



Mysterious Cells in Human Brain

For Prelims: Mysterious Cells in Human Brain, Neurons, Brain Atlas, Brain Cells, Cerebrum, Cerebral Cortex, Synapses.

For Mains: Mysterious Cells in Human Brain, Developments and their applications and effects in everyday life, Achievements of Indians in science & technology.

Why in News?

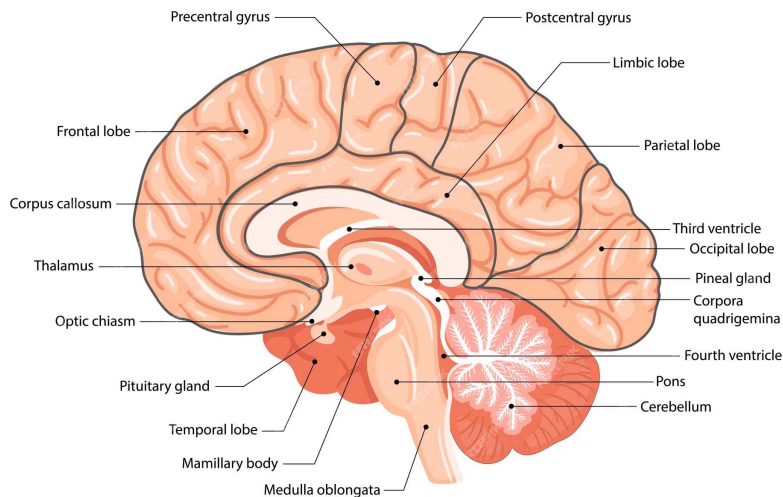
Recently, an international team of scientists has released a **Brain Atlas**, mapping the Human Brain in **much finer resolution** than ever before.

- The brain atlas has identified more than **3,300 types of brain cells**.
- The researchers utilized cutting-edge technologies to examine **millions of human brain cells** obtained from **biopsied tissue or cadavers**.

What are the Key Highlights of the Brain Atlas?

- **Understanding Brain Cells:**
 - Many new types of neurons were found, but neurons **make up only about half the cells in the brain**. The other half are far more mysterious.
 - Neuron cells use **electric signals and chemicals** to process information.
 - Astrocytes, for example, appear to nurture neurons so that they can keep working properly.
 - **Microglia serve as immune cells**, attacking foreign invaders and pruning some of the branches on neurons to improve their signaling.
 - And the **researchers found many new types of these cells** as well.
- **Vast Diversity of Brain Cells:**
 - Much of the brain's diversity is **situated outside the cerebral cortex**, challenging previous notions.
 - Cerebral cortex is the **outer layer that lies on top of the cerebrum**. Cerebrum is the **largest area** of the brain. Cerebrum divides the brain into two halves called hemispheres. The hemispheres are attached by a bundle of **nerve fibers called the corpus callosum**.
 - A vast number of the cell types **uncovered in the project lie in the deeper regions of the brain**, such as the brain stem that **leads to the spinal cord**.
- **Genetic Variations and Evolution:**
 - Comparison with brains of other species, including chimpanzees and gorillas, revealed that all **cell types in human brains matched those found** in our closest primate relatives.
 - However, specific genes that **become more or less active in humans** compared to other apes were identified. Many of these genes are linked to building connections (synapses) between neurons.

Human brain anatomy



What are the Implications of This Study?

- This research offers an **extensive dataset for future studies**, presenting a remarkable advancement in neuroscience.
- However, understanding the intricacies of the human brain entails not just cataloging its components but also comprehending it as a self-regulating system.

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