Medial frontal lobe

- Assessment of localized brain regions correlated with MMSE using VBM analysis of structural MRI in a Japanese sample
- Gamma synchronization between the medial temporal lobe and medial frontal cortex for goal-directed visual attention in humans
- Intracranial High-Frequency Oscillations and Epileptogenic Zone: Incorporating Neuroanatomic Variation
- Origin stories of neural crest roles in craniofacial development: A tale of the meninges
- Facial emotion recognition in focal epilepsy: localization is not the main factor
- Cognitive control of behavior and hippocampal information processing without medial prefrontal cortex
- Hippocampal systems for event encoding and sequencing during ongoing narrative comprehension
- The Cortical Structural Model Extends to Thalamocortical Connections

The **medial frontal lobe** refers to the **inner (medial) portion of the frontal lobe**, located along the midline of the brain, above the corpus callosum. It plays a crucial role in **cognitive control, decision-making, emotional regulation, and social behavior**.

Key Structures in the Medial Frontal Lobe: 1. **Anterior Cingulate Cortex (ACC):**

1. Involved in **cognitive control, emotion regulation, and pain processing**.
2. Dysfunction is associated with **depression, anxiety, and OCD**.

2. **Pre-supplementary Motor Area (pre-SMA) & Supplementary Motor Area (SMA):**

1. Important for **planning and initiating voluntary movements**.
2. Implicated in **motor disorders like Parkinson's disease**.

3. **Medial Prefrontal Cortex (mPFC):**

1. Plays a role in **self-referential thinking, decision-making, and social cognition**.
2. Involved in **understanding the thoughts and emotions of others (theory of mind)**.

4. **Orbitofrontal Cortex (OFC) (partially medial):**

1. Regulates **reward-based decision-making and emotional responses**.
2. Dysfunction can lead to **impulsivity and poor judgment**.

Functions of the Medial Frontal Lobe: - **Executive Function & Decision-Making:**

1. Helps in **goal-oriented behavior and adapting to new situations**.

- **Emotion & Social Behavior:**

1. Plays a role in **empathy, morality, and understanding social norms**.

- **Motor Control:**

1. Contributes to **voluntary movement planning and execution**.

Clinical Relevance

- Damage to the **medial frontal lobe** can result in:

1. **Apathy and lack of motivation (abulia)**
2. **Poor decision-making and impulse control**
3. **Deficits in emotional and social cognition (e.g., autism, schizophrenia)**
4. **Akinesia (difficulty initiating movement)** in disorders like **Parkinson's disease**.