

# Human body

- The human body is the most complex system ever created . the more we learn about it, the more appreciation we have about what a rich system it is.....

# **THE MUSCULAR TISSUE**

- **DEFINITION**
- **DERIVATION OF NAME**
- **TYPES OF  
MUSCLE(CLASSIFICATION)**
- **NOMENCLATURE OF SKELETAL  
MUSCLE**
- **GOLDEN FACTS**
- **APPLIED ANATOMY**

# Four basic types of tissues

- Nervous tissue
- Muscular tissue
- Connective tissue
- Epithelial tissue

# DEFINITION : CONTRACTILE TISSUE OF THE BODY

- The word muscle derived from the Latin word musculus : a little mouse.
- Primarily designed for movements
- In vertebrates 3 basic types of muscles:
  - skeletal muscles
  - smooth muscles
  - cardiac muscles

Muscle contractions and muscle relaxations are important for daily life

-body movement has the bones and joints to be movable but the actual movement based work is carried by the muscle.

-in the human body there are over 600 muscles.

-properties of muscles: -**contractility**

-**excitability**

-**extensibility**

-**elasticity**

# Origin:

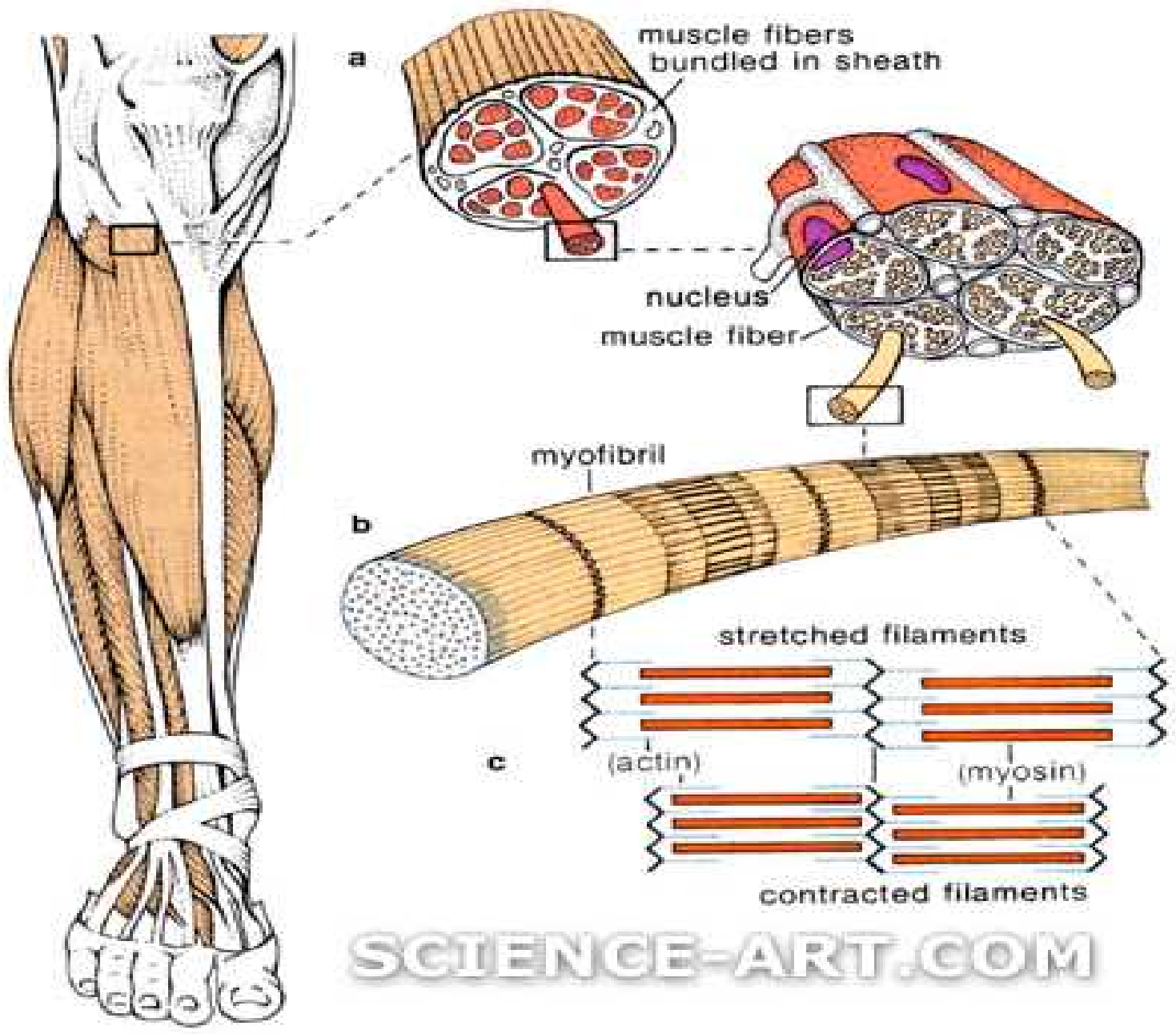
All muscles of the body are developed from Mesoderm

**except** the **arrector pilorum**, muscles of the iris, **myoepithelial cells** Of salivary glands, sweat glands, lacrimal gland which are derived from ectoderm

-myoepithelial cells : present at the bases of secretory acini of glands and are responsible for expulsion of secretion from the acini

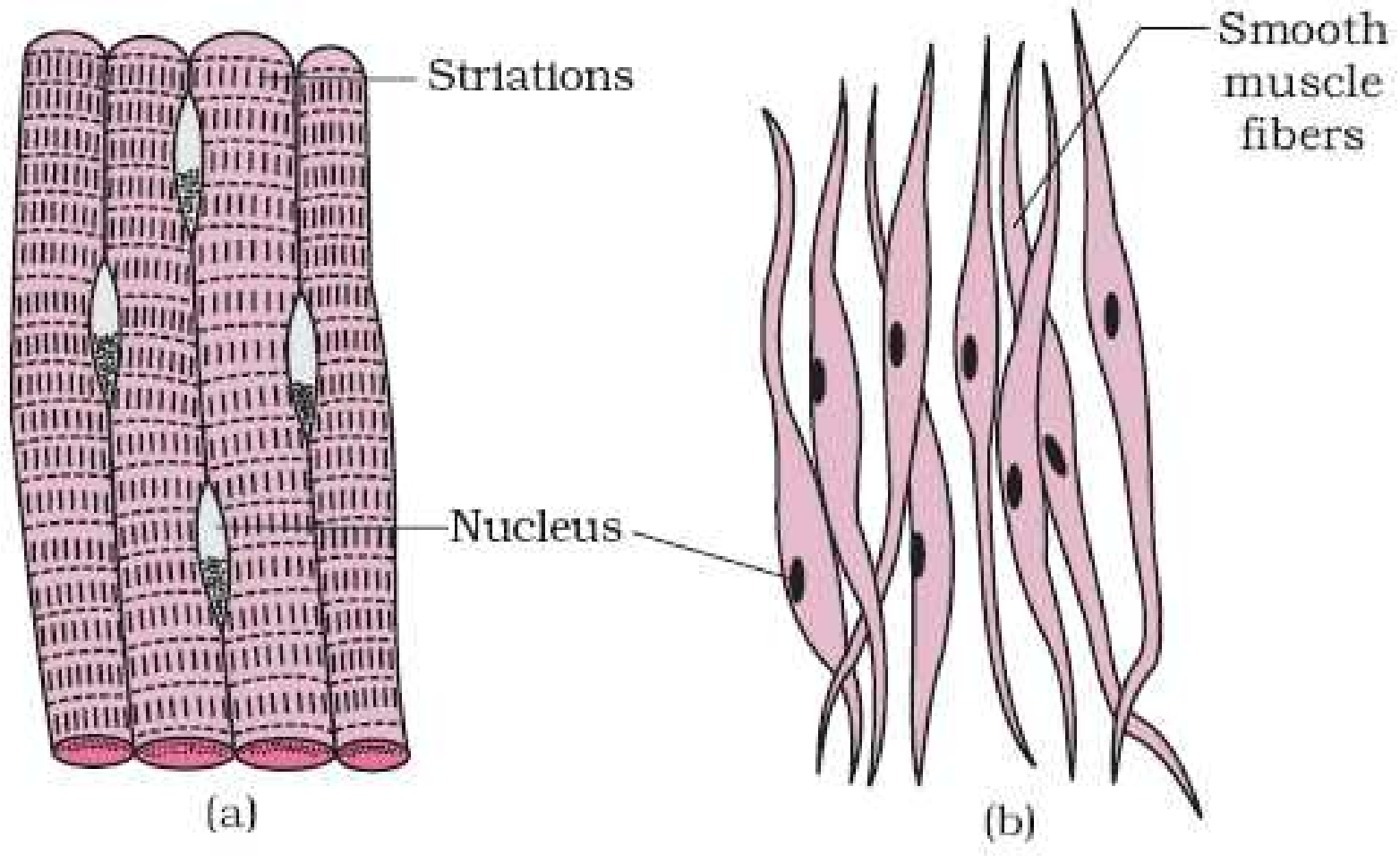
Myofibroblasts are involved in the wound healing

Skeletal muscle	Smooth muscle	Cardiac muscle
Striped striated, voluntary, somatic	Nonstriated, involuntary	Striated, involuntary
Attached to SKELETAN	In the wall of hollow viscera, e.g. GIT, RESPIRATORY TRACT	IN THE WALL OF THE HEART and WALL OF THE LARGE VESSELS
voluntary	involuntary	Involuntary
Movement of the body parts	Movement of the viscera	Movement (contractions) of the heart
Nerve supply: somatic	autonomic	Autonomic
Rhythmicity -nt	+nt	+nt
Muscle fibers: unbranched cylindrical	Unbranched: spindle shape	Branched: cylindrical with intercalated disc
Neuromuscular junction +nt	-nt	- Nt



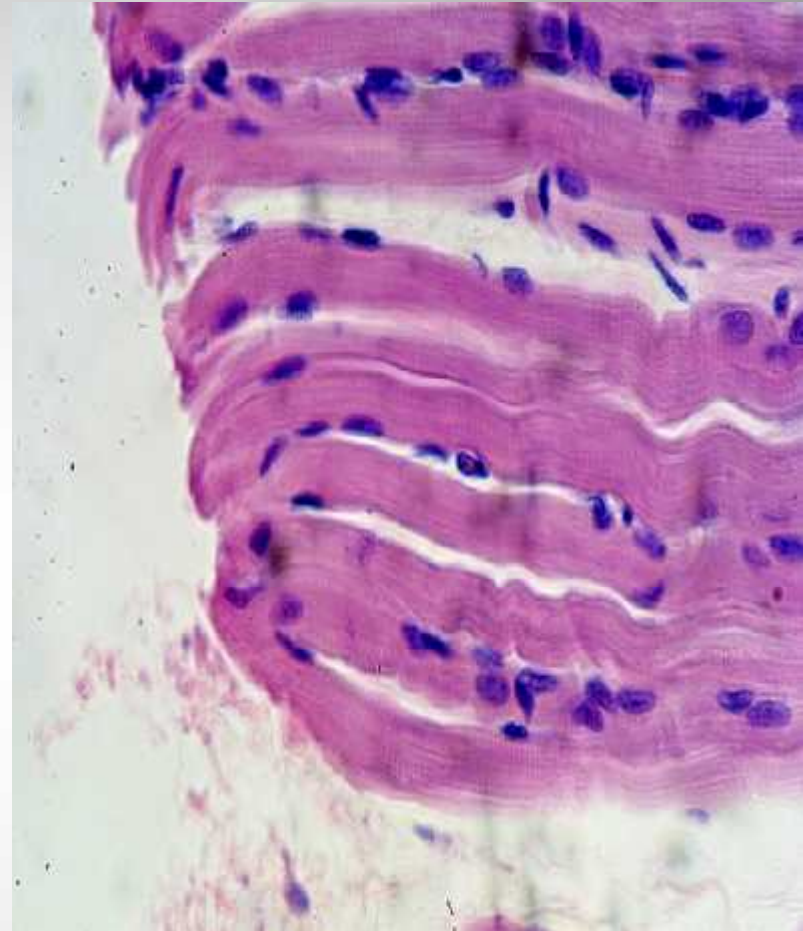
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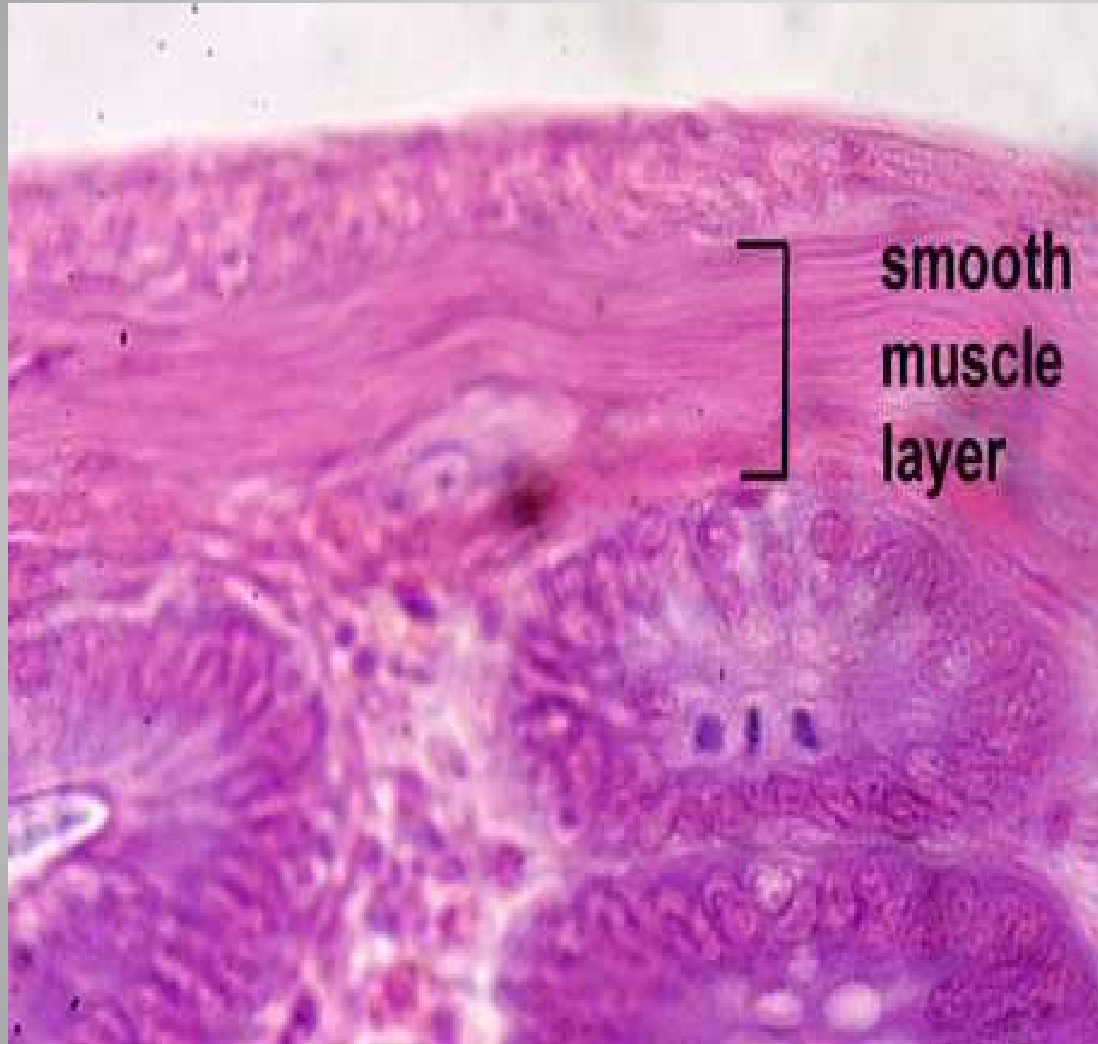




Cardiac muscle

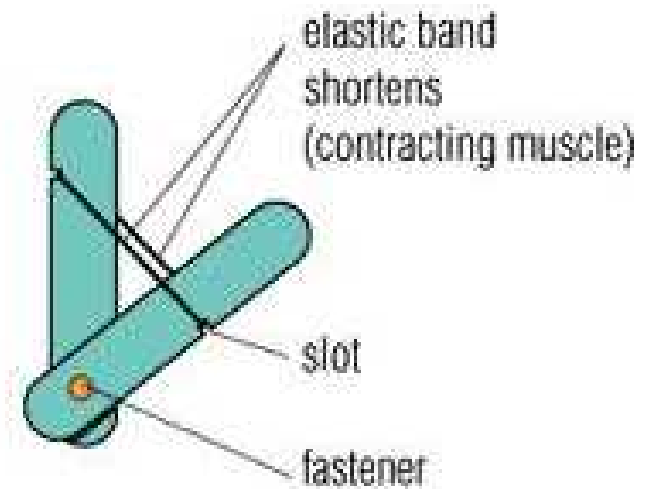
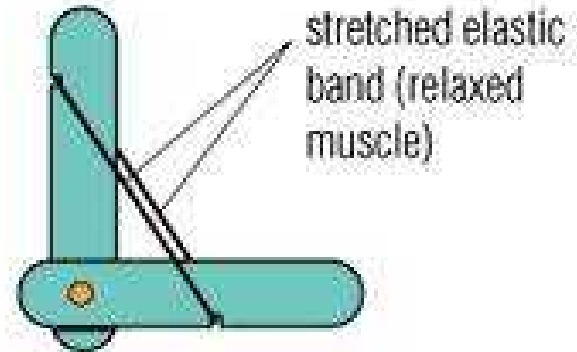
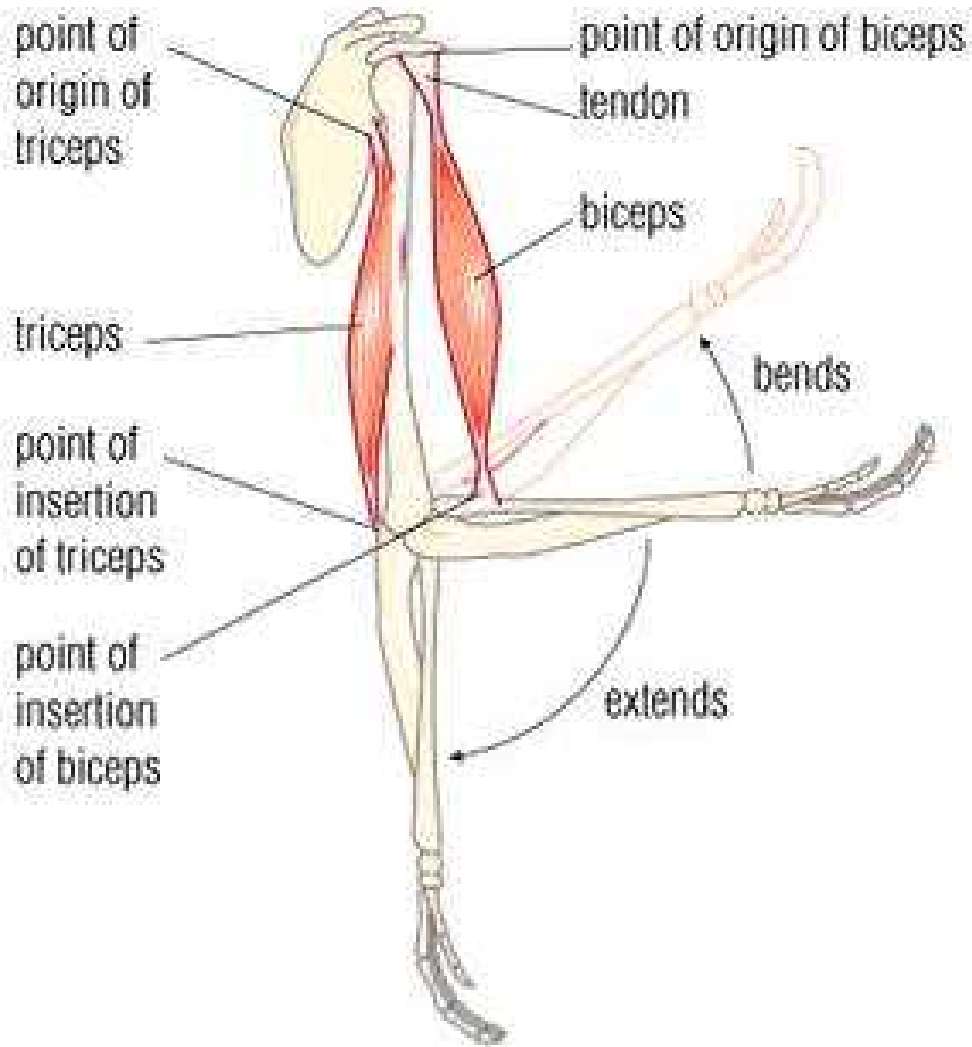


Skeletal muscle



# Voluntary muscles

- Muscles form 42% of the total body weight.
- 2 Parts: fleshy and fibrous
- 2 ends: origin and insertion



## Classification

1) according to color:

2) according to the  
direction of muscle fibers

3) according to the force  
of action

# According to colour

<b>RED MUSCLE</b>	<b>WHITE MUSCLE</b>
MORE PRIMITIVE	MORE RECENT
CONTRACTIONS SLOW AND SUSTAINED	RAPID AND LESS SUSTAINED
DEEP MUSCLES	SUPERFICIAL MUSCLES
SOLEUS, ANTIGRAVITY MUSCLES OF TRUNK	BICEPS BRACHII.
DENSE CAPILLARY NETWORK	POOR CAPILLARY NETWORK

# ACCORDING TO DIRECTION OF MUSCLE FIBERS

-Parallel: strap,quadrate,fusiform

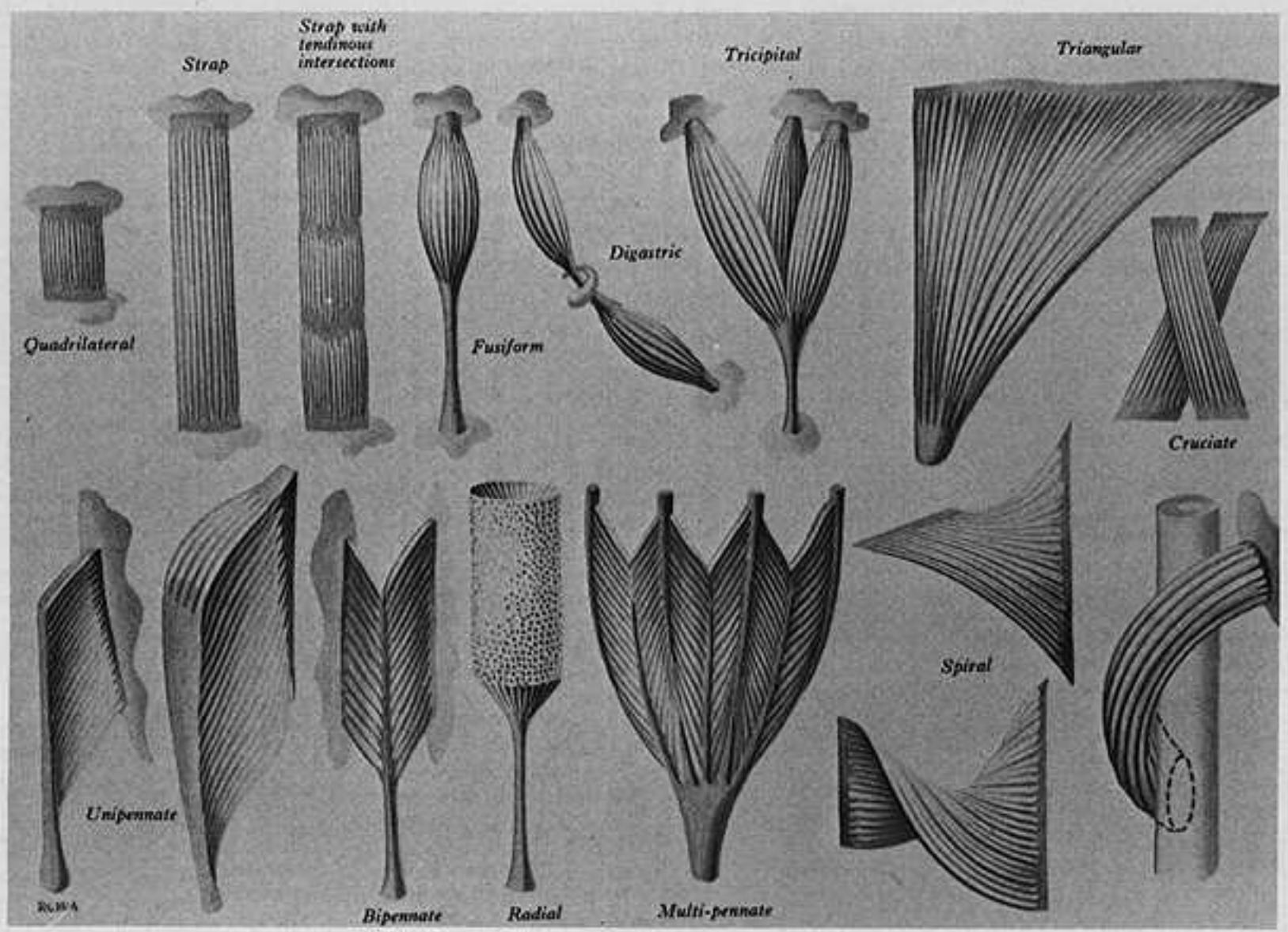
- pennate

:unipennate,bipennate,multipennate,circum  
pennate

-Spiral:

-Cruciate:



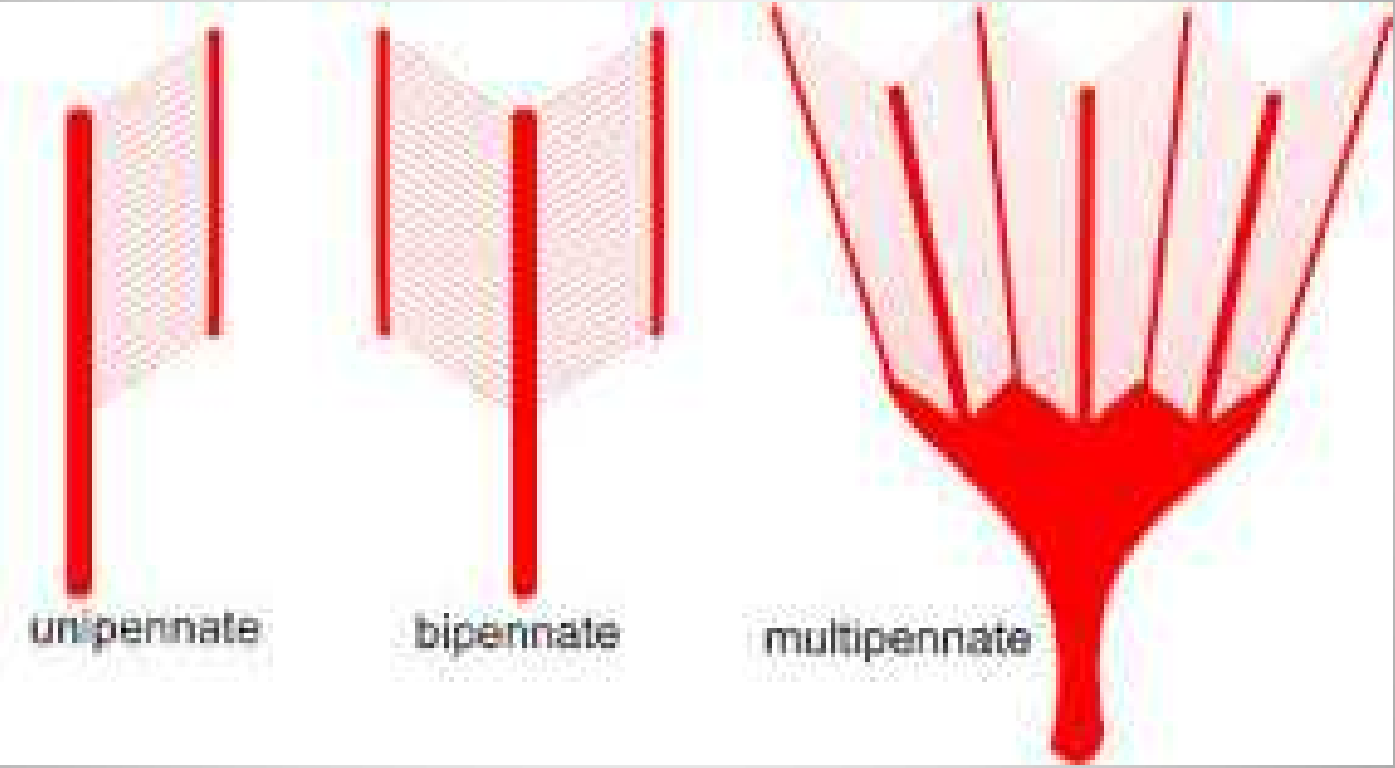


**FIG. 4-4** The morphologic "types" of muscle based upon their general form and fascicular architecture. (Williams PL, Warwick R: Gray's Anatomy, 36th ed. Philadelphia, WB Saunders, 1980. Copyright © 1980, Churchill Livingstone)

# Parallel muscle

- Strap
- Quadrate
- fusiform

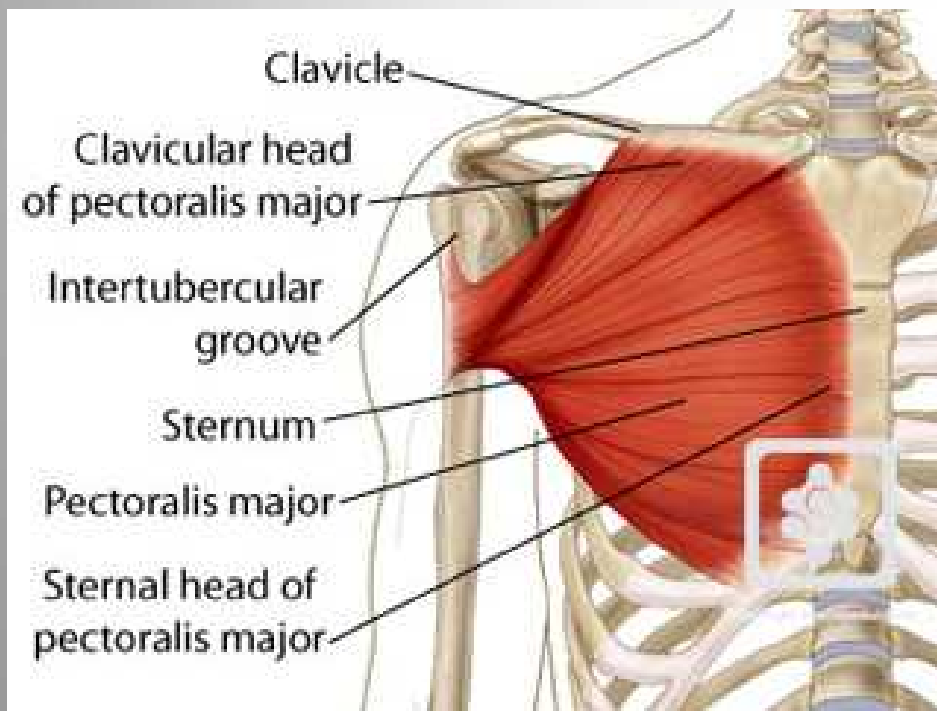
# Pennate muscle

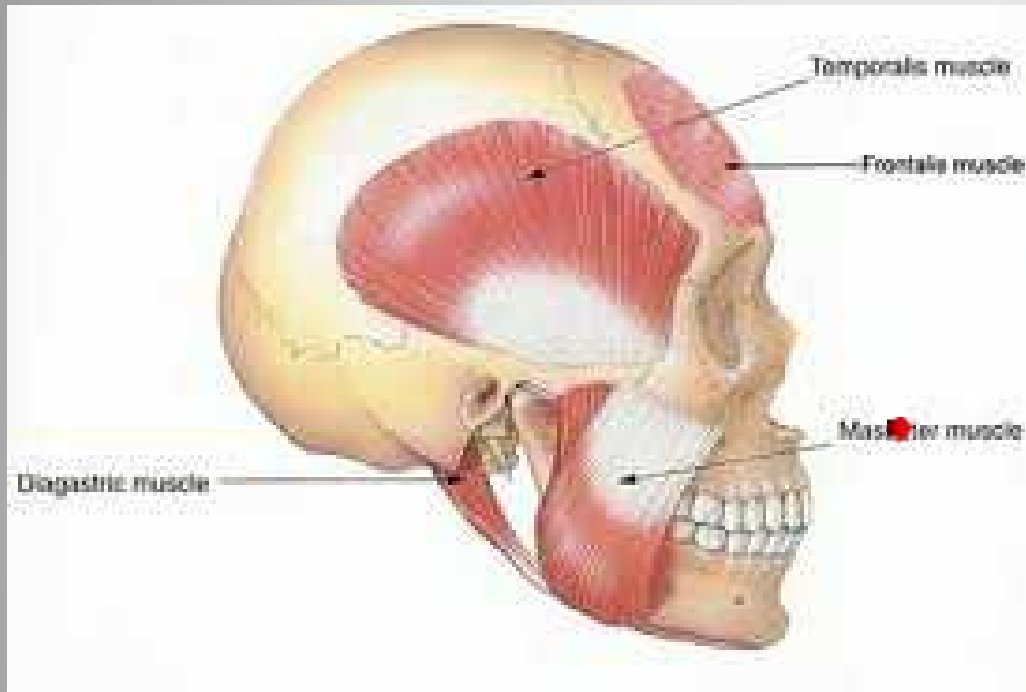


unipennate

bipennate

multipennate



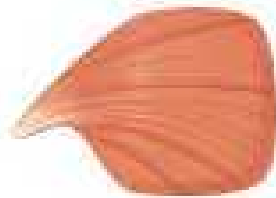


masseter

sternomastoid

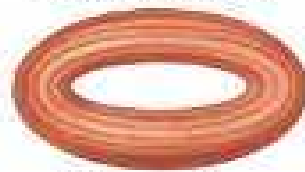


Pectoralis major



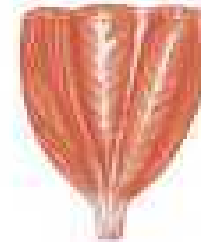
(b) Convergent

Orbicularis oris



(a) Circular

Deltoid

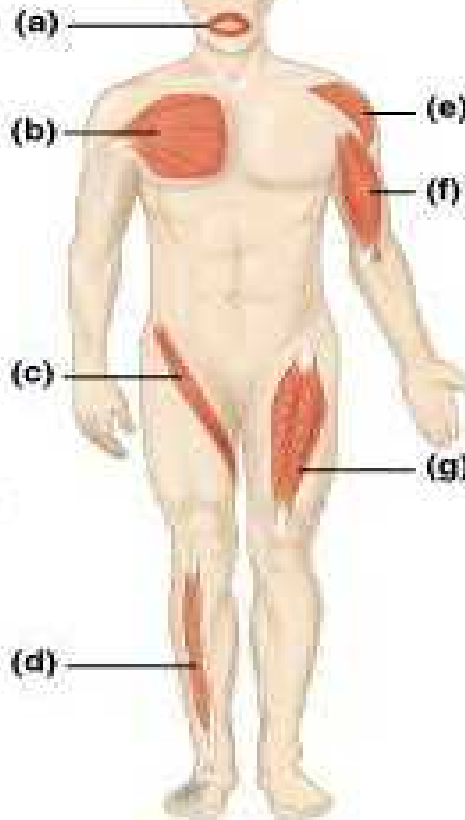


(e) Multipennate

Sartorius



(c) Parallel



Biceps brachii



(f) Fusiform

Extensor digitorum longus



(d) Unipennate

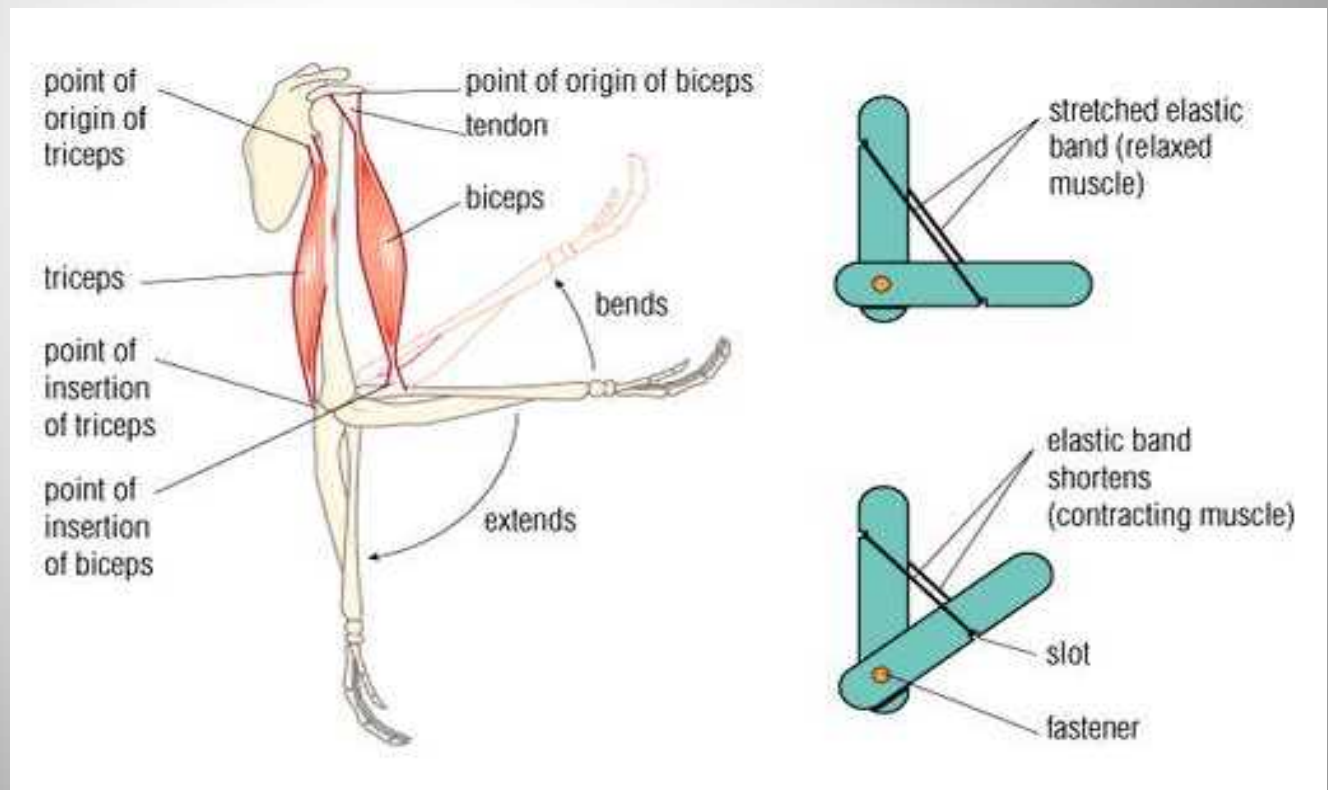
Rectus femoris



(g) Bipennate

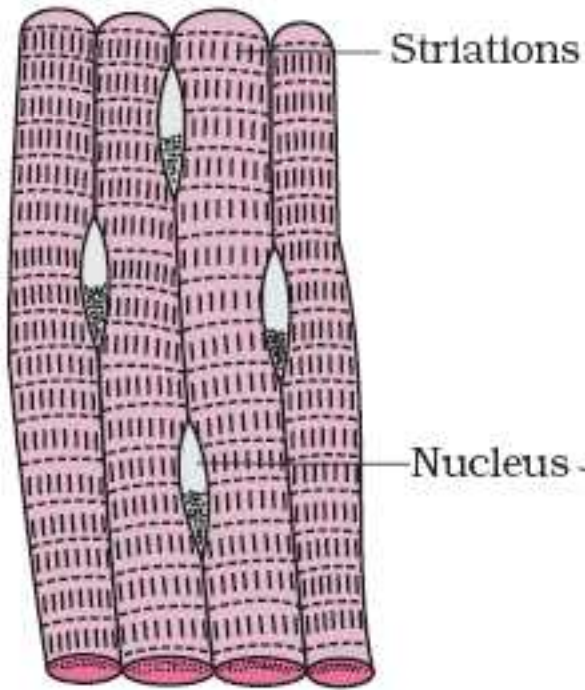
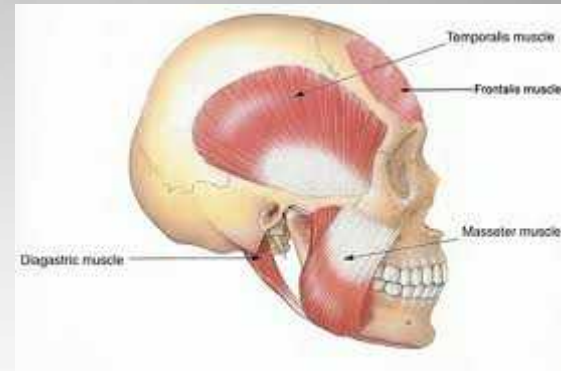
# ACCORDING TO FORCE OF ACTION

- Spurt muscle
- Shunt muscle

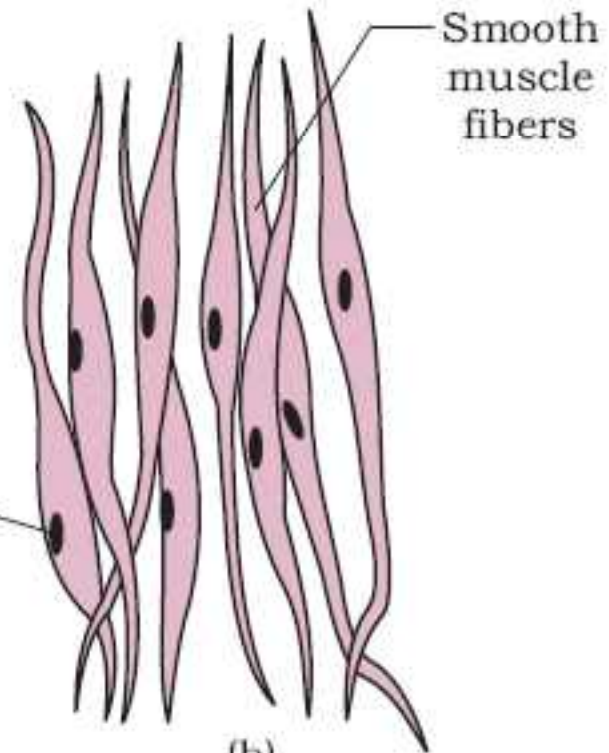








(a)



(b)

-According to colour : red and white muscle

-According to direction of muscle fibers:

parallel: fusiform, strap, quadrature

pennate: unipennate, bipennate,  
multipennate

spiral: pectoralis major

cruciate: sternomastoid

-According to force of action:

-shunt: brachioradialis

-spurt: brachialis

# Hybrid muscle

- Composite muscle
- Dual nerve supply
- Pectineus, adductor magnus, pectoralis major, flexor digitorum profundus.

## Golden facts:

Total no:600

All the muscles of the body developed from mesoderm except:

Largest muscle of the body: gluteus maximus

Longest muscle of the body: sartorius

Smallest muscle of the body: stapedius

Most important property of muscle: contractility

Longest tendon: plantaris

Largest tendon: tendoachilles

## Applied anatomy

- paralysis :loss of motor power.
- rigor mortis: development of stiff muscles several hours after death
- damaged skeletal muscles are repaired mainly by formation of a scar tissue because.....
- drug administered by I.M are absorbed faster than subcutaneous injection.....
- sites commonly used for i.m injection.....
- the action of muscles that move eyes are very precise,where as the action of muscles that move limbs are gross and generalized,depends on ratio of neurons : number of muscle fibres.1:10 in eye,1:500 in limbs

# Applied anatomy

- Duchenne muscular dystrophy : genetic disorder that involves male children more,
- Myasthenia gravis: rare neuro-muscular disorder that causes weakness in skeletal muscles.auto-immune disease

