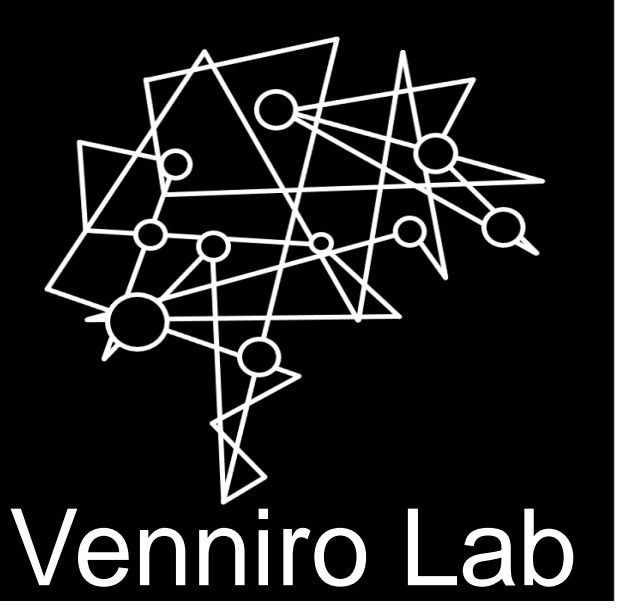




Norepinephrine mediates reciprocal social interactions

Cody A. Lis, Kimberly Papastrat, Zhengyi Huang, Jonathan Garcia, Vanessa Brecher, Rosanna Marino, Marco Venniro

Department of Neurobiology, University of Maryland School of Medicine, Baltimore, USA; Program in Neuroscience, University of Maryland School of Medicine, Baltimore, USA; Department of Psychiatry, University of Maryland School of Medicine, Baltimore, USA.



Background

- Social interactions are complex phenomena and involve reciprocal coordination based on the observation and interpretation of social cues^{1,2}.
- Animal models are commonly used to study social behaviors, but many current models place the social partner in a passive role³⁻⁵.
- Here, we developed a model where both resident and partner rats actively engaged in social interactions. Furthermore, we identified the pharmacological mechanisms underlying social coordination.

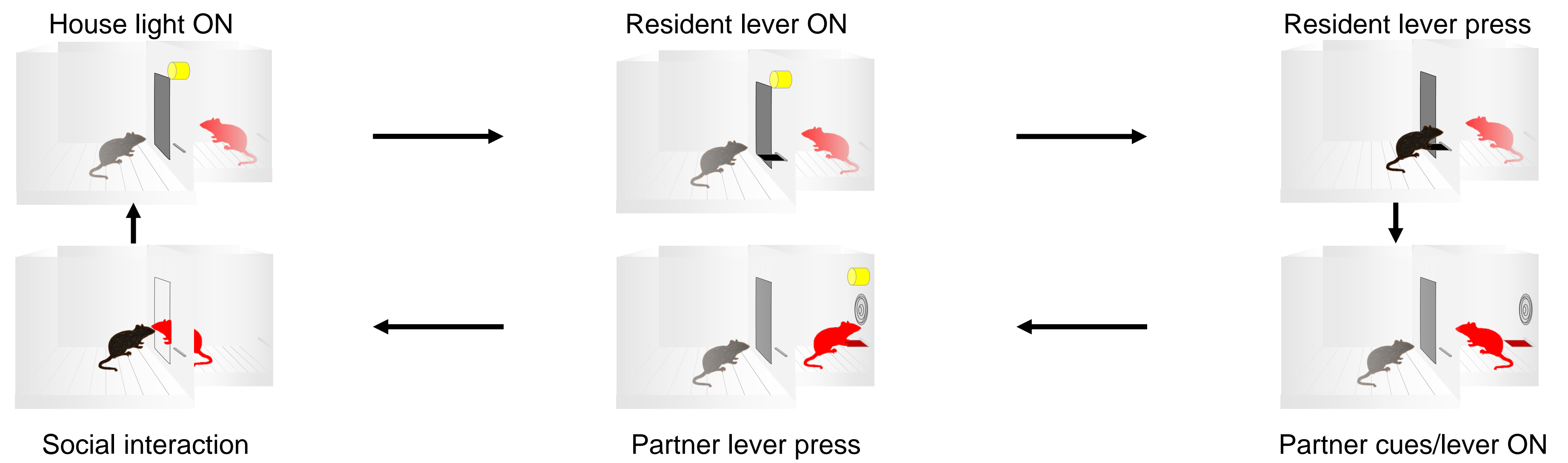
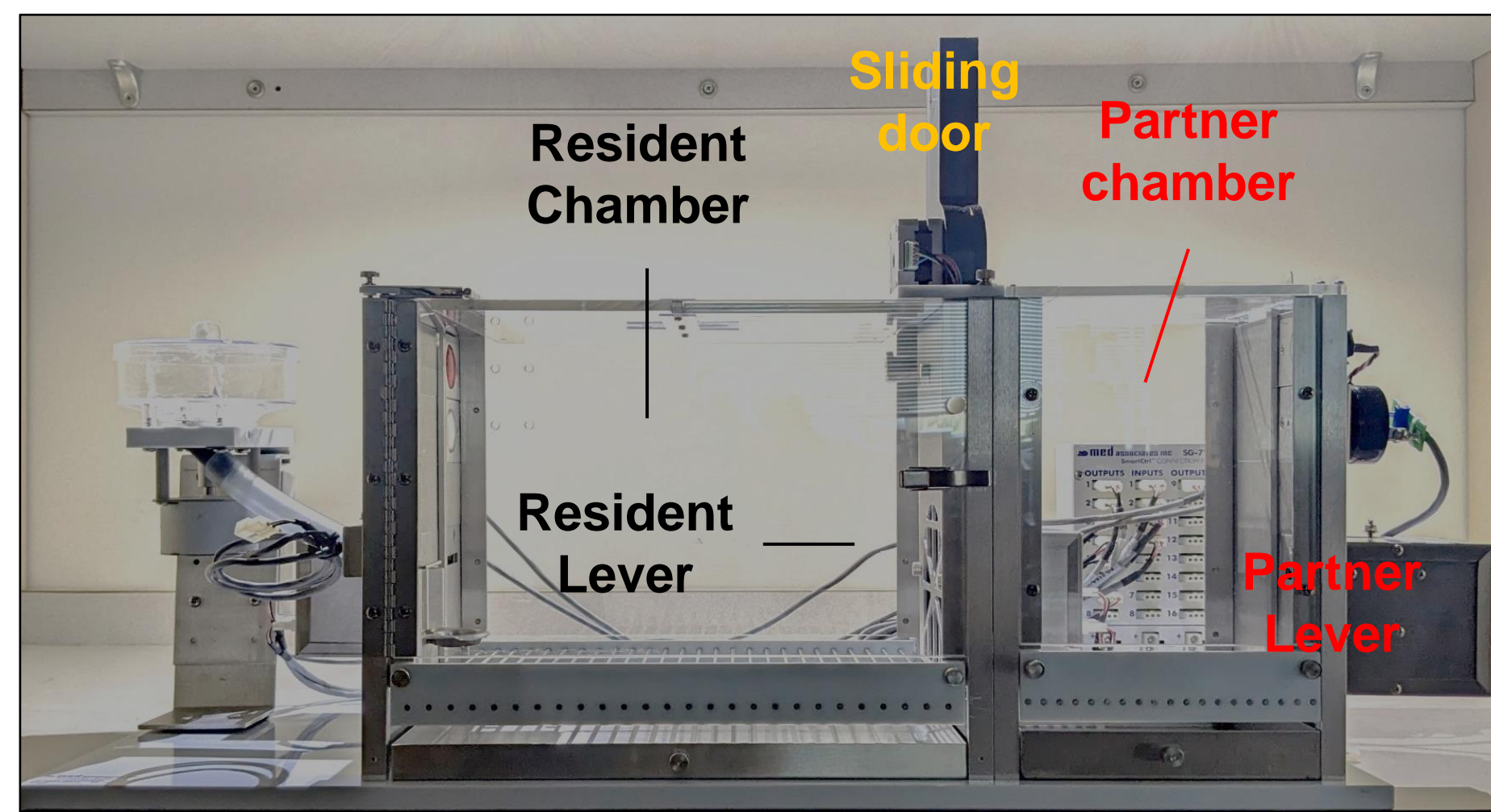
References:

1. Hackett et al., 2018 *J pers Soc. Psychol.*
2. Bolis et al. 2023, *Philos Trans R. Soc Lond B. Biol Sci.*
3. Achterberg et al. 2023, *Neurosci. BioBeh Rev.*
4. Venniro et al., 2018 *Nat. Neurosci*
5. Venniro et al. 2020 *Nat. Rev Neurosci.*

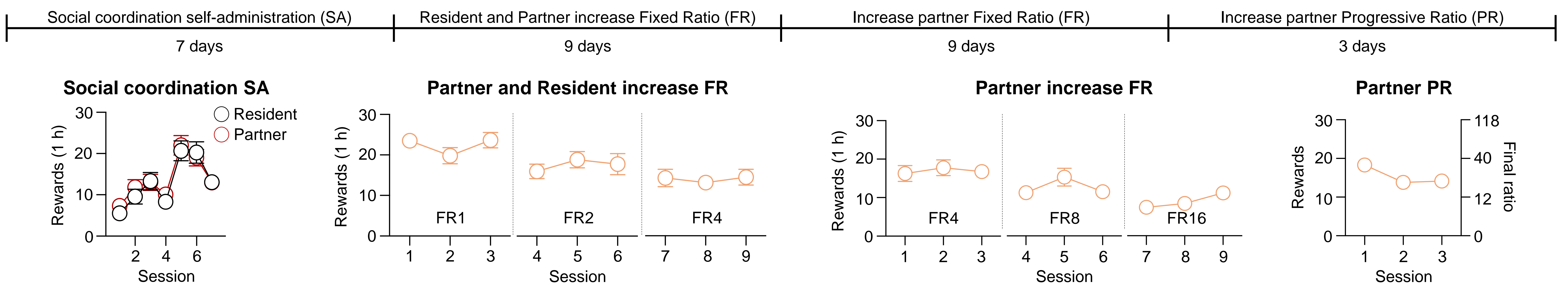
Results

Social coordination and experimental design

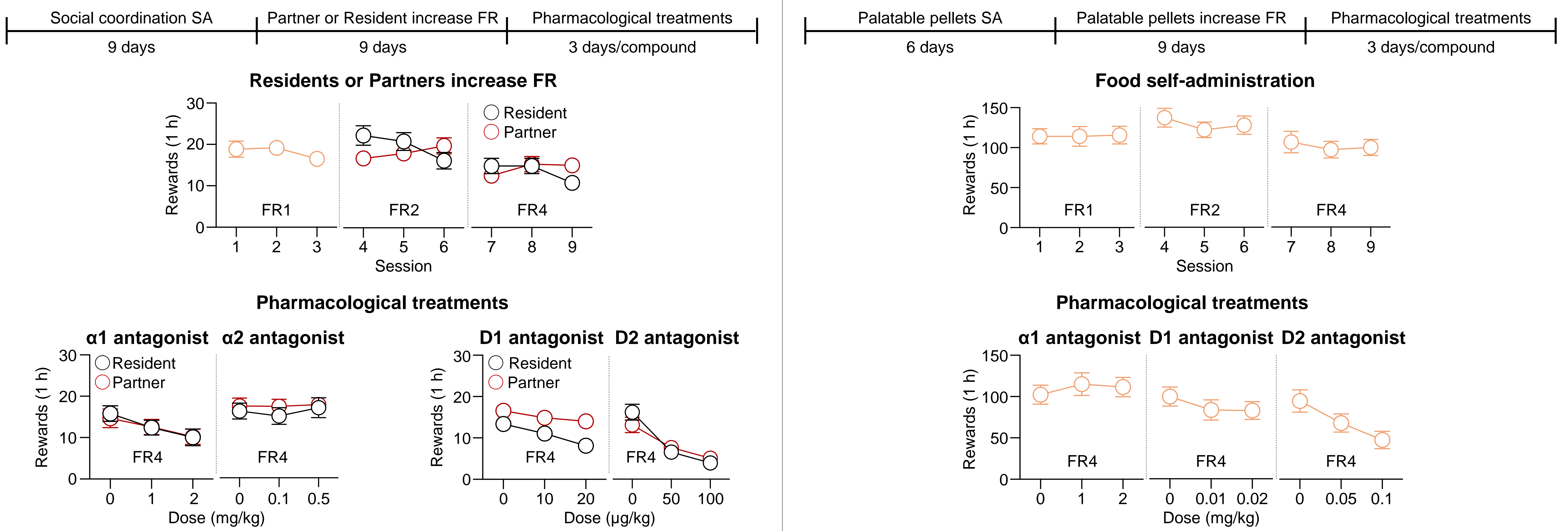
Social coordination self-administration chamber



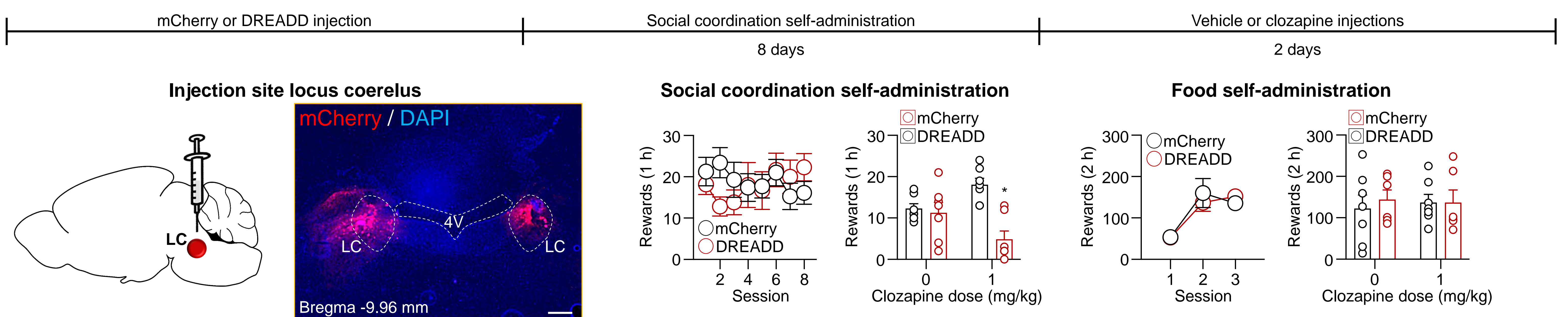
Male and female rats coordinate their motivation to engage in social interactions



Norepinephrine $\alpha 1$ receptor selectively mediates social coordination



Locus coeruleus is critical for reciprocal social interactions



Conclusion

- ❖ We developed a social coordination model in which rats complete a sequential operant task to socially interact.
- ❖ We report that norepinephrine $\alpha 1$ receptors selectively mediates social coordination in both partners and residents.
- ❖ We demonstrate that locus coeruleus is critical for reciprocal social interactions in both male and female rats.