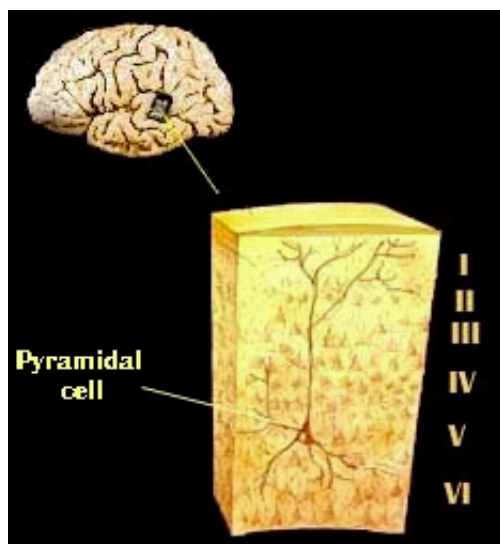




The Cerebral Cortex and Its Functions



Layers of nerve fibers in the cortex

- I. Molecular layer
- II. External granular layer
- III. External pyramidal layer
- IV. Internal granular layer
- V. Internal pyramidal layer
- VI. Fusiform layer

(Modified from [Bear et al., 1996](#))

The human brain hemispheres are covered in its greater part by an external layer of gray color called cerebral cortex.

A deep cut into the brain would show that this gray surface has a thickness varying from 1 to 4 mm. Its largest part is composed by nerve cells (neurons) which receive impulses from distant points from the body retransmitting them to the right destination.

The brain carries out highly diversified functions, and because of that, the cells that constitute it are also specialized. Different types of neurons are distributed across different layers in the cortex in arrangements which characterize the several areas of the hemispheres, each one with their own functions.

The specific layers are constituted by groups of neurons of several types, among them the pyramidal cells, with their characteristic form, and which can be of several types: small, median, large or giant cells. The pyramidal cells constitute the largest part of the third and fifth layers. Two other types of cortical cells are the granular cells, which exist in practically all layers of the cortex, but are present in higher numbers in the third and fourth layers; and the fusiform cells, which are characteristic of the sixth layer.

These cells are not alone in the cortex; the cellular branches stemming from the cells establishes connections and relate themselves to the several groups of fibers which run across the whole region. Some fibers arrive and come out of the cortex, bringing in or taking out nerves impulses. Other "tangential" fibers are disposed in parallel to the cerebral surface and are responsible for connecting the areas of the cortex between themselves. These fibers are distributed across the whole thickness of the cortex, but they can be grouped in certain areas.

Fibers coming from several places, like a chain, arrive in the cortex and branch out like the branches in a tree. They establish contact with several cortical cells by means of synapses

(connections between neurons). Thus, all the nerves impulses that arrive in the cortex are spread out into successive layers of the cortex.

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