

Wahlang, B., Gripshover, T. C., Gao, H., Krivokhizhina, T., Keith, R. J., Sithu, I. D., Rai, S. N., Bhatnagar, A., McClain, C. J., Srivastava, S., & Cave, M. C. (2022). Associations between residential exposure to volatile organic compounds and liver injury markers. *Toxicological Sciences*, 185(1), 50-63. <https://doi.org/10.1093/toxsci/kfab119>

## **Definitions**

- **Volatile Organic Compounds (VOCs):** Harmful chemicals that easily turn into gases. They come from things like car exhaust, factories, and cigarette smoke.
- **Liver Injury Markers:** Substances in the blood that show damage to the liver, like certain enzymes and bilirubin.
- **Biomarkers:** Indicators found in the body that show exposure to certain chemicals or diseases.

## **Key Findings**

- Higher levels of VOCs in the air are linked to liver damage.
- Specific VOCs like acrolein and acrylonitrile are strongly associated with higher levels of liver injury markers.
- Smokers have higher levels of VOCs and liver injury markers compared to non-smokers.

## **Introduction**

The study investigates how exposure to volatile organic compounds (VOCs) at home affects liver health. Researchers focused on people living in different neighborhoods to see if these chemicals cause liver damage.

## **Main Content**

### **Background**

VOCs are harmful chemicals found in the air from sources like car exhaust and industrial pollution. These chemicals can cause various health problems, including liver damage.

### **Objectives**

The goal was to find out how VOC exposure at home impacts liver health by measuring liver injury markers in people's blood.

### **Methods**

- **Participants:** 663 people from six neighborhoods in Louisville, Kentucky, participated in the study.

- **Sample Collection:** Researchers collected urine and blood samples to measure 16 different VOC metabolites and several liver injury markers.

## **Results**

- **General Population:** Higher levels of certain VOC metabolites were linked to increased levels of liver injury markers like alkaline phosphatase (ALP) and bilirubin.
- **Smokers:** Smokers had higher levels of VOC metabolites and liver injury markers than non-smokers. This suggests that smoking increases exposure to harmful VOCs and liver damage risk.
- **Race and Sex Differences:** The effects of VOC exposure on liver health were influenced by factors like sex and race, with some groups showing higher risks.

## **Conclusion**

The study shows that exposure to VOCs at home is linked to liver damage, with smokers being more affected. Reducing exposure to these harmful chemicals can help protect liver health, especially in vulnerable populations. More research is needed to understand how different factors like race and sex influence these effects and to develop strategies to reduce VOC exposure.

Word Count: 351