

CANNABIS AND THE DEVELOPING BRAIN: CONCEPTION TO CHILDHOOD

Cannabis Affects the Developing Brain

How? Through the Endocannabinoid System (ECS)

Brain cells communicate by sending and receiving chemical messages.

Like an electrical connection, these brain cells must be aligned properly during development to complete a fully functional neural circuit.

The ECS plays a significant role in the growth and alignment process from perinatal to childhood brain development.

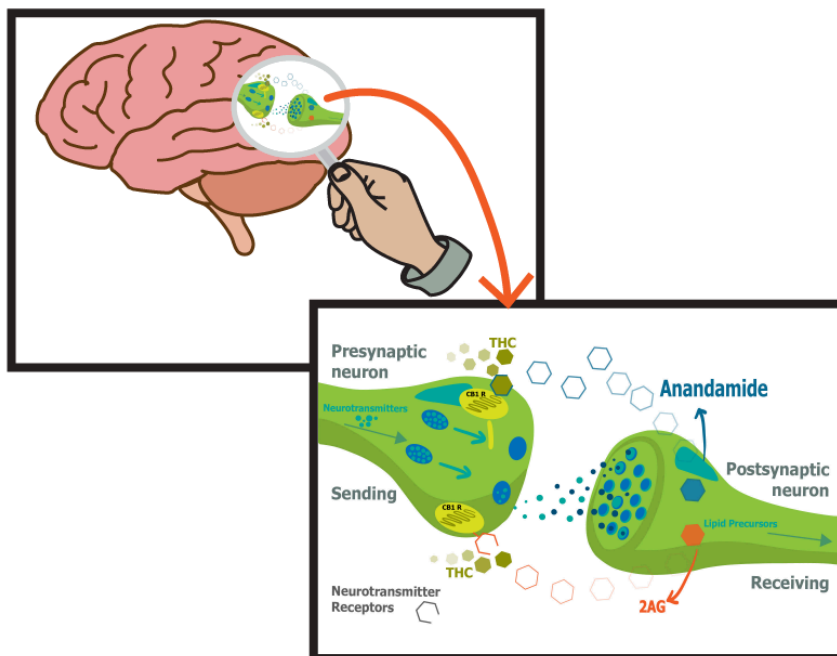


Figure 1: THC from Cannabis binds to receptors (R) in the ECS, affecting normal function and development.

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Role of the ECS in Brain Development

Biological Function

The endocannabinoid system (ECS) is a complex, natural network of biochemicals, structures, and functions in the body.

Cellular Growth

The ECS plays a significant role in brain cell growth and development, from initial formation during pregnancy through childhood until full brain maturity around age 25.

Cellular Communication

The maturation process includes brain cell growth and development of chemicals and connections between cells necessary for communication and function.

Cannabis Use and Genetics

Cannabis use may cause genetic alterations in either parent, which can be passed on to offspring.

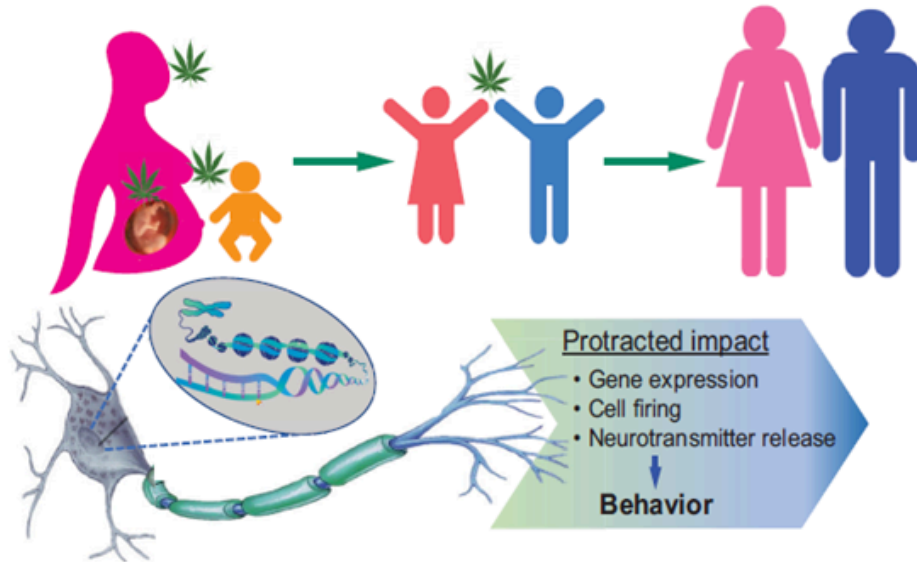


Figure 2: Cannabis exposure during prenatal, perinatal, and adolescent periods of development can exert prolonged effects on adult brain processes. These effects can lead to psychiatric vulnerability of underlying relevant behaviors. *Reproduced with permission from Hurd, Melis (2019).*

Cannabis Use and Pregnancy

Associated with increased risk of neonatal ICU stay, neurodevelopmental delays, autism, and autistic-like deficits.

Cannabis chemicals are transferred to baby through breastmilk, significantly prolonging exposure.

Functional and behavioral deficits in children, even as adults.

Increased risk of psychiatric disorders (e.g., increased anxiety, substance abuse disorder).

Increased risk for abuse of other drugs and addiction.

Does preconception cannabis exposure impact developmental outcomes?

Adult male cannabis use decreases sperm concentration.

Does cannabis exposure impact fertilization and early life development?

Adult male cannabis use changes DNA in sperm.

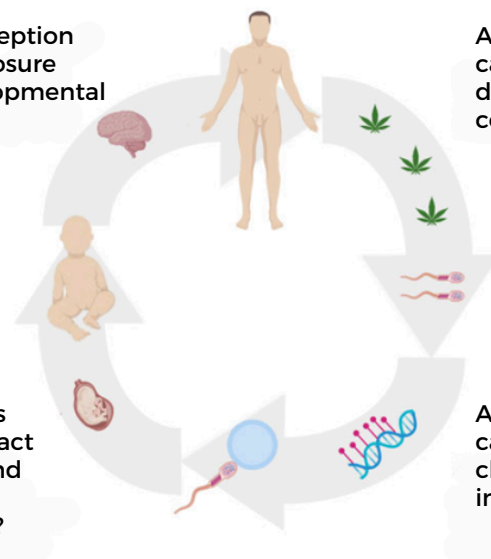


Figure 3: Overview of cannabis exposure and potential consequences. *Reproduced with permission from Murphy, Oxford University Press License (2020).*

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