

# Exposure to Psilocybin Alters Perception of Rewarding and Fearful Stimuli in Adulthood

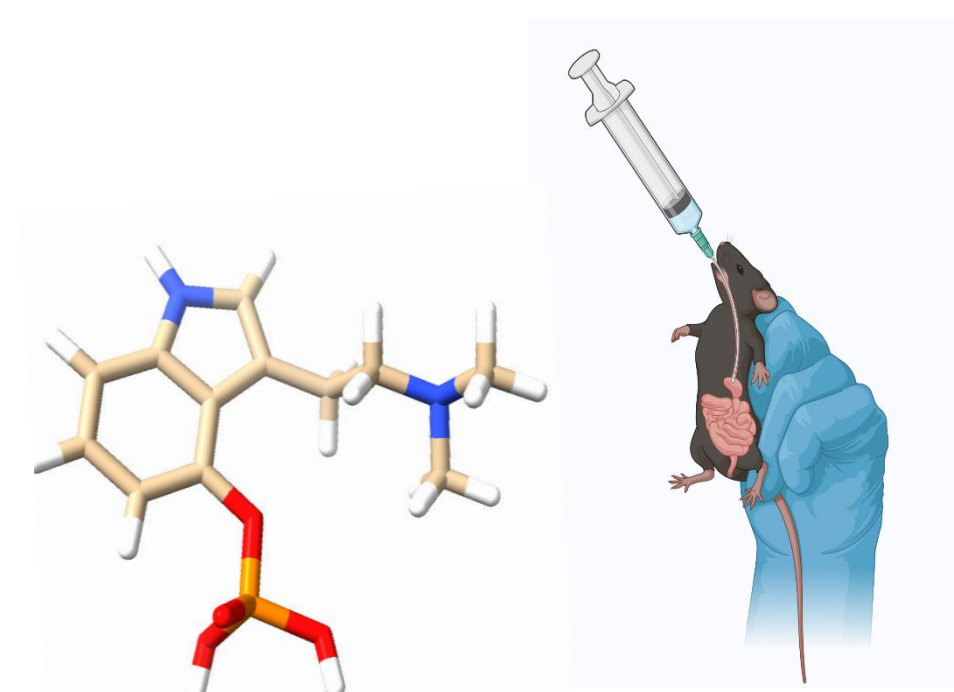
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## Background, Motivation, & Goals

In recent years, psilocybin has gained attention as a therapeutic treatment for psychiatric disorders, partly due to its ability to enhance brain neuroplasticity. The developmental changes in the brain after exposure to psilocybin were investigated in adolescent mice. 3 months later, the mice, now adults, were imaged awake for brain activity and connectivity while being exposed to rewarding (benzaldehyde/almond) and threatening (fox) scents.

## Process and Methods

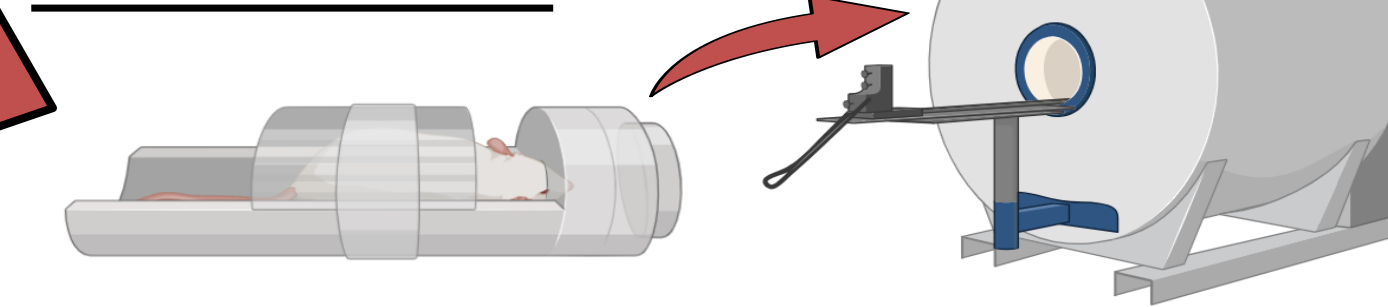
### Drug exposure



### Drug 7T MRI

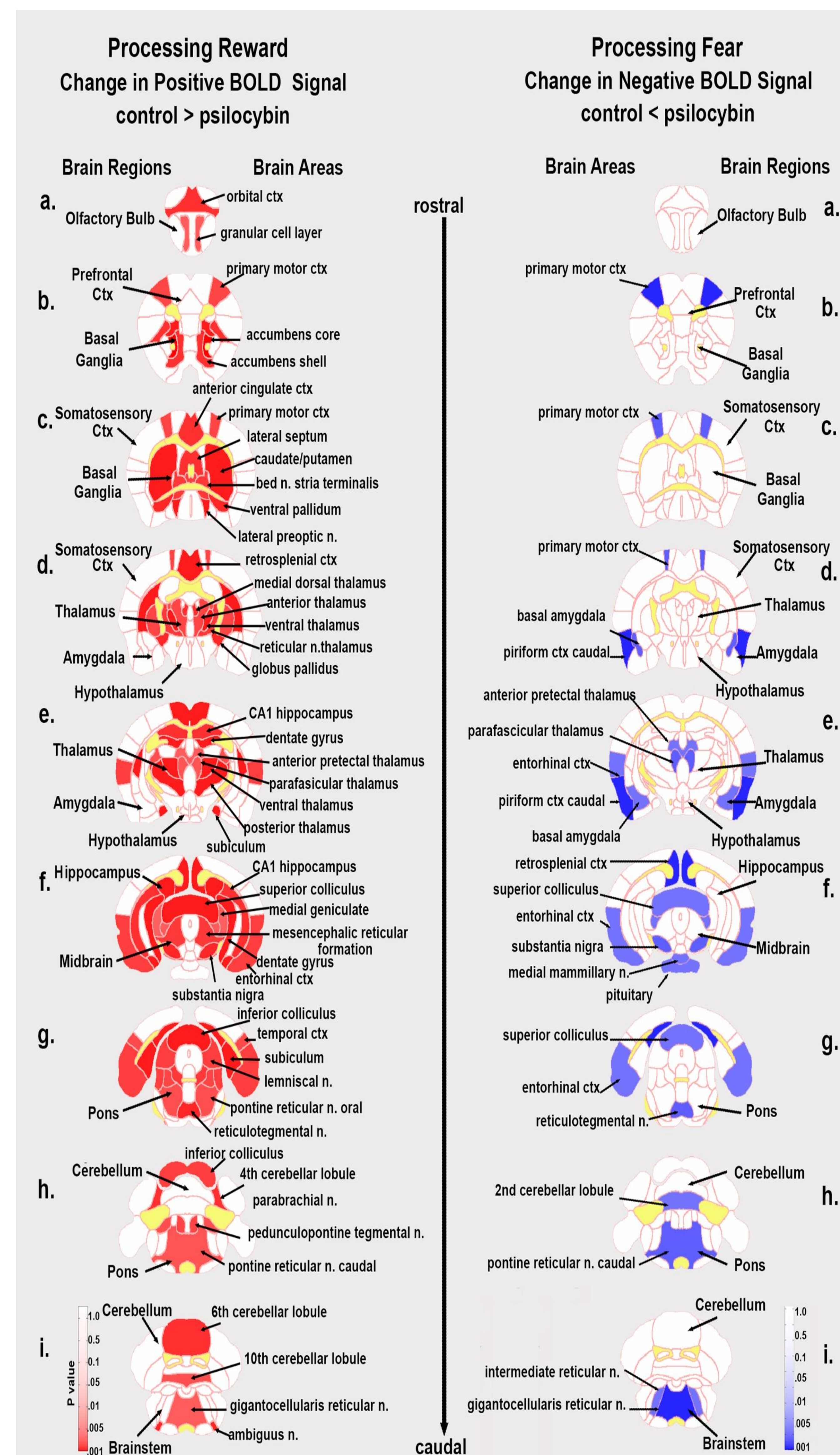
### fMRI Imaging

### Acclimation



### Lipidomics and Histopathology

## Findings



### Reward Response

The psilocybin-treated group experienced a decreased positive BOLD (Blood Oxygen Level Dependent) signal which can be due to a reduction of neural activity, functional deactivation, and changes in vascular responses. This indicates decreased activation in reward-related regions, such as the ventral striatum and the nucleus accumbens. The ventral striatum (located in the basal ganglia) and the nucleus accumbens (within the ventral striatum) are closely related regions in the brain, playing key roles in reward, motivation, and emotional processing. The significance is that the psilocybin given to the mice during adolescence has reduced motivation and has weakened the neural response to rewarding stimuli.

### Fear Response

The psilocybin-treated group experienced an increased negative BOLD signal, which can be a result of neural inhibition and brain regions being deactivated during tasks. This indicates decreased responses to threatening stimuli.

## Conclusion and Next step

Mice with prior exposure to psilocybin exhibited significant changes in global brain activity and connectivity within the basal ganglia, thalamus, sensory motor cortex, and cerebellum compared to vehicle controls. Data demonstrated that with age the response to the reward seeking and fear stimuli diminishes. Potential exploration of histopathology in the mouse brain tissue and exploration of lipidomics in blood samples.

## Acknowledgments

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