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Structure, Development and Functions of Cerebrum

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Perspective

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DESCRIPTION

The cerebrum is the largest part of the brain and is responsible for controlling voluntary movement, sensation, perception, learning, memory, and thought.The greatest portion of the brain is called the cerebrum. It may be in front of or on top of the brainstem, depending on how the animal is positioned. Among the five primary brain regions, the cerebrum is the largest and most developed in humans. The two cerebral hemispheres and their cerebral cortices, which are the outer layers of grey matter, as well as the underlying regions of white matter make comprise the cerebrum. The medial longitudinal fissure separates the cerebrum into the right and left cerebral hemispheres. The cerebrum is symmetrically divided into two hemispheres, with the left hemisphere controlling and processing impulses from the right side of the body and the right hemisphere controlling and processing signals from the left side of the body. The bilateral symmetry between the hemispheres is robust but not entirely full. The lateralization of brain function examines the differences that are currently understood to exist between the two. The olfactory bulb, basal ganglia, and hippocampal regions are some of its subcortical structures. Two C-shaped cerebral hemispheres make up the cerebrum, which is divided into them by a deep fissure known as the longitudinal fissure. The prosencephalon (forebrain), the mesencephalon (midbrain), the rhombencephalon (hindbrain), and the spinal cord are the four unique parts of the central nervous system that grow from the neural tube in the developing vertebrate embryo.

Structure of cerebrum

The cerebrum is located at the top and front of the brain and is divided into four lobes: the frontal lobe, parietal lobe, temporal lobe, and occipital lobe. Each lobe is responsible for specific functions.

Frontal lobe: The frontal lobe is located at the front of the brain and is responsible for controlling voluntary movement, decision making, planning, and personality. The prefrontal cortex, which is located in the frontal lobe, is responsible for executive functions, such as working memory, attention, and problem-solving.

Parietal lobe: The parietal lobe is located at the top and back of the brain and is responsible for processing sensory information, such as touch, temperature, and pressure. It also plays a role in spatial awareness and perception.

Temporal lobe: The temporal lobe is located on the side of the brain and is responsible for processing auditory information and memory formation. It is also involved in language comprehension and recognition of faces and objects.

Occipital lobe: The occipital lobe is located at the back of the brain and is responsible for processing visual information.

Functions of cerebrum

The cerebrum is responsible for a wide range of functions that are essential for human behavior and cognition. The following are some of the primary functions of the cerebrum.

Sensory processing: The cerebrum receives sensory information from the body and processes it to create a perception of the world around us. For example, the parietal lobe receives information from the skin, muscles, and joints, and processes it to create a sense of touch and spatial awareness.

Motor control: The cerebrum is responsible for controlling voluntary movement, such as walking, talking, and writing. The motor cortex, which is located in the frontal lobe, sends signals to the muscles to initiate movement.

Perception: The cerebrum is responsible for creating a perception of the world around us. It processes sensory information to create a perception of objects, people, and events.

Learning and memory: The cerebrum is responsible for learning and memory formation. The hippocampus, which is located in the temporal lobe, is responsible for the formation and retrieval of memories.

Language: The cerebrum is responsible for language processing. The left hemisphere of the cerebrum is dominant in language processing, and damage to this area can result in language deficits.

Emotions and personality: The cerebrum is responsible for regulating emotions and personality. The prefrontal cortex, which is located in the frontal lobe, is responsible for regulating emotions and decision making.