# When the executive gets drunk: Effects of alcohol intoxication on cognitive neurodynamics

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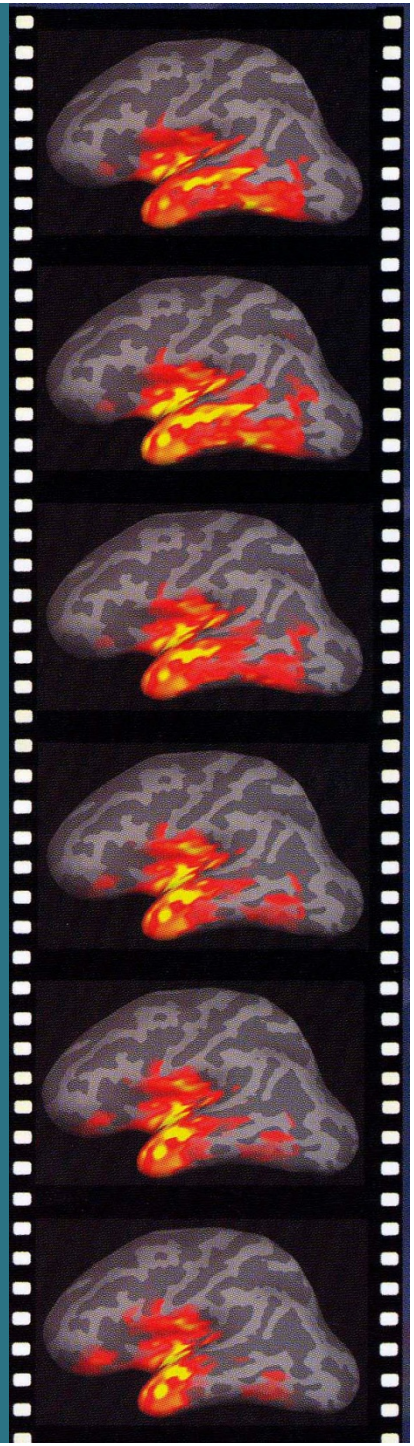


# Spatio-Temporal Brain Imaging Lab

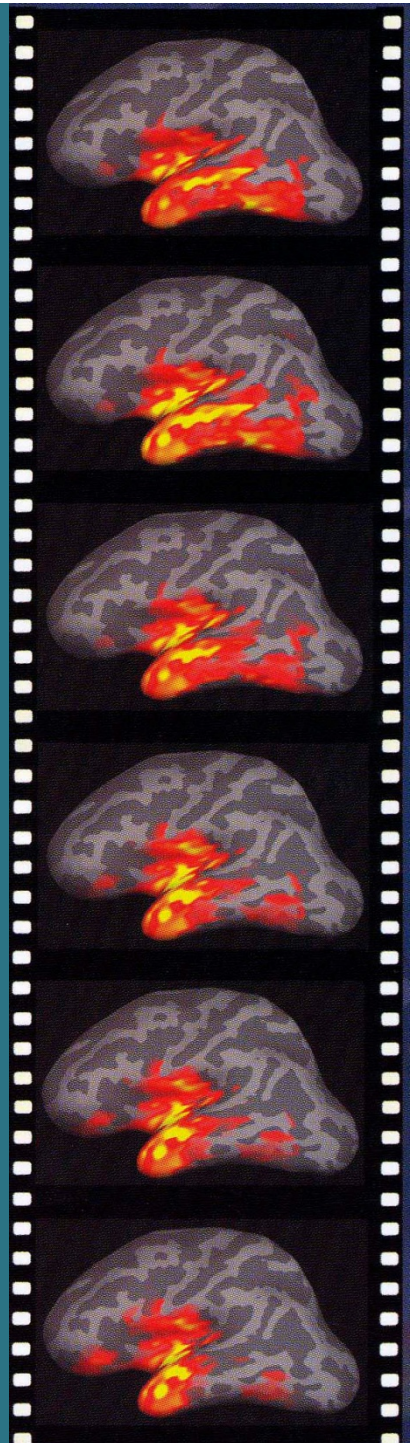
Multimodal imaging
"where" and "when" of cognitive functions

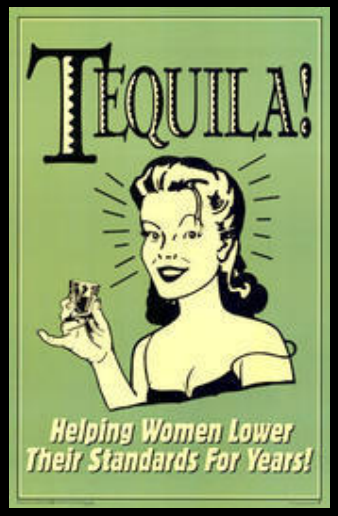
- Cognitive control
- Language
- Face perception

Autism spectrum disorder

Alcohol-induced impairments

- genetic markers
- family history






# EXECUTIVE CONTROL

- plan, make decisions
- suppress automatic responses


- Use anatomically-constrained MEG
  - Neural basis of cognitive control
  - Acute intoxication
  - Healthy social drinkers

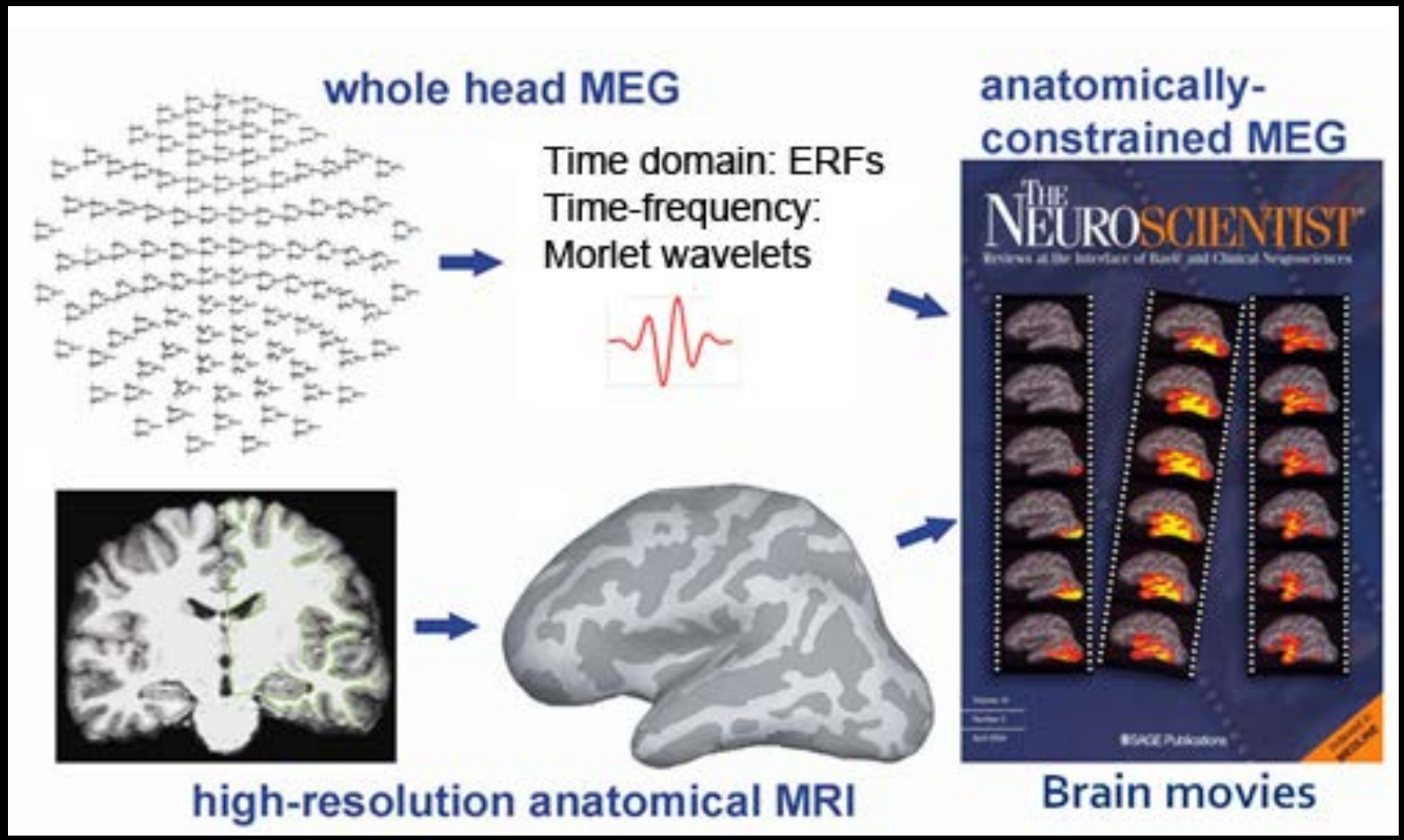
## Stroop task

Congruent GREEN

Incongruent BLUE

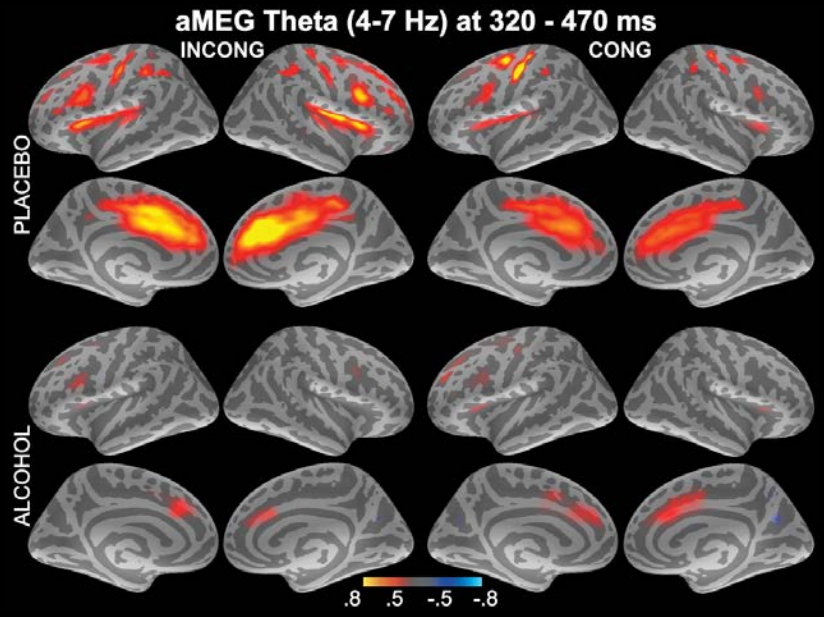
# Anatomically-constrained MEG

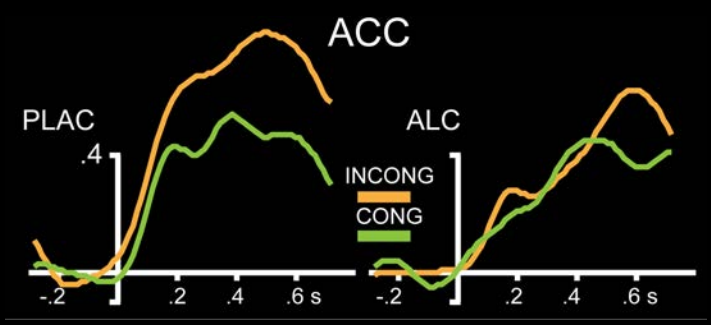
## combines distributed source modeling with structural MRI




Dale et al., 2000; Marinkovic, 2004

# Group average: Theta during Stroop



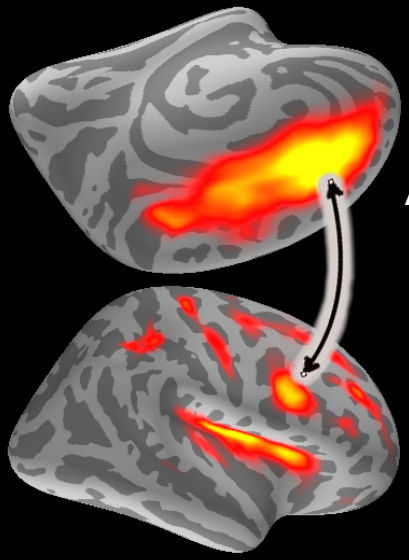



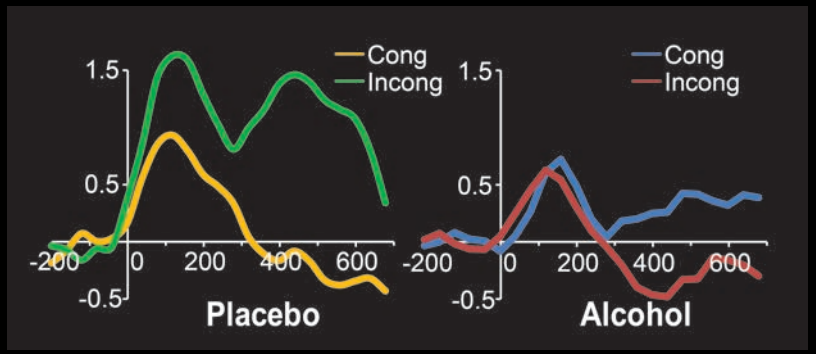

Theta timecourses (group average)

-Anterior cingulate cortex subserves executive control
-Alcohol reduces conflict-related theta in ACC

# Phase-Locking (Co-oscillations):

-Explore effects at the level of an interactive functional *system*




-Theta synchrony increased to conflict under placebo

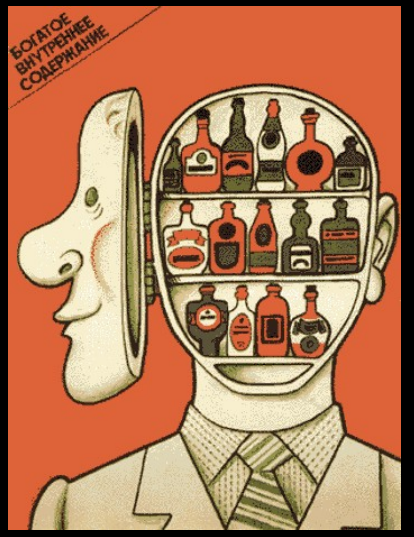
-Alcohol disrupts co-oscillations

# Alcohol-induced impairment of executive control:

-inappropriate decisions in conflict situations, social interactions, traffic

-may contribute to continued drinking

-Binge drinking
-dopamine genetic markers
-dispositional variables (impulsivity)
-family history

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