Effects of Reward Loss on c-Fos Expression: Building a Neural Connectome

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Introduction

•Reward loss is accompanied by a stress response affecting emotion and health.

•A comprehensive map of brain activity, or connectome, during an episode involving reward loss remains to be worked out.

•c-Fos is a protein expressed in recently depolarized neurons and can be used as a proxy for neural activity.

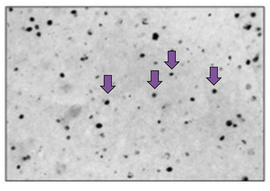
•General goals:

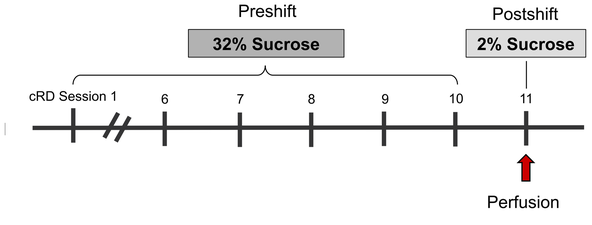
Evaluate c-Fos expression in response to a consummatory reward downshift.

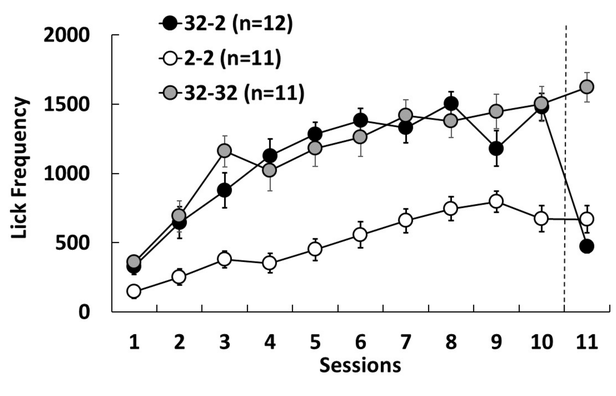
Method

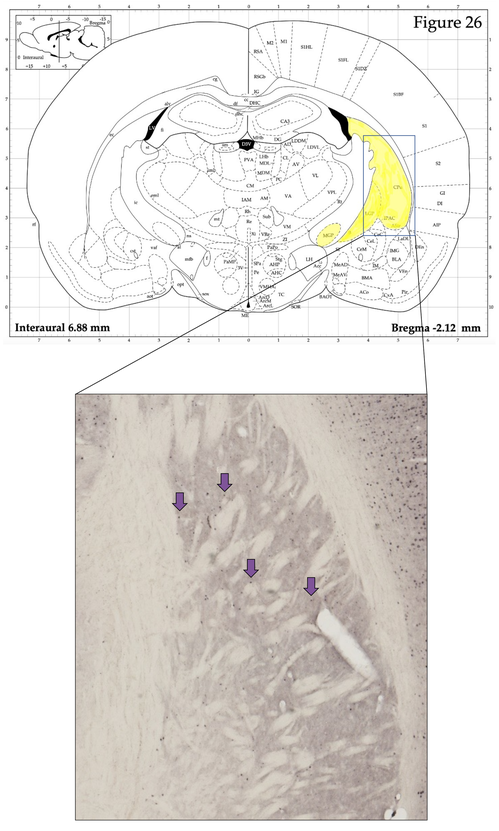
•cSNC: Three groups of animals were trained using 32% or 2% sucrose across ten sessions. One group was downshifted from 32% to 2% on session 11. All animals were perfused after session 11.

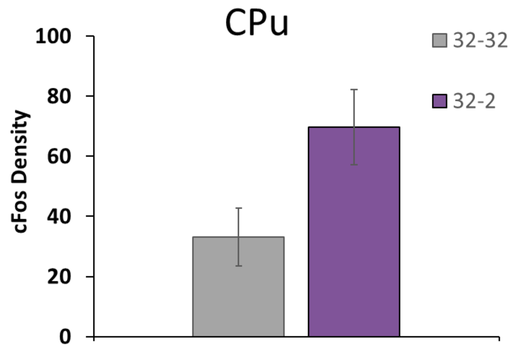
•Histology: After rats were perfused, brains were extracted to measure c-Fos using Immunohistochemistry. We counted c-Fos in three main areas: the caudate putamen, globus pallidus externus, and global pallidus internus.

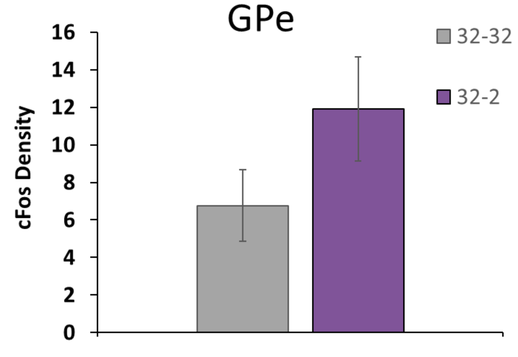


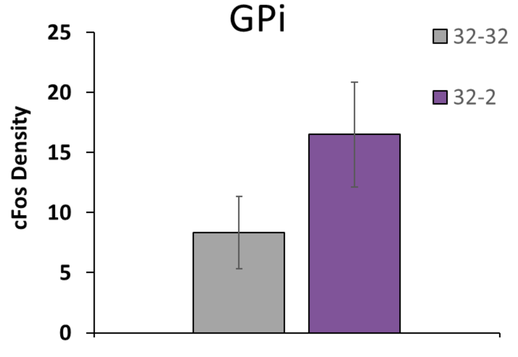










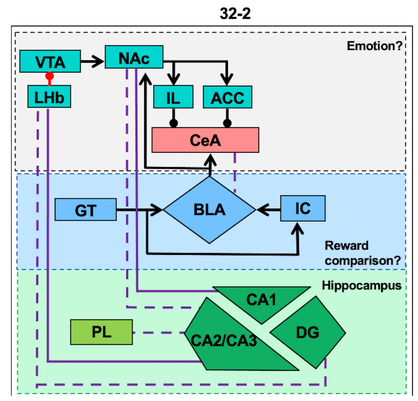


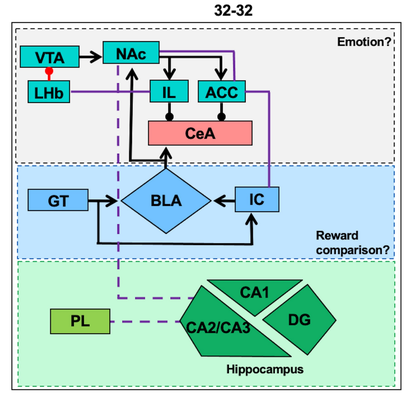
Results

•Animals overall had a more neuronal activity in the basal ganglia after a 32-2% sucrose downshift compared to 32-32% controls.

•Correlations in c-Fos expression between brain areas allows us to begin finding connections between brain areas.

•Additional data is needed to further establish correlations between the BG and other areas.





Conclusions

•c-Fos expression in additional brain areas is planned for future evaluation to continue building the connectome for frustration.