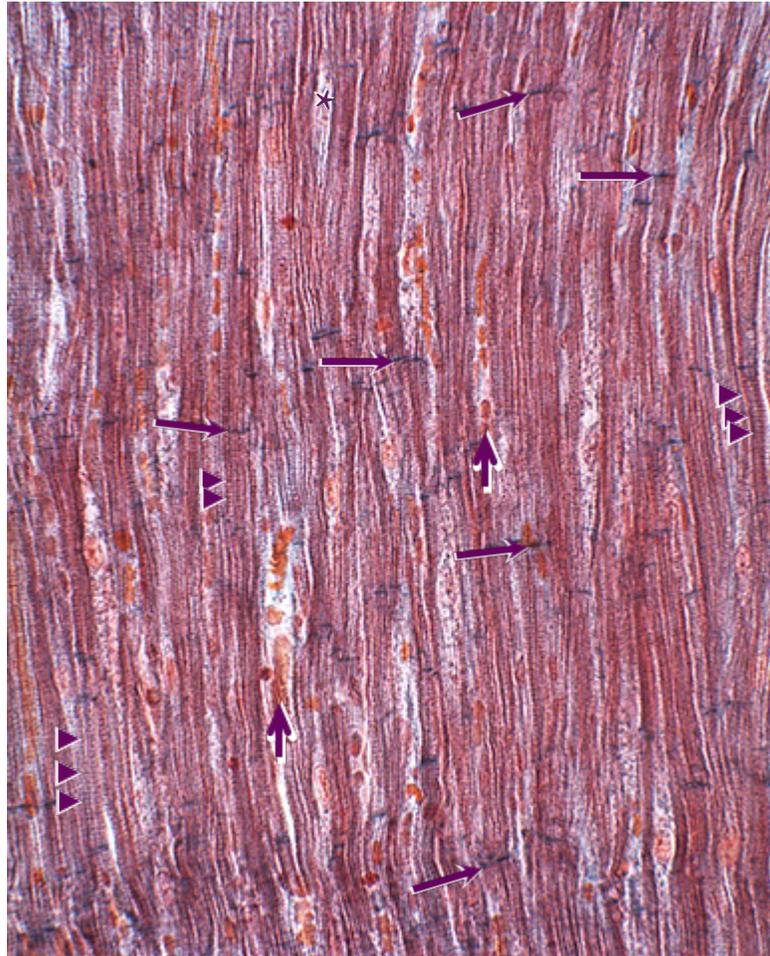


## PST-musc-5: Cardiac Muscle Longitudinal Section Visual Microscopy Kit



This is cardiac muscle tissue from the heart, stained using hematoxylin and eosin. The hematoxylin typically stains nuclei purple because it stains nucleic acids and proteins, while the eosin typically stains cytoplasm pink. The cardiac muscle tissue in this image is cut longitudinally enabling visualization of striations. Cardiac muscle is striated, but the striations are not as organized as in skeletal muscle, so not all muscle cells reveal their striations.

- Indicates an intercalated disk
- ▶ Indicates striations
- Indicates a blood vessel
- \* Indicates a cellular branch or bifurcation

Cardiac muscle is composed of individual cells connected to one another via intercalated disks; because of the density of proteins for gap junctions and desmosomes, the intercalated disks tend to stain darkly. Cardiac muscle tissue is highly vascularized, so many blood vessels can be seen running through it-- red blood cells are unstained but possess their own coloration due to their hemoglobin content. Some cardiac muscle cells can be seen to branch, giving the tissue an overall messy appearance.

## 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. Ask your students to identify the characteristics of cardiac muscle tissue (striated, intercalated disks, well vascularized, branches) and find those features in the image.
3. Have your students evaluate the amount of striation visible in cardiac muscle as compared to other muscle tissues (less than skeletal, more than smooth).
4. Hand your students a dry erase marker and have them label
  - a cell with visible striations
  - an intercalated disk between cells (they may need to first outline a few cells to figure out how to find the cell ends where the intercalated disks are located)
  - a blood vessel or red blood cell
  - any place where a cell may be branching (this is difficult to find)
5. 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 of different muscle tissues, some cardiac, some not cardiac. Have students put the microscope numbers onto the poster with a dry erase marker, where those microscopes that have high power smooth muscle views have 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.

