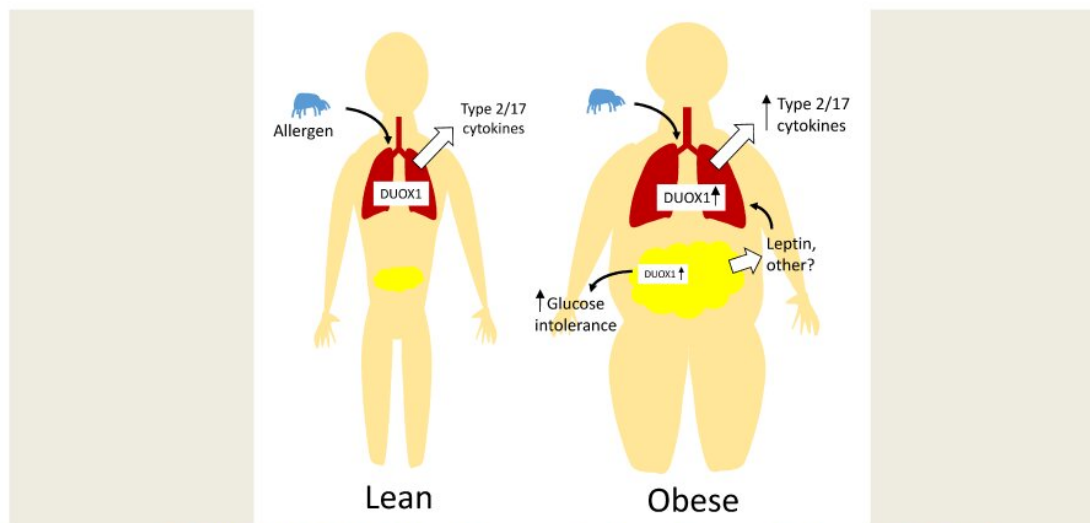


Study identifies potential new target to treat obesity-associated allergic asthma

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Obesity Enhances DUOX1-Mediated Airway Allergen Responses



CONCLUSION: Obesity results in enhanced airway DUOX1 expression, thereby sensitizing individuals to enhanced DUOX1-mediated airway responses to airborne allergens

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Graphical abstract. Credit: *American Journal of Physiology-Lung Cellular and Molecular Physiology* (2023). DOI: 10.1152/ajplung.00331.2022

New research out of the University of Vermont is homing in on why people with asthma often have worse symptoms if they are obese. The study is published ahead of print in the *American Journal of Physiology-Lung Cellular and Molecular Physiology*.

According to the U.S. Centers for Disease Control and Prevention, obesity "is associated significantly with the development of asthma, worsening asthma symptoms and poor asthma control." New research demonstrates that the gene DUOX1 likely contributes to this connection between obesity and asthma. DUOX1 produces an enzyme, also called DUOX1, which is involved in the production of reactive oxygen species. The gene is abundant in the respiratory tract.

To assess the role of DUOX1 in obesity-related asthma, the research team looked at a combination of human, animal and in vitro studies. The researchers collected human nasal samples from participants with allergen-induced asthma who were and were not obese before and after exposure to an irritant. In [mice](#), they compared unmodified mice, mice that do not produce DUOX1 at all and mice in which DUOX1 can be selectively turned off. Mice were fed either a high-fat or low-fat diet. After 14 weeks of feeding, mice were exposed to either an irritant to induce an allergic response or a saline control. The research team then analyzed a variety of their tissues. In a separate study, mice were repeatedly exposed to the irritant to induce a model of chronic exposure.

In humans, [statistical analysis](#) "revealed a significant positive association" between [body mass index](#) and markers of DUOX1 activity. Multiple markers of DUOX1 activity and of inflammation were higher in the participants with asthma compared to controls and still higher in the participants with [asthma](#) and obesity. The mouse and in vitro studies further verified these findings. Obese mice showed greater DUOX1 activity. When DUOX1 was not present, many of the inflammatory

markers seen in asthmatic reactions were either not present or significantly reduced even in obese animals.

"Increased epithelial expression and activation of DUOX1 represents an important factor in [allergic inflammation in the context of diet-induced [obesity](#)]," conclude the researchers.

More information: Aida Habibovic et al, Diet-induced obesity worsens allergen-induced type 2/type 17 inflammation in airways by enhancing DUOX1 activation, *American Journal of Physiology-Lung Cellular and Molecular Physiology* (2023). [DOI: 10.1152/ajplung.00331.2022](#)

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