

PST-nerv-5: Neuron Smear Visual Microscopy Kit



This is a spinal cord multipolar neuron that has been smeared on a slide and stained using hematoxylin and eosin. The hematoxylin typically stains nuclei purple because it stains nucleic acids and proteins. In the case of large neurons, there are many nucleic acids and proteins in the cytoplasm as well because of all of the protein synthesis machinery (Nissl bodies or chromatophilic substance) needed; therefore the entire cell body appears purple. The eosin typically stains cytoplasm pink, so all the dendrites and axons in this image are pink.

- ➔ Indicates the nucleus
- ▶ Indicates the nucleolus
- ➔ Indicates dendrites

No obvious axon emanates from this multipolar neuron since axons are the thinnest processes and are thus hardest to recognize without a special stain. The pale pink background containing numerous lines is where the neuropil, or synaptic region, is. This, along with many glial cell nuclei (pink dots) were smeared on the slide along with the neurons.

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 cell is from. Then have them identify the type of cell that this is (unipolar, multipolar, bipolar, etc.). Ask them to determine where in the nervous system this cell must have come from (central nervous system white matter, central nervous system gray matter-- yes!, peripheral nervous system white matter, dorsal root ganglion, etc.) based on this cell's appearance.
2. Hand your students a dry erase marker and have them identify every part of the multipolar neuron that they can see clearly in the photomicrograph by writing on the poster frame. They will likely debate about which process is the axon... note that it could be sticking off toward you or away from you in the photo as well. See if they can also identify any Nissl bodies within the cytoplasm.
3. When pairing the use of the poster with microscopy, you can do each of the following:
 - Set up a few microscopes with pointers on specific cells and have them match the poster to the microscope with the most similar image visible. Other options to have them choose from are dorsal root ganglion neurons, cerebellar Purkinje cell neurons, white matter in cross section, glial cells, adipose tissue, elastic cartilage, and then also the correct match-- spinal cord multipolar neurons. You can even give them both a smear and a cross section and have there be two correct microscopes.
 - 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.

