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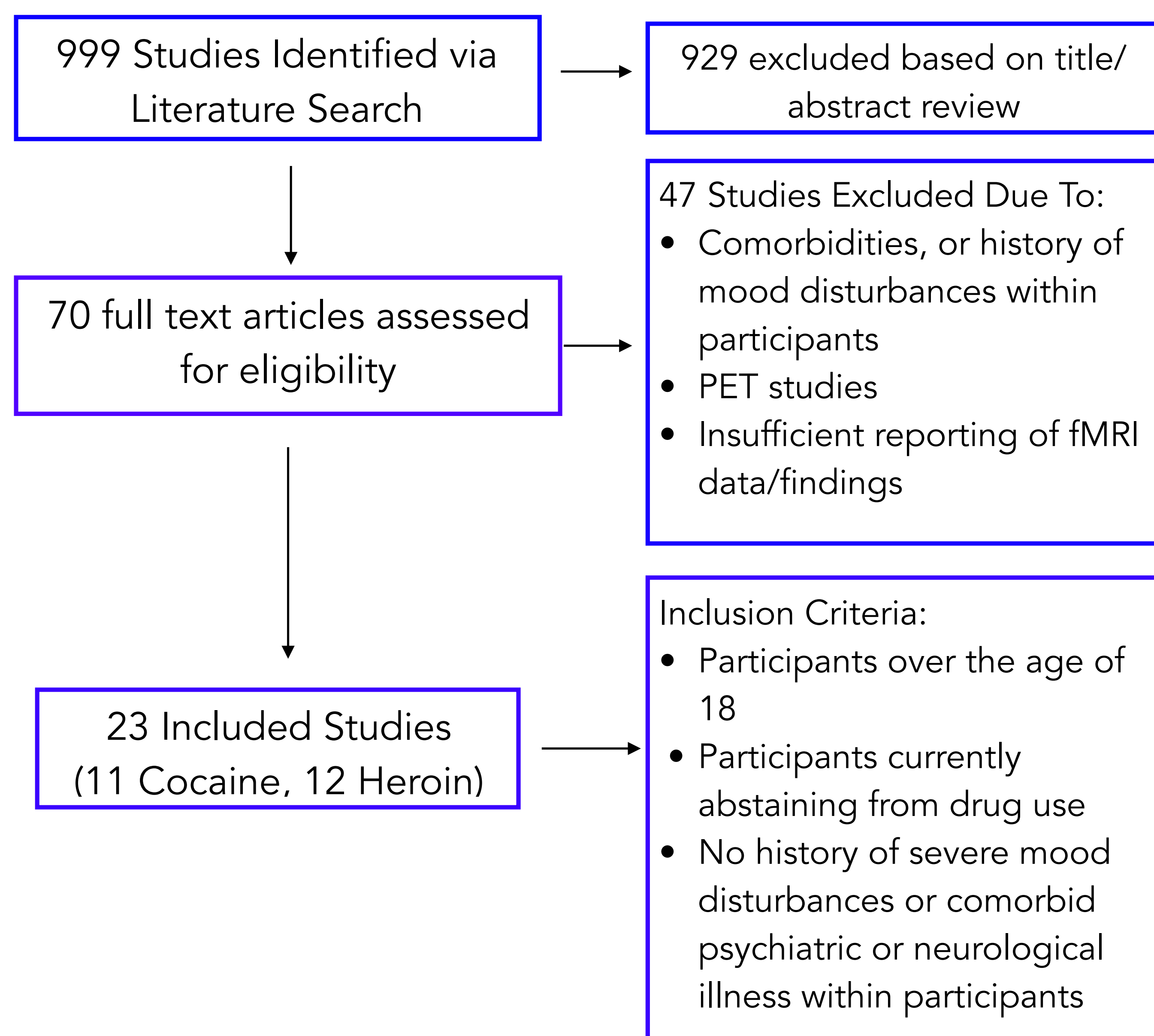
Introduction

- Opioid and substance related death has now increased to the point where it creates a public health threat¹.
- Various areas such as the basal ganglia, nucleus accumbens, and dorsal striatum have been implicated as regions of interest in past studies of cue-reactivity due to their roles in addiction related processes such as decision making and habit formation²⁻⁷.
- Previous studies have found behavioral differences between cocaine and heroin addicted individuals. This includes greater depiction of inhibition impairments within cocaine users, and increased reward seeking behaviors seen in heroin users. ^{8,9}

Goal

We sought to examine whether differences in cue-reactivity responses will be seen between cocaine and heroin addicted individuals

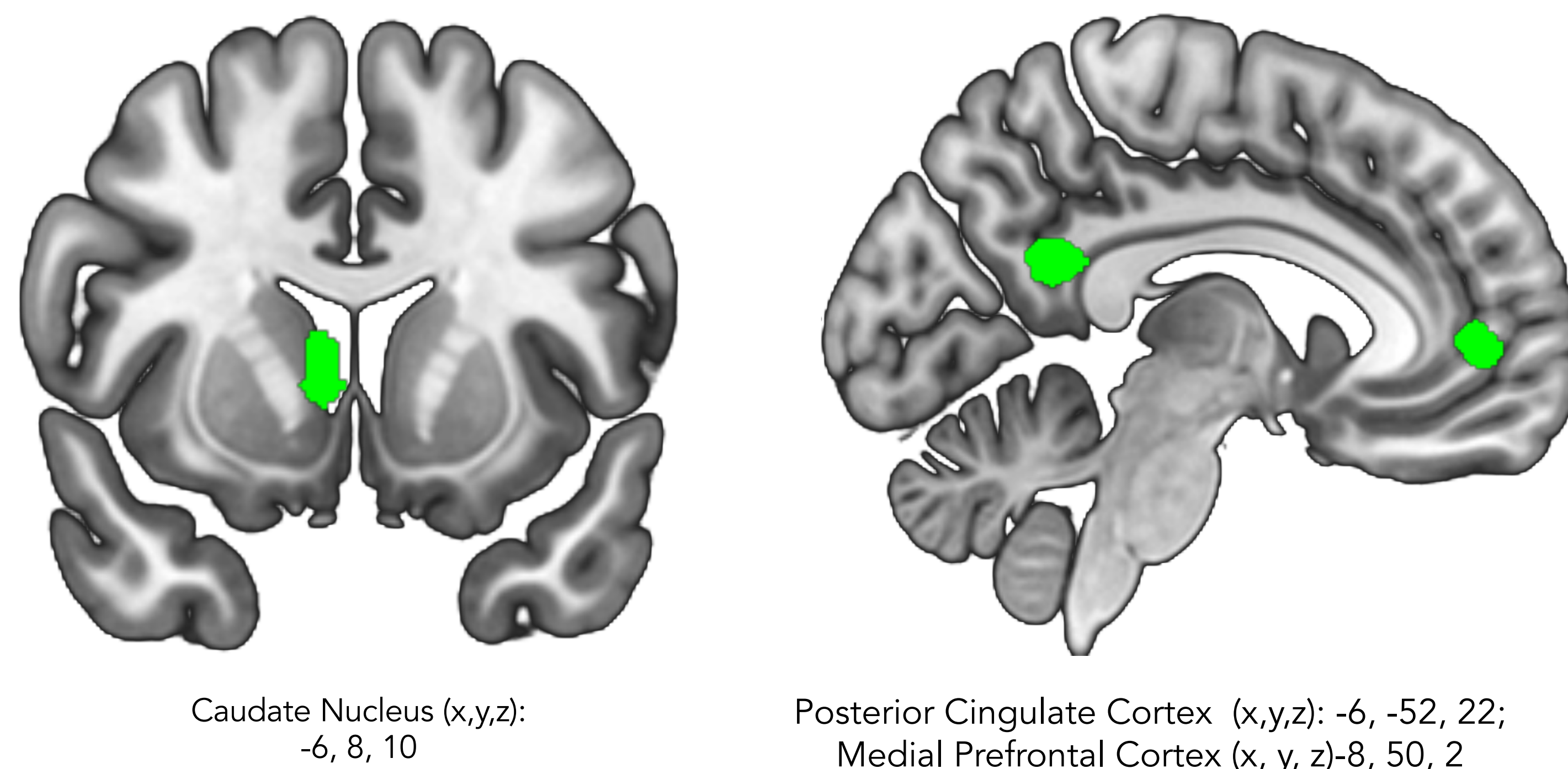
Literature Search and Meta-Analytic Approach



- The meta-analysis was conducted using activation likelihood estimation (GingerALE) ¹⁰
- ALE maps were generated using 10000 permutations and corrected to $p < .05$ (FWE, cluster-level)

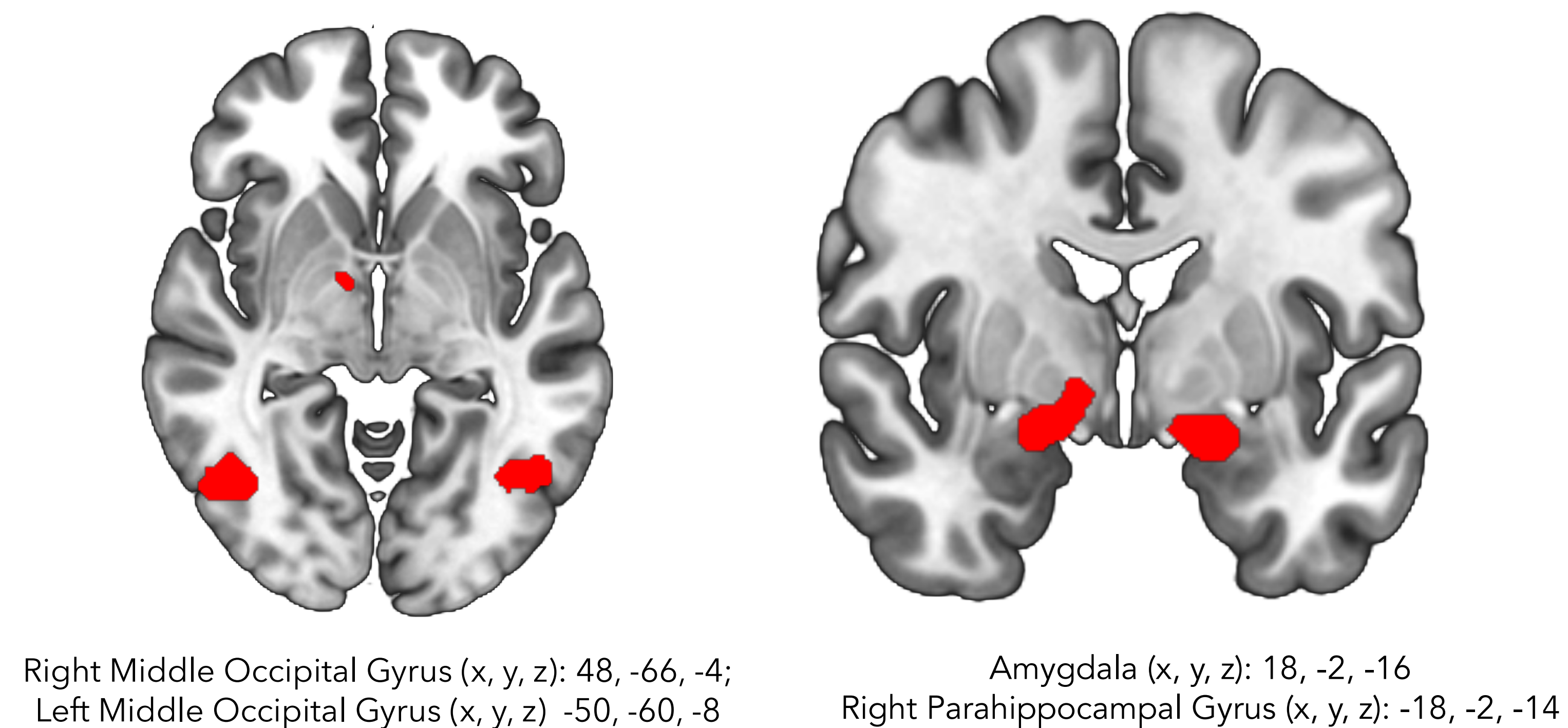
Meta-Analysis Results

Cue-Reactivity: Cocaine



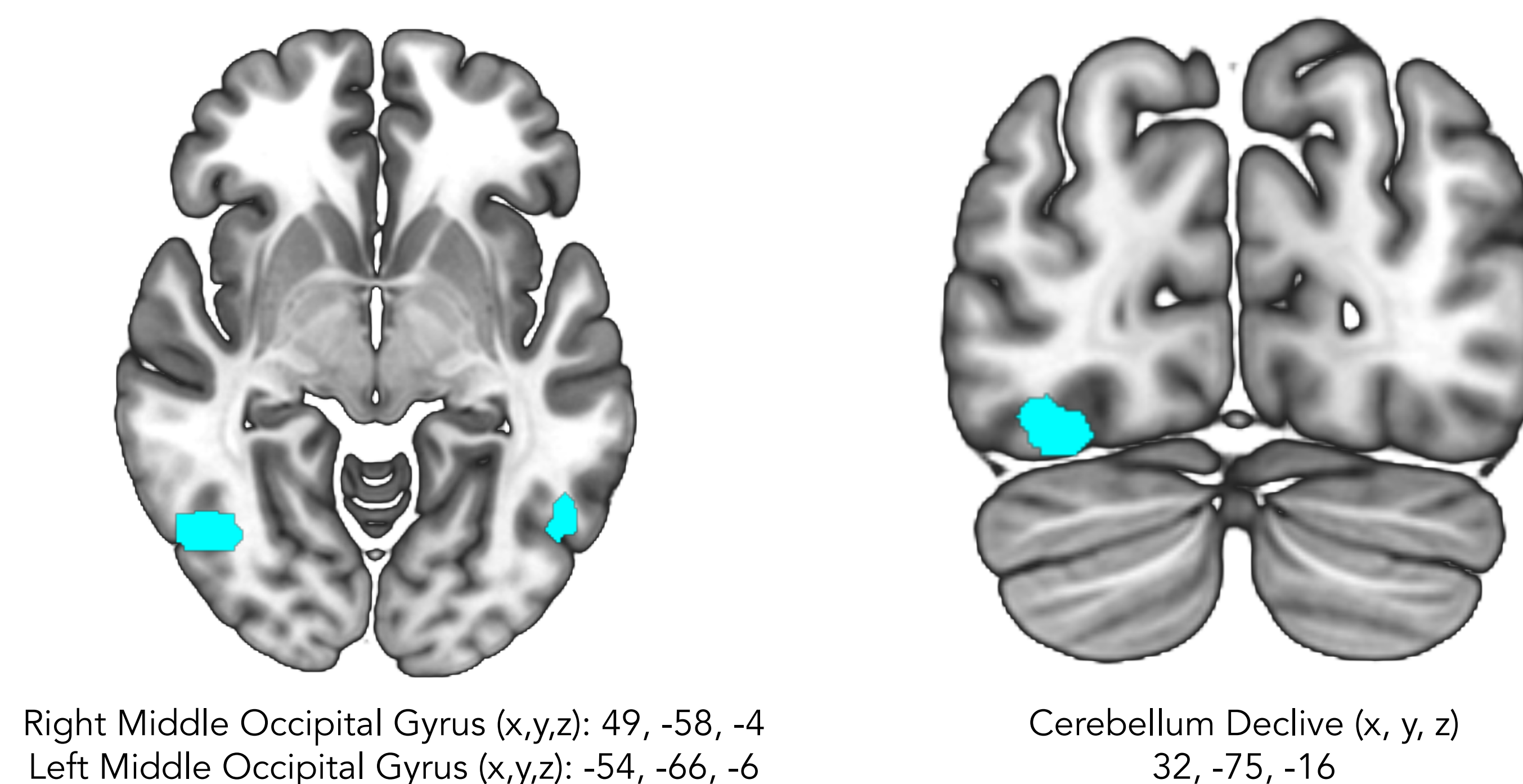
Preliminary analyses of cocaine specific data showed drug cues elicited engagements in the PCC, mPFC, and VS

Cue-Reactivity: Heroin



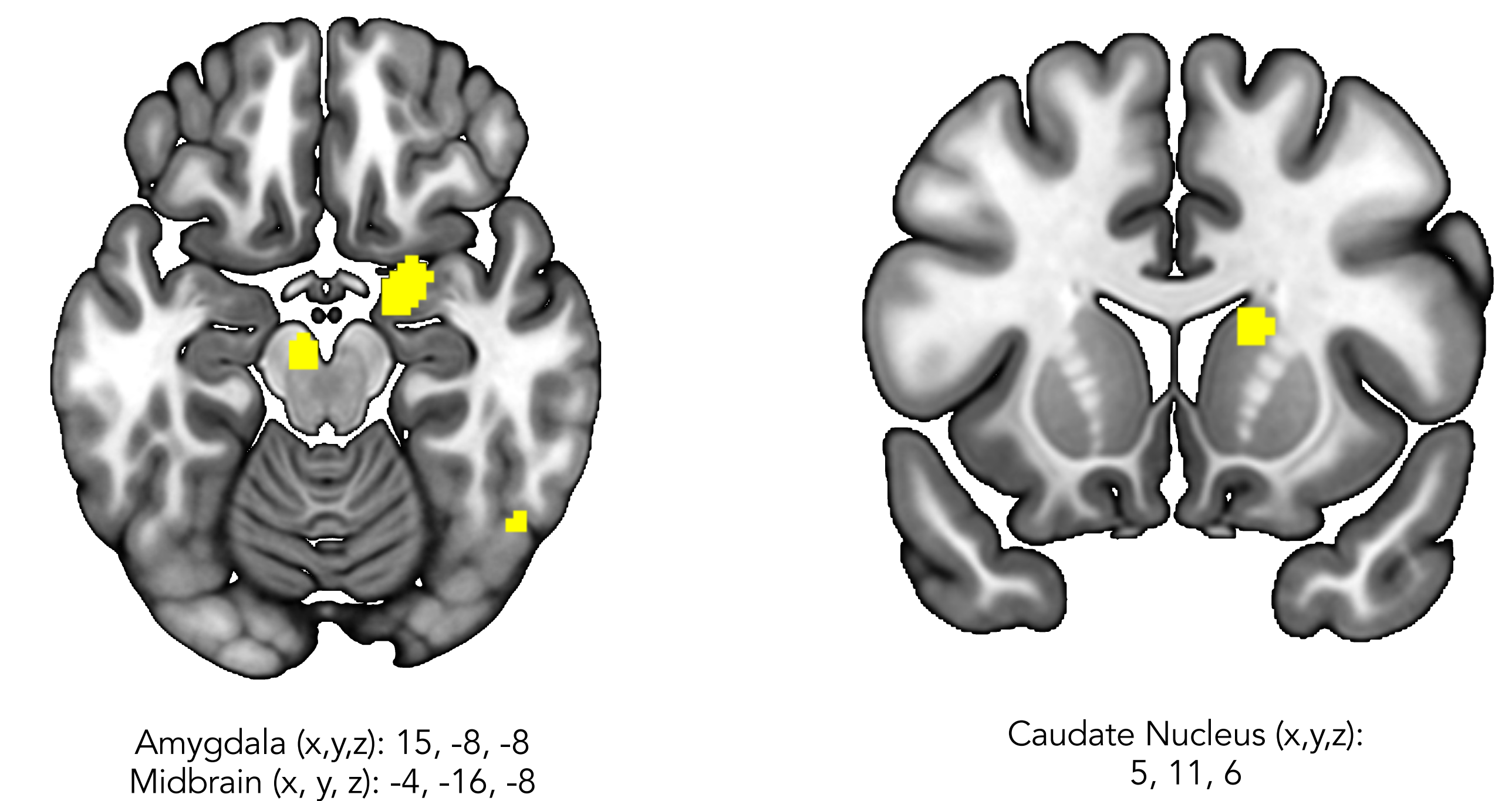
Preliminary analyses of heroin specific data showed drug cues elicited engagement of the amygdala and ventral occipital lobes

Contrast Analysis: Cue Reactivity Heroin > Cocaine



Contrast analyses revealed enhanced engagement of the occipital lobe and right posterior cerebellum declive in heroin relative to cocaine users

Exploratory Contrast Analysis Cocaine > Heroin



Exploratory uncorrected contrast analyses revealed enhanced engagement of the midbrain, amygdala, and caudate nucleus in cocaine relative to heroin users

Discussion

- Previous work has suggested that which noted that heroin addicted individuals may demonstrate attentional bias towards drug cues, which is frequently assessed via visual fixation ¹¹. Our findings of increased activation in the occipital lobe during cue reactivity in heroin users may be consistent with attentional bias.
- We also found increased engagement of the cerebellum in heroin relative to cocaine users. Increased cerebellar activity in heroin users during cue-reactivity tasks has been shown to correlate with self-reported feelings of tenseness and withdrawal ¹².
- The current study further supports previous studies which highlighted the role of the cerebellum in reinforcement and learning behaviors. ¹³
- Future studies may seek to examine the role of attentional bias in vulnerabilities to addictive tendencies, and seek to explore if activations of the visual cortex can be seen in at risk groups prior to engagement in addictive behaviors.

References

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Acknowledgments

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