

Genetic risk factor found for Covid-19 smell and taste loss, researchers say

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Scientists are piecing together why some people lose their sense of smell after contracting Covid-19.

[A study published Monday in the journal Nature Genetics](#) identified a genetic risk factor associated with the loss of smell after a Covid infection, a discovery that brings experts closer to understanding the perplexing pattern and may point the way toward much-needed treatments.

Six months after contracting Covid, as many as [1.6 million people](#) in the United States are still unable to smell or have experienced a change in their ability to smell. The precise cause of sensory loss related to Covid is not known, but scientists do think it stems from damage to infected cells in a part of the nose called the olfactory epithelium. These cells protect olfactory neurons, which help humans smell.

"How we get from infection to smell loss remains unclear," said [Dr. Justin Turner](#), an associate professor of otolaryngology at Vanderbilt University who was not a part of the study.

"Early data suggests that supporting cells of the olfactory epithelium are the ones mostly being infected by the virus, and presumably this leads to the death of the neurons themselves," he said. "But we don't really, really know why and when that happens, and why it seems to preferentially happen in certain individuals."

A genetic locus near two olfactory genes is associated with Covid-induced loss of smell and taste, according to the study. A locus is the fixed position of a gene on a chromosome.

This genetic risk factor increases the likelihood a person infected with SARS-CoV-2 will experience a loss of smell or taste by 11 percent. While some estimates suggest [4 out of 5 Covid patients](#) regain these senses, [research suggests](#) the persistent inability or reduced ability to smell and taste impacts relationships, physical health and psychological well-being.



Researchers at the genomics and biotechnology company 23andMe conducted the study as part of a larger [Covid project](#). All participants live in the U.S. or the United Kingdom.

Within a group of 69,841 individuals who self-reported receiving a positive Covid test, 68 percent reported a loss of smell or taste as a symptom. The loss of smell and taste were combined as a single survey question; this grouping and the use of self-reported data are limitations of the study.

After comparing the genetic differences between those who lost their sense of smell and those who reported that they did not suffer this effect, the study team found a region of the genome associated with this split that's situated near two genes, UGT2A1 and UGT2A2. Both of these genes are expressed within tissue inside the nose involved in smell and play a role in metabolizing odorants.

"It was this really beautiful example of science where, starting with a large

body of activated research participants who have done this 23andMe test, we were able to very quickly gain some biological insights into this disease that would otherwise be very, very difficult to do," said [Adam Auton](#), vice president of human genetics at 23andMe and the lead author of the study.

How UGT2A1 and UGT2A2 are involved in this process is unclear, though he and his colleagues hypothesize the genes "may play a role in the physiology of infected cells" and the resulting impairment that leads to smell loss.

To use these findings, scientists need to learn more about how these genes are expressed and what their functions are in olfactory signaling, Turner said.

Certain trends also emerged among the participants who reported the loss of smell and taste: Women, for example, were 11 percent more likely than men to experience this. Meanwhile, adults between the ages of 26 and 35 made up 73 percent of this group.

The study team also found people of "East Asian or African American ancestry were significantly less likely to report loss of smell or taste." The cause of this observation is not yet known, but Auton said it's likely not explained by the genetic variants of this specific locus. The team also notes the study is biased toward people of European ancestry because of [limited reference data](#).

These findings can help patients in two ways, said [Danielle Reed](#), associate director of the Monell Chemical Senses Center. She studies person-to-person differences in the loss of smell and taste due to Covid and was not a part of the new paper.

First, "it helps answer the question of 'why me' when it comes to taste and smell loss with Covid-19," she said. "Some people have it and some do not. Inborn genetics may partially explain why."

The study may also help scientists find treatments. Earlier research suggests the loss of these senses is related to a “failure to protect the sensory cells of the nose and tongue from viral infection,” Reed said.

“This study suggests a different direction,” she said. “The pathways that break down the chemicals that cause taste and smell in the first place might be over or underactive, reducing or distorting the ability to taste and smell.”

For most of the coronavirus pandemic, the loss of smell and taste have been known as signature symptoms. Early [research](#) suggests loss of smell and taste is rarer with the omicron variant, but not entirely unlikely: In a [study](#) of 81 omicron cases in Norway, 12 percent reported reduced smell and 23 reported reduced taste.

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