

# WSJ Print Edition

## Fighting A Cold? Battle Is In the Nose

BY AYLIN WOODWARD

A new study helps explain why you get sick from a common cold virus. The secret, it turns out, lies inside your nose.

Winter brings a surge of respiratory illnesses, including rhinoviruses, the most frequent cause of the common cold. How your nasal-passage cells respond to the rhinovirus helps determine whether you get sick and how bad you feel, according to a new study published Monday in the journal Cell Press Blue.

"This study offers a more detailed picture of what's going on during common cold infections than we ever had," said Dr. Ellen Foxman, an immunologist at the Yale School of Medicine and senior author of the new research.

Not everyone who gets a cold virus in their nose gets sick. Only about half of infections cause symptoms, Foxman said. To help understand why, her group grew nasal tissue in a lab, allowing them to study cellular and molecular changes in the nose and lung lining when those cells are exposed to rhinovirus.

The researchers found there are generally two outcomes to an exposure. In a good response, less than 1% of the cells get infected, because the body quickly produces a protein called interferon to block the entry and replication of viruses. Interferons help coordinate an antiviral defense. If they work fast enough, they stop the virus from spreading.

When the researchers disrupted this interferon response, the virus was able to spread and replicate more.

If the virus spreads, it can trigger a different reaction, causing our bodies to produce proteins that drive inflammation, prompting extra mucus production. A bad response is marked by inflammation, and 30% or more of the cells becoming infected—this is when you experience symptoms and feel sick. "What tips the scale toward one or the other response is not completely understood," Foxman said.

There are some conditions that are associated with a good—or bad—response.

If a person has had a recent viral infection, some evidence suggests the antiviral interferon response stays active, making it easier for the body to mount a quick defense against the next virus, Foxman said.

Cooler air surrounding the cells in your nose and lungs appears to give viruses an advantage. Lower temperatures seem to be associated with the suppression or delay in the production of interferons, according to Foxman.

Harmful environments or substances can worsen a response to an exposure. "Inhaling pollution or cigarette smoke really changes the immune response to the next thing you're exposed to, like a common cold virus, and that usually means a more detrimental inflammatory response," she said.