Study of the Juul E-Cigarette through Investigation of Factors which Contribute to Popularity

Dell, Liam-Gavin (School: City Honors School)

In recent years, the popularity of the Juul e-cigarette, and products similar to it, have increased dramatically, with Juul now leading the e-cigarette market. They are especially prevalent in high schools, with teenagers sixteen times more likely to use the Juul than adults. Very little is known about these products, which led me to study them with the assistance of the Roswell Park Comprehensive Cancer Center and their technology. With a focus on what drives the popularity, I studied the shape of the device, the compounds in the flavorings, the type of nicotine, and the nicotine concentration. I found the device to be very different in shape and use to previous e-cigarettes, the flavorings to contain an average of 28 various known compounds, the nicotine salts to contain extremely high percentages of unionized nicotine, the more addictive form, with an average of 99.4%, and the nicotine concentration to be immensely higher than in previous nicotine products with an average of 56 mg/ml in the liquid and 9 mg/ml in the aerosol after 300 puffs. I also found devices similar to Juul, specifically the Bo and the Phix, to have aerosol nicotine concentrations of 16 mg/ml and 8 mg/ml, respectively. Overall, the Juul e-cigarette and products similar to it have many differences to the majority of nicotine products that have come before them, and they have the potential to enact a more devastating effect on users through an increase in multiple factors of addiction.

Awards Won: