

Review of: "Oxytocin neurons mediates the effect of social isolation via the VTA circuits"

Jun-Li Cao

Potential competing interests: The author(s) declared that no potential competing interests exist.

In this manuscript, Musardo et al. demonstrated that social isolation during adolescence in mice increased social interaction and this effect could last until adulthood—which may be mediated by oxytocin-related homeostatic adaptations within the PVT-VTA-mPFC reward circuit. The studies are interesting, important and shed light on mechanism that social isolation impacts neural circuits and behavior. It is also very interesting that one-week social isolation during adolescence produced a long-lasting effect. There are a few issues as following:

1. The behavioral finding in this study is clear and significant, however, neural and molecular mechanisms for this finding is not solid.
2. Whether social isolation increases the level of oxytocin (release of oxytocin) in the VTA including in acute phase and adulthood?
3. Whether the VTA express intrinsic oxytocin and what is its role in present behavioral finding?
4. Whether blockage of oxytocin receptors in the VTA during social isolation could abolish its acute and long-lasting effects on social interactions?
5. In electrophysiological experiments, they performed whole-cell patch clamp recording to measure the excitability of putative DA neurons in the VTA. In acute VTA slice, the spontaneous firing can be recorded in putative DA neurons. Why authors did not record the spontaneous firing to see difference in activity of DA neurons after social isolation?
6. Whether PVN oxytocin neurons and VTA DA neurons have the monosynaptic connections?
7. In present study, chemogenetic inhibition of PVN oxytocin neurons did not affect social interactions in grouped control mice, this result did not agree with previous finding (Science, 2017,357:1406-1411), please interpret it or repeat their behavioral protocol using present chemogenetic system.