

Homeostatic mechanisms of alcohol-induced sleep disturbances in *Drosophila*

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Alcohol addiction is known to affect a variety of biological processes. Among them, a specific set of sleep disturbances arise from acute alcohol exposure that lead to the development of tolerance and dependence. As both, alcohol addiction and sleep regulation are under homeostatic control, we hypothesize that these processes share a common mechanism. At the behavioral level, alcohol's sedative properties cause an increase in total sleep and decrease in sleep latency (or time it takes to fall asleep). In this proposal, the *Drosophila* model system will be used to understand the molecular aspects behind alcohol-induced sleep patterns. Specifically, this study focuses on the genes and neuronal circuits that bring about alcohol-induced sleep behaviors. Here, we show that a gene that is associated with the development of alcohol tolerance and dependence, has also been implicated in the regulation of sleep cycles. In addition, we found that alcohol-sleep responses are mediated by a specific set of neurons involved in establishing circadian rhythms. Our results suggest that sleep and alcohol neuroadaptation share a common regulatory mechanism and brings us closer to understanding the interaction between these two homeostatic processes.