Mitochondrial Morphology in Orbitofrontal Cortical Neurons During Incubation of Oxycodone Craving

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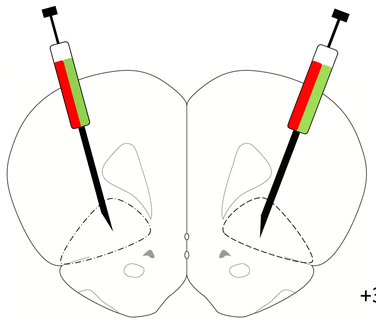
Background

- Relapse is a major challenge in treating opioid addiction, including oxycodone, a commonly abused prescription opioid.
- In rats, cue-induced oxycodone seeking progressively increases during abstinence.
- Our previous work demonstrated that orbitofrontal cortex (OFC) plays a critical role in this incubation of oxycodone craving.
- Here, we focus on mitochondrial dynamics in OFC and characterize the mitochondrial morphology in OFC neurons during incubation of oxycodone craving.

Dual-viral injection



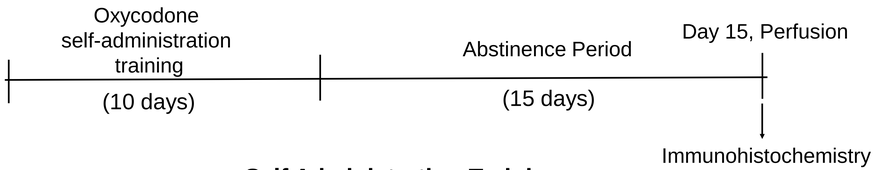
(AAV)-hSyn-GFP
+
AAV-CMV-mito-DsRed

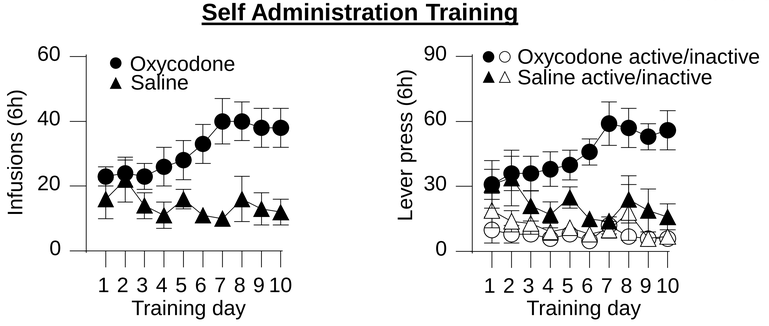
Saline:
Male = 5

Oxy:
Male = 6

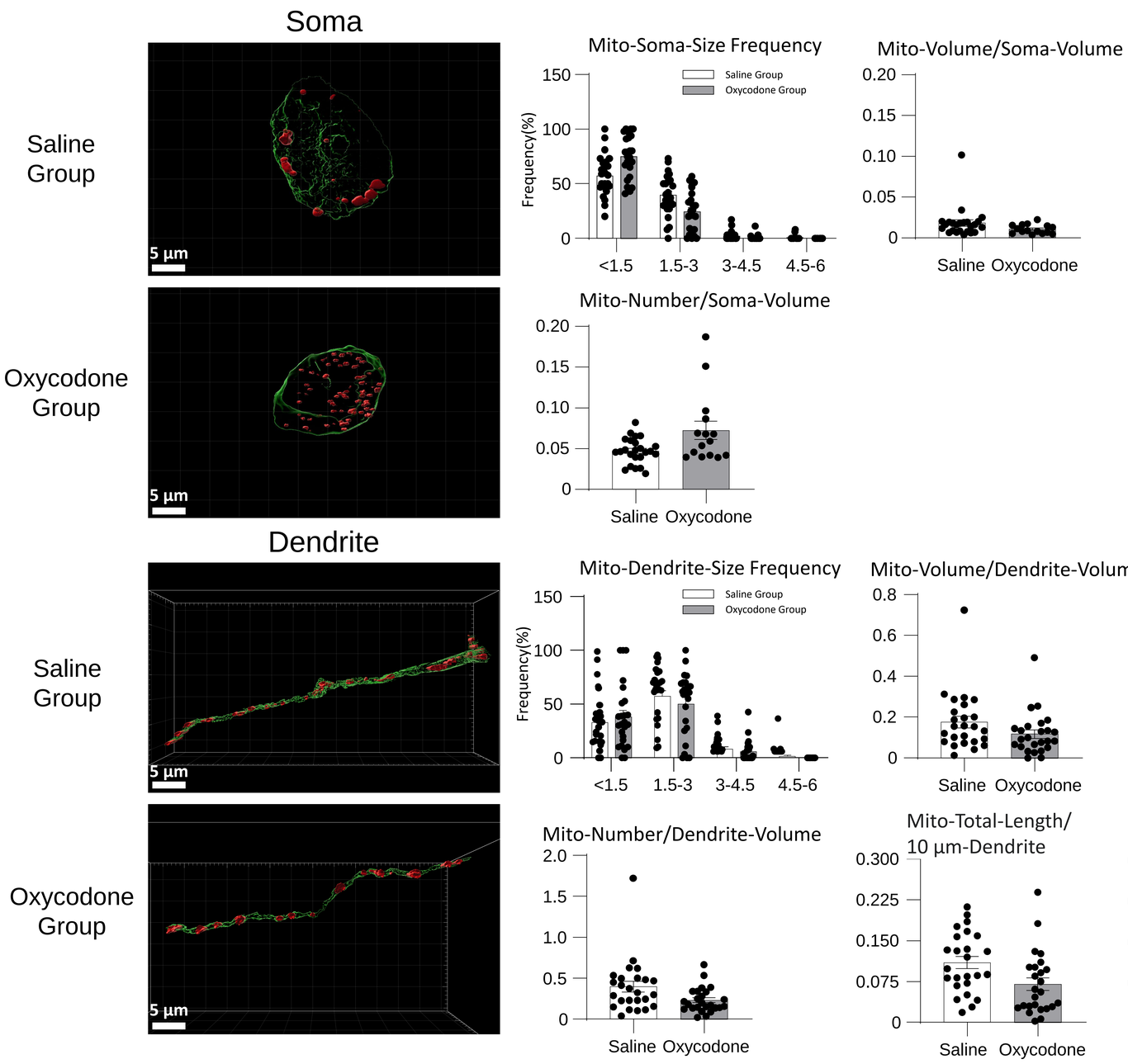
+3.3 mm

Oxycodone Self-administration Training





Results



Conclusion

-Mitochondria in OFC neuronal cell bodies enhanced fission after 15-day abstinence from oxycodone self-administration.
-There are no differences in mitochondrial morphology in primary dendrites of OFC neurons between the two groups.

References

- Altshuler RD, Yang ES, Garcia KT, Davis IR, Olaniran A, Haile M, Razavi S, Li X (2020). Role of orbitofrontal cortex in incubation of oxycodone craving in male rats. Addiction Biology. PMID: 32570285