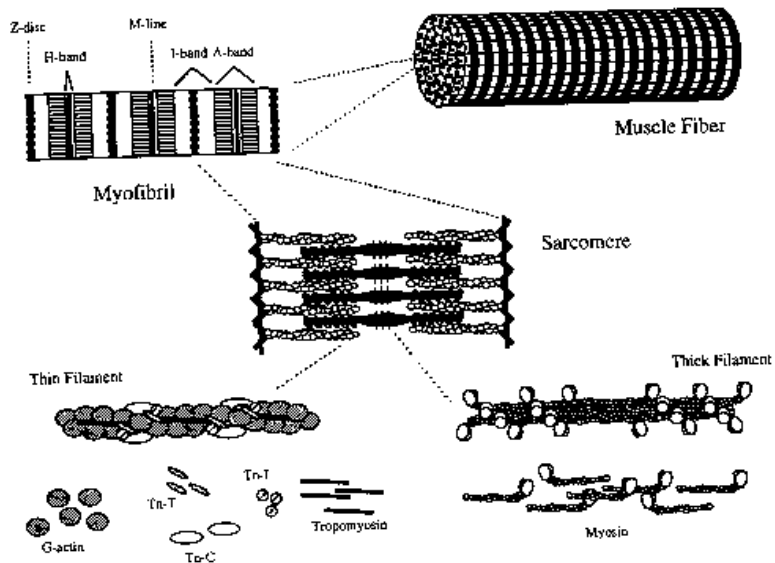


# SKELETAL MUSCLE

## Disintegration of the Muscle

It was the philosophy of Albert Szent-Györgyi that in order to understand muscle contraction one has to take the muscle apart and then put it together. This idea was victorious by reproducing contraction with actomyosin threads as discussed in the Introduction chapter. Nevertheless, the disintegration of muscle has its own merit because it gives an overview of how muscle is built of its components (Fig. D).



**Fig. D.** Disintegration of muscle (Courtesy of Dr. Paul Jensen).

Muscle fibers consist of many individual myofibrils. The alternating dark (A) and light (I) bands in the myofibrils are observed by light microscopy. The sarcomere is the fundamental morphological unit of the contractile protein matrix and it is defined as the region between two Z-lines (disks). The sarcomeres are functionally coupled in series. Two major structures form the striated muscle sarcomere, the thin filaments (about 1 micron long) which project from either side of the Z-lines to the center of the sarcomere. The thin filaments are composed of 3 different proteins, actin, tropomyosin, and troponin (TN), consisting of three subunits, TN-C, TN-I, and TN-T.. The other major structures in the sarcomere are the thick filaments, (about 1.6 micron in length) and are located in the center of the sarcomere.

In the figure, a schematic organization from the level of the entire muscle fiber to the individual contractile and regulatory proteins is depicted.