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MONITORING CIRCADIAN BEHAVIOR IN DNA REPAIR-DEFICIENT *DROSOPHILA*

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Mus109 is one of 58 mutagen-sensitive genes found in *Drosophila melanogaster*. This recessive gene has been postulated to play a role in DNA repair due to sensitivity of *mus109* mutant flies to different DNA damaging reagents such as methyl methanesulfonate, which instigate base adducts; nitrogen mustard, which cause base adducts and interstrand crosslinks; and ionizing radiation, which result in damaged bases and DNA strand breaks. The concept of circadian rhythms has been recently been connected to DNA repair by recent findings that the NER mechanism is directly regulated by the circadian clock and has shown to be heightened in the evening. Similarly, our study aimed to explore the relationship between DNA repair and circadian rhythms in D. melanogaster by assessing their behavioral patterns of *mus109* mutants. We used Drosophila Activity Monitors to measure the activity of $mus109^{lS}/mus109^{D1}$, $mus109^{lS}/mus109^{D2}$, and w^{1118} females under a normal light-dark cycle and free-running (dark-dark) cycle. Preliminary findings suggest that *mus109* mutants have altered daily activity levels in comparison to the wildtype flies during their normal light-dark cycle as well as the free-running dark-dark cycle. Hence, this study further defines the function of *mus109* as it supports the relationship between circadian rhythms and DNA repair. Future research plans include analysis of other circadian endpoints such as period length, as well as investigating circadian behavior in *mus109* mutants that are treated with DNA damaging reagents.