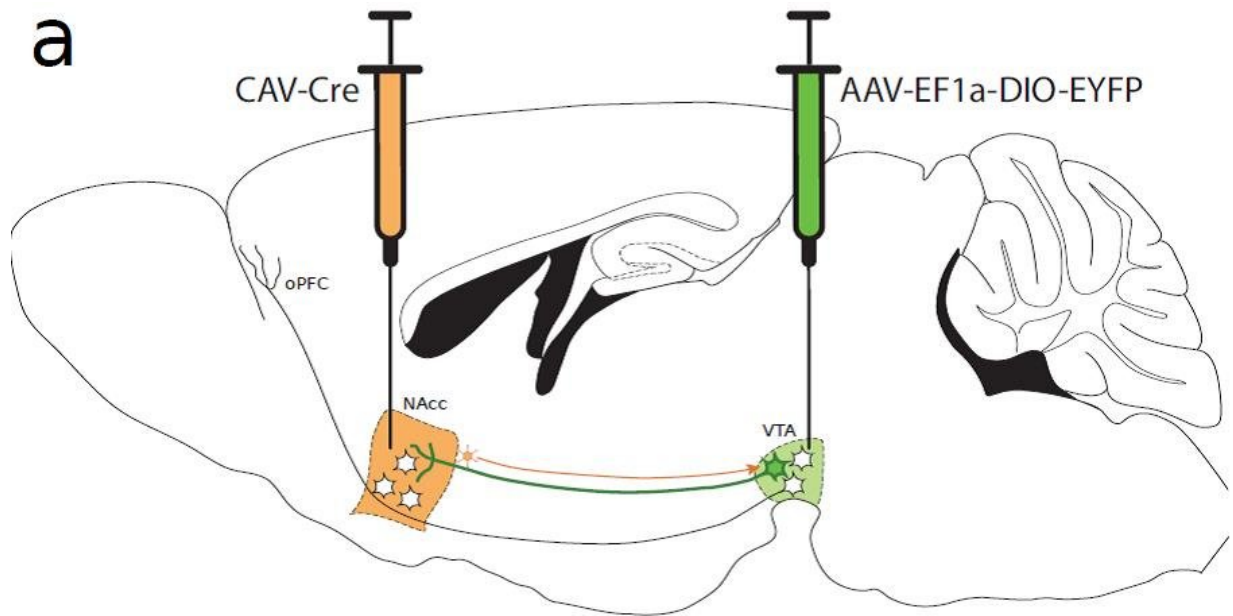


Amphetamine abuse disrupts development of mouse prefrontal cortex

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Axons continue to grow to the orbital prefrontal cortex during adolescence. This image illustrates the dual-viral injection method used to label nucleus accumbens-projecting ventral tegmental area neurons. Credit: Hoops et al., *eNeuro* (2018)

Recreational drug use during adolescence may disrupt development of an understudied part of the prefrontal cortex, according to a study of male mice published in *eNeuro*.

Brain cells that utilize the [neurotransmitter dopamine](#) are key players in

the development of the [prefrontal cortex](#), which continues to mature through early adulthood. During adolescence, the axons of these [dopamine neurons](#) extend from the nucleus accumbens to the medial prefrontal frontal cortex.

Cecilia Flores and colleagues show that this delayed growth of dopamine axons also applies to the orbital prefrontal cortex (oPFC), a brain region involved in complex functions such as decision-making, but the development of which is poorly understood. Mice exposed to the stimulant amphetamine at doses similar to those obtained when the drug is abused by humans had fewer synapses in the oPFC, likely as a result of reduced axon growth, compared to control mice.

The researchers did not observe ongoing adolescent dopamine axon growth nor similar effects of amphetamine in a neighboring brain region, the [piriform cortex](#). This suggests that the ongoing extension of dopamine axons and their sensitivity to environmental influences like drugs may be unique to the prefrontal cortex.

More information: Dopamine development in the mouse orbital prefrontal cortex is protracted and sensitive to amphetamine in adolescence, *eNeuro*, [DOI: 10.1523/ENEURO.0372-17.2018](https://doi.org/10.1523/ENEURO.0372-17.2018)

Provided by Society for Neuroscience

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