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DIVERSITY IN ADDICTION RESEARCH TRAINING

Validation of FosTrap Technology in an Animal Model of Binge Alcohol Drinking

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Background: C-Fos is an immediate early gene expressed in neurons that acts as a transcription factor when synthesized in response to stimulation. FosTRAP (c-Fos Targeted Recombination in Active Populations), allows for permanent expression of a fluorophore, tdTomato, in transgenic mice when stimulated and 4-hydroxytamoxifen (4-OHT), an estrogen receptor antagonist, is administered. Previous studies have shown the optimal time to inject 4-OHT is immediately after a behavior of interest, however, it is unknown if this is true for consumption of alcohol. The primary aim of this study was to confirm this timing. **Methods:** Two cohorts of FosTRAP mice were used. Cohort 1 (n = 4) was deprived of light for 48 hours after which one half was exposed to one hour of bright light while the other half remained in the dark. The entire cohort was then injected with 4-OHT. In cohort 2 (n = 10), half the mice drank ethanol (20% v/v) for 2 hours/day, 5 days/week for 2 weeks. On the final day of drinking, 4-OHT was administered to the entire cohort 30 minutes into the drinking session. Five days later brain tissue was extracted and sliced to visualize c-Fos in the visual cortex (cohort 1) and reward-related brain areas (cohort 2). **Results:** Data collection is currently underway, but we anticipate that in cohort 1, we will see significantly more TRAPed cells in the visual cortex of the animals that were exposed to light compared to those that remained in the dark. Similarly, we expect that animals that had access to alcohol will show increased TRAPed cells in reward related brain regions (e.g., nucleus accumbens and prefrontal cortex). **Conclusion:** Once collected, data from this study will help optimize the methods for future studies utilizing FosTRAP mice and will identify key brain regions involved in binge-alcohol drinking.