

Cerebellum Encyclopedia Article

Cerebellum

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Contents

Cerebellum Encyclopedia Article.....	1
Contents.....	2
Cerebellum.....	3

Cerebellum

The cerebellum, which is Latin for "little brain," is located at the back of the head. In the human brain it is the second-largest part, occupying a place partially tucked under the forebrain's cerebral hemispheres. In birds, it is the largest part, in relative terms, and processes the constant flow of nerve impulses between the brain and body that are necessary for flight. It is extensively folded, giving it an appearance of irregular pleats, and possesses right and left hemispheres that are connected with the spinal cord and forebrain. Each of the cerebellum's hemispheres connect with spinal cord nerves on the same side of the body, but with the opposite cerebral hemisphere.

The cerebellum's specialized function in the human brain is to maintain posture and balance, and to carry out coordinated movement, by processing signals that are transmitted from the cerebral cortex's motor area to the spinal cord and then to muscle groups, creating movements. The cerebellum also receives muscle and joint signals. It compares these with the cortex's signals, and makes adjustments as necessary to achieve the coordinated movement intended. Some evidence exists that the cerebellum can store a sequence of instructions for movements that are repeated frequently, and for repetitious skilled movements that are learned by rote. In some studies of the brain's responses to language-related tasks, researchers were surprised to find that, as tasks became more complex, several sites in the cerebellum were activated along with areas of the forebrain that process many types of information. The finding was a surprise because the cerebellum's functions are associated with movement.

Another important function played by the cerebellum is its role in the reticular activating system, a widespread network of nerve cells that are the means by which humans maintain consciousness. The reticular activating system is also involved in the brain's ability to focus attention, blocking out some distractions that originate both within and outside the body.