

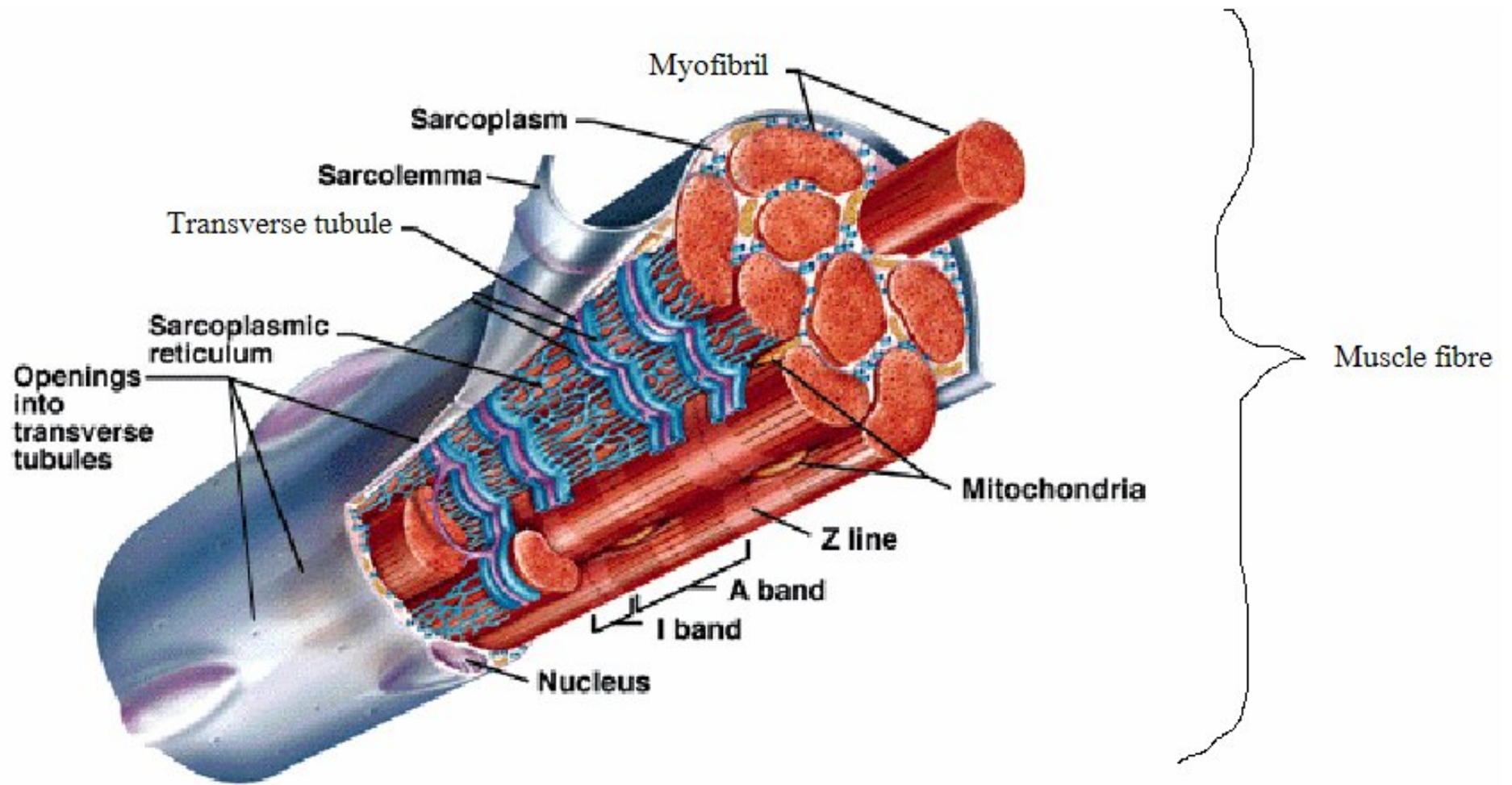
A photograph of a human arm, likely a forearm, with a semi-transparent diagram overlaid. The diagram shows the skeletal structure, including the humerus, radius, and ulna, and highlights the muscle compartments. The text 'Muscle Structure' is centered over the diagram.

Muscle Structure

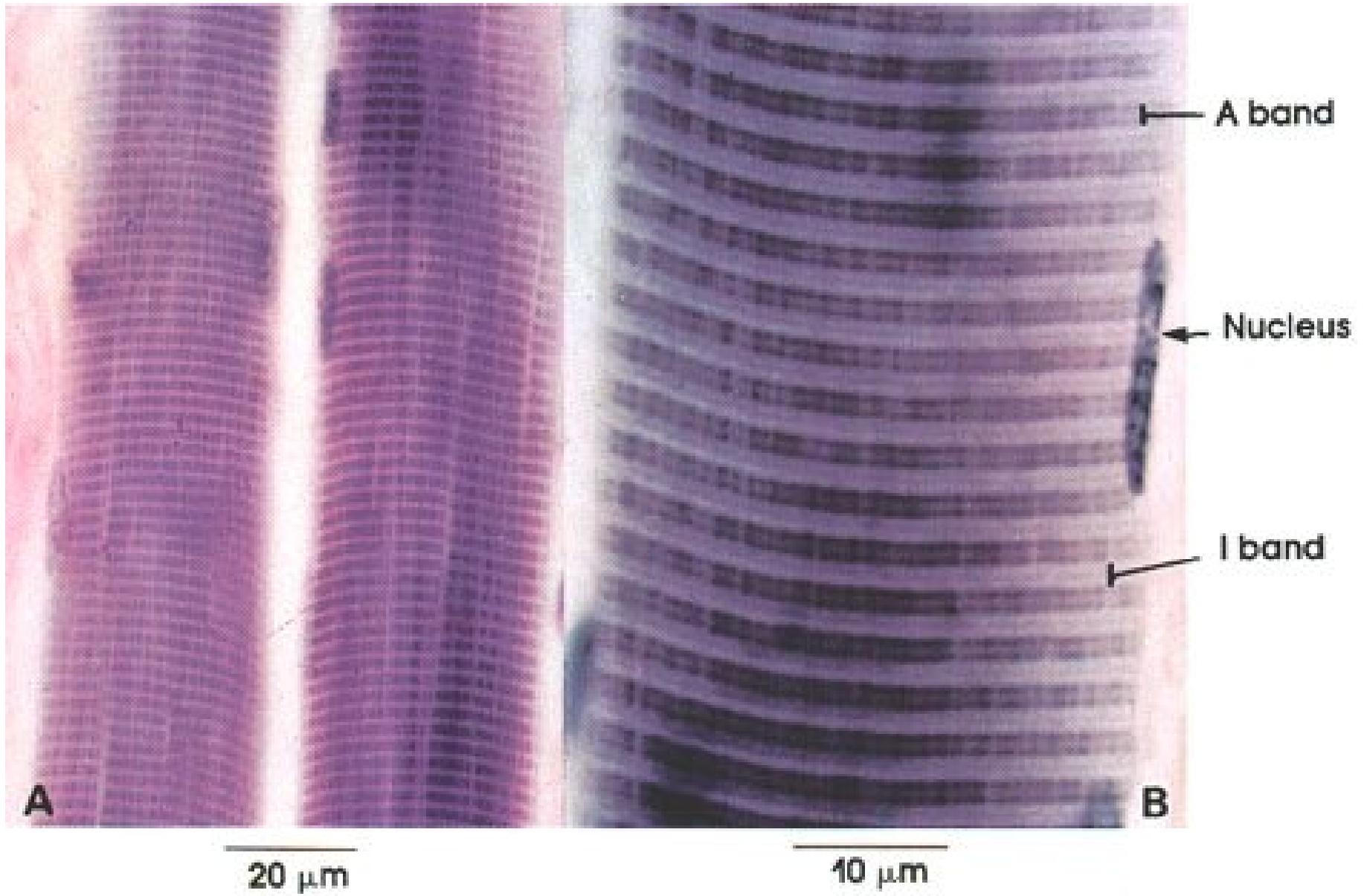
PGt 2007

Structure of Striated Muscle

- Muscles are made up of many muscle fibres
- These are the equivalent of very long individual cells
- These are enclosed in a membrane called the sarcolemma
- The cells are multi- nucleate



- A muscle fibre is the equivalent of a muscle cell.
- It is made up of parallel running myofibrils
- It is also multinucleate





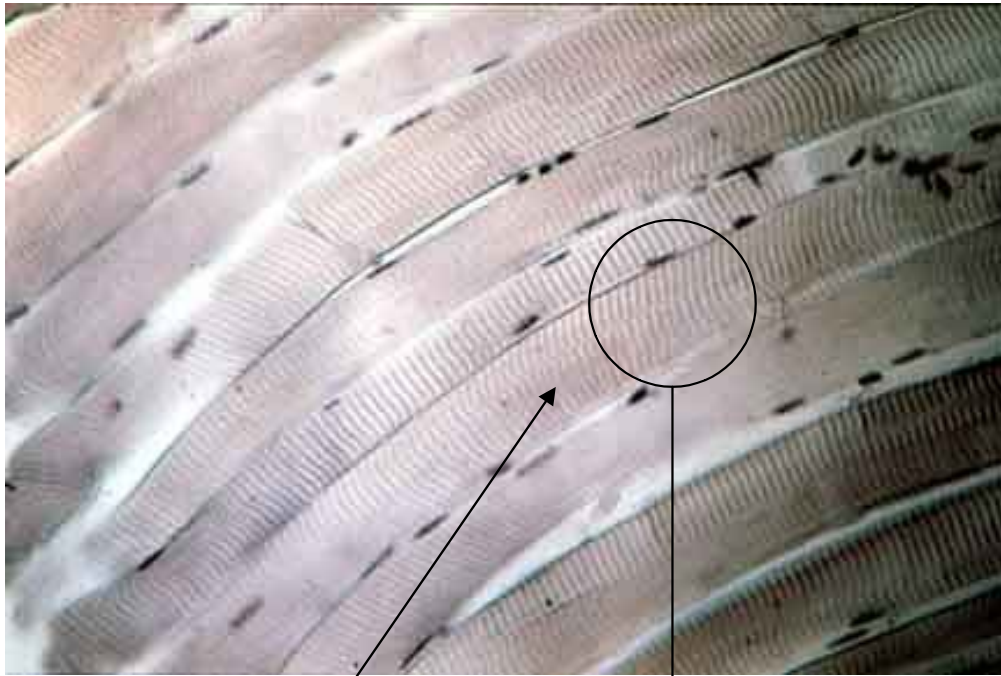
Parallel running myofibrils

Sarcollema

Nucleus

Neuro muscular
junction

Motor nerve fibre

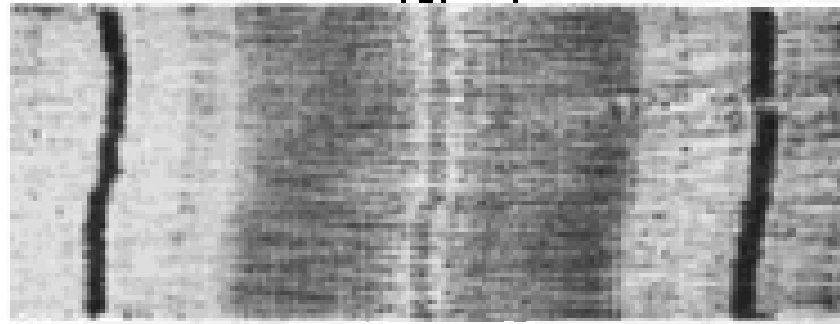


Muscle fibres extend the length of the muscle



Each muscle fibre is made up of a mass of parallel running myofibrils

Sarcomere



Z line

Z line

Thin filaments

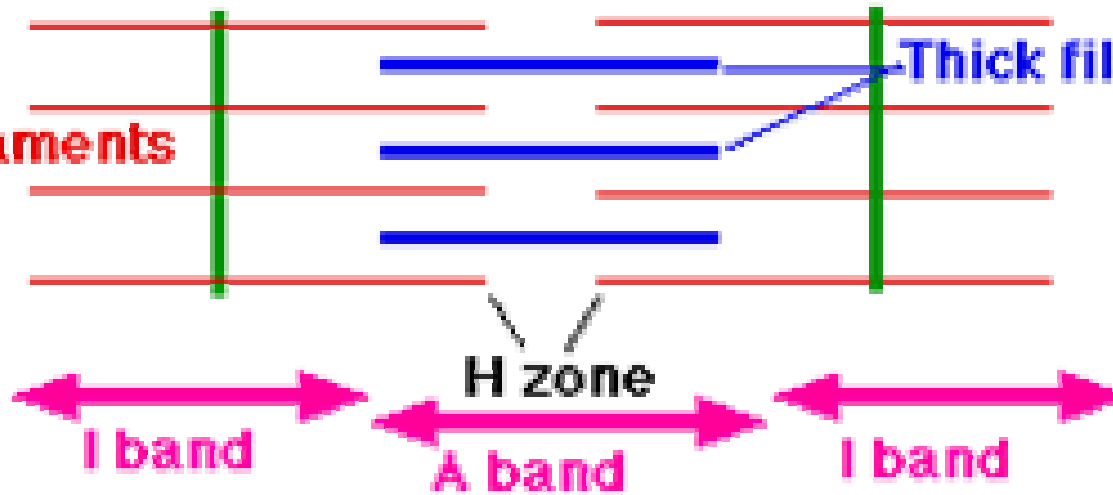
Thick filaments

H zone

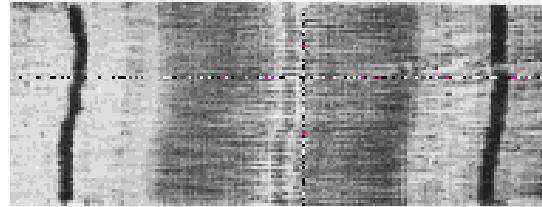
I band

A band

I band



Sarcomere



Z line

Z line

Thin filaments

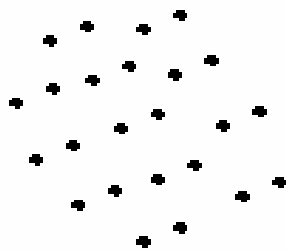
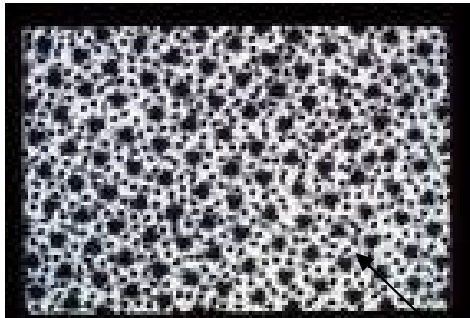
Thick filaments

H zone

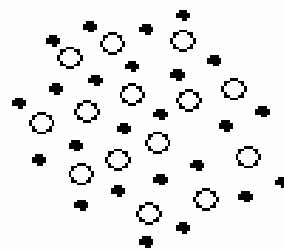
I band

A band

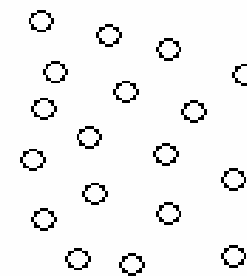
I band



Thin Actin filaments only



Thin Actin and thick Myosin Filaments



Thick Myosin filaments only

General components of Muscle

Fibres/cells:

- The components of skeletal muscle cells that are specific to muscle tissue are myofibrils.
- Each **muscle fibre** ("**muscle cell**") is covered by a plasma membrane sheath which is called the sarcolemma.
- Tunnel-like extensions from the **sarcolemma** pass through the muscle fibre from one side of it to the other in transverse sections through the diameter of the fibre.
These tunnel-like extensions are known as transverse tubules ("T Tubules")
The **nuclei** of **muscle fibres** ("**muscle cells**") are located at the edges of the diameter of the fibre, adjacent to the **sarcolemma**. A single **muscle fibre** may have many **nuclei**.
- The cytoplasm present in **muscle fibres** (**muscle cells**) is called sarcoplasm.
- The **sarcoplasm** present in **muscle fibres** contains very many mitochondria, which are the energy-producing units within the cell. These **mitochondria** produce large amounts of ATP.
- Myoglobin is also present in the **sarcoplasm** of muscle fibres/cells. This is a reddish pigment that not only results in the distinctive colour of skeletal muscle, but also stores oxygen - until it is required by the **mitochondria** for the production of **ATP**.

- Each myofibril is divided into SARCOMERES by cross partitions called the Z lines
- In each sarcomere there are two types of protein:
ActinThin filaments
Myosin Thick filaments.
- The thin Actin filaments extend into the myofibril from the z lines
- The thicker myosin proteins are held in position between the Actin fibres by chemical bonds

The Neuro- Muscular junction

- In order to contract striated (striped) skeletal muscle must be stimulated by a nerve impulse
- This is via a motor nerve
- The point at which they meet is called the Neuro Muscular Junction
- This is similar to a synapse where the post synaptic membrane is very much folded to form the motor end plate Draw diagram from text book!

Use these animations to help you revise and understand

[Animation 1](#)

[Animation 2](#)

