

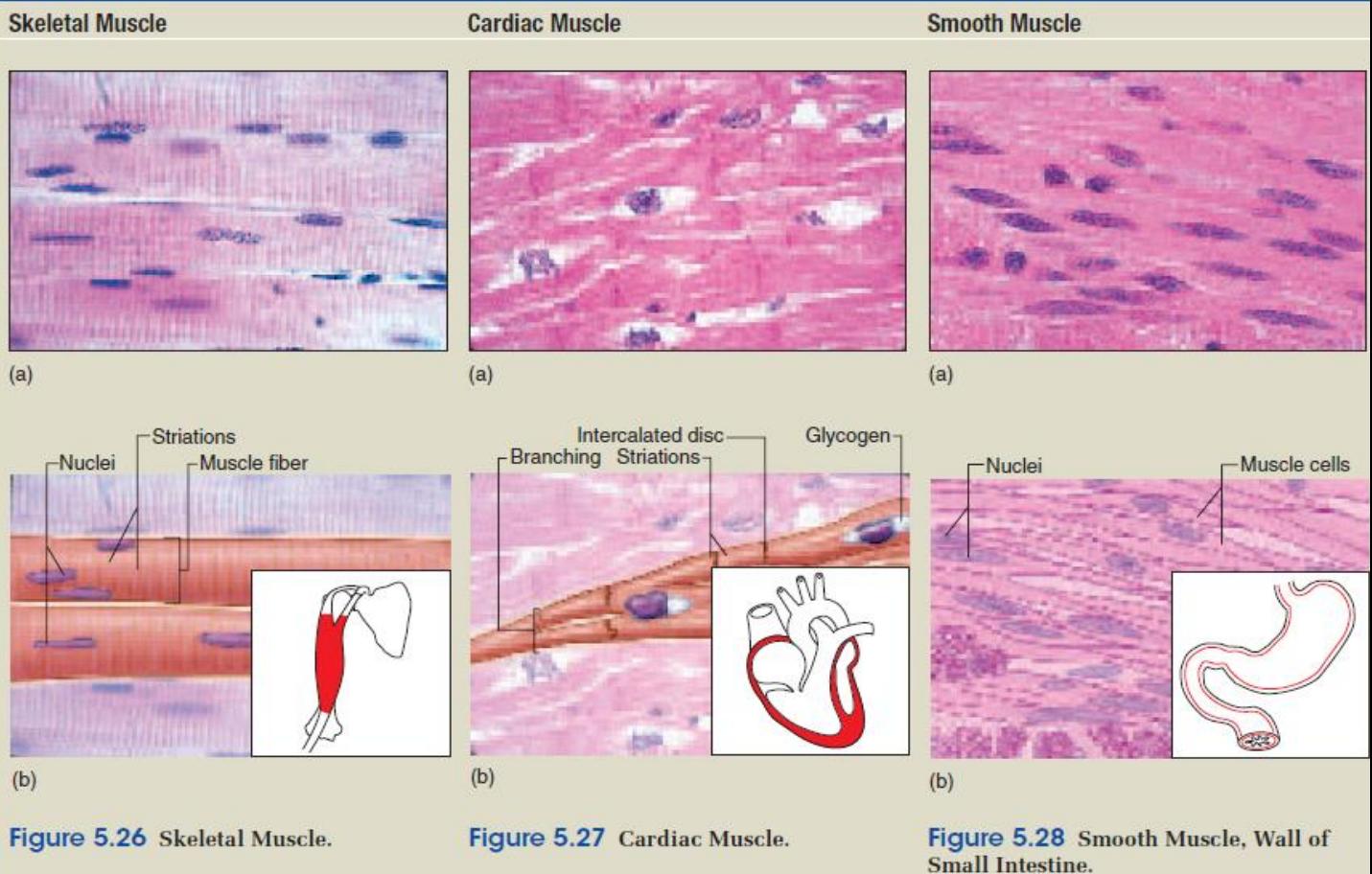
Muscular Tissue

Muscular tissue consists of elongated cells that are specialized to respond to stimulation by contracting; thus, its primary job is to exert physical force on other tissues and organs—for example, when a skeletal muscle pulls on a bone, the heart contracts and expels blood, or the bladder contracts and expels urine. Not only do movements of the body and its limbs depend on muscle, but so do such There are three histological types of muscle—**skeletal, cardiac, and smooth**—which differ in appearance, physiology, and function

Skeletal muscle consists of long, cylindrical cells called **muscle fibers**. Most of it is attached to bones, but there are exceptions in the tongue, upper esophagus, some facial muscles Each cell contains multiple nuclei adjacent to the plasma membrane. Skeletal muscle is described as *striated* and *voluntary*. The first term refers to alternating light and dark bands, or **striations** .

Cardiac muscle is essentially limited to the heart, though it extends slightly into the nearby blood vessels. It, too, is striated, but it differs from skeletal muscle in its other features. Its cells are much shorter, so they are commonly called **myocytes** rather than fibers. The myocytes are branched and contain only one nucleus, which is located near the center. A light-staining region of glycogen often surrounds the nucleus. Cardiac myocytes are joined end to end by junctions called **intercalated discs**

Smooth muscle lacks striations and is involuntary. Smooth muscle cells are fusiform (thick in the middle and tapered at the ends) and relatively short. They have only one, centrally placed nucleus. Small amounts of smooth muscle are found in the iris of the eye and in the skin, but most of it, called **visceral muscle**, forms layers in the walls of the digestive, respiratory, and urinary tracts, blood vessels, the uterus, and other viscera



Nervous Tissue

Nervous tissue, which contains nerve cells called neurons, is present in the brain and spinal cord. A **neuron** is a specialized cell that has three parts: **dendrites**, a **cell body**, and **an axon**. A **dendrite** is a short extensions that conducts signals toward the cell body. The cell body contains the major concentration of the cytoplasm and the nucleus of the neuron. An **axon** is a process that typically conducts nerve impulses away from the cell body. Long axons are covered by myelin, a white fatty substance. The term **fiber** is used to refer to an axon along with its myelin sheath if it has one. Outside the brain and spinal cord, fibers bound by connective tissue form **nerves**. The nervous system has just three functions: **sensory input, integration of data, and motor output**. Nerves conduct impulses from sensory receptors to the spinal cord and the brain where integration occurs.

Neurons (nerve cells) are specialized **non dividing cells** in which irritability and conductivity are **highly** developed. The mammalian nervous system is divided into two major parts, the central nervous system (CNS) and peripheral nervous system (PNS). The CNS consists of the **brain** and **spinal cord**. The component of the PNS are cranial

and spinal nerves are located outside the CNS. In addition to neurons, nervous tissue contains neuroglial cells.

Neuroglia

Neuroglia outnumber neurons nine to one and take up more than half the volume of the brain, but until recently, they were thought to merely support and nourish neurons.

Three types of neuroglia are **oligodendrocytes**, **microglia**, and **astrocytes**.

Oligodendrocytes form myelin , and microglial cells, in addition to supporting neurons, engulf bacterial and cellular debris. Astrocytes provide nutrients to neurons and produce a hormone known as glia-derived growth factor

Myelin sheath develops when schwann cells (PNS) or oligodendrocytes (CNS) warp their membranes around an axons many times .

