

# Investigating the Role of the Cat-2 Gene in Substance Dependence

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The researcher conducting this experiment investigated the role of the Cat-2 gene in developing substance dependence. Substance dependence/addiction is an emerging public health crisis with researchers still attempting to understand dependence development. According to the National Survey on Drug Use and Health (NSDUH), 21.5 million Americans (aged 12 or older) battled a substance abuse disorder in 2014. In 2014, almost 80% of individuals suffering from substance abuse disorder suffered from alcohol abuse disorders, per the NSDUH. In this experiment, the researcher exposed two variants of *Caenorhabditis elegans* (*c. elegans*) to an exogenous dosage of a 7% ethanol solution. The two variants of *c. elegans* were a wild-type group with a functioning Cat-2 gene and a mutant-type group with an inhibited Cat-2 gene. The cat-2 gene plays a role in dopamine synthesis in *c. elegans* and is considered analogous to the TH-gene in humans. These two *c. elegans* variants were exposed to ethanol over the course of five days and their affinity to the ethanol solution was tested at the end of the five day exposure period. Findings from the experiment indicate that the Cat-2 gene plays a substantial role in addiction development.

## Awards Won:

National Institute on Drug Abuse, National Institutes of Health & the Friends of NIDA: Honorable Mention