

Calcium

The sarcoplasmic reticulum is a **network of tubules and sacs in skeletal muscles**. This network is analogous, but not identical, to the **smooth endoplasmic reticulum** of other cells.

Remember: The **endoplasmic reticulum** is an extensive network of membrane-enclosed tubules in the cytoplasm of cells. This organelle is classified as granular or rough surfaced when ribosomes are attached to the surface of the membrane and as **agranular** or smooth surfaced when ribosomes are absent. The structure functions in the **synthesis of proteins** and lipids and in the transport of these metabolites within the cell.

The cytoplasm of muscle cells is called **sarcoplasm**. The sarcoplasm of each skeletal muscle fiber contains many parallel, thread-like structures called **myofibrils**. Each myofibril is composed of smaller strands called **myofilaments** that contain the contractile proteins, **actin** and **myosin**. The regular spatial organization of the contractile proteins within the myofibrils forms the **cross banding**. A network of membranous channels, called the sarcoplasmic reticulum, extends throughout the sarcoplasm.

Note: It is mainly a great increase in the numbers of additional myofibrils (*which is caused by progressively greater numbers of both actin and myosin filaments in the myofibrils*) that causes muscle fibers to hypertrophy.

Important: The **number** of muscle fibers **does not increase**; the size of each fiber increases.