CELLZONE

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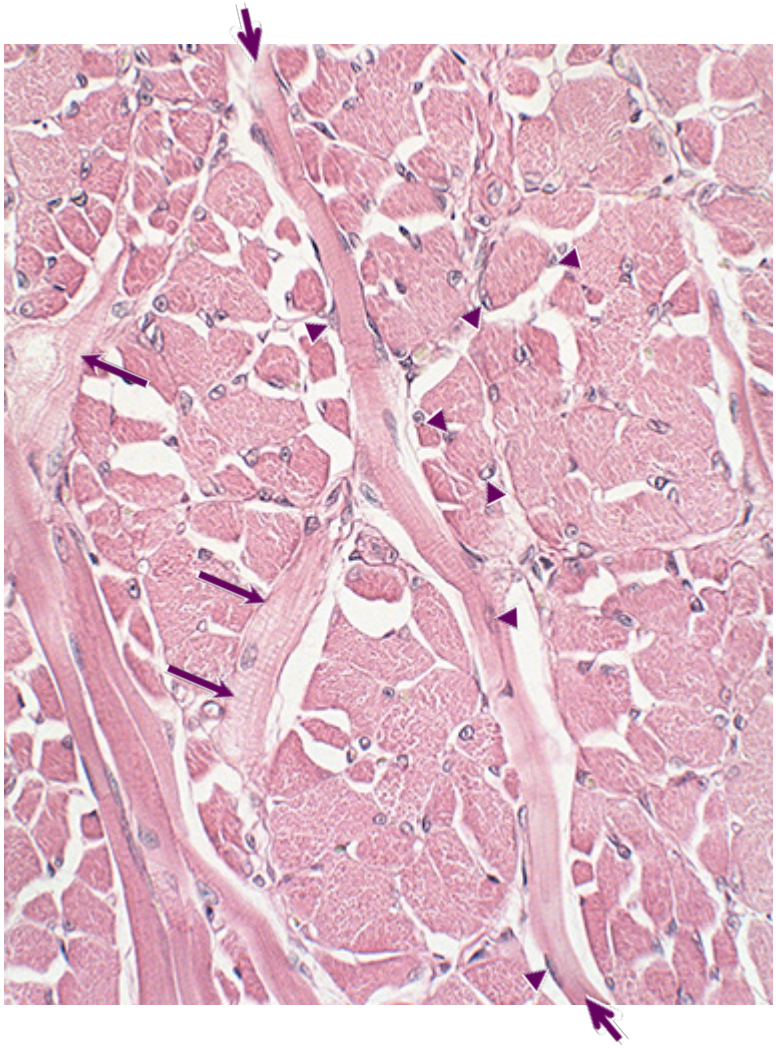
PST-musc-2: Skeletal Muscle from Tongue
Visual Microscopy Kit



The tongue has skeletal muscle fibers which run in multiple directions. Therefore, one can see both longitudinal and cross sections through in this one photomicrograph. The tissue was stained using hematoxylin and eosin; hematoxylin typically stains nuclei purple while the eosin typically stains cytoplasm pink. Skeletal muscle is characterized by having lengthy cells (measured in centimeters rather than micrometers), multiple nuclei (because embryonic cells fuse to make such large cells), and striations that are visible in longitudinal section. Because of their large size, skeletal muscle cells are also called muscle fibers.

- → Indicates striations
- ▶ Indicates multiple nuclei in one muscle fiber
- → One long muscle fiber runs from arrow to arrow.

The striations in skeletal muscle cells are due to organized cytoskeleton within them that has a repeating pattern of actin and myosin filaments. The dark lines, pointed out in the image above, are due to the myosin filaments, while the light lines are due to the actin filaments. Skeletal muscle has so much cytoskeleton that nuclei are pushed toward cell edges.

For all Cell Zone®, Inc. posters

General Instructions:

- Move from room to room or maintain in one location
- Hang on any permanent or removable hook by the grommet
- Use a dry erase marker on the frame; erase the same day to ensure clarity
- Store multiple posters by stacking so that the grommet cannot scratch the front of a neighboring poster

Advantages with using posters:

- Hanging real cell micrographs makes your classroom or lab space look like a place where real science is done
- The posters can be hung as art or for learning
- The posters can be paired with microscopy or used separately
- You will always have a good example of what you want your students to see

Lessons for this specific poster

1. Have your students identify the type of tissue this is (epithelial, connective, muscle, nervous). Then have them identify the specific type of muscle tissue visible (skeletal, cardiac, smooth). Then ask them to explain where this type of muscle tissue is found.
2. Hand your students a dry erase marker and have them label
   - the outline of one muscle fiber in longitudinal section and another in cross section.
   - nuclei in the muscle fiber they outlined.
   - regions where striations are clearly visible.
3. When pairing the use of the poster with microscopy, you can do each of the following:
   - Set up numbered microscopes with pointers on specific muscle tissues and cells and have them match the number to the entire poster or to specific items in the poster. Microscopes could show low power or high power views, cross section or longitudinal sections. Have students put the microscope numbers onto the poster with a dry erase marker, with numbered arrows to specific items in the poster.
   - Use a dry erase marker on the frame to indicate a part of the cell or the field. Have your students, each working on their own microscopes or in pairs, put their pointer on a similar structure in their microscope fields. You can check their choices, or have them check on each other.
4. Ask your students about the size of these muscle fibers, the number of nuclei, and the presence of striations:
   - Are they a similar size to other cells? If they cannot tell (no calibration is on the image), have them evaluate the size of a nucleus relative to the size of one cell.
   - Is each cell uninucleate or multinucleate? They should be able to identify the limits of a cell and count the nuclei. Not all cells show as multinucleate because not all nuclei are in this section of tissue (some are in adjacent sections on other slides).
   - Are these cells striated? Why aren't striations visible in cross sections?

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