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Inbred Mouse Strains Selected for High and Low Open Field Activity Also Show Differences in Alcohol-Related Behaviors

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An estimated 16 million adults currently suffer from alcohol use disorder (AUD) in the United States alone. The high relapse rate of AUD is in part affected by its high comorbidity with other addiction disorders and psychiatric illnesses. The current study examined whether innate differences in anxiety relate to differences in alcohol-related behaviors. To model anxiety, replicate strains of mice selected for differences in open-field (OF) activity were inbred to yield two H2 (High Activity) and L2 (Low Activity) strains. Voluntary alcohol consumption was measured using an unlimited 2-bottle choice assay and initial acute sensitivity to alcohol using the loss of righting reflex (LRR) protocol. A main effect of strain was found for differences in alcohol consumption and preference. These differences were driven by differences in the females (p = 0.019 and 0.001)), since strain differences within males were non-significant for both alcohol consumption and preference ($p > 0.05$ for both). Strains also significantly differed in acute alcohol sensitivity (p = 6.963e-07). Female L2 mice took longer to recover the righting reflex than their H2 counterparts (p = 0.0011). Male mice demonstrated the same pattern, with High Activity males recovering faster than Low Activity males (p=0.00025). These findings support the hypothesis that genetic differences in anxiety-related behaviors may contribute also to differences in drug behaviors, representing pleiotropic genetic effects.