Lab activity manual
Histology of the muscles and nerves

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In this activity we learn about the histology of the various muscle fibers and nerve cell (neuron). You have to look at the microscopic appearance of the fibers, and differentiate between the 3 kinds of muscles. Moreover, you have to look for a motor neuron from the spinal cord, and look at the specific features of a neuron. First look at the whole specimen using low magnification (10x4 or 5X10), then look for the tissue/structure/cell that you want to see using higher magnification (10x10, 10x20, 10x40, or 10x45).

Smooth muscle
Specimen: duodenum, jejunum, or ileum cross section (potongan melintang)
Look for:
• Inner (circular) muscle layer
  o muscle fibers cut longitudinally
    ▪ cell shape – fusiform/spindle shape
    ▪ nucleus (1) at the center
• Outer (longitudinal) muscle layer
  o muscle fibers cut transversely
    ▪ cross section containing nucleus
    ▪ cross section without nucleus
      (various diameter)

Longitudinal section (potongan memanjang)
The opposite

Specimen: artery/small vein (arteri/vena kecil-sedang) (HE)
Look for:
• small artery – tunica media (smooth muscle layer)
  o muscle fibers
    ▪ cell shape – fusiform (spindle shape)
    ▪ nucleus (1) at the center

Neuron
Specimen: spinal cord (medulla spinalis)
Look for:
• Substantia alba (white matter)
• Substantia grisea (gray matter)
  o Motor neurons
    ▪ Neuron cell body
      • Nucleus – nucleolus
      • Nissl bodies
    ▪ Dendrite
    ▪ Axon – axon Hillock

Cardiac muscle
Specimen: cor (jantung)– Purkinje fiber Look for:
• Myocardium (relatively thick)
  o Cardiac muscle fiber - longitudinal section
    ▪ Branching fibers
    ▪ Cross striation
    ▪ Nucleus (1-2) – at the center
    ▪ Perinuclear space
    ▪ Intercalated disk
  o Cardiac muscle fiber – cross section
    ▪ Cross section with nucleus
    ▪ Cross section at perinuclear space
    ▪ Cross section without nucleus

Skeletal muscle
Specimen: lingua (lidah)
Look for:
• Skeletal muscle – longitudinal section
  o Long, non branching fibers
  o Cross striations
  o Many nuclei at the periphery (can appear in the middle too)
  o Satellite cells – outside sarcolemma – inside external lamina
• Skeletal muscle – cross section
  o Nuclei at the periphery
  o Connheim’s field