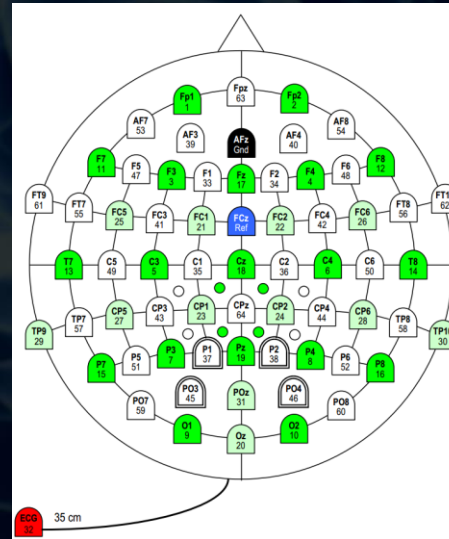


# EEG-fMRI – GT-002

## Target Engagement Study

### Initial findings

64 channel headset

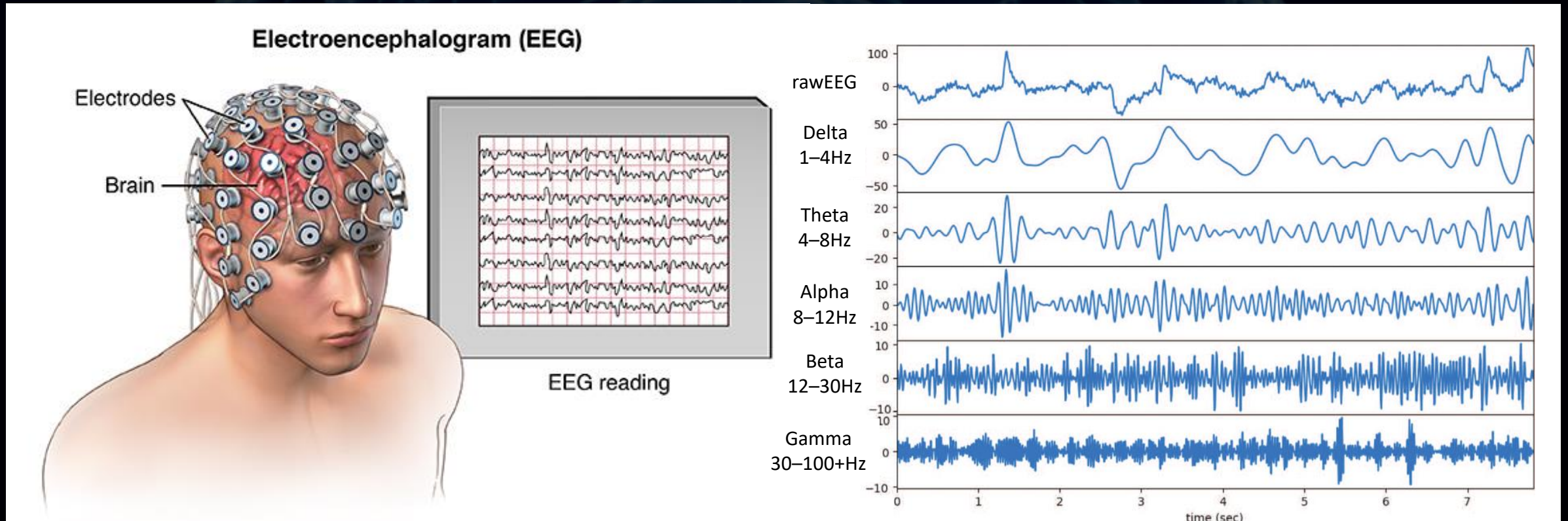


3Tesla

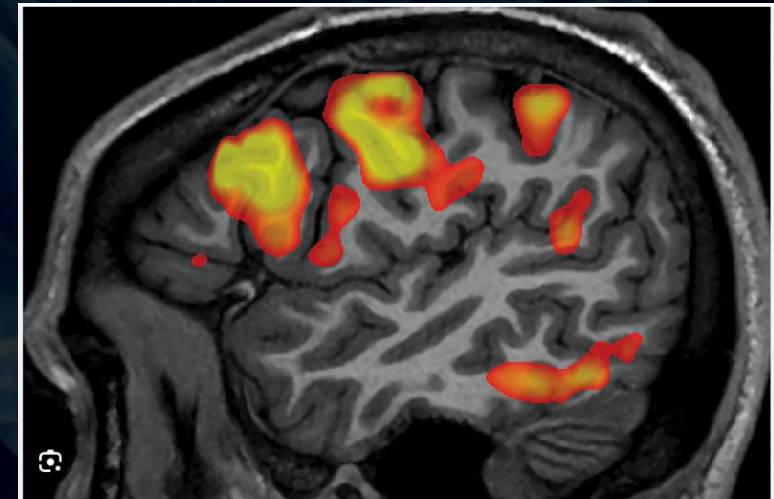




# EEG as biomarker for selecting a drug for mental disorders



# Neuroimaging



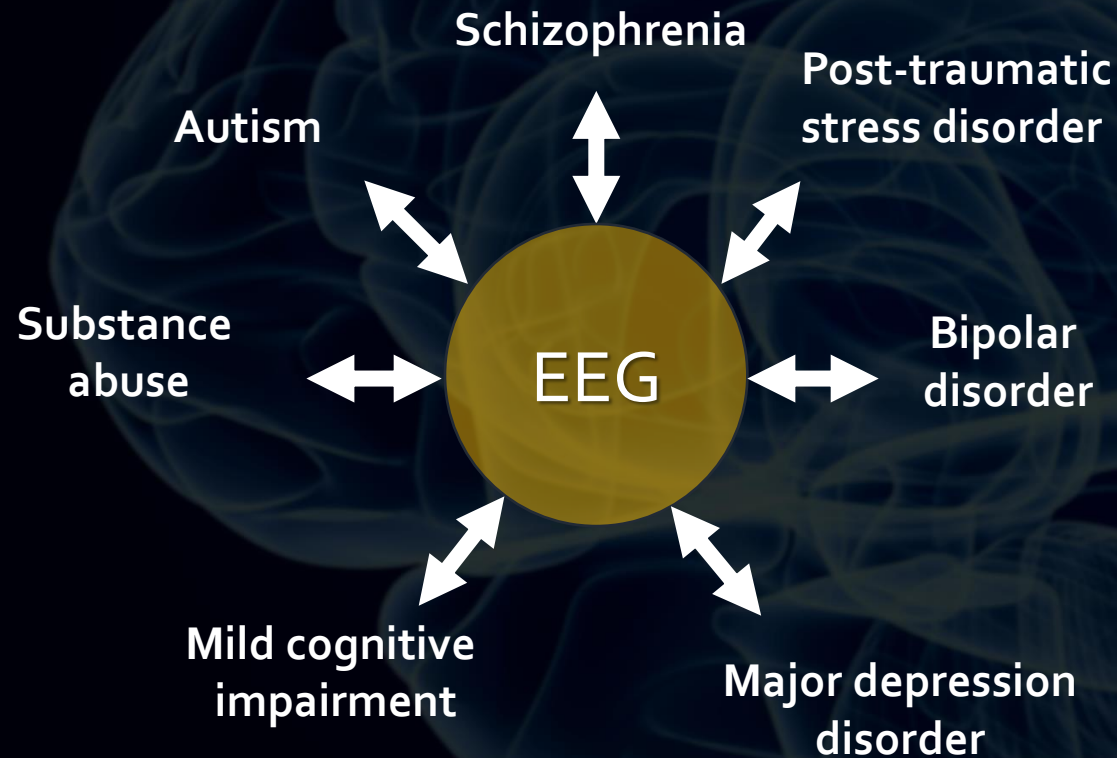
Scientists use AI to decipher words and sentences from brain scans | Science | AAAS

[Visit >](#)

GT-002, through its novel mode of action, can modulate network connectivity and as such delay the progression of disease

Gabather

# Clinical strategy for GT-002



- The effects of GT-002 on EEG is key as a biomarker in healthy drug-free subjects
- GT-002 can then be tested in patients already on different drugs

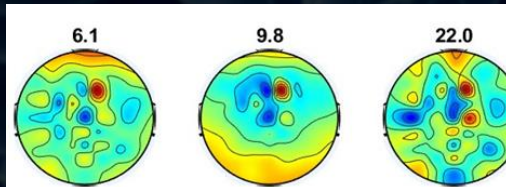
# Clinical strategy for GT-002

## Neuroimaging : *A Window into the Brain*

EEG recordings

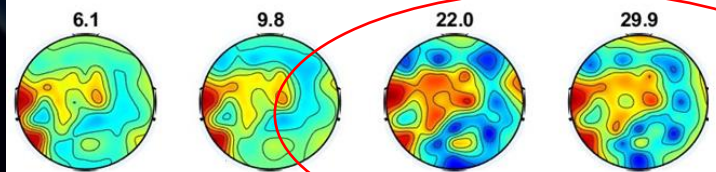
fMRI recordings

Baseline

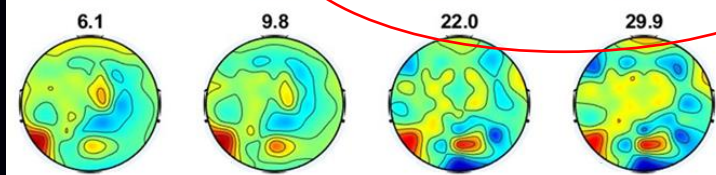


**Effect of GT-002**  
*target engagement in human brain*

2h

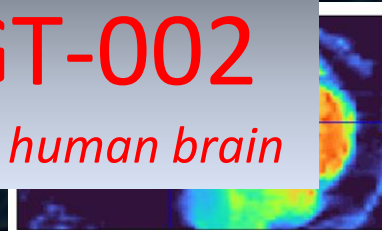


4h

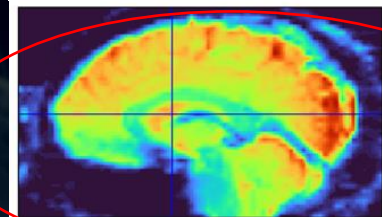


EEG measures brain electrical activity

2h



4h



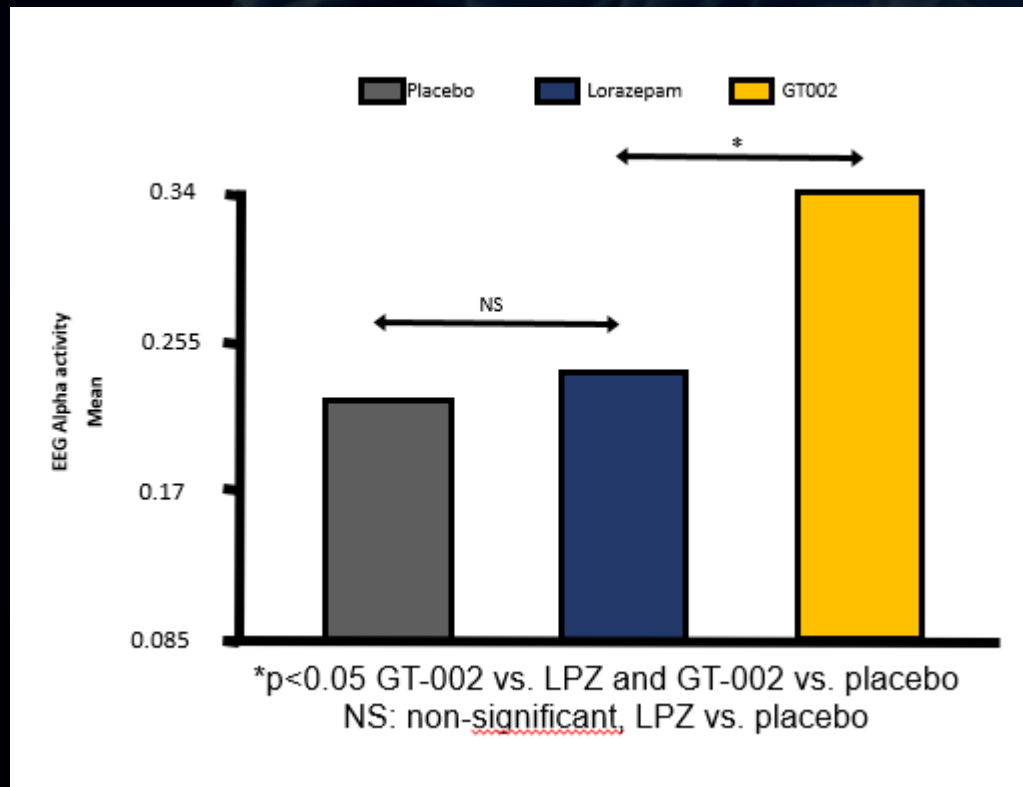
Heat-maps from one Subject at baseline and after GT-002 drug treatment

fMRI measures blood oxygenation levels as an indicator of increased brain activity

Gabather

# Key Results

- EEG power has been quantified during GT-002 and the alpha band (8-12 Hz) has been extracted.
- EEG alpha band is recognized as a marker of cognitive activity such as **attention** and associated with **relaxation and less anxiety**; an increase in this band may be beneficial for different pathological conditions.



## CONCLUSION

- Significant increase of EEG power on alpha band by GT-002 vs LPZ ( $p<0.05$ ) at 2h post challenge
- No significant effect of LPZ vs Placebo

# fMRI Data Analysis

### Analysis settings

**Analyses**

- SBC\_01
- ICA\_01
- MVPA\_01

**Analysis name**: SBC\_01      **Analysis type**: functional connectivity (weighted GLM)

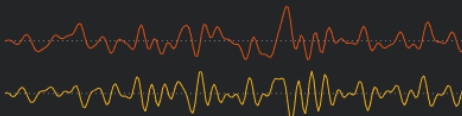
**Analysis options**

- ROI-to-ROI and Seed-to-Voxel analyses
- correlation (bivariate)
- hrf weighting

**Selected Seeds/Sources**

- networks.DefaultMode.MPFC (1,55,-3)
- networks.DefaultMode.LP (L) (-39,-77,33)
- networks.DefaultMode.LP (R) (47,-67,29)**
- networks.DefaultMode.PCC (1,-61,38)
- networks.SensoriMotor.Lateral (L) (-55,-12,29)

**Source timeseries**

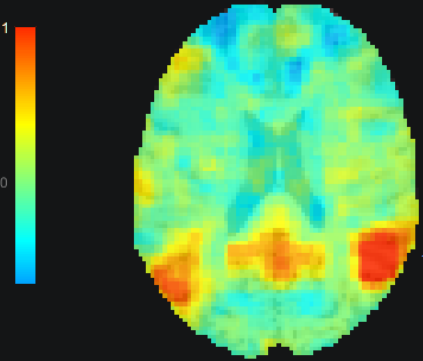


**Source dimensions**

- 1
- add 1st-order derivatives
- no frequency decomposition

### Analysis results (from disk)

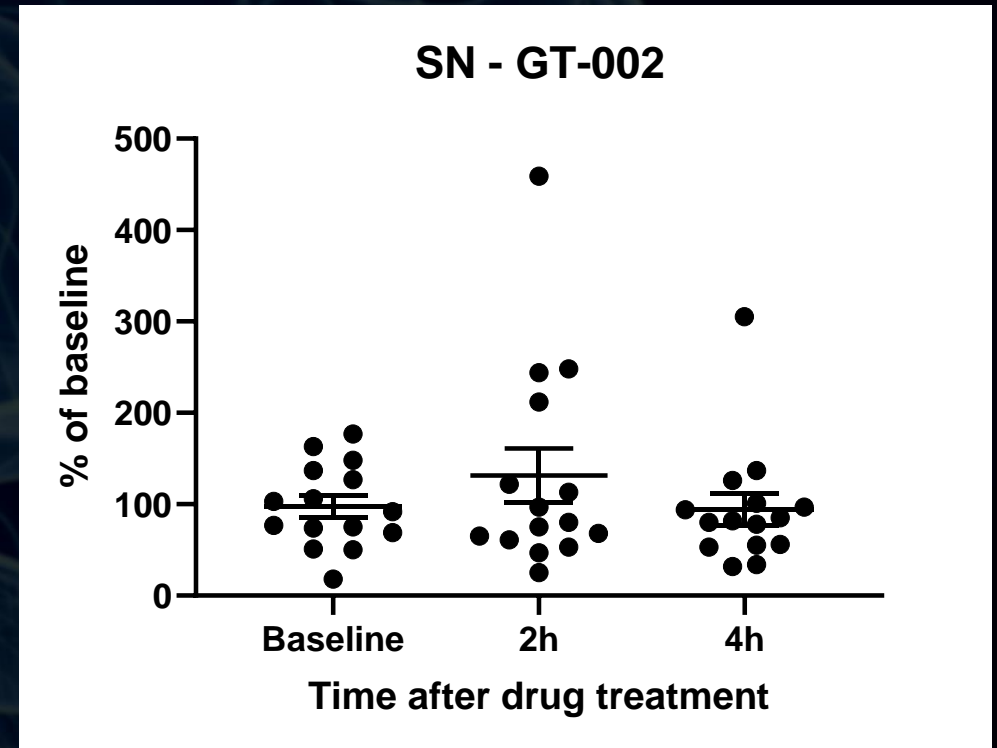
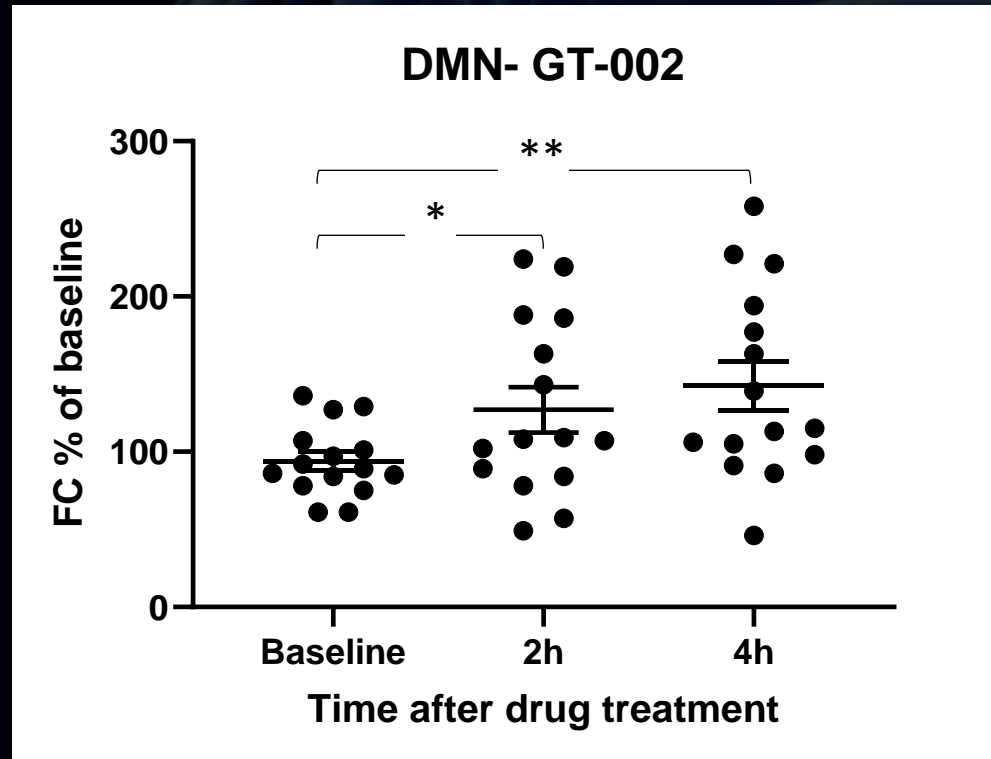
**Connectivity (SBC map)**



Increased activity in the Default Mode Network (DMN)



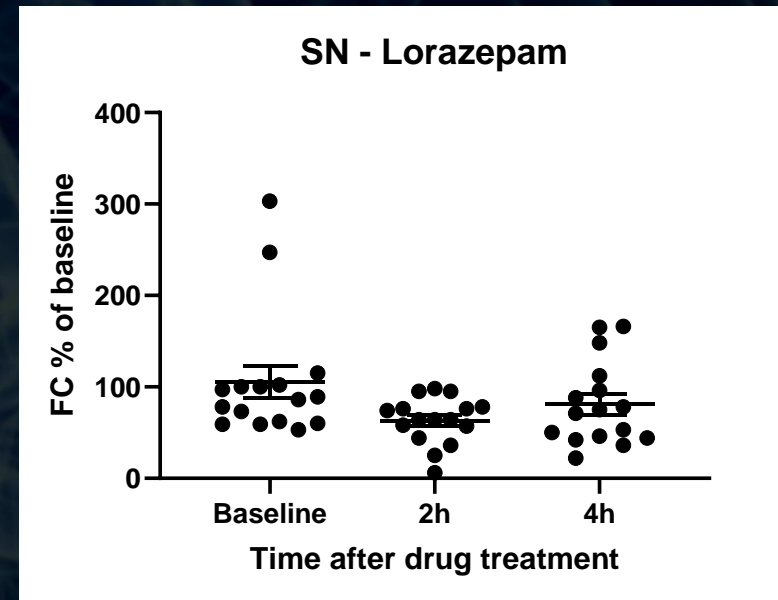
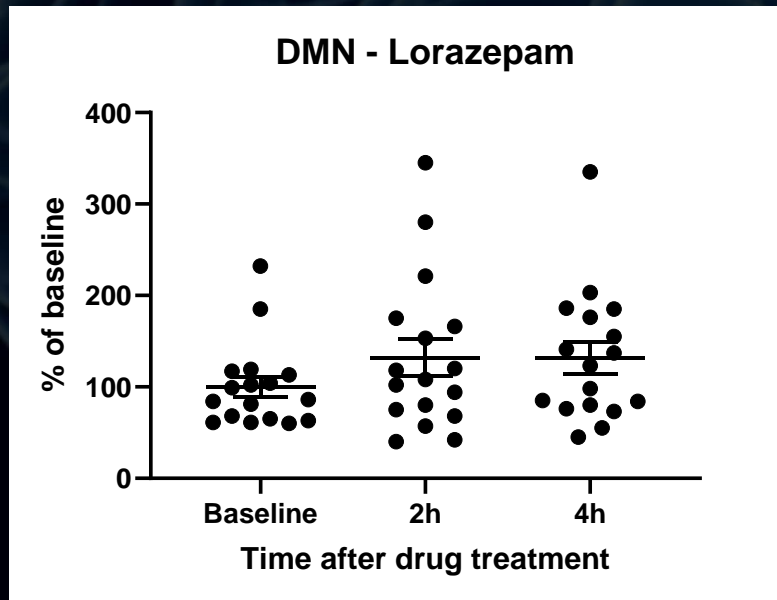
# Brain Network Functional Connectivity- GT-002 activation of Default Mode Network



Statistically significant effect of GT-002 on DMN activity at 2 and 4h after dosing compared to baseline,  $P < 0.05$

GT-002 activates Default mode Network activity

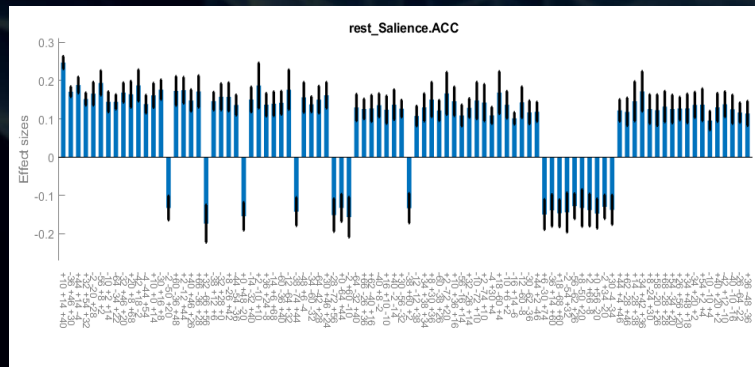
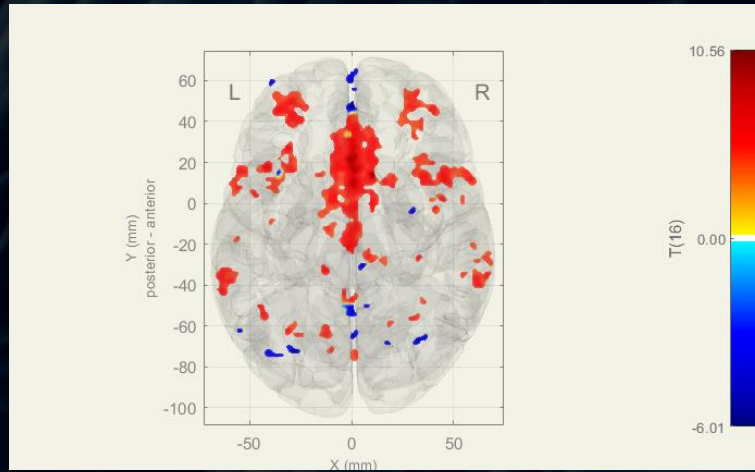
# Brain Network Functional Connectivity- No effect of Competitor drug Lorazepam



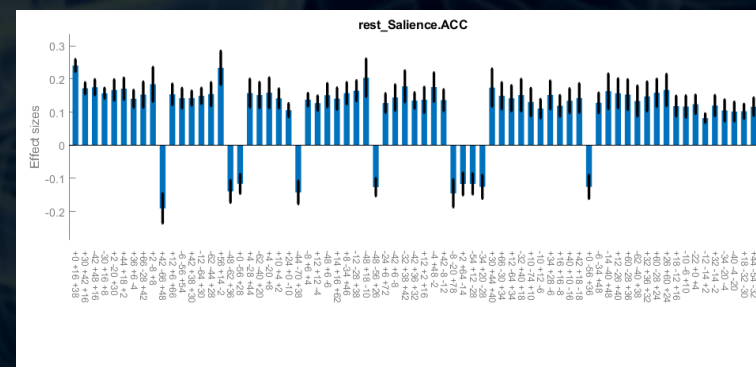
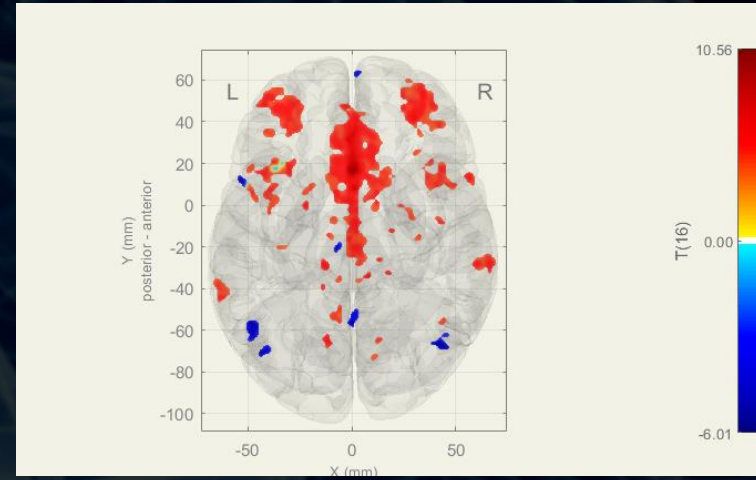
No statistically significant effect of Lorazepam on SN and DMN activity at 2 and 4h after dosing compared to baseline.,

# Saliience Network Anterior Cingulate Cortex

Baseline



GT-002 2h



Modulation of Saliience Network