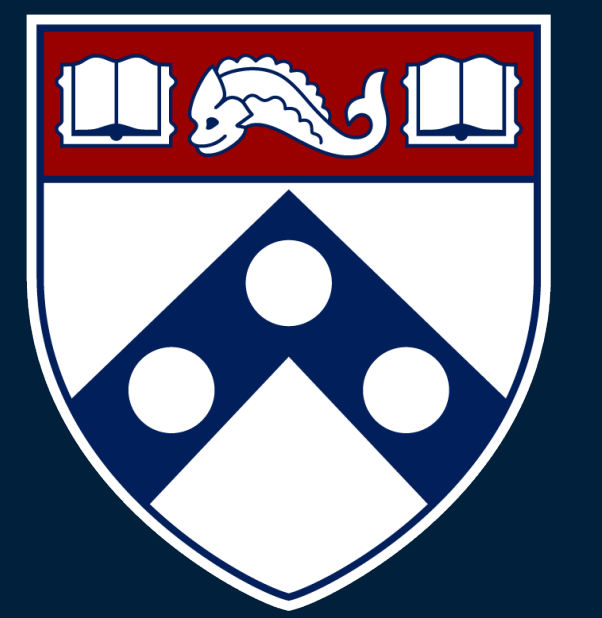


GLP-1R Activation Increases Neural Activity in Central Amygdala GABAergic Neurons



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INTRODUCTION

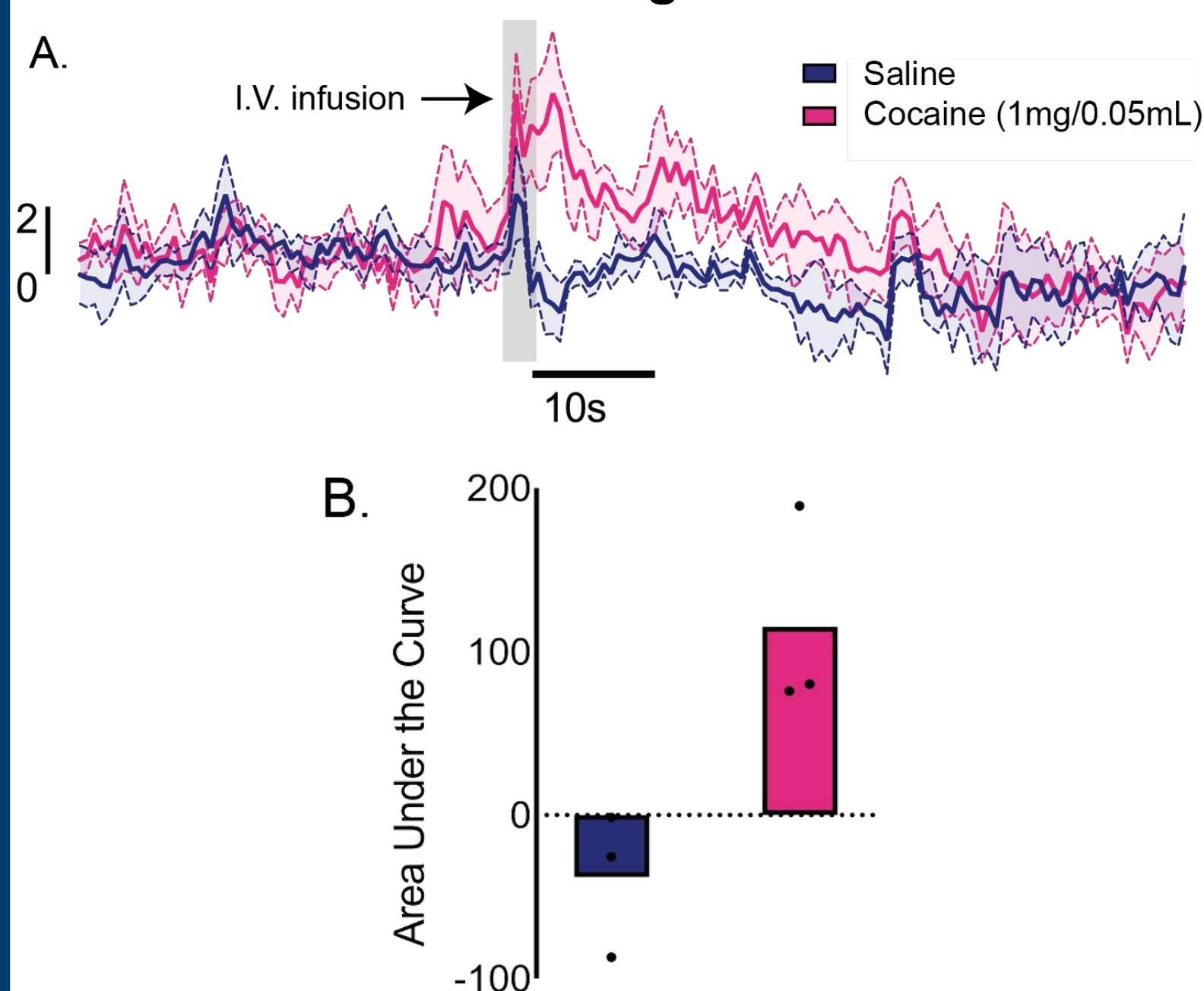
Cocaine use disorder (CUD) continues to be a pressing health issue in the United States with 4.8 million people aged 12 or older using cocaine in 2021¹. Yet, to this day, there is no FDA-approved pharmacotherapy to treat CUD². Evidence from our lab suggests that glucagon-like peptide-1 receptor (GLP-1R) agonists, which are FDA-approved for treating type II diabetes and obesity, could be repurposed for treating CUD³.

GLP-1Rs are highly expressed in the central amygdala (CeA)⁴, and our lab's preliminary data have suggested administration of GLP-1R agonist Exendin-4 (Ex-4) directly into the CeA attenuates cocaine reinstatement in rodents. Further studies identified a subpopulation of CeA GLP-1R-expressing GABA neurons that project to the nucleus accumbens, a brain region known to play a role in cocaine seeking⁵.

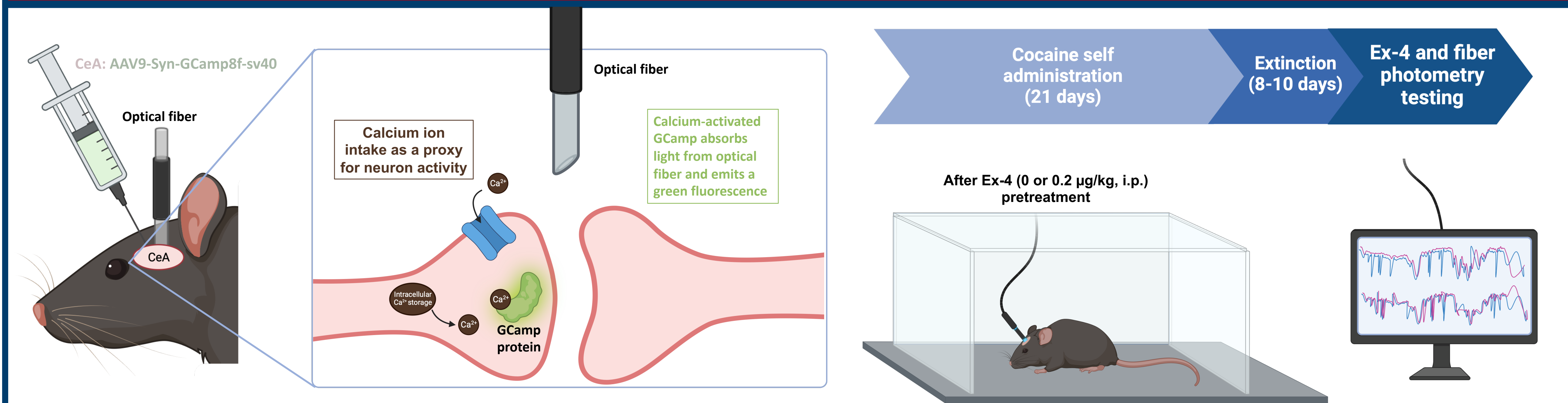
While our pilot studies indicate that CeA GLP-1R-expressing neurons are implicated in cocaine seeking, the cellular and molecular consequences of central GLP-1R activation are unknown. Accordingly, no studies have explored the influence of cocaine on CeA neuron dynamics. Thus, this study aimed to characterize the effects of systemic Ex-4 pretreatment on CeA GABA neurons during cocaine seeking.

BACKGROUND

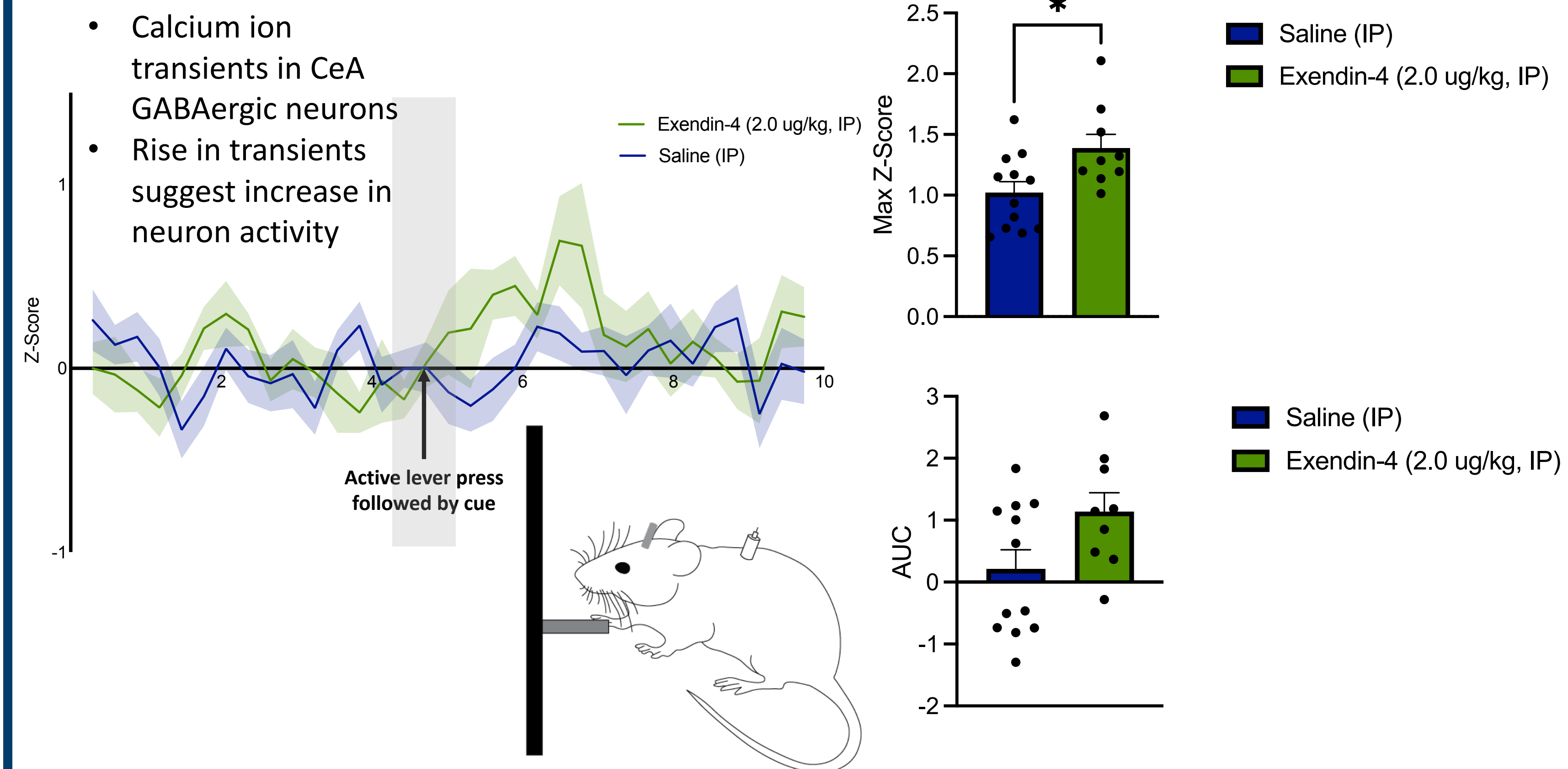
Cocaine increases the activity of CeA GABA neurons in drug-naïve rats



METHODS



RESULTS



SUMMARY

- Systemic pretreatment with GLP-1R agonist Exendin-4 **increased** Ca²⁺ transients in CeA GABAergic neurons in cocaine-experienced rodents
 - These findings align with our lab's previous findings that **activation** of CeA→NAc GABA projections attenuate cocaine seeking
- Future Directions**
- Explore potential differences between sexes in Ex-4's action on CeA GABA activity
 - Fiber photometry recording during cocaine self-administration to compare Ca²⁺ transients in both phases
 - Utilize a GABA sensor to specifically measure NAc-projecting CeA GABA neuron dynamics

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ACKNOWLEDGEMENTS

I would like to express my gratitude to my advisor Dr. Heath D. Schmidt, Riley Merkel, and everyone at the Schmidt Lab for their invaluable guidance and unwavering support. I would also like to thank CURF for providing the Grant for Faculty Mentoring Undergraduate Research which partially funded my project this summer.