Study provides further support for genetic factors underlying addictions

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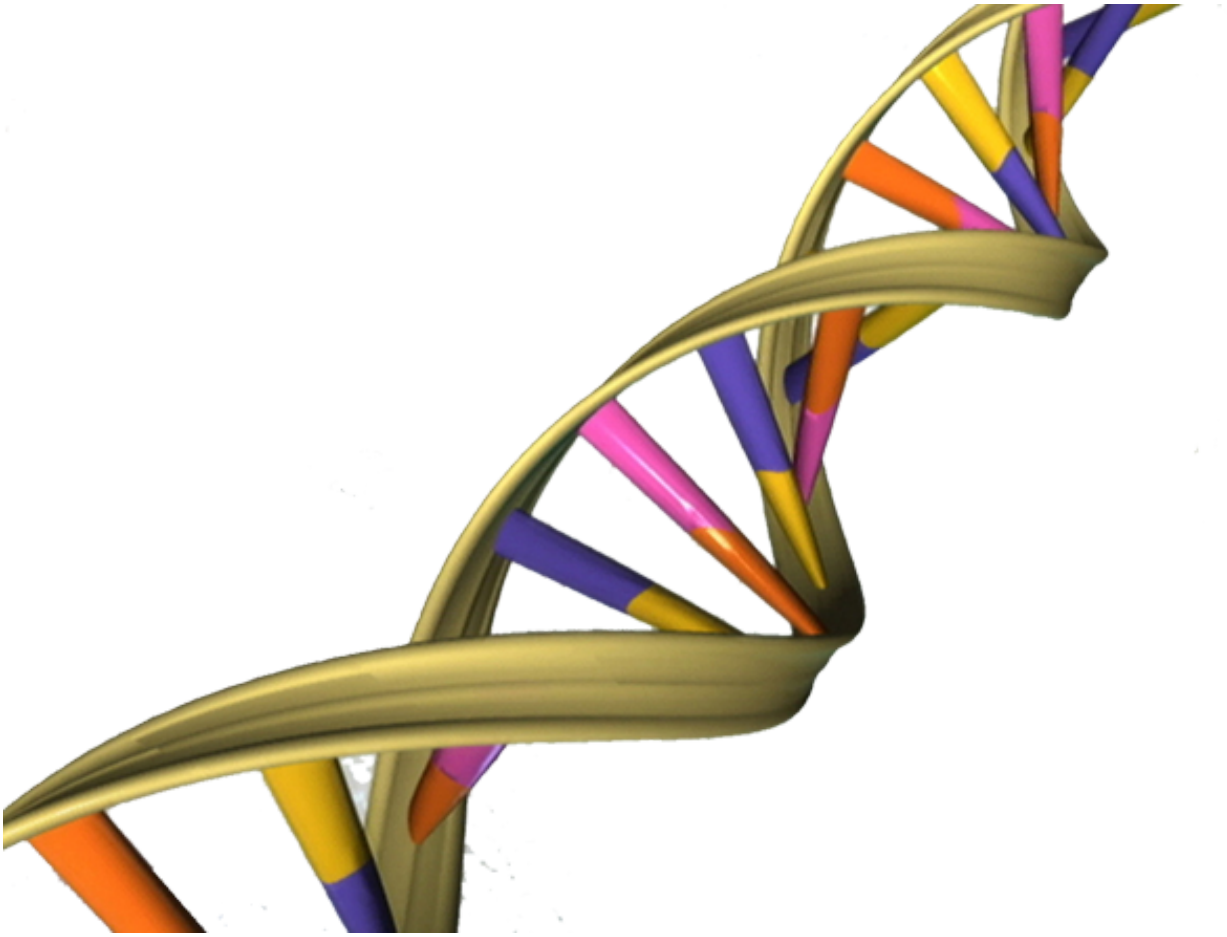

A depiction of the double helical structure of DNA. Its four coding units (A, T, C, G) are color-coded in pink, orange, purple and yellow. Credit: NHGRI

Impairment of a particular gene raises increases susceptibility to opioid addiction liability as well as vulnerability to binge eating according to a new study.

Dysfunction of the gene, casein kinase1-epsilon (CSNK1E), increases opioid's euphoric response and produces a marked increase in sensitivity to binge eating in a female experimental model but not in the male.

Similar to opioid addiction, very little is known regarding the genetic basis of binge eating. These combined findings provide further support indicating that shared genetic factors may underlie behavioral traits associated with the addictions and eating disorders. Furthermore, they also provide an important clue that the genetic basis of binge eating and eating disorders in women versus men is likely to differ. The findings appear online in the journal *Genes, Brain and Behavior*.

Addiction is a multi-stage process that begins with drug exposure and the initial pleasurable experience and progresses toward tolerance, dependence, physiological and emotional withdrawal upon cessation of use, protracted withdrawal that can last years, and finally, relapse to drug taking. The genes associated with risk for opioid addiction could potentially affect one or more of these stages.

"Because increasing evidence points toward an association between CSNK1E and opioid addiction in humans, our findings indicate that genetic variation in CSNK1E could function as a potential risk factor that influences the initial pleasurable/euphoric response to opioids and thus, could ultimately have implications for personalized medicine with regard to drug choice for therapeutic treatment (e.g., non-opioid pain relief) and therapeutic dosing of opioids," explained corresponding author Camron Bryant, PhD, assistant professor of pharmacology and experimental therapeutics & psychiatry at BUSM.

The researchers also believe the female-specific binge eating property associated with Csnk1e dysfunction suggests that different genetic loci (position on the chromosome) are likely to be uncovered for binge eating and eating disorders in women versus men and may lead to sex-specific treatments ultimately being developed for treating eating disorders.

According to the researchers CSNK1E may also play a role in a subset of patients with alcohol use disorders. Additionally, CSNK1E is known to be a crucial player in regulating circadian rhythms. "The potential interaction of CSNK1E with circadian biology in affecting addiction is an unexplored area of investigation that could be a crucial piece to the puzzle in fully understanding its role in the addictions," said Bryant.

Provided by Boston University Medical Center