



# Research Week 2023

## Chronic prenatal delta-9-tetrahydrocannabinol exposure impacts offspring behavior in rhesus macaques

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### Keywords

Cannabis, marijuana, delta-9-tetrahydrocannabinol, prenatal cannabis exposure, maternal cannabis use

### Abstract

#### Background:

Cannabis is the most frequently used federally illicit substance in pregnancy. The available human literature suggests that infants exposed to cannabis in pregnancy display signs of impaired neurodevelopment, including altered visual perception, exaggerated response to stimuli, and a high-pitched cry. Results from human studies are often confounded and limited by retrospective observational data, thus a relevant, translational animal model is needed.

#### Objective:

The objective of this study is to define the impact of chronic contemporary THC exposure on infant sensorimotor development and socioemotional behavior in a rhesus macaque model.

#### Methods:

Timed-pregnant rhesus macaques (n=8) were divided into 2 groups, control (CON, n=4) and THC-exposed (n=4). All animals were maintained on a standard chow diet with the THC group receiving an additional THC edible daily. These animals were titrated to 2.5mg/7kg/day of THC (equivalent to a heavy human medical cannabis dose) over 4 months to model established medical marijuana acclimation guidelines. All animals then underwent time-mated breeding with the THC group maintained at their THC dose throughout pregnancy and during lactation. All animals delivered naturally at term. Neonates were assessed from birth to postnatal day 120 (P120) for markers of sensorimotor development, object retrieval and permanence, emotional regulation in response to novel stimuli, and maternal attachment.

## Results:

Compared to their control counterparts, all THC-exposed infants (n=4) exhibited increased anxiety in response to novel stimuli and displayed less independence during maternal-infant interactions.

## Conclusion:

In our rhesus macaque model, prenatal exposure to THC was associated with an adverse effect on infant socioemotional behavior including greater anxiety and decreased independence that may have long-term implications for offspring outcomes. Further studies are needed to determine whether these findings in early childhood correlate with long-term offspring neurodevelopmental health.