



Immune Function Pilot Study

A summary of published findings for our community

PURPOSE OF THE STUDY

This study explored how the immune system may respond to chemical exposure following the East Palestine, Ohio train derailment and vent and burn of chemicals.

WHAT DID THE STUDY INVOLVE?

On July 17–18, 2023, nineteen (19) adults living about one mile from the derailment site gave a blood samples at the First United Presbyterian Church in East Palestine. One of the blood samples was analyzed for immune function. The immune function study:

- Identified and counted the types of immune cells in the blood; and
- Compared those cells with stored samples from a comparison group of 21 adults in Riverside, California, of similar age and sex, with no known exposure to toxic chemicals.

From the same 19 adults, blood was also collected for dioxins and furans, and urine for compounds linked to volatile organic chemicals. Summaries of those results were shared earlier and are on the study website: <https://research.uky.edu/environment/east-palestine-health-research/findings>

WHY FOCUS ON THE IMMUNE SYSTEM?

The immune system protects the body from harmful substances and infections. Changes in immune cells can affect how well the body fights infection or toxic substances.

WHAT DID WE FIND?

Compared with the California group, the East Palestine samples showed four main differences:

+ **More red blood cells**

Higher numbers of red blood cells and hemoglobin, which carry oxygen through the body.

- **Fewer infection fighters**

Lower numbers of some white blood cells that help the body fight infection.

+ **More “clean-up” cells**

Higher numbers of cells whose job is to surround and break down foreign substances to clear them from the body.

+ **More repair proteins**

Higher numbers of proteins that work to repair tissue damage.

WHAT DO THE FINDINGS MEAN?

Taken together, these patterns suggest the body may be showing signs of responding to environmental exposures and repairing tissue. This is an important early signal, but it is one possible explanation, not a proven one.

These differences could also be influenced by other factors. The comparison group lived in southern California where lifestyle may be different than rural Ohio residents, and their samples were collected several years earlier and stored frozen for longer a longer period of time.

In short: the results are meaningful, and they point clearly to the need to do this study again on a larger group of people and with a comparison community that most closely aligns with East Palestine residents. **This larger study is already underway!**

WHAT HAPPENS NEXT?

The [East Palestine Health Research Program](#) is designed to fully answer the questions about how the immune system is responding to the derailment and vent and burn. This study will also include a comparison community in Cambridge, Ohio, a socioeconomically similar community 100 miles away from the derailment site. This larger scale study will provide information on how immune systems of adults and children are responding to chemical exposures following the events related to the derailment.

The research will be used to inform specific health care needs.

WHERE CAN I READ THE FULL STUDY?

The full paper is open-access and available online at [nature.com/articles/s41370-026-00918-y](https://www.nature.com/articles/s41370-026-00918-y)

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Learn more about the study or contact us



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