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Cannabidiol Attenuates Nicotine Self-Administration and Withdrawal Symptomology in Mice

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Cigarette smoking remains a leading cause of preventable disease and death worldwide. Due to the damaging effects of smoking, many users attempt to quit, but few are successful in the long-term.

Thus, there is a critical need for novel therapeutic approaches. In these investigations, we sought to investigate whether cannabidiol (CBD) has the potential to be repurposed as a cessation therapeutic. In the first study, male and female C57BL/6J mice were trained to respond for intravenous nicotine infusions at either a low or moderate nicotine dose. Once stable responding was evidenced, mice were pretreated with CBD (0, 40, or 100 mg/kg) in a Latin square design. We found that both doses of CBD decreased intravenous nicotine self-administration at the lower and moderate nicotine dose. In the second study, we examined lever pressing for food reward and found no significant effect of CBD on lever pressing behavior, thereby demonstrating the specificity of CBD for nicotine intake. In the third study, we investigated the potential effects of CBD in mitigating nicotine withdrawal symptoms, and we found that administration of 30 and 60 mg/kg CBD attenuated various aspects of nicotine withdrawal, including physical and affective signs. Together, these results indicate that modulation of cannabinoid signaling may be a viable therapeutic option for smoking cessation.

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