

## The role of *CAMK2A* in the comorbidity of PTSD/SUD in individuals seeking detoxification treatment

Angela G. Junglen<sup>a</sup>, Leslie A. Brick<sup>b,c</sup>, Tammy Jensen<sup>d</sup>, Nicole R. Nugent<sup>b,c,e</sup>, & Douglas L. Delahanty<sup>a,f</sup>

<sup>a</sup> Kent State University, Department of Psychological Sciences, Kent OH, USA; <sup>b</sup> Department of Psychiatry and Human Behavior, Alpert Medical School of Brown University, Providence, RI, USA; <sup>c</sup> Division of Behavioral Genetics, Department of Psychiatry, Rhode Island Hospital, Providence, RI, USA; <sup>d</sup> Oriana House Alcohol, Drug Addiction, and Mental Health Crisis Center, Akron OH, USA; <sup>e</sup> Bradley/Hasbro Children's Research Center of Rhode Island Hospital; <sup>f</sup> Northeastern Ohio Medical University, Rootstown OH, USA

Substance use disorder (SUD) and post-traumatic stress disorder (PTSD) are highly comorbid. Uniquely, both disorders require exposure to an environmental cue (e.g. substance/trauma) to induce subsequent symptoms of the disorder. Memory formation related to the exposure is essential to the development of both SUD and PTSD. *CAMK2A* (Calcium dependent Calmodulin Kinase II-alpha) has been found to be responsible for contextual memory formation and long term potentiation. *CAMK2A* has also been associated with various SUDs, specifically focusing on the role of memory formation for addictive behaviors. For both disorders, treatment focuses on mitigating triggers that precipitate from contextual/environmental cues. Treatment effectiveness is driven partially by an individual's behavioral inhibition/activation approach. The present study was designed to identify the variation in *CAMK2A* that could account for PTSD/SUD comorbidity along with differences in behavioral inhibition/activation approaches.

There were 247 participants recruited from a detoxification center, where individuals received medically assisted detoxification treatment. Of the sample, 63.6% were opioid-dependent and the remainder were either alcohol or poly-substance dependent. Questionnaires were completed in the detoxification center, including measures of PTSD symptom severity (PCL-5) and behavioral inhibition and activation (BIS/BAS). Finally, participants provided an Oragene saliva sample. Samples were genotyped using the Illumina PsychArray. After quality control (QC) and imputation, 225 participants and 11,340,314 variants remained. Of these, 13 variants were located in *CAMK2A* and those that are significantly associated with PTSD symptoms will be further examined. Analyses are ongoing; however, we will be able to present on the genetic influence of *CAMK2A* associated with comorbid PTSD/SUD and the impact of both behavioral inhibition and activation approaches on this relationship of *CAMK2A* and PTSD/SUD.

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