# Neural correlates in Insular Cortex after volitional social reward

University of Maryland School of Medicine
Department of Anatomy & Neurobiology

Rosanna Marino[1], Kimberly M. Papastrat[1], Cody A. Lis[1], Leslie A. Ramsey[2], Marco Venniro[1]
1. Department of Anatomy and Neurobiology, University of Maryland School of Medicine
2. Behavioral Neuroscience Research Branch, National Institute on Drug Abuse, Intramural Research Program

Venniro Lab

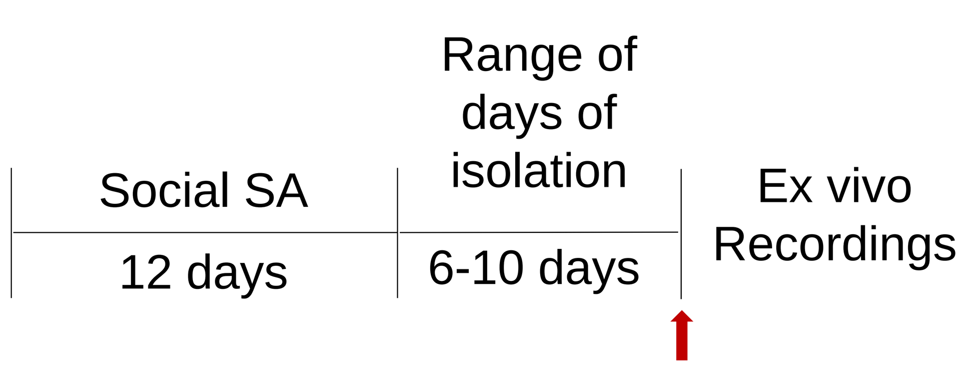
## Background

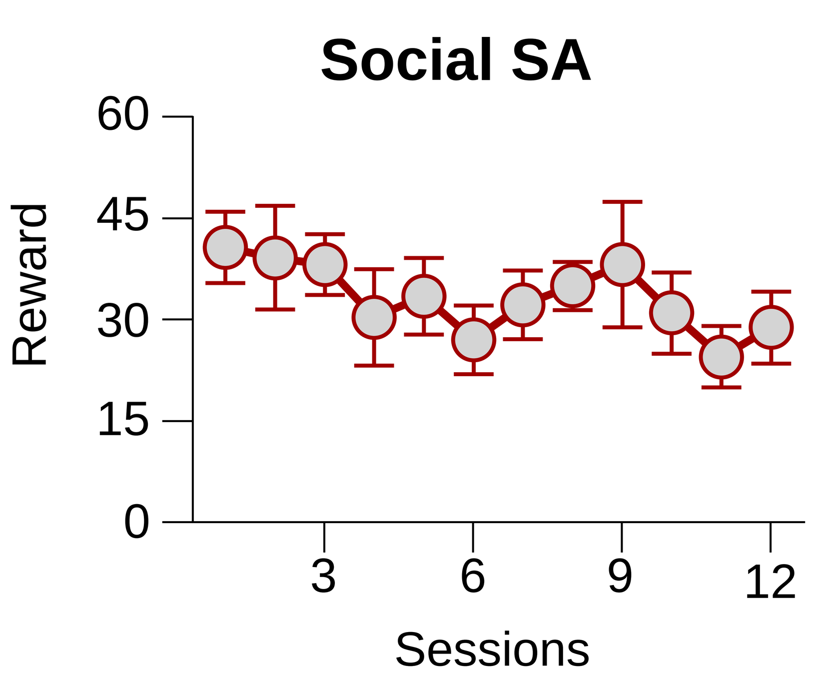
❖We recently developed a rat operant model of choice between abused drug and affiliative social interaction [1].
❖The insular cortex (IC) is critical for social and motivated behaviors in both humans and laboratory animals[2].
❖**Aim**: Determine the intrinsic properties and synaptic plasticity of IC underlying volitional social reward .

*References:*
1. Venniro et al., 2018 Nature Neuroscience
2. Rogers-Carter & Christianson, 2019 Neuro Bio Rev

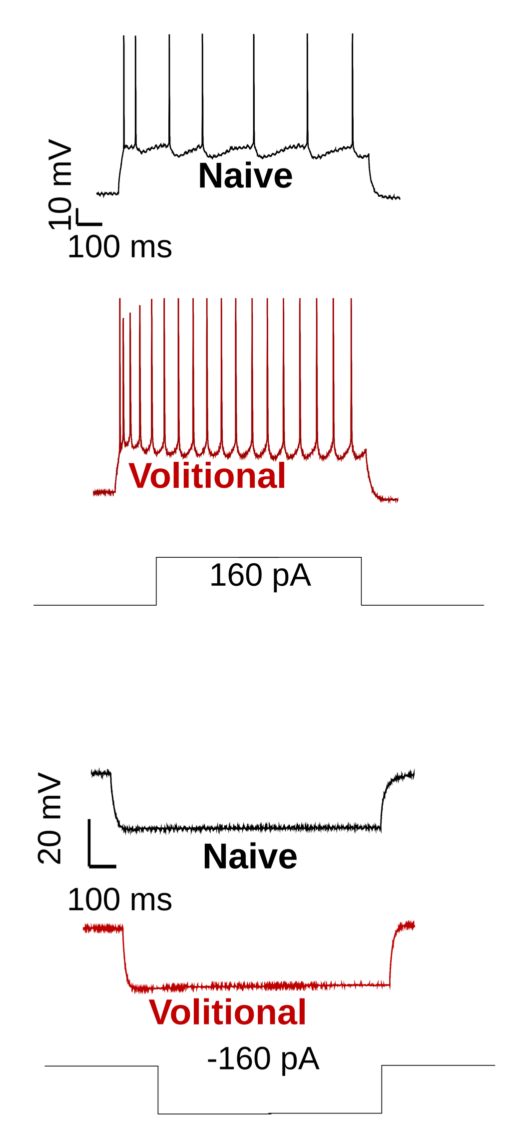
## Results

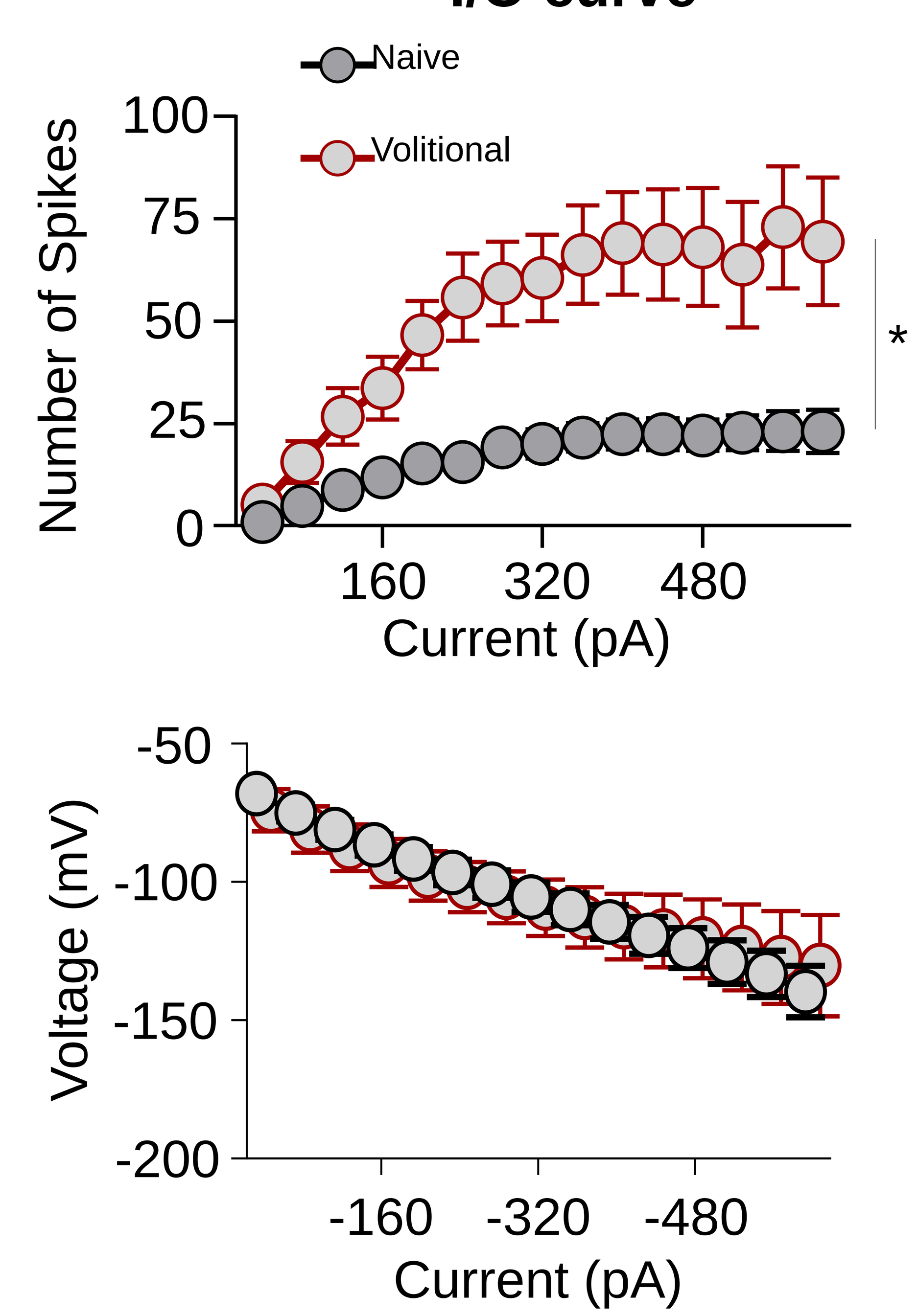
### Behavioral data



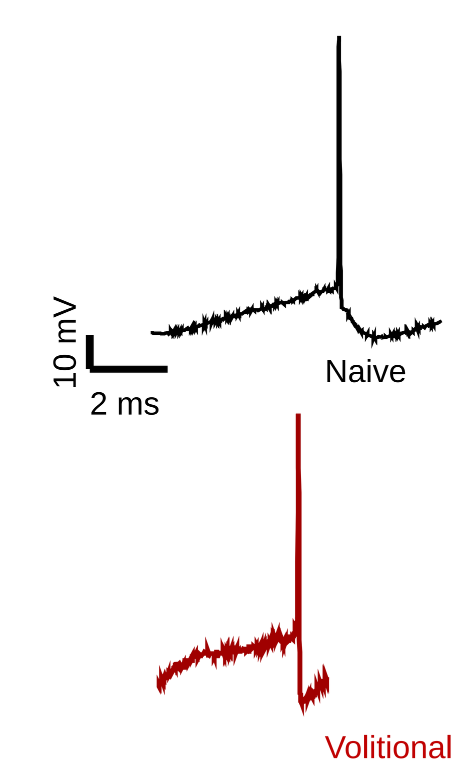



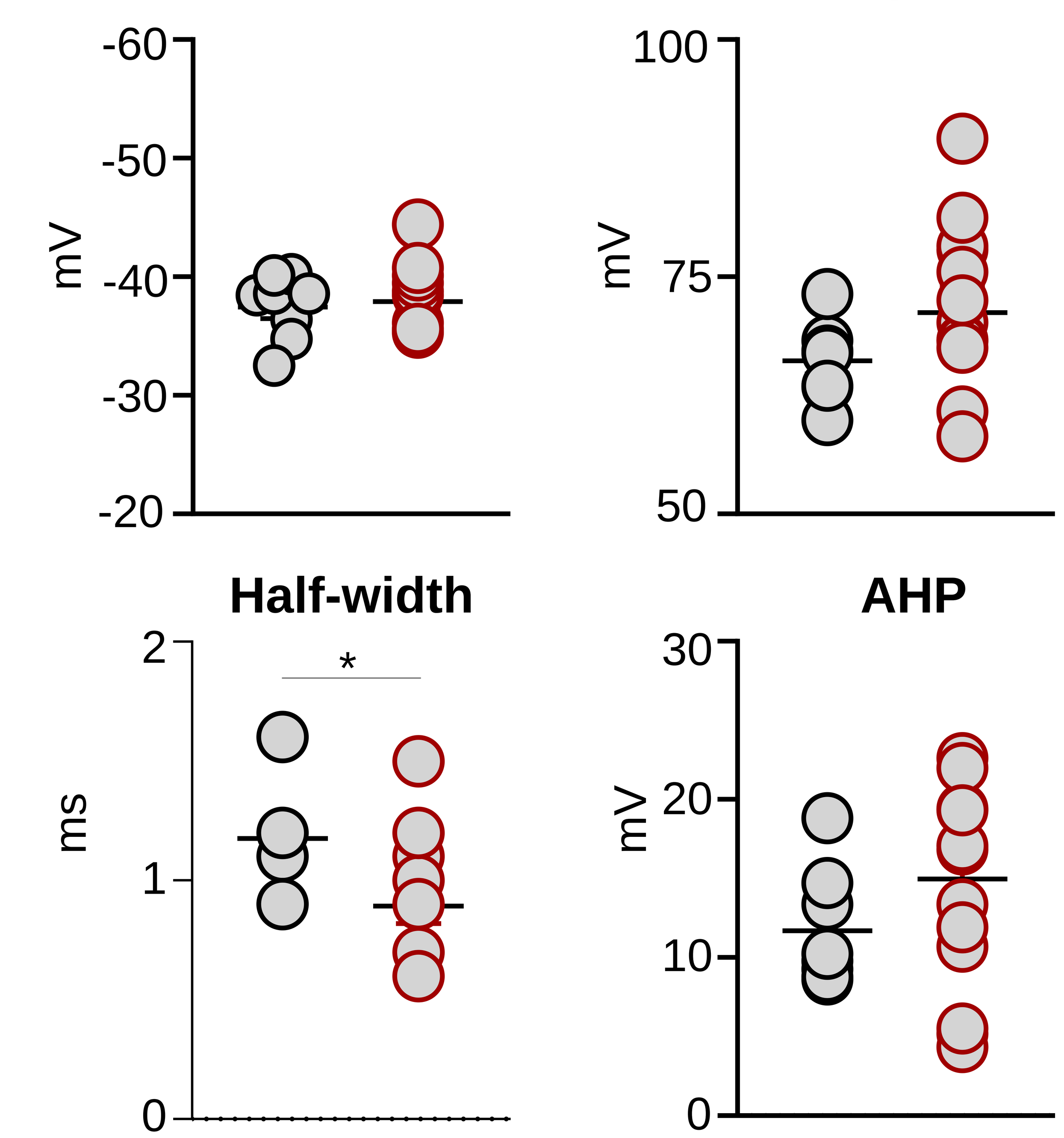

### Volitional social interaction increases excitability in IC neurons



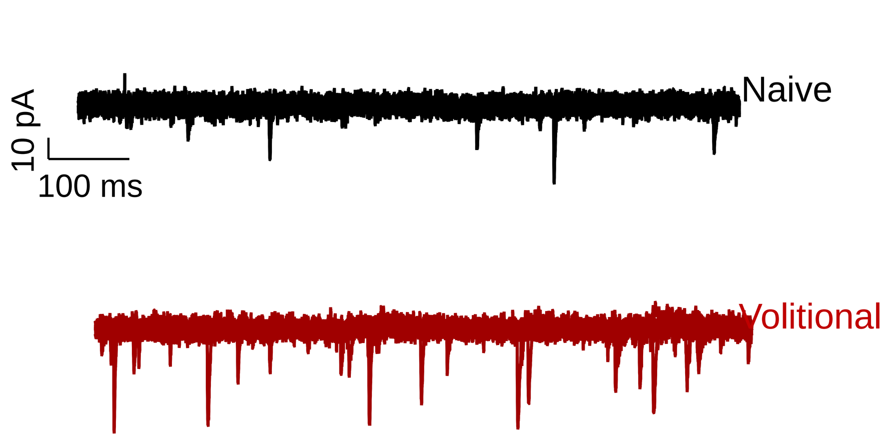

### Single action potential properties

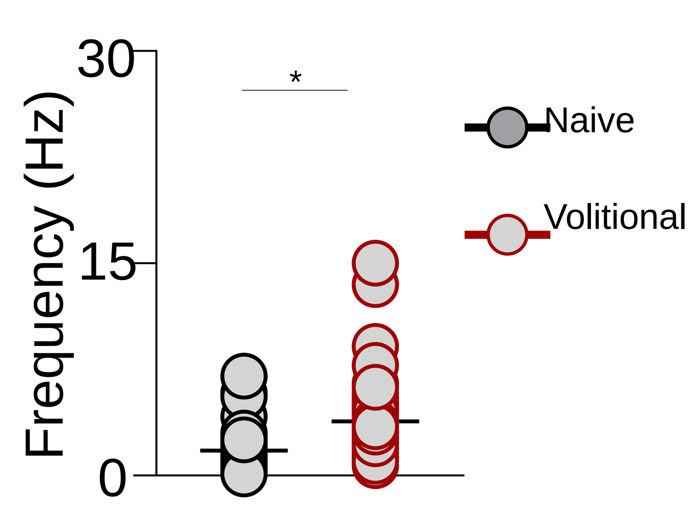


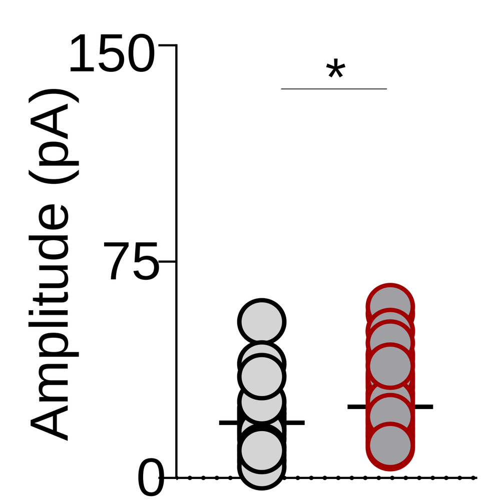




### Volitional social interaction increases synaptic transmission onto IC neurons

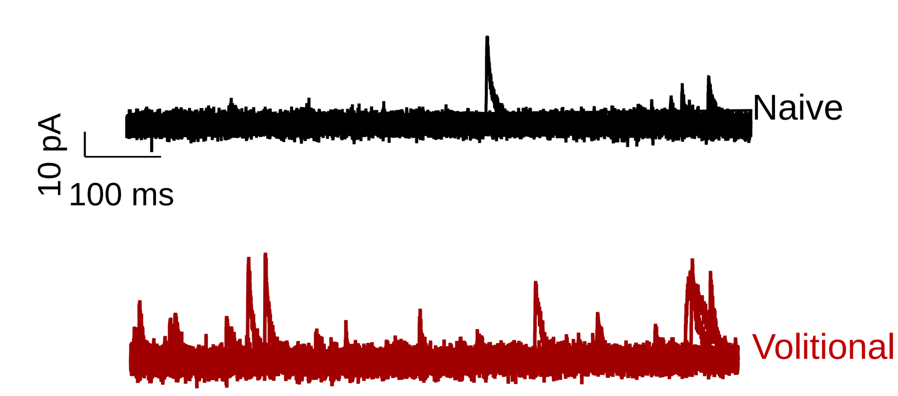
#### Spontaneous EPSC

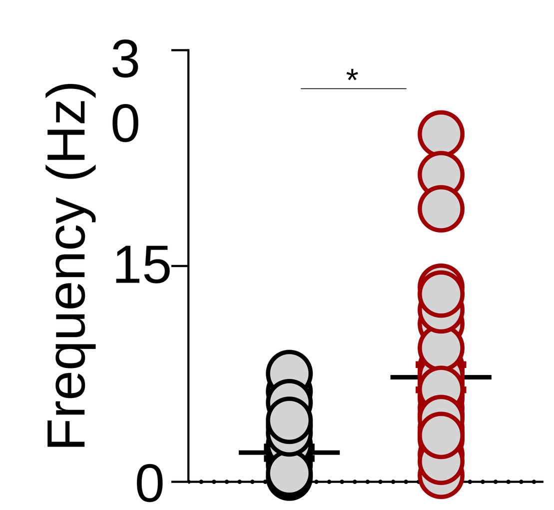


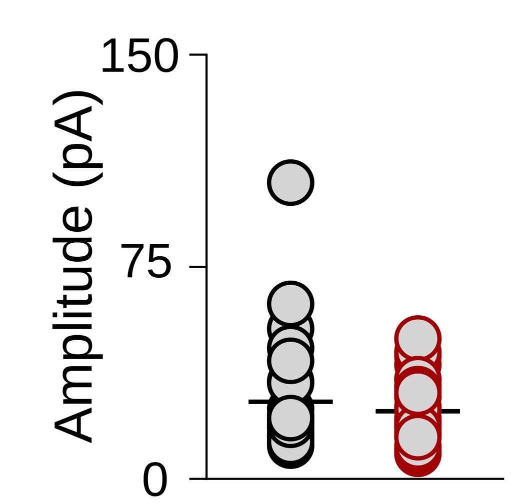




#### Spontaneous IPSC




## Conclusion

❖Volitional social reward increases excitability in IC pyramidal neurons.
❖Volitional social reward reduces spike half-width which may contribute to the observed changes in intrinsic excitability.
❖Volitional social reward increases sEPSC frequency, sEPSC amplitude and sIPSC frequency in IC pyramidal neurons.

marco.venniro@som.umaryland.edu vennirolab.org @MarcoVenniro