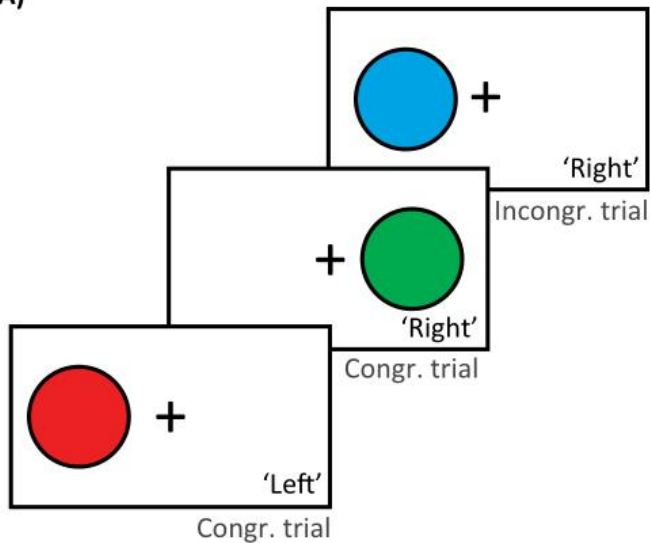


# Introduction

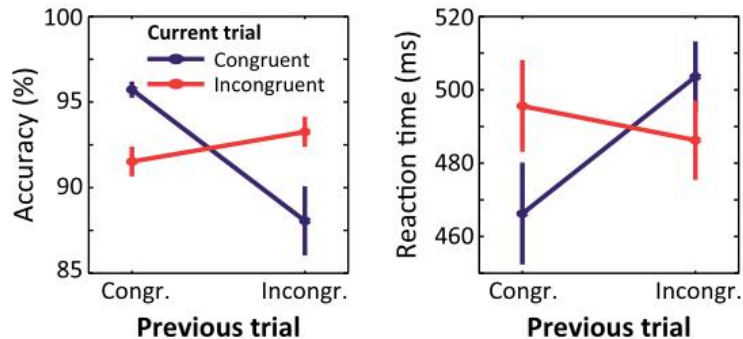
It is a law of nature we overlook, that intellectual versatility is the compensation for change, danger, and trouble... Nature never appeals to intelligence until habit and instinct are useless. H.G. Wells, *The Time Machine*.

## Monitor Adjustment

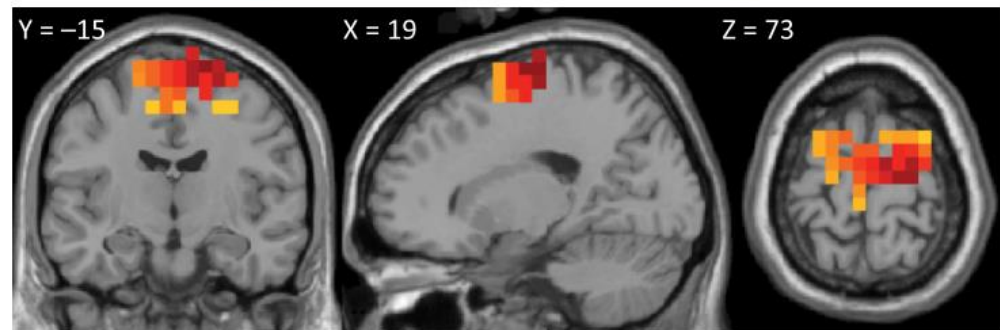
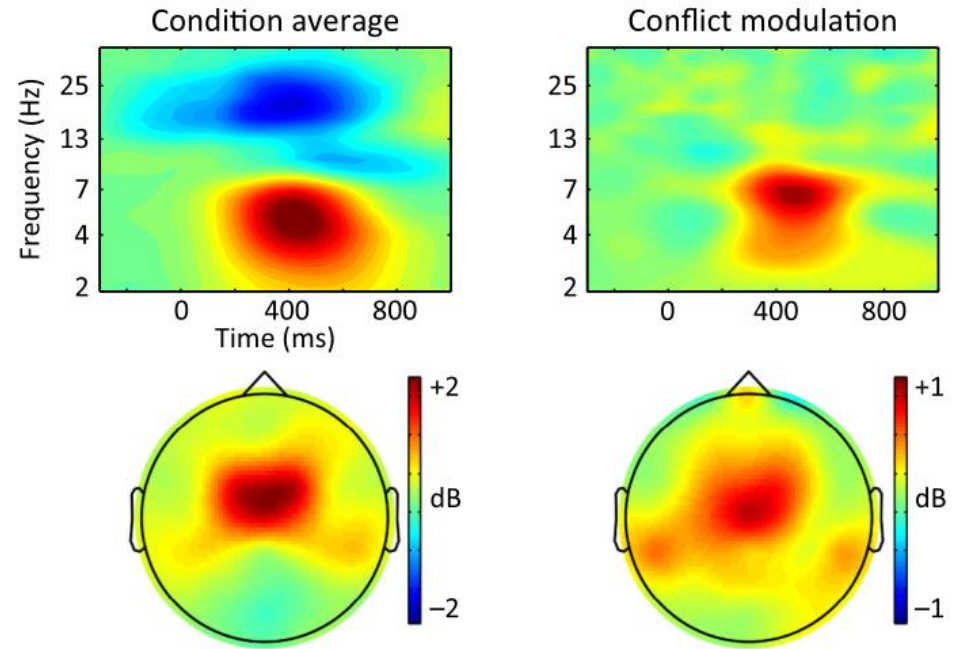
(A)



(B)



(C)



*RacLab*

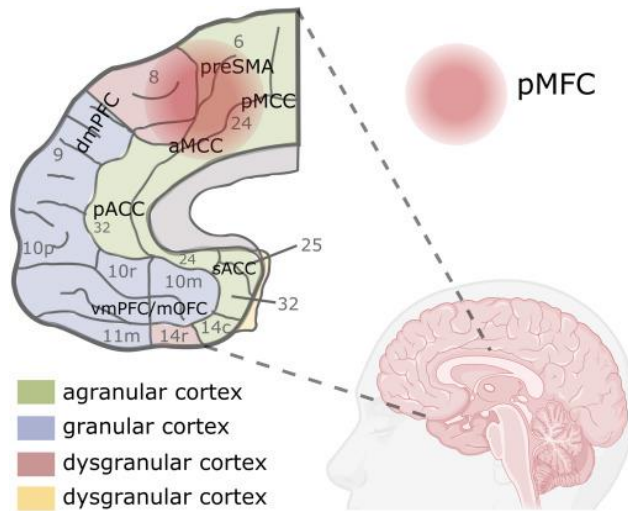
***Medial frontal cortex* and response conflict  
Evidence from human intracranial EEG and  
medial frontal cortex lesion**

*Brain Research; 2008*

Yang Ziyang

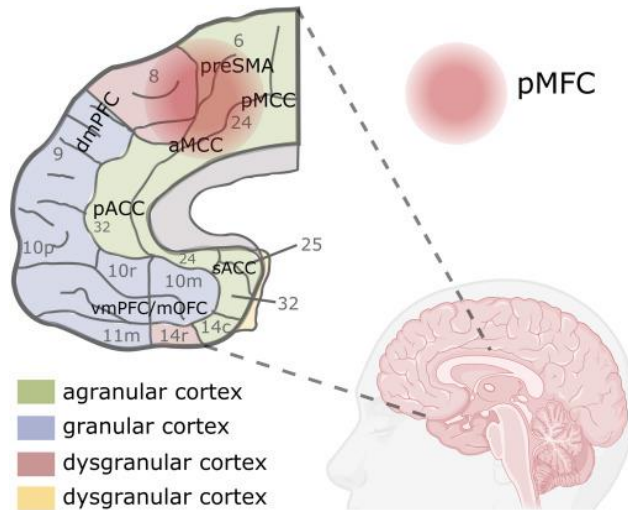
2025.4.24

# Introduction



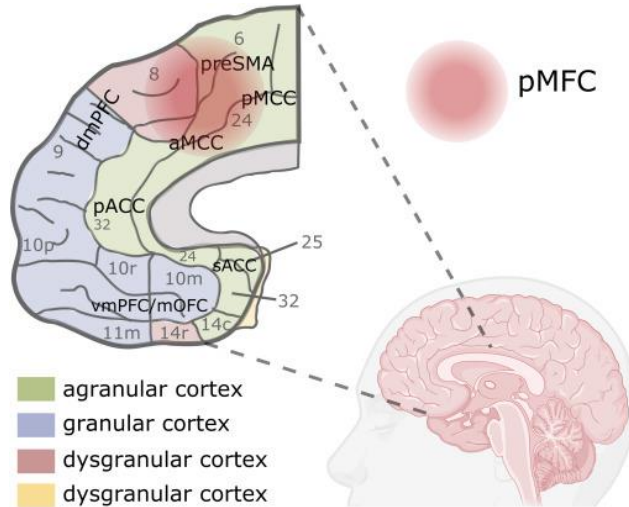
- conflict monitoring
- outcome evaluation
- error prediction
- action control

# Introduction

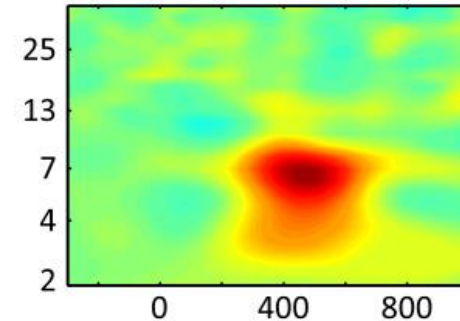


## Action monitoring

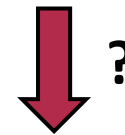
# Introduction



## Action monitoring

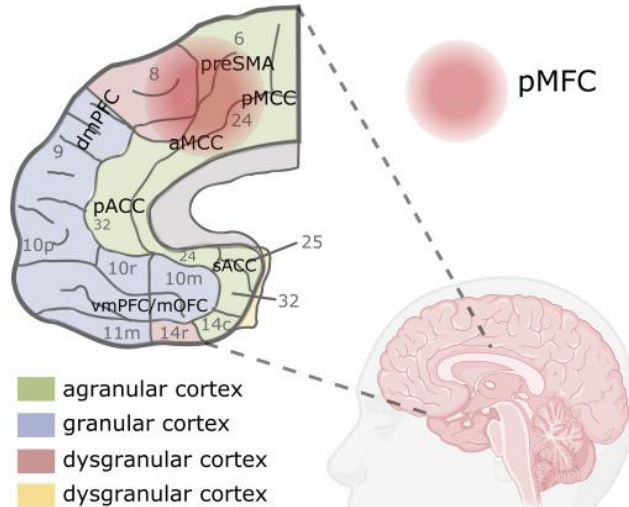


**4-8 Hz**  
**Incorrect Response**

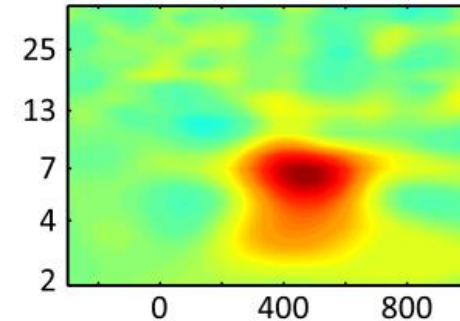


**Response conflict**

# Introduction

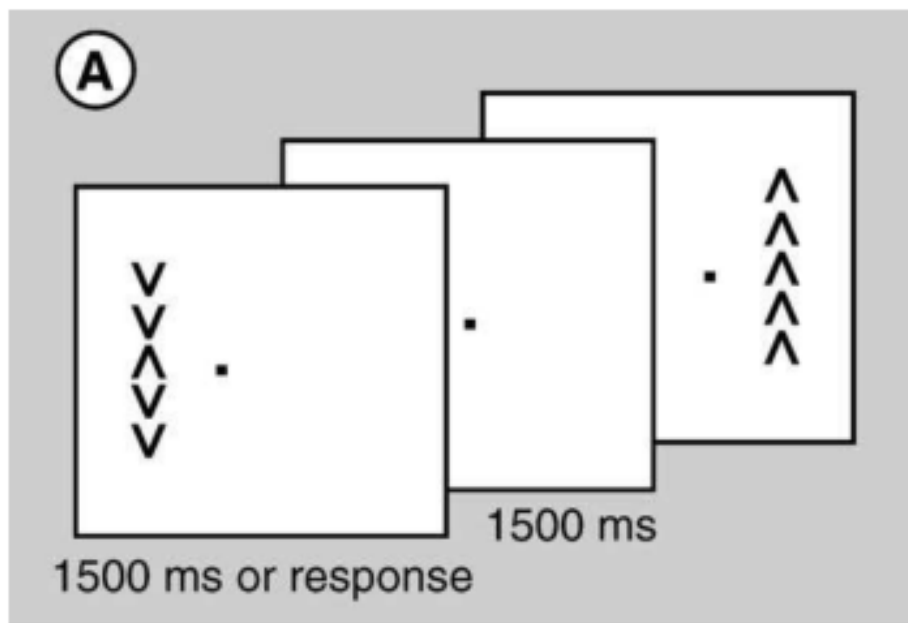


**Action  
monitoring**



**4-8 Hz  
Incorrect Response**

**Response conflict**



**RK**

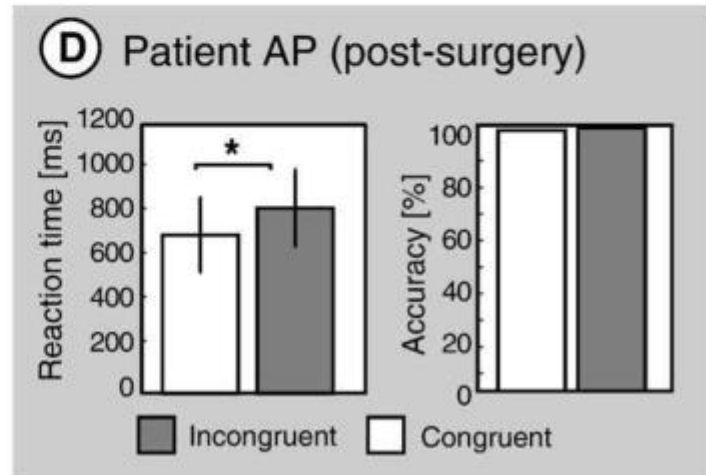
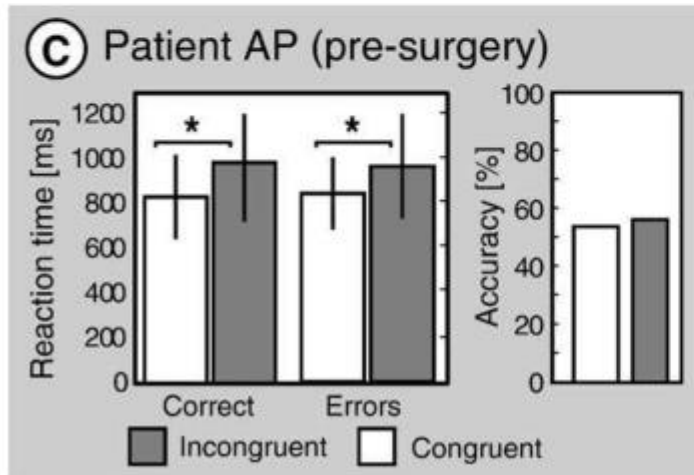
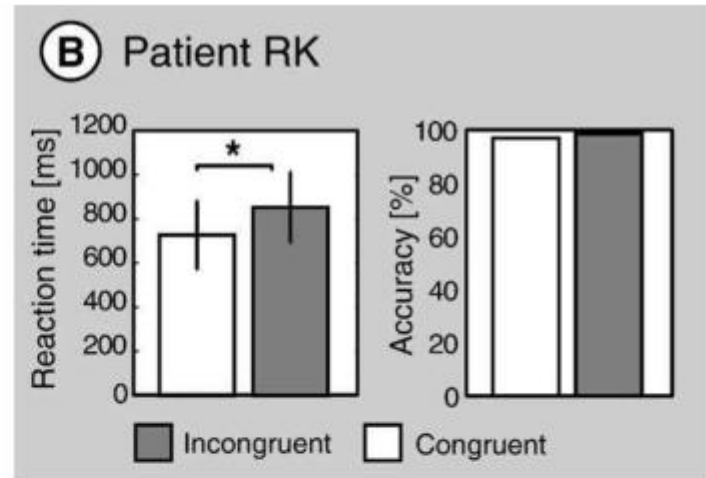
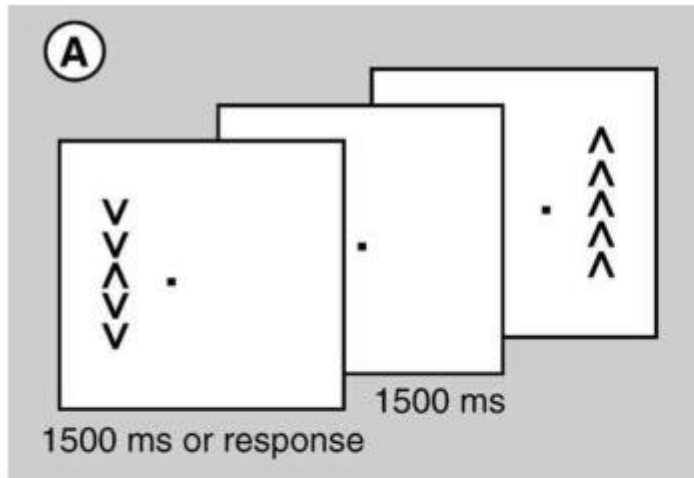
**MRI扫描未显示典型的癫痫源性病灶**

**AP**

**右侧前额中线部分存在皮质发育不良**

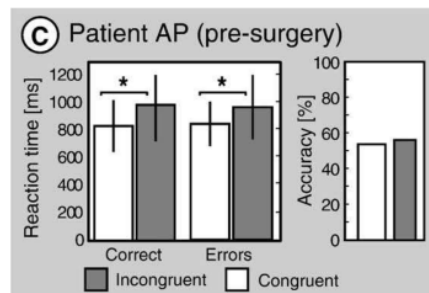
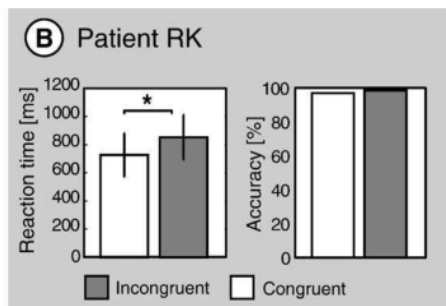
**均为药物难治性癫痫**

# Result

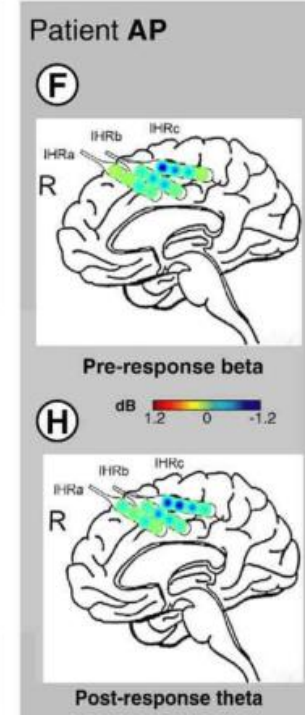
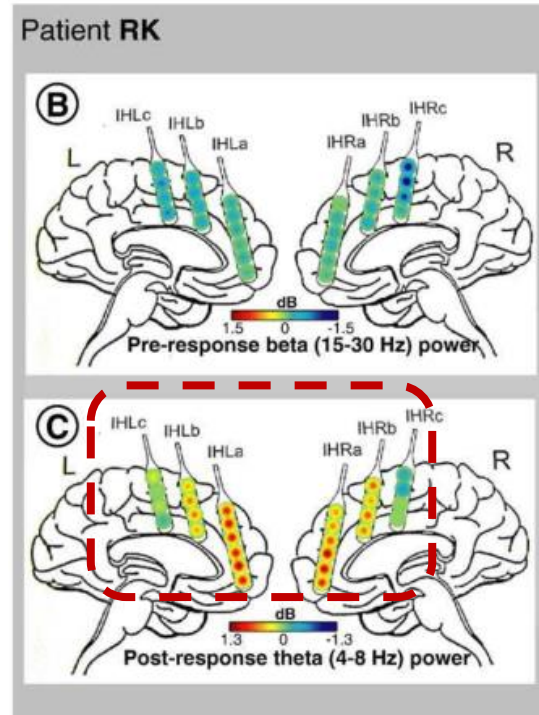
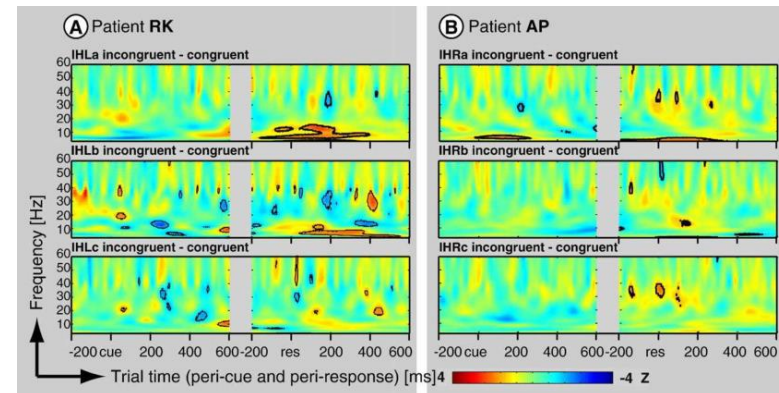
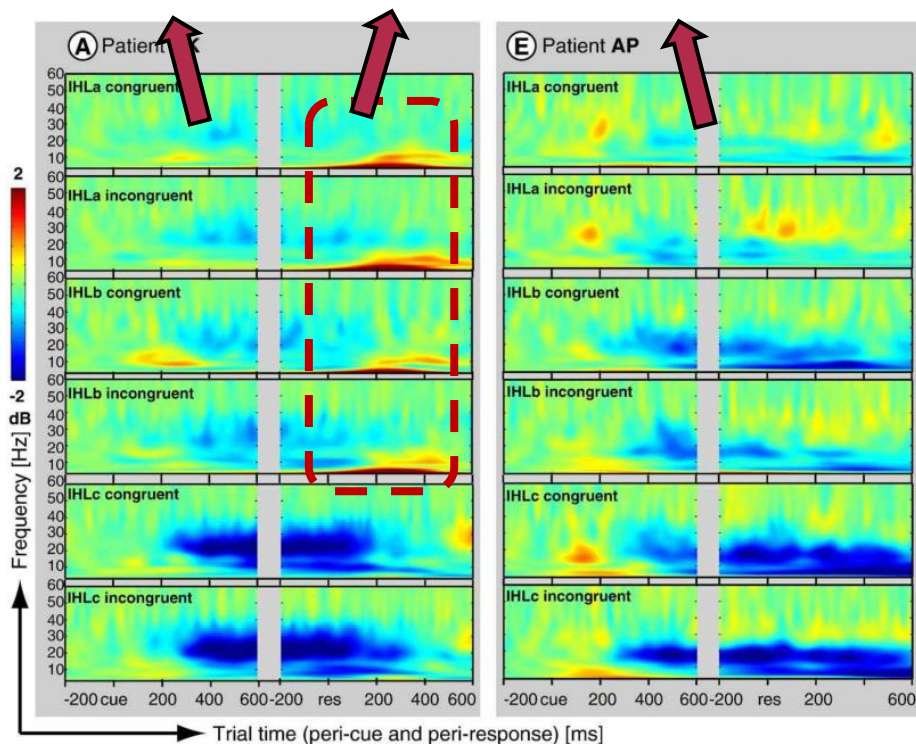




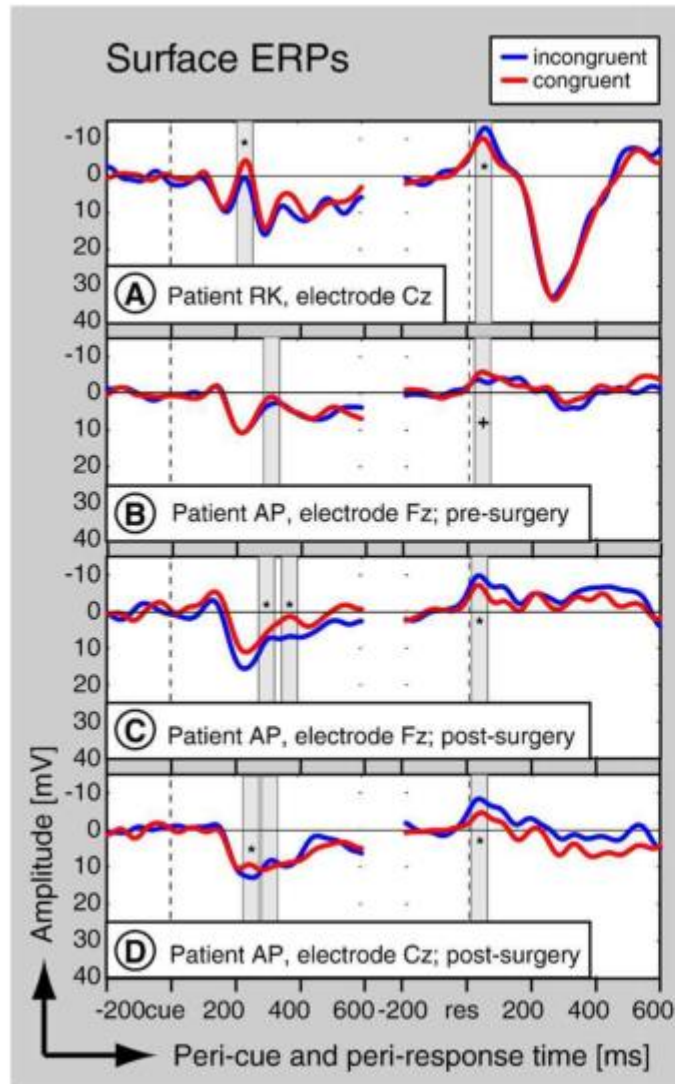
# Result



*beta theta beta*



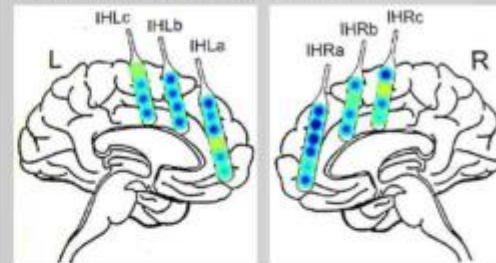
# Result



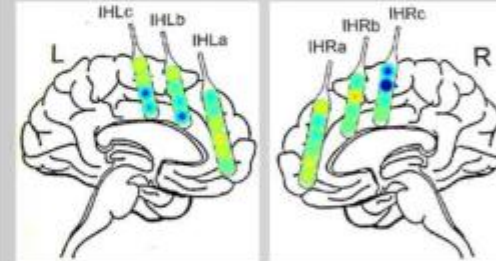
## Intracranial ERPs during surface peak

**(E) Patient RK** 2 -2 μV

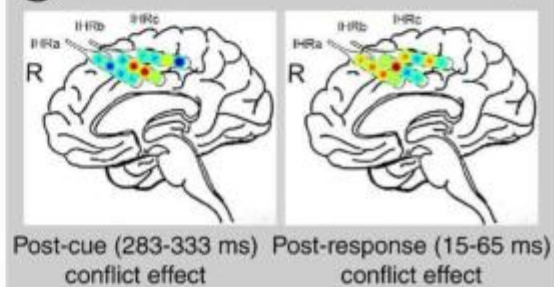
Post-cue (205-255 ms) conflict effect



Post-response (25-75 ms) conflict effect

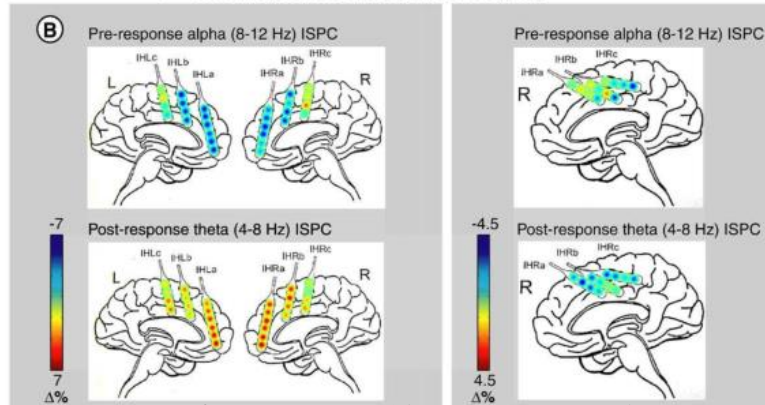
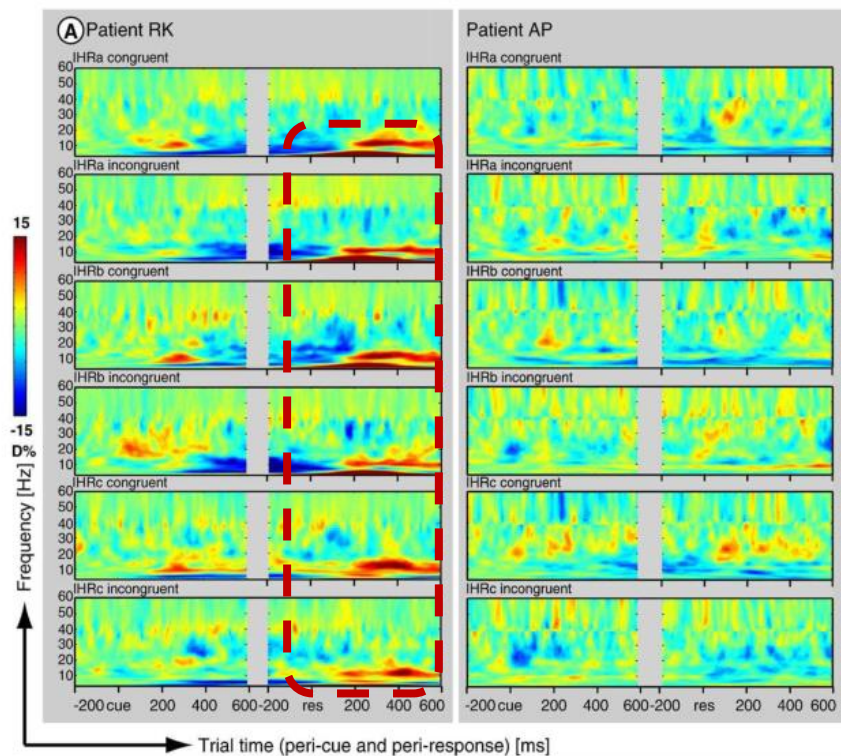


**(F) Patient AP** 2 -2 μV





# Result



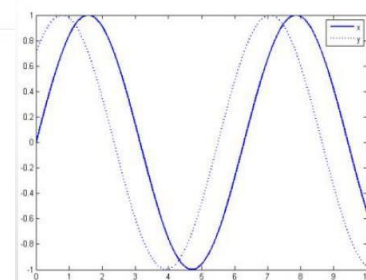
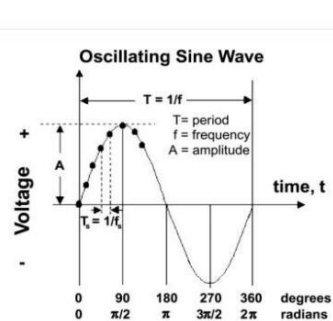
尤其是在前部的内侧额叶皮层电极中

## 二、基于相位同步的指标

### 什么是相位同步

相位同步 (phase synchronization, PS) 指的是, 两个相互耦合的神经振荡活动的相位 (phase) 同步化 (即两个活动的相位差不随着时间的变化而变化, 有一个固定的相位差)

PS的优点是 (理论上) 与两个神经振荡活动的波幅无关, 而只与相位有关



信号x和信号y之间的相位差恒定为 $\pi/4$ , 即45度

*RacLab*

**Distinct fMRI patterns colocalized in the  
cingulate cortex underlie the after-effects of  
cognitive control on pain**

*NeuroImage; 2024*

Yang Ziyang

2025.4.17