

Team tracks integrin's role in lung function

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Researchers Timothy Blackwell, MD, left, Erin Plosa, MD, Roy Zent, MD, PhD, and colleagues are studying beta-1 integrin's role in normal lung function. Credit: Susan Urmey

Beta-1 integrin, a critical component of epithelial extracellular matrix receptors, is essential for normal lung function in adulthood, researchers at Vanderbilt University Medical Center have discovered.

In a [mouse model](#), deleting the gene for beta-1 integrin from the [epithelial cells](#) lining the alveoli of the adult lung, where the exchange of

oxygen and [carbon dioxide](#) takes place, results in accelerated inflammation and severe emphysema resembling [chronic obstructive pulmonary disease](#) (COPD) in humans, the researchers reported.

Their findings, published recently in the *Journal of Clinical Investigation (JCI) Insight*, could lead to new ways to treat COPD and other lung disorders.

"The regulation of inflammation is a newly described, nontraditional role for integrins in an epithelial tissue," said the paper's lead author, Erin Plosa, MD, assistant professor of Pediatrics.

"We normally think of integrins as regulators of critical cellular functions, such as adhesion, migration, proliferation and differentiation. However, we have shown that if you don't have integrins, you have unchecked chronic epithelial inflammation," added senior author Roy Zent, MD, Ph.D., Thomas F. Frist Professor of Medicine and vice chair for Research in the Department of Medicine.

White blood cells called macrophages are an important part of the lung's innate immune system, where they patrol the alveolus engulfing pathogens and dead, dying or dysfunctional cells. In this way they help maintain the normal lung tissue architecture.

In the absence of beta-1 integrin, increased reactive oxygen species production and NF-kappa-B signaling stimulates recruitment of a subset of macrophages that protect the lungs by eliminating diseased epithelial cells. Blocking the recruitment of these protective macrophages results in early emphysema.

More information: Erin J. Plosa et al. β 1 Integrin regulates adult lung alveolar epithelial cell inflammation, *JCI Insight* (2019). [DOI: 10.1172/jci.insight.129259](https://doi.org/10.1172/jci.insight.129259)

Provided by Vanderbilt University

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