The Effects of Secondhand E-Cigarette Vapor on Drosophila melanogaster

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The purpose of this study is to determine a relationship between the secondhand vapor emitted from an e-cigarette (via human exhalation) and Drosophila melanogaster. Secondhand vapor is quite a controversial topic in the modern scientific world. Called "passive smoking", SHV is considered nonexistent. This conception results from the product's cigarette background: smoke comprises of 85% side stream smoke, generated by combustion and pyrolysis processes. E-cigarettes are equipped to generate aerosols without these processes. Therefore, when the aerosol is exhaled, there is theoretically no side stream vapor. Current studies have drawn questionable conclusions, reporting limited and hazardous effects. The aim of this study is to provide a realistic, ethical, in vivo model of SHV effects. It was hypothesized that if 10-15 fruit flies are exposed to secondhand vapor exhaled by a human subject five times a day one day, then mutations in their behavior and next generation phenotypic expression will occur. There are five subgroups: Larval Population/Larval Crawling Assay/Larval Locomotor Assay/RING Assay/phenotypic-behavioral analysis. The first two exposed trials: 13.4% reproductive yield;72.5% mutation rate. The F2 generation: 0.48% reproductive yield. Trial 3 F1 resulted in no larvae. There is a negative and mutagenic relationship between secondhand vapor and fruit flies, but the extent to which is not confirmed yet. E-cigarettes are advertised as smoking cessation tools. As e-cigarette usage rises, unwanted SHV exposure increases, especially in non-smoking areas. Therefore, SHV effects have an even greater impact on society. The results of this study may determine if the population in general is at risk from harmful vapors and regulations should be instituted.

Awards Won:

Third Award of $1,000