

# Study reveals how smoking increases vulnerability to alcohol abuse

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Smoking is a well-known risk factor for subsequent alcohol abuse, but the mechanisms underlying this link are unknown. Now researchers reporting in the Cell Press journal *Neuron* on July 18 show in a study conducted in rats that even a single exposure to nicotine temporarily changes how the brain's reward system responds to alcohol and increases the reinforcing properties of alcohol via stress hormones.

"Our findings indicate the mechanisms by which nicotine influences the neural systems associated with alcohol abuse, providing a foundation for conceptualizing strategies aimed at diminishing the link between smoking and later alcohol abuse," says senior author Dr. John Dani, of the Baylor College of Medicine.

Dr. Dani and his team found that rats exposed to nicotine subsequently sought to drink alcohol more often than other rats. Also, signaling in the brain's reward system was dampened when the nicotine-exposed animals consumed alcohol. This decreased reward response to alcohol arose via two mechanisms: an initial activation of stress [hormone receptors](#) and a subsequent increase in inhibitory signaling in the brain. These processes were responsible for causing the rats to self-administer more alcohol after [nicotine exposure](#).

"Young people typically experiment with nicotine from tobacco in their teens, and that exposure possibly contributes to a greater vulnerability to [alcohol abuse](#) later in life. Therefore, greater vigilance is called for to prevent the initial exposure to nicotine and to follow those at risk," says Dr. Dani. "In addition, our work suggests that [stress hormones](#) are candidate targets for prevention or treatment therapies."

Provided by Cell Press

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