

Electronic cigarette flavorings alter lung function at the cellular level

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Certain flavorings used in electronic cigarette liquid may alter important cellular functions in lung tissue, according to new research presented at the 2015 American Thoracic Society International Conference. These changes in cell viability, cell proliferation, and calcium signaling are flavor-dependent. Coupling these results with chemicals identified in each flavor could prove useful in identifying flavors or chemical constituents that produce adverse effects in users.

"The effects of the various chemical components of e-cigarette vapor on [lung tissue](#) are largely unknown," said lead author Temperance Rowell, a graduate student in the Cell Biology and Physiology Department of the University of North Carolina at Chapel Hill. "In our study using human lung epithelial cells, a number of cell viability and toxicity parameters pointed to 5 of 13 flavors tested showing overall adverse effects to cells in a dose-dependent manner."

In the study, cultured human airway epithelial cells were exposed to various doses of the 13 e-cigarette liquid flavors for 30 minutes or 24 hours. During the 30 minute exposure test, the flavors Hot Cinnamon Candies, Banana Pudding (Southern Style), and Menthol Tobacco elicited a dose-dependent calcium response and were toxic to the cells at higher doses.

During the 24 hour exposure test, these same three favors decreased [cell proliferation](#) and cell viability in a dose-dependent manner.

The toxic effects of these flavorings were not seen with either nicotine or the e-liquid vehicle, which consisted of propylene glycol and vegetable glycerin.

Additional experiments testing the aerosolized product of e-liquid flavors on cultured primary human bronchial [epithelial cells](#) are ongoing. Flavors being tested were selected from the findings in this study.

"The specific chemical components underlying the toxic effects of these e-cigarette flavors on [cell viability](#), proliferation, and [calcium signaling](#) in airway epithelia are undergoing further study in our lab," said Ms. Rowell. "Given the increasing popularity of flavored e-cigarettes, a better understanding of their ingredients, the potential health risks of these ingredients, and the causes of these risks is urgently needed."

More information: Abstract 67743: Select E-Cigarette Flavors Alter Calcium Signaling, Cell Viability and Proliferation in Lung Epithelia

Provided by American Thoracic Society

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