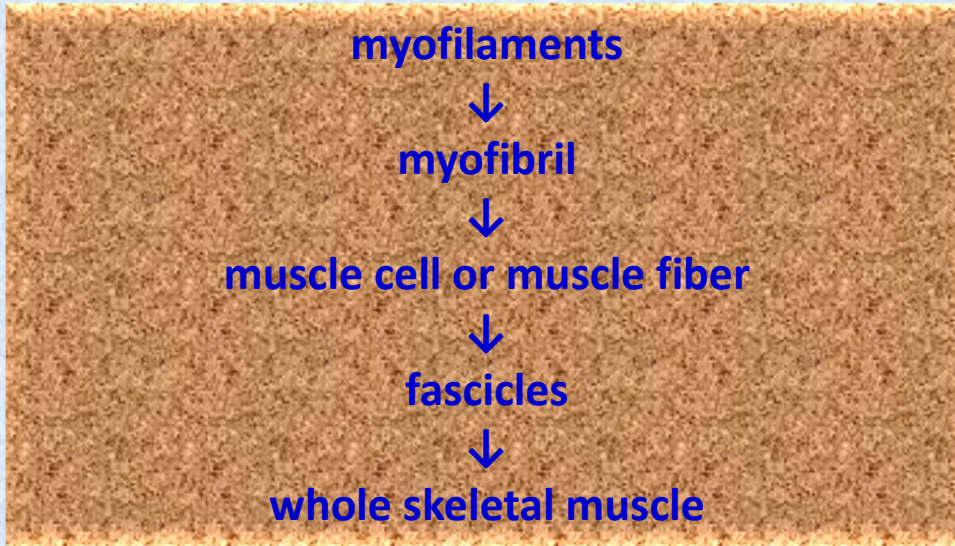
muscle cell or muscle fiber



fascicles



whole skeletal muscle





Fusiform



Multipennate



Circular



Unipennate



Convergent



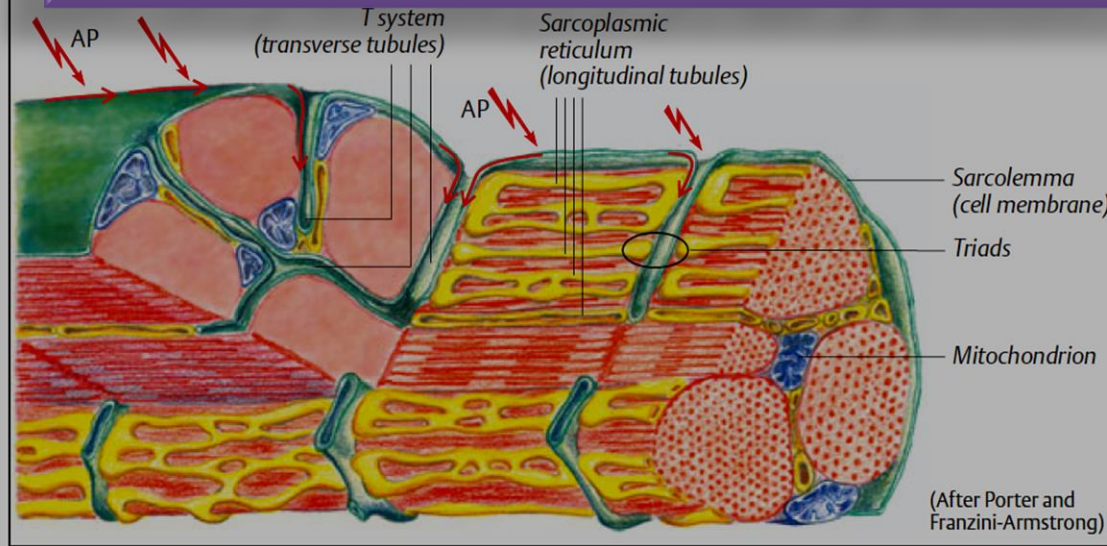
Bipennate



Parallel

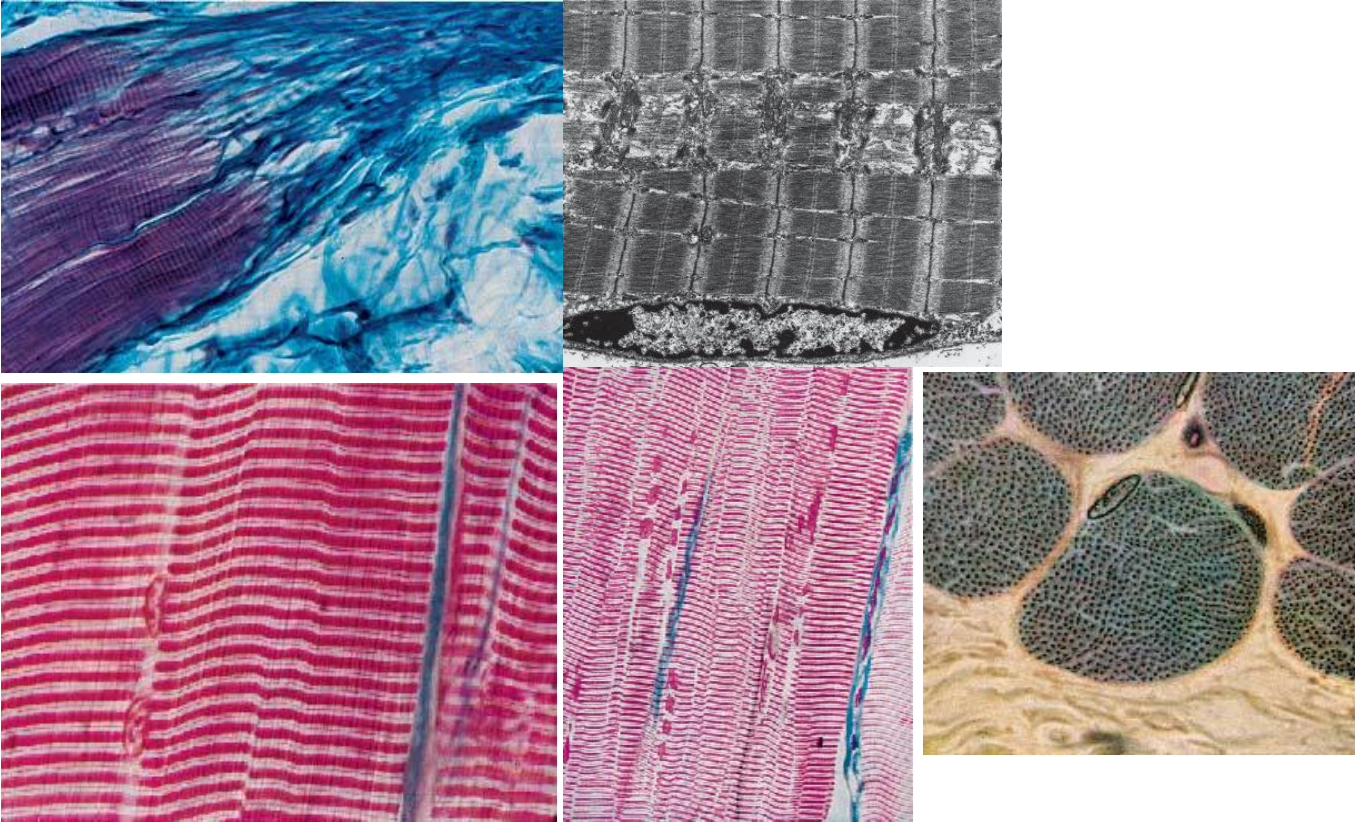
الخلية العضلية اسطوانية طويلة متعددة الانوية ذات نهاية مستدقة او متكورة شيئا ما
يمكن ان تكون الخلية مفردة وقد تكون جدا طويلة او كما يحصل في بعض العضلات يكون
طولها اقصر من طول العضلة الكلي عندها تكون احدى نهايات الليف العضلي مرتبط الى
وتر والنهية الاخرى ترتبط الى النسيج الضام في الحواجز العضلية

الشبكة الاندوبلازمية غير حبيبية وهي من نوع خاص اضافة الى وجود الحبيبية



B. Ca^{2+} as mediator between electrical stimulus and contraction

T system



الغشاء العضلي مكون من غشاء بلازمي وصفيحة قاعدية
 التقلص يبدأ في منطقة الاتصال I-A موقع وجود الثلاث T-AID و تنقل موجة التحفيز عبر
 جهاز نيبب T الى الداخل الامر الذي يحفز الشبكة الاندوبلازمية واطلاق ايونات الكالسيوم