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Neighbor housing alleviates the behavioral and neurobiological consequences of social stress-induced drinking in a sex-dependent manner

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Adolescence is characterized by high levels of playful social interaction and increased risk-taking behavior, including drug experimentation. Disruptions of cortical development by social isolation or binge ethanol during this critical period can lead to behavioral problems later in life including attention, social, and cognitive deficits, and can increase risk for alcohol use disorders. Our goal is to identify the enduring behavioral and neurobiological consequences of social stress, and determine how these alterations contribute to excessive alcohol drinking. Social stress was modeled by social isolation during adolescence and modulated using a novel housing environment (neighbor housing) as an interventional strategy that may alleviate addiction vulnerability associated with early-life social stress. Adolescent C57BL/6J mice were single or neighbor housed with or without access to intermittent ethanol. As adults, mice were tested for social, anxiety-like and cognitive behaviors and escalation of ethanol consumption. Neighbor housing reduced social and basal anxiety-like behaviors found in single-housed mice. Recognition memory deficits were also rescued by neighbor housing in both sexes. Social isolation, however, doubled ethanol intake in adolescent females, but not males. These data suggest that complex housing may partially ameliorate anxiety and cognitive deficits induced by social isolation. Ongoing genomic profiling has identified epigenetic and genomic targets modified by social stress and drinking and will further identify whether these behavioral alterations are mediated, in part, by dysregulation of myelin expression in the frontal cortex, or by dysregulation of the social circuit. *Supported by NIAAA P50AA022537 to MFM and JTW.*