Attenuation of social interaction-associated ultrasonic vocalizations and spatial working memory performance in rats exposed to chronic unpredictable stress

- Unpredictable chronic mild stress (CUS) is a commonly used protocol in rats that is reported to evoke antidepressant-reversible behaviors.

- We compared a widely used behavioral marker of anhedonia—the sucrose preference test, with another phenotypic marker of emotional valence, social interaction-associated ultrasonic vocalizations (USV) as well as a marker of an anxiety-like phenotype and cognitive performance in the eight-arm radial maze task in adult male Sprague–Dawley rats exposed to CUS for 4 weeks. Exposure to CUS resulted in:
    1) attenuation of social interaction-associated USVs,
    2) attenuation of spatial memory performance on the radial arm maze,
    3) attenuation of body weight gain,
    4) increased latency to feed in a novelty-suppressed feeding task,
    5) however, there was no significant change in sucrose preference.

- Our study demonstrates the utility of USVs in a social interaction context as an alternative to the sucrose preference test in determining the ability of CUS to generate an anhedonic-like phenotypic state. It remains to be determined if clinically relevant treatment with an antidepressant drug will reverse the effects of CUS on social interaction-associated ultrasonic vocalizations.

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Attenuation of social interaction-associated ultrasonic vocalizations and spatial working memory performance in rats exposed to chronic unpredictable stress

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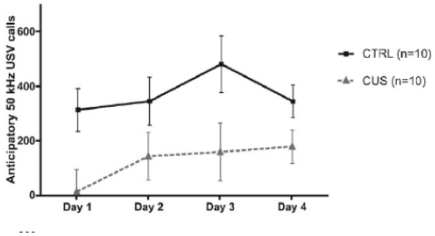
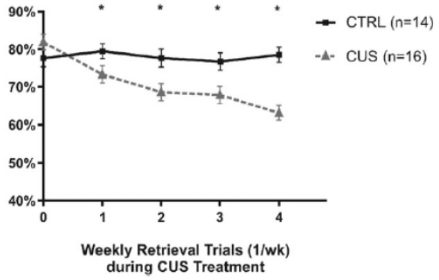


CUS-treated rats produced significantly lesser anticipatory 50 kHz USVs (Band-3; 44.5 – 100 kHz) through all 4 days of testing [$F(1,8) = 7.20$, $p < 0.05$,*].



CUS-treated animals had a significant reduction in memory retrieval (y-axis: % Success Rate) during all 4 weeks of CUS treatment, when compared with pre-treatment performance in the radial arm maze testing [$F(4, 40)$, $p < 0.05$, *].