

Examining the factors in air pollution that can lead to lung cancer

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A large international team of researchers has found that most lung cancers that result from exposure to air pollution are not due to induced mutations but are instead the result of inflammation inciting cells that

are more likely to develop into cancer.

In their paper published in the journal *Nature*, the group describes their extensive study of the means by which air pollution can cause [lung cancer](#). Allan Balmain, from the University of California, San Francisco, has published a News & Views piece in the same journal issue outlining the work done by the team on this new effort.

Prior research has shown that there is a strong link between exposure to some types of air pollution and lung cancer. But because of the wide variety of particles in air pollution, medical scientists have not been able to definitively describe how breathing air pollution can lead to the development of lung cancer. In this new effort, the researchers set themselves the task of finding that answer.

The researchers analyzed [medical records](#) in databases for patients living in Canada, Taiwan, South Korea and the U.K., focusing specifically on patients who developed lung cancer and who also had a gene mutation called EFGR—it had previously been tied to an increased likelihood of developing lung cancer. They found that lung cancers in such patients were more likely to occur in those exposed to particles that were 2.5 micrometers in diameter or less—a size that allowed them to make their way deeply into the lungs.

The team next engineered test mice to carry the EFGR mutation. This made them more likely to develop lung cancer when exposed to fine particulate air pollution. But as part of their study, they also found that the mice did not experience an increase in the number of cell [mutations](#) in their lungs. This suggested that the air pollution itself did not cause new mutations, but instead contributed to conditions that induce cells predisposed to mutation to begin doing so.

The researchers suggest that [air pollution](#) in general is not a direct cause

of mutations in the lungs leading to lung cancer, but instead incites preexisting cells to begin to mutate due to the inflammation that results. This theory was bolstered by giving the test mice IL-1 β -blocking drugs, which reduced their chances of developing lung cancer.

More information: William Hill et al, Lung adenocarcinoma promotion by air pollutants, *Nature* (2023). [DOI: 10.1038/s41586-023-05874-3](https://doi.org/10.1038/s41586-023-05874-3)

Allan Balmain, Air pollution's role in the promotion of lung cancer, *Nature* (2023). [DOI: 10.1038/d41586-023-00929-x](https://doi.org/10.1038/d41586-023-00929-x)

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