

## **Toxic Effects of Vaping in *Caenorhabditis elegans***

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### **Abstract**

Nicotine is a chemical that produces a rapid increase in serotonin and dopamine levels creating difficulty for any user to quit usage. Studies show that excessive smoking negatively impacts the lungs causing an unbalance between carbon dioxide and oxygen levels. Oxygen levels play an important role in brain function and its reduction within the brain can induce damage to the cerebral cortex, which is the sector of the brain that encloses the neurological connections that are responsible for thought processing, learning, and memory functions. Because vaping is very popular among teenagers, in this research we performed a quantitative approach to analyze if nicotine- containing e-liquids can affect movement in *C. elegans* (worms) within time. This *C. elegans* has been used as a living model to test the effects of different toxic chemicals. In this study, we exposed the worms to a 1/100 e-liquid dilution for periods of 5 min and 20 min exposure and compared the effects on motor activity (number of curling) with a control (untreated sample). Our preliminary data showed that worm curling was dramatically affected after the exposure to the 1/100 e-liquid dilution for 20 min when compared to control. According to literature review, nicotine affects cognition, learning, and memory. This investigation demonstrates that *C. elegans* prototype can be used not only to study the toxic effects of vaping in neurological function, but also to study the possible effects on learning and memory.