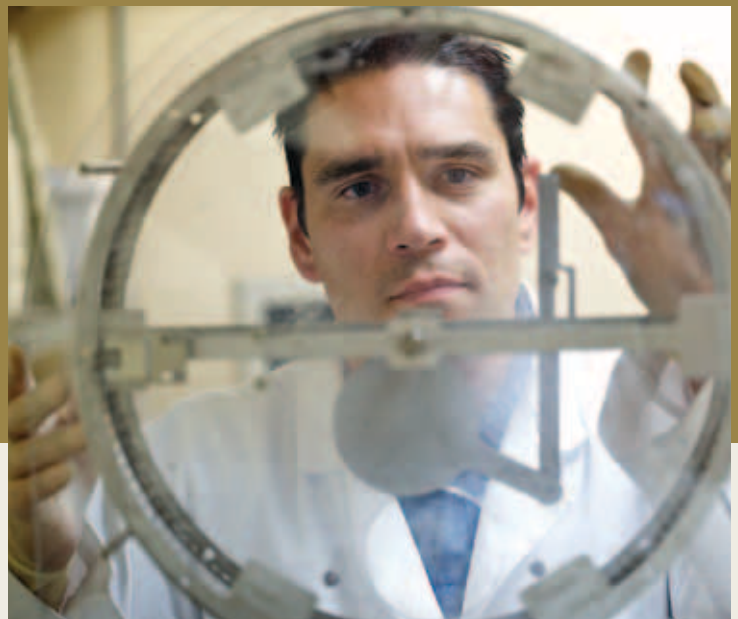


Keith Williams

Assistant Professor
Department of Psychology



The causes of alcohol consumption



Alcohol-related problems have substantial costs for society. According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), problems with alcohol cost the United States approximately \$185 billion every year. The NIAAA estimates that 18 million people may be diagnosed with an alcohol use disorder, approximately 40 percent of college students binge drink, and drinking onset prior to age 15 is related to a four-fold increase in meeting criteria for alcohol dependence as an adult.

Because alcohol-related problems are a growing concern, Keith Williams is exploring the cause of drug-taking behavior and addiction with a focus on clarifying the behavioral or environmental conditions that alter the effectiveness of pharmacotherapies used to treat alcoholism. He and his coworkers are conducting research on the behavioral and pharmacological mechanisms contributing to drug reinforcement and craving as explored using animal models of oral alcohol self-administration.

Recent publications focus on the ability of the opioid antagonist naltrexone to reduce alcohol self-administration. Naltrexone blocks the body's opioid receptors and is being used clinically in oral and long-term injection formulations to reduce alcohol consumption and craving in alcohol-dependent patients. Even though opioid antagonists appear to be effective in these people, the mechanism by which antagonists reduce alcohol consumption is unclear. Williams' current hypothesis is that alcohol's rewarding effects are caused by release of endorphins in the brain and opioid antagonists block the effects of these endorphins, thereby reducing alcohol consumption and craving. However, naltrexone also reduces other consummatory behaviors.

In 2007, Williams reported that sensitization to naltrexone's effects in a food-consumption paradigm transferred to an alcohol self-administration paradigm. This finding indicates that context or environmental conditions can alter the effectiveness of naltrexone in reducing alcohol consumption. To explore ways to increase the effectiveness of naltrexone, his laboratory conducted a subsequent study to determine whether naltrexone would enhance the effects of repeated exposure to alcohol cues.

Williams' experimental design modeled the cue-exposure treatment in humans, which repeated exposure to alcohol-paired cues and reduced the ability of the cues to stimulate subjective craving for alcohol. Williams found that naltrexone interfered with the beneficial effects of repeated alcohol cue exposure in an animal model of alcohol craving. He concluded that naltrexone should not be given as an adjunct in cue-exposure therapy.

Williams is also interested in whether or not certain drug treatments can enhance the ability of repeated cue exposure to alter cue-conditioned reinforcement. He also studies the effects of early life experience with alcohol and sweet-tasting fluids on adult alcohol consumption, and the effects of exercise on the reinforcing properties of alcohol.

Representative Recent Publications

1. Williams KL, Broadbridge CL. 2009. Potency of naltrexone to reduce ethanol self-administration in rats is greater for subcutaneous versus intraperitoneal injection. *Alcohol* 43:119-126.
2. Williams KL, Schimmel JS. 2008. Effect of naltrexone during extinction of alcohol reinforced responding and during repeated cue-conditioned reinstatement sessions in a cue exposure style treatment. *Alcohol* 42:553-563.
3. Pascoe JE, Williams KL, Mukhopadhyay P, Rice KC, Woods JH, Ko MC. 2008. Effects of mu, kappa, and delta opioid receptor agonists on the function of hypothalamic-pituitary-adrenal axis in monkeys. *Psychoneuroendocrinology* 33:478-486.
4. Williams KL. 2007. Development of naltrexone supersensitivity during food-maintained responding enhances naltrexone's ability to reduce ethanol-maintained responding. *Alcohol Clin Exp Res* 31:39-47.
5. Williams KL, Broadbear JH, Woods JH. 2004. Non-contingent and response-contingent intravenous ethanol attenuates the effect of naltrexone on hypothalamic-pituitary-adrenal activity in rhesus monkeys. *Alcohol Clin Exp Res* 28:566-571.
6. Williams KL, Holden Ko MC, Rice KC, Woods JH. 2003. Effect of opioid receptor antagonists on hypothalamic-pituitary-adrenal activity in rhesus monkeys. *Psychoneuroendocrinology* 28:513-528.
7. Williams KL, Woods JH. 2000. A behavioral economic analysis of concurrent ethanol- and water-reinforced responding in different preference conditions. *Alcohol Clin Exp Res* 24:980-986.