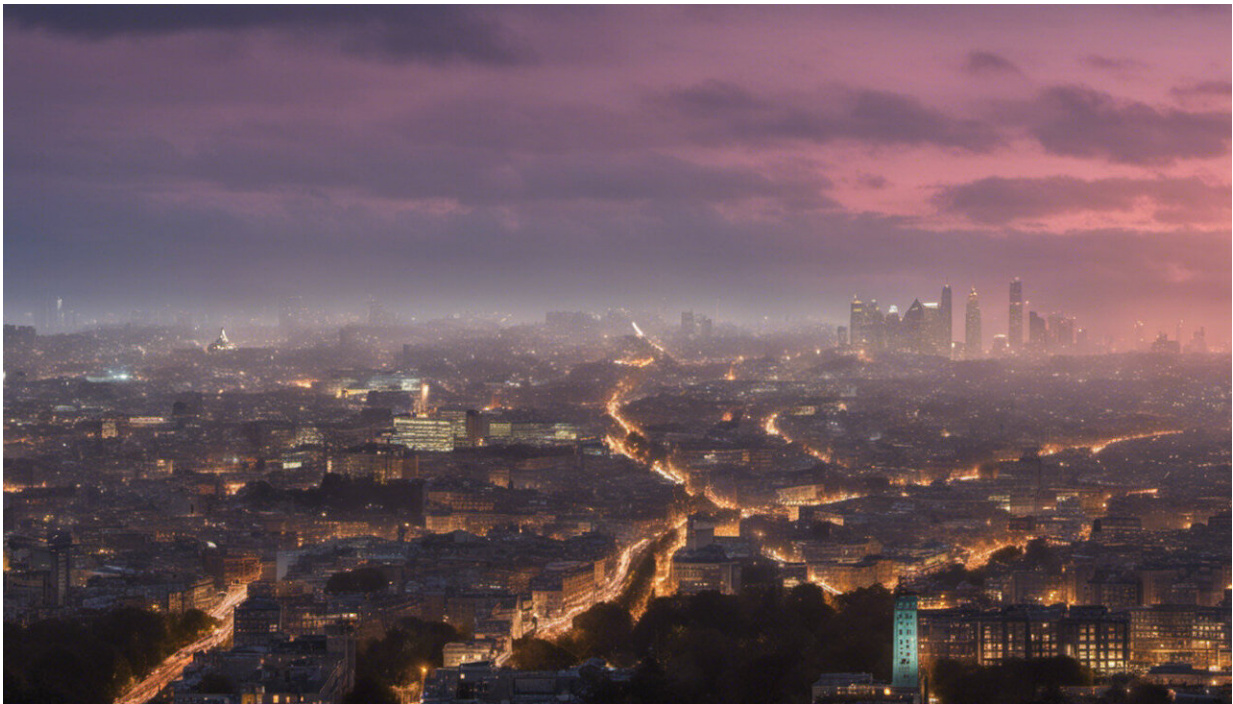


# Uncovering how air pollution causes lung cancer

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Credit: AI-generated image ([disclaimer](#))

Cigarette smoking is the No. 1 risk factor for lung cancer. Exposure to second-hand smoke can also increase the risk of lung cancer. This is what scientists have known for a long time. What they did not know until now is that very small pollutant particles in the air may trigger lung cancer in people who have never smoked.

The discovery is based on research carried out on more than 400,000 people in search of associations between their air pollution and [cancer risk](#). Researchers from the PROTEUS, THESEUS, PLOIDYNET, CHROMAVISION and WHOLENICHE projects performed ultra-deep profiling of 247 normal lung tissue samples and analyzed normal lung tissue from humans and mice following exposure to the air pollutant particulate matter (PM). They also investigated the consequences of PM on tumor promotion in mouse lung cancer models.

The findings were presented at the European Society for Medical Oncology (ESMO) Presidential Symposium in Paris in September 2022. Specifically, the research showed that air pollution can trigger lung cancer in people with no history of smoking because some air pollutant particles may promote changes in cells in the airways.

## **Non-smokers at risk**

As reported in a news item posted on "CNN," more exposure to airborne PM—at 2.5 micrometers in diameter or smaller—can drive rapid changes in airway cells that have mutations in a gene called EGFR, which are seen in about half of people with lung cancer who have never smoked, and another gene linked to lung cancer called KRAS. This is according to the research conducted by scientists at The Francis Crick Institute in London and other institutions around the world.

"We found that driver mutations in EGFR and KRAS genes, commonly found in lung cancers, are actually present in normal lung tissue and are a likely consequence of aging," Dr. Charles Swanton, a scientist at The Francis Crick Institute and chief clinician at Cancer Research U.K. who presented the findings, explains in a news release published by ESMO.

In a video released by ESMO, Dr. Swanton notes, "It's been known for some time that air pollution is associated with lung cancer risk, but it

hasn't been known how air pollution causes [lung cancer](#). ... What we found is that air pollution exposure in both mice and humans results in an inflammatory axis."

The research findings are important considering that many more people than smokers are exposed to what the World Health Organization (WHO) would describe as unsafe levels of air pollution. In fact, it is estimated that nearly every single person on this planet (95 %) is exposed to levels of [air pollution](#) that WHO would consider unsafe. "I think this is an urgent mandate to lower pollution levels," says Dr. Swanton. "And of course, climate health and human health are intimately linked."

**More information:** CHROMAVISION project website:  
[chromavision.eu/](http://chromavision.eu/)

Provided by CORDIS

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