

## Annual Report Fiscal Year 2020

### Column E:

Chronic Sleep fragmentation (CSF): Vole pups will be used due to their similarities with human social development and their use as an established animal model of autism spectrum disorder. The only way to experimentally test the role of sleep in the developing brain is to manipulate sleep during development. Chronic sleep deprivation and sleep fragmentation methods may cause pain or distress. Previously published studies and preliminary data from our own lab suggest there is no significant weight loss in either the pups or the parents. Furthermore, preliminary data from our lab show that, surprisingly, there are no significant differences in parental behavior of the parents towards the pups during chronic sleep fragmentation. Animals will be closely monitored twice daily during this procedure for normal eating, drinking, ambulation, and grooming behaviors. Animals, including the parents, will be weighed during pup weaning to minimize handling. Any animals that do not appear to be eating, drinking, ambulating or grooming sufficiently, or are <80% of the normative body weights for age and sex for voles (using the control group as a comparison), will be removed from the study and appropriately treated with VMO consultation (i.e., provided supportive care with softened foods, hydration, euthanasia as indicated).

Conditioned fear response (CFR) is a widely used, validated behavior test which tests the animal's ability to learn an association between an aversive stimulus and the context in which this stimulus was delivered. The aversive stimulus consists of the delivery of a mild footshock (duration: 1.0 second, amplitude: 0.4-1.0 mA, the smallest shock possible will be used in which a learning response is achieved). While the stimulus is aversive, it is mild, brief in duration, and does not cause long-lasting pain. Voles return to normal ambulation, eating, drinking, and grooming/nest building when placed back in their home cage. Therefore, no pain or distress relief is necessary for this procedure. Moreover, analgesics may interfere with the learning process that is being tested. Animals will be monitored closely for signs of distress and discomfort immediately after the CFR procedure.

All 52 voles noted in Category E were approved to undergo both Conditioned Fear Response and Chronic Sleep Fragmentation procedures. However, all 52 voles only underwent the Chronic Sleep Fragmentation procedure.

01 DEC 2020