

VIRTUAL MICROSCOPY

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MUSCLE

Slides: MM 1-12

I. Skeletal muscle (MM 1-4)

a. **MM 1** is a section of skeletal muscle fascicle in which the muscle fibers are cut in cross-section. Note the peripheral position of the cell's nuclei and the **ENDOMYSIUM** surrounding each fiber. Note also the "stippling" of each fiber. What is this due to? The C.T. surrounding a fascicle of fibers is called the **PERIMYSIUM** and that surrounding the entire muscle, the **EPIMYSIUM**. This slide and the next lack an epimysium.

MM 2 has been stained to enhance the cross-striations. Under high magnification, the cross striations can be seen clearly. The pale stripe with a barely visible line down its center is the **I-BAND** and the line is the **Z-BAND**. The darker band is the **A-BAND**, WHICH has a lighter staining **H-BAND** in its center. This banding is due to the regular arrangement of myofilaments that constitute the **MYOFIBRILS**. See the electron micrograph (**MM 3**) for the fine structural arrangement

MM 4 is a section of a trachea and esophagus. Locate the muscularis externa of the esophagus. Examples of skeletal muscle cut longitudinally and in cross-section are present in this layer. Distinguish the muscle from the associated connective tissue.

b. **Myoneural Junctions (MM 5,6)**. Two sections of teased skeletal muscle are present on this slide. Locate the nerves sending fibers to individual muscle cells and the termination of these nerve fibers (boutons) forming myoneural junctions (motor end plates).

2. Cardiac muscle (MM 7-9)

Cardiac muscle fibers are joined mechanically by desmosomes and by gap junctions (**intercalated discs**). In cross section note that the fibers are larger than

smooth muscle fibers and not circular; the nuclei are central. In longitudinal section, the cross-striations can be seen as well as the branching of the fibers. Regions can be found where the **INTERCALATED DISCS** can be seen to cut across an individual fiber, often in a step-like fashion. The Intercalated discs are particularly prominent on slide **MM 7**.

3. Smooth muscle (MM 10-12)

In smooth muscle the individual smooth muscle cell constitutes the fiber. Since these fibers are fusiform, the region where the nucleus is situated is generally the thickest part of the fiber.

- a. Duodenum (slide MM 10).** The muscularis externa of the small intestine is composed of inner circular and outer longitudinal layers of smooth muscle. In longitudinal section (of the cells in the inner circular layer), note that some of the nuclei have a corkscrew appearance. In cross section (of the cells in the outer longitudinal layer), note that central position of the nucleus (not all cells are cut through the nucleus). Look for other examples of smooth muscle in the wall of any blood vessels you come across.
- b.** Observe the smooth muscle in the wall of the uterine tube (**MM 11**) and that of the vas deferens (**MM 12**). Note that in some areas the smooth muscle cells are cut longitudinally and in cross-section in other areas.