Cross-species Transmission of Drosophila melanogaster Nora Virus in Other Drosophila Species and Effect on Geotaxis

Buhlke, Ella (School: Central City High School)

This study was performed to determine the cross-species transmission of Drosophila melanogaster Nora virus in other Drosophila species and its effect on geotaxis. There are millions of known viruses, and new ones are discovered every year. A major source of new viruses is epizootic and enzootic animal viruses, seen when viruses typically occurring in animals adapt and mutate to infect humans. COVID-19 is an example of one of these host-switching viruses, as it originated in bats (Ji, 2020). Nora virus is a picorna-like virus whose only known pathogenic effect is a geotaxis defect. The cross-species transmission of this virus in fruit flies can be used to help scientists better understand host-switching in other viruses. It was predicted that the virus would infect the other species of Drosophila and that it would have an effect on their geotaxis. To test this hypothesis, Nora virus-positive males were allowed to defecate on fly food. Once they were removed, negative males and negative virgin females of each species were added to the vials. The geotaxis of their offspring was measured before they were collected for RNA analysis. RT-PCR was performed to determine infection, and all species tested positive in some fashion, showing Nora virus to be a host-switching virus. Geotaxis results showed a defect in the experimental groups in comparison to the control indicating that the virus does have a pathogenic effect on the other species. Learning more about cross-species transmission has increased importance in today's world as the number of zoonotic viruses increases.

Awards Won: