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2023 ASRF Schedule

Apr 25th, 9:00 AM - 11:00 AM

The effect of cannabidiol (CBD) on behavioral and neuroinflammatory consequences of comorbid AUD and PTSD in a rat model

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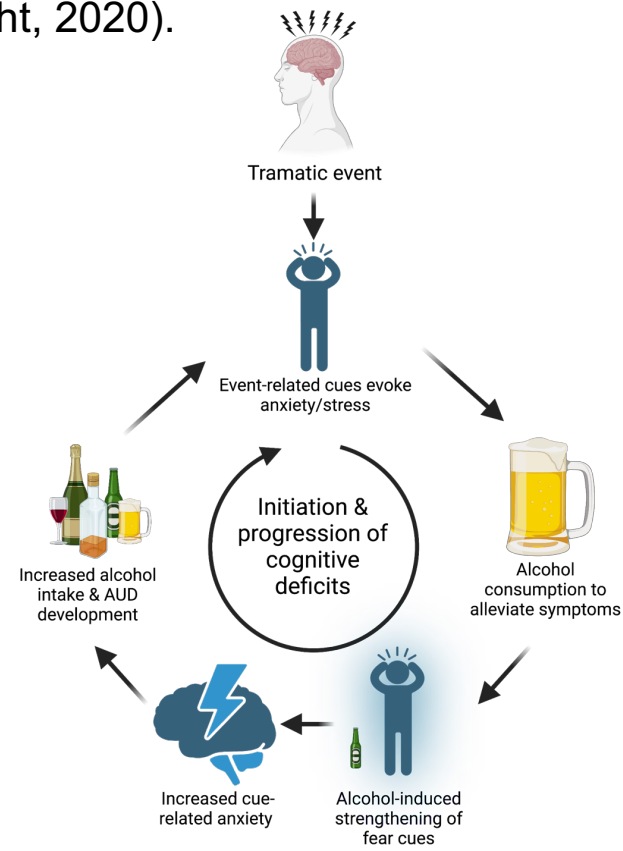
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McGuffin, Bailey; Schwartz, Britta; Wills, Liza; and Gass, Justin, "The effect of cannabidiol (CBD) on behavioral and neuroinflammatory consequences of comorbid AUD and PTSD in a rat model" (2023). *Appalachian Student Research Forum*. 142.
<https://dc.etsu.edu/asrf/2023/schedule/142>

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Background

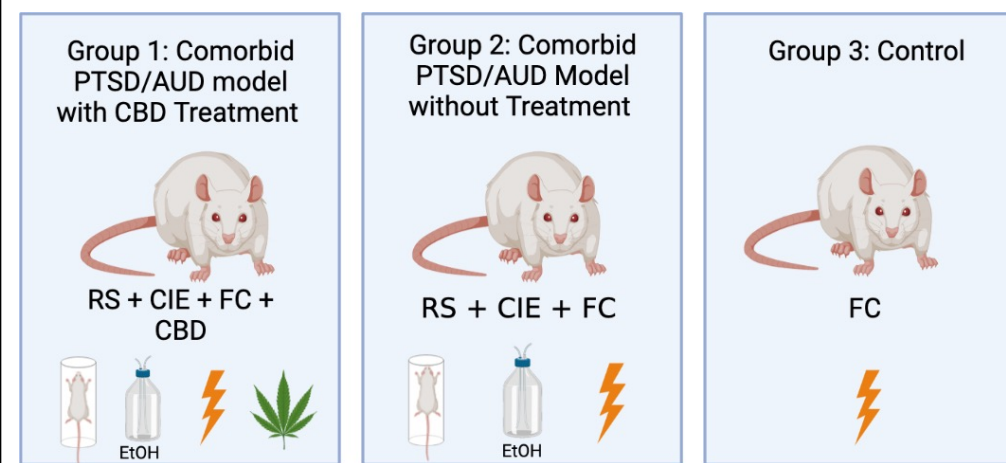
- Alcohol use disorder (AUD) and post-traumatic stress disorder (PTSD) are debilitating conditions that often co-occur, with an estimated 41-79% comorbidity rate (Pietrzak et al, 2011).
- The therapeutic potential of endocannabinoid modulation is a promising approach that can provide a much more effective treatment option for those suffering comorbid PTSD-AUD.
- Cannabidiol (CBD), a non-psychoactive compound found in cannabis, has been a focus of study due to its therapeutic potential (Bellozi, 2019; Blessing, 2015; Pellati, 2018).
- Researchers have demonstrated the anxiolytic and anti-inflammatory effects of CBD in both humans and animals, showing its promise as a novel therapeutic agent in the treatment of psychiatric disorders (Bergamaschi, 2011; Wright, 2020).



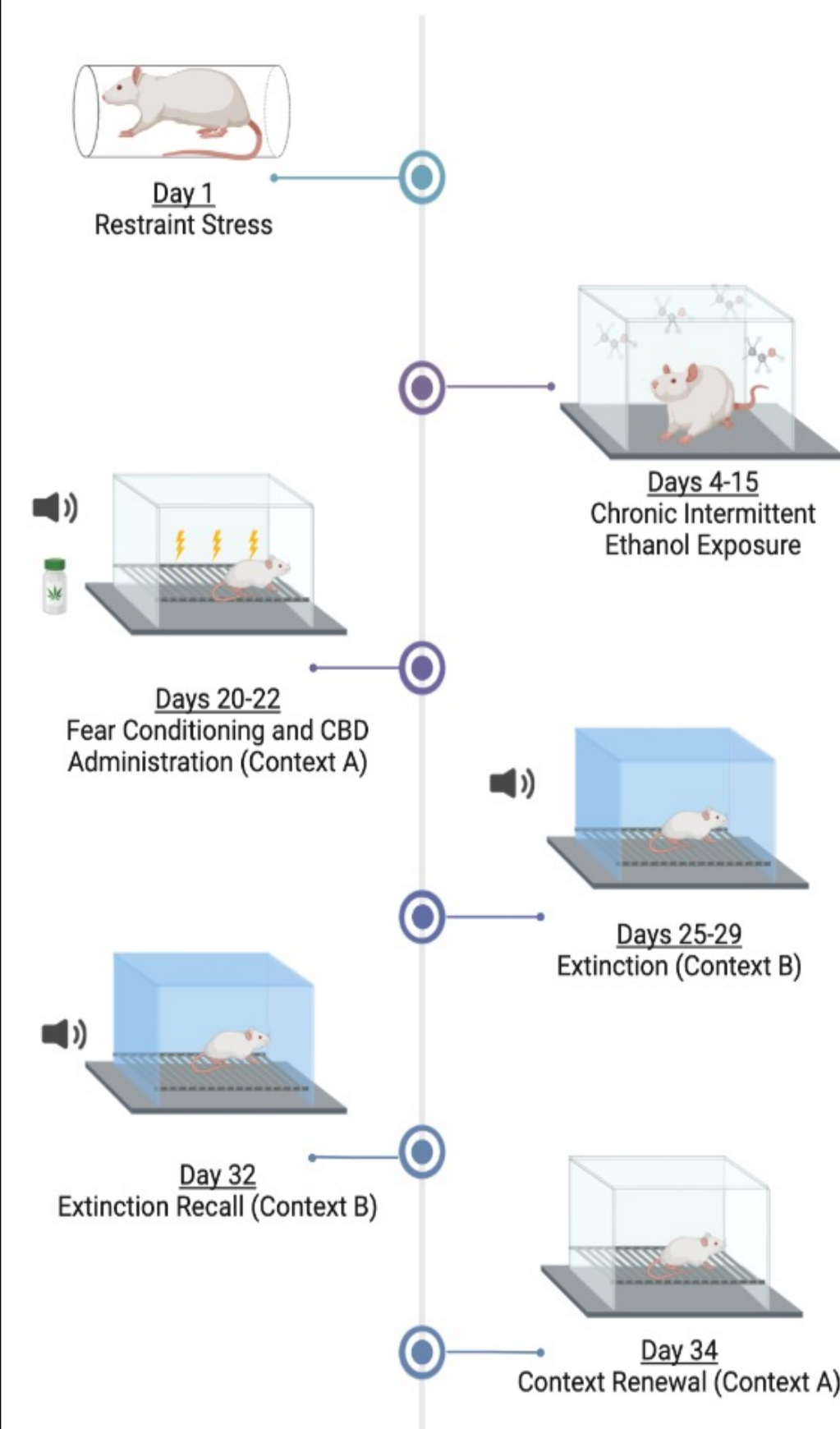
Purpose

- This study aims to examine the efficacy of CBD in the reduction of fear-related behaviors associated with comorbid AUD and PTSD.
- The overall hypothesis is that CBD will reduce fear-related behaviors in a rat model of AUD/PTSD. Specifically, rats with a history of stress and alcohol who receive a 20mg/kg i.p. injection of CBD during fear conditioning will display lower percent freezing time than saline and control rats and during fear conditioning.

Groups

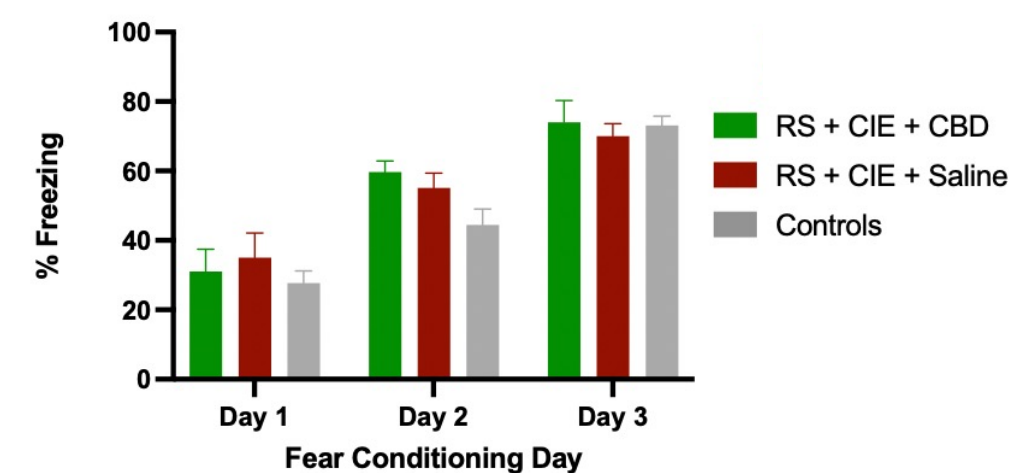


Methods Timeline



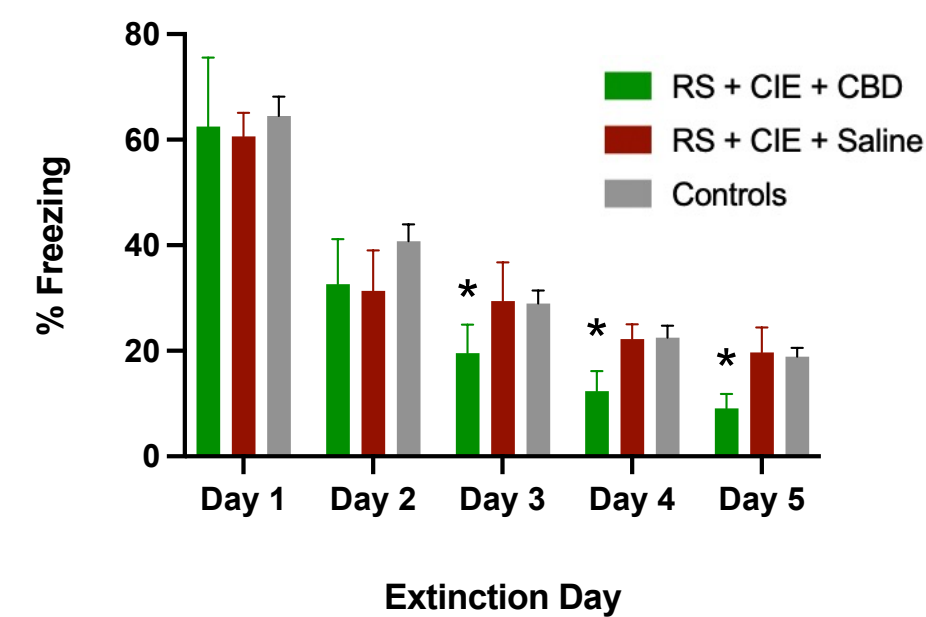
Figures created in BioRender

Fear Conditioning



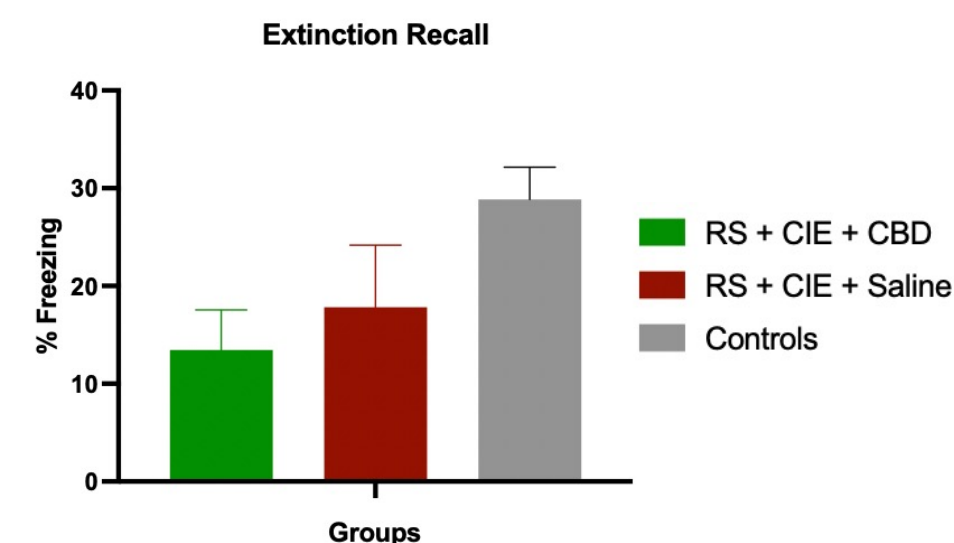
During fear conditioning there were no observed significant differences between the CBD, SAL, and CTRL groups.

Fear Extinction



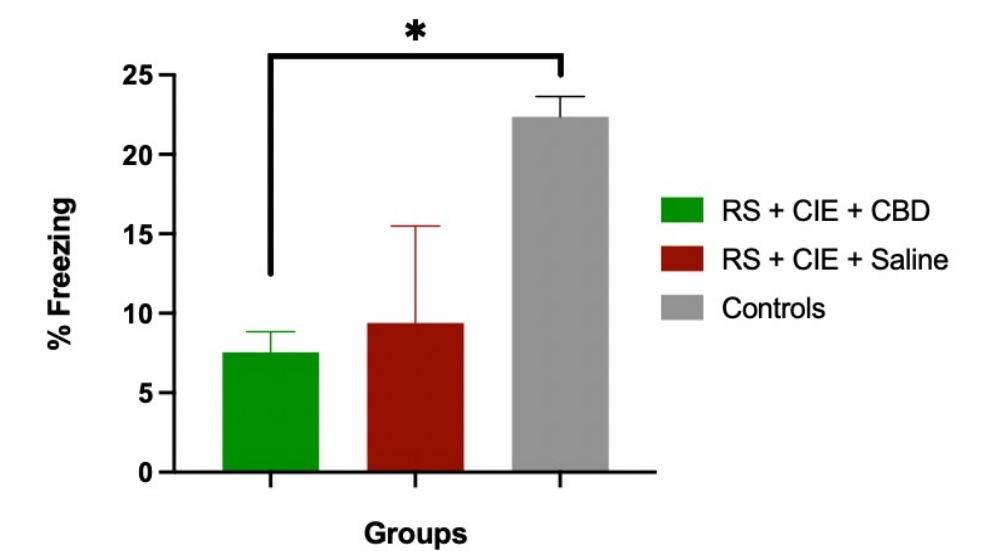
During fear extinction, CBD facilitated extinction learning. Freezing behaviors were significantly reduced in rats who received CBD on days 3, 4, and 5 when compared to SAL and CTRL groups [$F(8,56) = 2.214, *p < 0.05$].

Fear Extinction Recall



During fear extinction recall there were no significant differences between the CBD, SAL, and CTRL groups.

Context Renewal



During context renewal the CBD group froze significantly less [$F(2,15) = 4.81, *p < 0.05$] than the CTRL group.

Discussion

- Our current results indicate rats with a history of acute stress and alcohol exposure displayed significantly higher freezing behaviors and this effect was significantly decreased with CBD treatment.
- CBD was shown to enhance extinction, maintain extinction during recall, and translated the extinguished memory to context renewal.
- Taken together, the current results show promise for CBD to reduce enhanced fear-related behavior associated with comorbid AUD and PTSD. The current study provides additional evidence for the therapeutic potential of CBD in the attenuation of exacerbated fear-related behaviors associated with comorbid AUD and PTSD.
- These results could be paramount in the treatment of PTSD-AUD because the endocannabinoid system affects reward-related behavior, anxiety-like behavior, and the expression of conditioned fear. Many of which those battling this comorbidity struggle with daily.
- Future studies will be implemented to assess the role of CBD in reducing stress and alcohol-induced neuroinflammation. As well as, exploring if CBD can attenuate alcohol self-administration in rats with a history of stress and alcohol addiction.

Funding

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