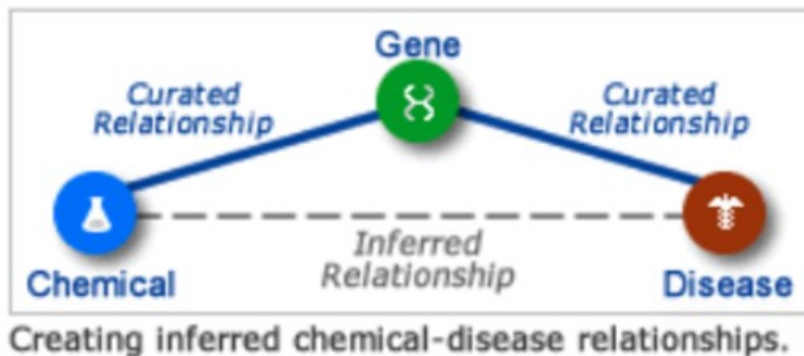


Vaping and Disease Risk — What does the data tell us? By Dr. Cynthia Grondin

Dr. Cynthia Grondin is a Boxford resident and mother of 2 college aged daughters and a son who attends Masconomet High School. She earned her B.A. in Biochemistry at Mt. Holyoke College, her Ph.D. in Molecular Biology and Microbiology at Tufts University, and has worked remotely on the Comparative Toxicogenomics Database for the past 12 years with a dedicated team of scientific researchers, software engineers and biostatisticians. The database resides at North Carolina State University.



Since their invention in 2004 as a way to help tobacco cigarette users quit smoking, e-cigarettes have exploded in popularity, with marketing and fruity flavors heavily targeted towards teens. Many e-cigarette users are under the misconception that when they vape, they are merely inhaling flavored water vapor. Contrarily, information from the Comparative Toxicogenomics Database (CTD), shows that the chemicals from e-cigarette liquids and their aerosols are directly and indirectly associated with diseases.



CTD integrates data from tens of thousands of published scientific articles with chemical, gene and diseases data to identify direct relationships between chemicals and diseases (e.g. when a chemical has been scientifically shown to play a role in the disease), and indirect or potential relationships (e.g. when a

chemical affects a gene that is known to be associated with a disease). By linking these data, **more than 11,000 direct relationships have been shown between chemicals found in e-cigarettes and their aerosol and diseases. Additionally a staggering 822,000+ indirect relationships have been calculated.**

Identification of these chemical-disease associations supports the findings of the National Academies of Sciences, Engineering and Medicine in their report “Public Health Consequences of E-Cigarettes” that *“There is **conclusive evidence** that in addition to nicotine, most e-cigarette products contain and emit numerous potentially toxic substances.”* **Thus, there is conclusive scientific data that e-cigarette aerosol emits toxic substances and is not ‘just water’.**

CTD is a free, public resource, funded by the National Institute of Environmental Health Sciences. The database is available at <http://ctdbase.org>, and is a valuable tool for

anyone interested in exploring how chemicals found in the environment affect human health.

Curious? Follow a few steps to start exploring chemical-disease relationships

1. Open the database ctdbase.org
2. Find **KEYWORD SEARCH** box and select **‘Chemicals’** from the pull down menu
3. Input a common chemical found in vaping liquids (like Nicotine, Acrolein, or Propylene Glycol)
4. From the chemical’s home page, click on the **DISEASES** tab
5. Scroll through the results OR filter by **‘disease category’** or **‘association type’** (*curated = direct, inferred = indirect*)
6. Click the hyperlinks and see what comes up!