

# THE BRAIN

## INTRODUCTION

The nervous system is composed of two main divisions: the **PERIPHERAL NERVOUS SYSTEM (PNS)** consisting of sensory and motor neurons that carry nerve impulses toward and away from the CNS, respectively, and the **CENTRAL NERVOUS SYSTEM (CNS)** consisting of the brain and spinal cord. The CNS integrates and interprets incoming sensory impulses from the PNS and send outgoing impulses to PNS motor pathways that stimulate the appropriate effectors (muscles and/or glands).

The human brain can be divided into four areas: **BRAIN STEM, DIENCEPHALON, CEREBRUM AND CEREBELLUM**. The brain and spinal cord are covered with protective outer coatings that include bone (cranium and vertebral column) and three connective tissue layers called the **MENINGES** (singular form = meninx): **DURA MATER** (outermost), **ARACHNOID MATER**, and **PIA MATER** (deepest). The meninges provide physical protection and the pia mater contains blood vessels that serve the brain. **CEREBROSPINAL FLUID (CSF)**, is a clear, colorless liquid, circulates between the pia mater and arachnoid mater in what is called the **SUBARACHNOID SPACE**, inside cavities in the brain called **VENTRICLES**, and in the **CENTRAL CANAL** of the spinal cord.

## PROCEDURE

Identify structures associated with the sheep brain. The anatomy of the sheep brain is very similar to the human brain. In humans, the cerebrum is proportionally a little larger and because humans walk upright, the orientation of the spinal cord, brain stem and cerebellum is different from the sheep brain. For ease of discussion we will separate the procedure into surface and internal anatomical features.

## SURFACE ANATOMY

- 1) Use surgical gloves to handle the sheep brain.
- 2) Remove the sheep brain from the container and rinse it in the sink. Immediately cap the container to prevent preservative volatilization.
- 3) Put the brain into a dissecting pan and take it back to your bench. Identify the surface anatomical features listed in TABLE 7.1
- 4) If the dura mater is intact on your specimen, carefully use your scissors to remove it, while leaving the pituitary gland and cranial nerves in place.

## INTERNAL ANATOMY

- 1) Hold the brain in the dissecting pan dorsal side up. Make a midsagittal section beginning at the anterior end, following the longitudinal fissure. Cut through the entire brain so that you have left and right portions.
- 2) Identify the structures listed in TABLE 7.2
- 3) When you are finished with the dissection, discard loose tissue into the garbage. Rinse the dissecting pan with water and store it upside down by the sink. Return your sheep brain to the jar for storage. Discard used surgical gloves, or retain them for future use.