

Neocortex

The major part of the [cerebral cortex](#) consists of up to six horizontal layers, each with a different composition in terms of neurons and connectivity.

It is referred to as grey matter as it consists of cell bodies and capillaries and contrasts with the underlying white matter, which mainly consists of the white myelinated sheaths of neuronal axons.

The phylogenetically most recent part of the cerebral cortex, the neocortex (also called isocortex), is differentiated into six horizontal layers.

The more ancient part of the cerebral cortex, the [hippocampus](#), has at most three cellular layers.

Neurons in various layers connect vertically to form small microcircuits, called cortical columns. Different neocortical regions known as Brodmann areas are distinguished by variations in their cytoarchitectonics (histological structure).

Neocortex Classification

2. Classification by Function

Type	Main Role	Examples
Sensory Cortex	Processing sensory input	V1, A1, S1
Motor Cortex	Voluntary movement control	M1
Association Cortex	Integration, cognition, language	Prefrontal cortex, temporal association areas

3. Classification by Region (Lobe-Based)

Lobe	Main Functions
Frontal Lobe	Executive functions, motor control, speech
Parietal Lobe	Somatosensory processing, spatial skills
Temporal Lobe	Auditory processing, memory
Occipital Lobe	Visual processing

4. Classification by Cytoarchitecture (Brodmann Areas)

- Classification based on cellular structure. - Examples:
- BA 4: Primary motor cortex
 - BA 17: Primary visual cortex
 - BA 41: Primary auditory cortex
 - BA 44-45: Broca’s area

5. Specialized Types of Neocortex

Type	Characteristics
Homotypical Neocortex	Well-defined six layers (typical structure)
Heterotypical Neocortex	Modified layering (granular or agranular)

Summary

The **neocortex** is classified by **function**, **anatomical region**, and **microscopic structure**, reflecting its complexity and specialization.

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