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SAFE Glen Cove Coalition: Drugs and Alcohol Can Effect Gene Expression

Recent research on gene expression in the brain and how it is affected by alcohol and substance use has been conducted to obtain effective and sustainable treatment approaches. Researchers maintain many people are wired to seek and respond to rewards such as food and water when hungry or thirsty. However, addictive substances like alcohol and drugs of abuse can overwhelm the natural reward pathways in your brain, resulting in intolerable cravings and reduced impulse control.

A big misconception is that addiction is a result of individuals having little to no willpower. Through research scientists and health care professionals have discovered a strong neurobiological and genetic basis for addiction. A better understanding of how genes are dynamically regulated in the brain has provided new ways of thinking about how addictions form has the potential to change how treatment is approached.

Recent data suggests that alcohol and illicit drugs directly influence changes in gene expression in areas of the brain that help drive memory and reward responses. When gene activity changes, the proteins your cells produce also change. Such changes can range from a single neuronal connection in your brain to how you behave. There are several ways in which addictive substances can change gene expression. For example, alcohol can cause an alternative form of a gene to be expressed in the memory circuits and cocaine can cause an alternative form of a gene to be expressed in the reward center leading them to seek out more of the substance. Exactly how these drugs cause changes in gene regulation are unknown. Alcohol, nicotine, cocaine and opioids also all activate important signaling pathways that regulate metabolism. This suggests they can also affect many aspects of neuronal function and consequently affect which genes are expressed.

Researchers seek to discover similar therapies for alcohol and substance use disorders. These treatments could potentially target important signaling pathways linked to addiction, altering how brain circuit's function and how alcohol and drugs affect them.

JAMA Network Open is a monthly open access medical journal published by the American Medical Association covering all aspects of the biomedical sciences. For more information, please visit www.jamanetwork.com.

SAFE, Inc. is the only alcohol and substance abuse prevention, intervention, and education agency in the City of Glen Cove. Its Coalition is conducting an opioid prevention awareness campaign entitled, "Keeping Glen Cove SAFE," to educate and update the community regarding

opioid use and its consequences. To learn more about the SAFE Glen Cove Coalition please follow us on www.facebook.com/safeglencovecoalition or visit SAFE's website to learn more about the Opioid Epidemic at www.safeglencove.org.