Supplement on the Cortex

The **cerebral cortex** is the most prominent feature of the brain in mammals. It is responsible for conscious sensation of sensory stimuli as well as intellectual function, memory storage, and the voluntary control of somatic motor activity. The cerebral cortex consists of two hemispheres, the right and left, which are derived from the telencephalic vesicles. The two hemispheres are separated at the midline by the **longitudinal fissure** and the surface of the hemispheres is folded into ridges called **gyri** (singular is gyrus) separated by grooves called **sulci** (singular: sulcus). The folding of the surface of the cortex allows more neurons to be packed into the limited space of the cranial cavity. In general, the greater the number of neurons in the brain, the more neurons that are available to process information, and the greater the complexity of the processing that can occur. Each hemisphere can be divided into four lobes: the **frontal lobe**, the **parietal lobe,** the **occipital lobe**, and the **temporal lobe**. The boundaries between these lobes are demarcated by specific sulci and structural landmarks. In the human brain, the most important landmarks are the **central sulcus**, which separates the frontal and parietal lobes, and the **lateral sulcus**, which separates the temporal lobe from the frontal and part of the parietal lobe. Each of the lobes contain functional regions that were first defined by **Korbinian Brodmann** on the basis of the microscopic organization of the neurons and the different types of neurons that were found in each region. On this basis Brodmann defined 52 brain regions which he numbered. Today these 52 areas are called Brodmann areas. You will not be expected to know all 52 of these areas, but I pointed out a few that we will be seeing again in the course. Three of these were **areas 3, 1, and 2**, which are found on the gyrus just caudal to the central sulcus (the postcentral gyrus). These areas together compose what is referred to as the **primary sensory cortex**. The primary sensory cortex process somatosensory information (touch, temperature, pain, and pressure sensation). We will discuss this area in more detail when we cover the somatosensory system. The gyrus on the other side of the central sulcus (the precentral gyrus) is **Brodmann 4**, which is also called the **primary motor cortex**. This area is where voluntary motor acts are initiated and we will discuss this area in further detail when we cover the somatic motor system. **Areas 17 & 18** are the **primary** and **secondary visual cortex**, respectively. This area of the cortex receives and processes visual information and we will discuss this area when we cover the visual system. **Area 43,** also known as the **gustatory cortex**, is located on the inferior part of the primary sensory cortex and extends onto the superior part of the insular cortex. This is part of the cortex where taste sensations are initially processed. Finally, **Area 41** is the auditory which is located on the supratemporal gyrus of the temporal lobe.

The rest of the class period was spent in the lab. See the lab handouts for structures you should have identified.