

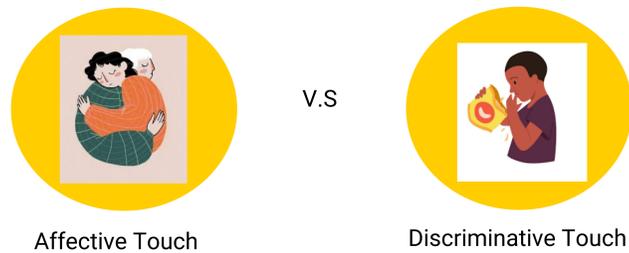
“Exploring the Spatiotemporal Dynamics of Social Touch Perception and Isolation on Stress Resiliency”

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Background

Social Touch Hypothesis?

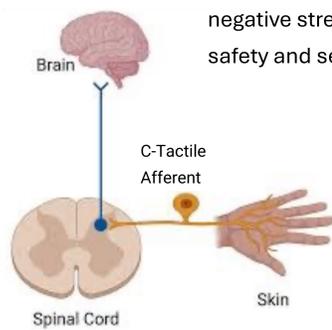


Affective Touch

Discriminative Touch

V.S

❖ emotional regulation by modulating the maladaptive physiological responses to negative stress and promoting feelings of safety and security.



- ❖ Low threshold Mechanoreceptors
- ❖ Located in the Hairy Skin
- ❖ Gentle touch, pressure, stroking
- ❖ Mildly thermosensitive (Body temp)

How does manipulation of periphery social touch neurons, impact electrical networks in the CNS post stress?



Methods

2) Experimental Timeline



1) Implantation



3) LFP Machine learning Network Analysis

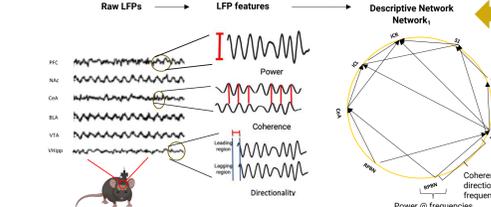


Figure 1: (1) Mice are implanted with a 7-brain region electrode. (2) On the 1st day of experimental timeline, LFP data are recorded during forced interaction test. On days 2-4 mice undergo variable stress. On day 5 LFP data are recorded during sucrose splash test. On day 6, LFP data are recorded during forced interaction test. (3) LFP data are measured against pre-established electome factor networks (EF1 & 2).

Results “Electome Factor 1”

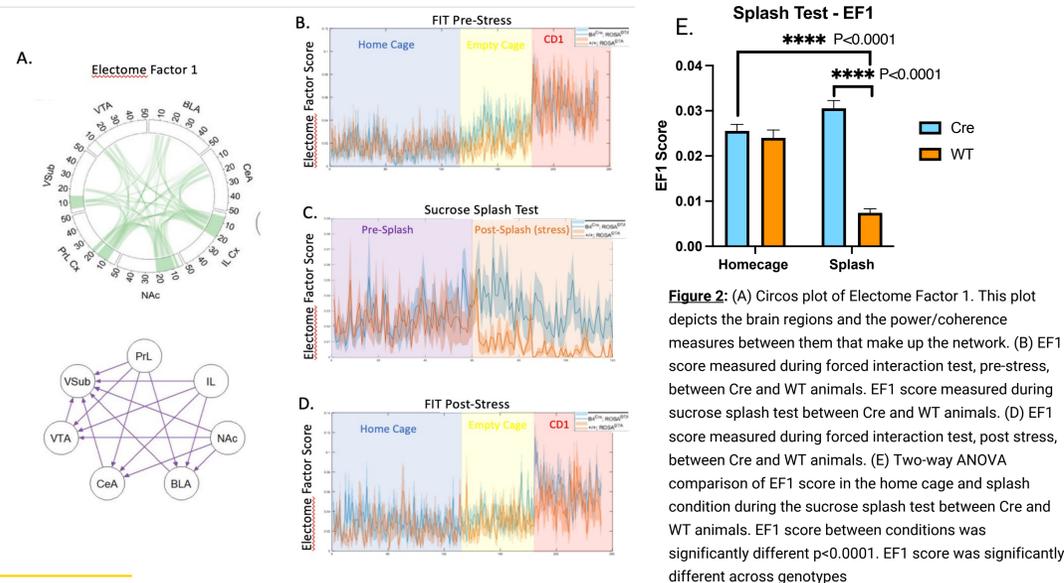


Figure 2: (A) Circos plot of Electome Factor 1. This plot depicts the brain regions and the power/coherence measures between them that make up the network. (B) EF1 score measured during forced interaction test, pre-stress, between Cre and WT animals. (C) EF1 score measured during sucrose splash test between Cre and WT animals. (D) EF1 score measured during forced interaction test, post stress, between Cre and WT animals. (E) Two-way ANOVA comparison of EF1 score in the home cage and splash condition during the sucrose splash test between Cre and WT animals. EF1 score between conditions was significantly different $p < 0.0001$. EF1 score was significantly different across genotypes

Results “Electome Factor 2”

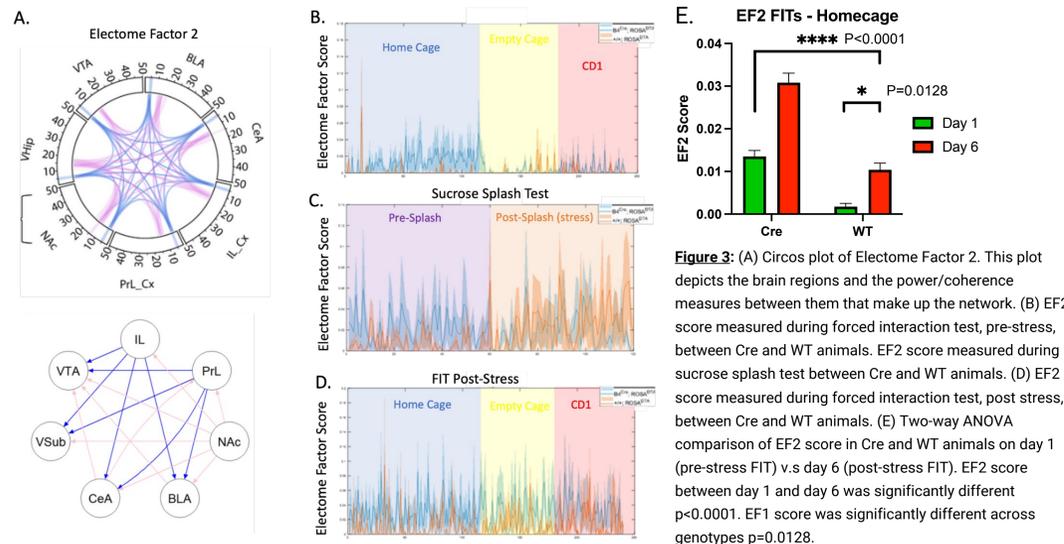


Figure 3: (A) Circos plot of Electome Factor 2. This plot depicts the brain regions and the power/coherence measures between them that make up the network. (B) EF2 score measured during forced interaction test, pre-stress, between Cre and WT animals. (C) EF2 score measured during sucrose splash test between Cre and WT animals. (D) EF2 score measured during forced interaction test, post stress, between Cre and WT animals. (E) Two-way ANOVA comparison of EF2 score in Cre and WT animals on day 1 (pre-stress FIT) v.s day 6 (post-stress FIT). EF2 score between day 1 and day 6 was significantly different $p < 0.0001$. EF1 score was significantly different across genotypes $p = 0.0128$.

Behavior Results

Splash Test Grooming Time

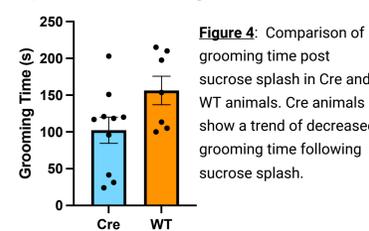


Figure 4: Comparison of grooming time post sucrose splash in Cre and WT animals. Cre animals show a trend of decreased grooming time following sucrose splash.

A. Juv direct interaction duration

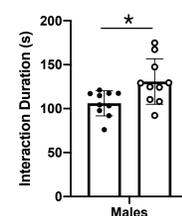
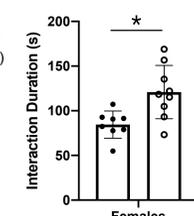


Figure 5: (A) Duration of interaction with juvenile mice in male isolated and control adults. Isolated males spent significantly more time interacting with juveniles $p = .02$. (B) Duration of interaction with juvenile mice in female isolated and control adults. Isolated females spent significantly more time interacting with juveniles $p = .007$

B. Juv direct interaction duration



Conclusions

- **EF1:** Cre animals showed a significant increase in electome factor score post sucrose splash test (acute stressor).
- **EF2:** Cre animals showed a significant decrease in electome factor score on Day 6 when compared to WT controls
- Cre animals showed a significant decrease in grooming time during the sucrose splash test

Future Directions

Future directions aim to investigate if social isolation evokes the same behavioral and electrical network phenotypes as genetic manipulation.



Figure 6: Experimental timeline for social isolation paradigm. Animals will be isolated for 14 days and implanted with electrode. LFP data will be recorded during initial FIT, sucrose splash, and final FIT. DJI and NSF behavioral assays will also be observed.

Acknowledgments

I would like to thank the University of Iowa Carver College of Medicine, Iowa Neuroscience Institute, iDREAM, The Hultman Lab, and all of our collaborators for making this research opportunity possible. I would also like to acknowledge biorender for the use of their tools.

References



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