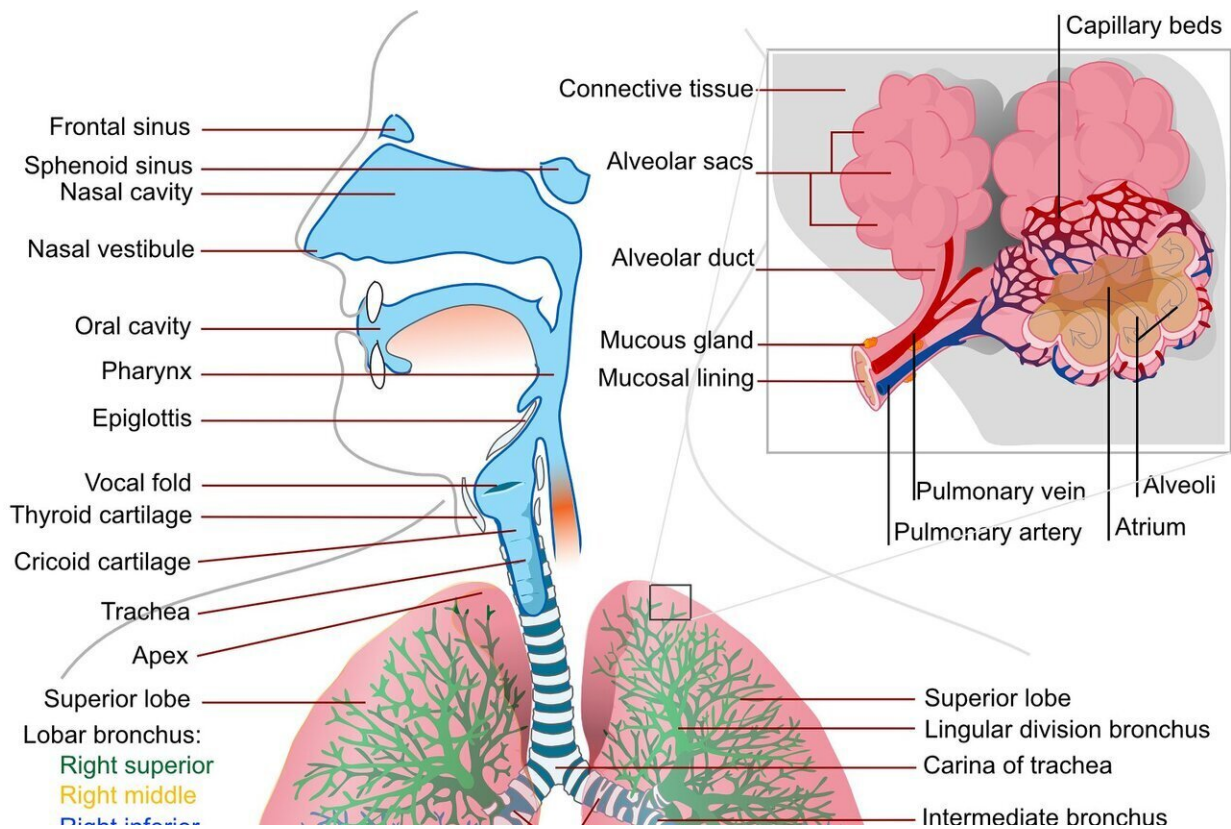


Discovery of bitter taste receptors in the lung could pave way for new treatment

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Scientists have discovered a new family of helpful proteins in the lung, with the finding potentially paving the way for a new course of treatment for patients with respiratory failure.

Researchers from Anglia Ruskin University (ARU), alongside colleagues from Brown University and the Providence Veterans Affairs Medical Center in Rhode Island, US, have identified for the first time that bitter taste receptors commonly found in the tongue, called T2Rs, are also present in the walls of [blood vessels](#) in the lung.

Over 10% of patients in intensive care units worldwide suffer from [acute respiratory distress syndrome](#) (ARDS), and it has a mortality rate of nearly 40%. ARDS requires patients to undergo ventilation and is commonly caused by pneumonia, [major surgery](#), trauma, sepsis, and more recently, COVID-19.

ARDS is associated with an excessive increase in pulmonary vascular permeability, which allows proteins and liquids to enter the lung, leading to the development of pulmonary edema, commonly referred to as "water on the lungs."

The new study, led by Dr. Zsuzsanna Kertesz and Dr. Havovi Chichger of Anglia Ruskin University (ARU) in Cambridge, England, and published in the journal *Frontiers in Physiology*, has discovered that when these bitter taste receptors in the lung are stimulated, they help to protect the lining of the blood vessels, called the endothelium.

The researchers found that the compounds phenylthiocarbamide and denatonium—the most bitter substance known—act on bitter taste receptors T2R38 and T2R10, respectively. Once stimulated, the bitter taste receptors provide a protective mechanism for the wall of the blood vessels, preventing barrier disruption and stopping liquids from passing through.

Senior author Dr. Havovi Chichger, Associate Professor in Biomedical Science at Anglia Ruskin University (ARU), said, "One of the biggest issues that intensive care unit patients with COVID, trauma or [bacterial](#)

[infection](#) suffer from is respiratory distress, commonly diagnosed as acute respiratory distress syndrome. This is an inability to get enough oxygen into the body because of fluid leak from blood vessels into the lung.

"In this new study, we have identified a new family of proteins in blood vessels in the lung called T2R, or bitter taste receptors. These are the same proteins found in the tongue which sense any bitter substances and tell us that they taste unpleasant. In blood vessels in the lung, we show that these [bitter taste receptors](#) are able to regulate how our blood vessels function when stressed.

"Most intriguingly, when we stimulate these proteins, we have found that they offer protection against fluid leak. These findings indicate that this new family of proteins in blood vessels could offer a new avenue of drugs to reduce fluid leak into the [lung](#), and therefore help to treat patients with [respiratory distress](#)."

More information: Zsuzsanna Kertesz et al, Agonists for Bitter Taste Receptors T2R10 and T2R38 Attenuate LPS-Induced Permeability of the Pulmonary Endothelium in vitro, *Frontiers in Physiology* (2022).
[DOI: 10.3389/fphys.2022.794370](https://doi.org/10.3389/fphys.2022.794370)

Provided by Anglia Ruskin University

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