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### Abstract

Electronic cigarettes have become popular tobacco cigarette substitutes, with a rapidly growing consumer population in the United States. While marketed as non-toxic nicotine delivery devices, the acute and long-term health effects of electronic cigarettes are largely unknown. Similar to mentholated tobacco cigarettes, the most popular electronic cigarette products contain large amounts of menthol and other mint-like chemical additives such as carvone, the natural product of spearmint. Electronic cigarettes also contain many of the chemical flavors and sensory additives outlawed for use in tobacco cigarettes by the Family Smoking Prevention and Tobacco Control Act (FSPTCA).

The goal of our FDA funded research is to investigate whether menthol and the other flavor additives in electronic cigarettes were selected by the manufacturers to mask the unpleasant taste and irritant effects of nicotine and whether they cause respiratory irritation and inflammation. We will use the mouse as a model system to study whether flavor additives increase nicotine levels, lead to alterations in breathing, and if they cause lung inflammation and exaggeration of asthma. These studies aim to provide data for the FDA to support potential regulatory actions towards the marketing of electronic cigarette products.