

Science News

from research organizations

Print Email Share

Global warming may cause spike in asthma, allergy symptoms

Date: June 6, 2017

Source: American Physiological Society (APS)

Summary: Exposure to a widespread outdoor fungus can increase cell damage (oxidative stress) in the airways, research shows. This spike weakens the airways' barrier defense system that, when functioning normally, removes infection- and allergy-causing organisms (mucociliary clearance).

Share: Facebook Twitter Google+ Pinterest LinkedIn Email

RELATED TOPICS

Health & Medicine

- > Allergy
- > Immune System
- > Stem Cells

Plants & Animals

- > Fungus
- > Biology
- > Molecular Biology

Earth & Climate

- > Global Warming
- > Climate
- > Environmental Issues

FULL STORY

A new study finds that exposure to a widespread outdoor fungus can increase cell damage (oxidative stress) in the airways. This spike weakens the airways' barrier defense system that, when functioning normally, removes infection- and allergy-causing organisms (mucociliary clearance). The study, published ahead of print in the *American Journal of Physiology -- Cell Physiology*, was chosen as an APSselect article for June.

Alternaria alternata is a fungus that produces spores in the dry, warm weather of late summer and early fall. Previous studies have found that *Alternaria* produces up to three times more spores when atmospheric carbon dioxide (CO₂) levels are high. Airway exposure to the fungal spores may induce allergy symptoms and asthma in some people.

A research team from the University of Minnesota and the Mayo Clinic took cells from the lining (epithelium) of human airways and exposed them to *Alternaria*. The researchers analyzed the exposed cells to determine the effects of fungal exposure on permeability properties and barrier function of the epithelium. When permeability is compromised, proteins and nutrients can leak out of the lining and into the airways. In addition, reduced barrier function can let bacteria and other allergens enter the airways, increasing the risk of inflammation and infection.

The research team also measured oxidative stress, or cell damage, in the treated cells. Exposure to *Alternaria* produced more cell damage in the cells of the airway's lining. Fungus-treated cells had higher concentrations of calcium, which prompted the epithelial cells to secrete more salt and fluid than usual. Salt and fluid secretion is normally associated with improved mucociliary clearance -- keeping the airways free of allergens. "However, prolonged exposure [to *Alternaria*] leads to disruption of epithelial barrier function that would ultimately reduce mucociliary clearance," the researchers wrote. Reduced mucociliary clearance typically makes allergy symptoms worse.

Current climate-warming trends may intensify the problem, the research team noted. "These results suggest that continuing increases in atmospheric CO₂ associated with global climate change will increase both the level of *Alternaria* exposure and antigenicity [the ability to produce an immune response] of spores that come in contact with the airways."

Story Source:

Materials provided by **American Physiological Society (APS)**. Note: Content may be edited for style and length.

Journal Reference:

1. Nathan A. Zaidman, Kelly E. O'Grady, Nandadevi Patil, Francesca Milavetz, Peter J Maniak, Hirohito Kita, Scott M. O'Grady. **Airway epithelial anion secretion and barrier function following exposure to fungal aeroallergens: Role of oxidative stress..** *American Journal of Physiology - Cell Physiology*, 2017; ajpcell.00043.2017 DOI: 10.1152/ajpcell.00043.2017

Cite This Page:

MLA APA Chicago

American Physiological Society (APS). "Global warming may cause spike in asthma, allergy symptoms." ScienceDaily. ScienceDaily, 6 June 2017. <www.sciencedaily.com/releases/2017/06/170606123423.htm>.

RELATED TERMS

- > Asthma
- > Immune system
- > Poison ivy
- > Necrosis
- > Bacteria
- > Wheeze
- > Emphysema
- > Brain damage

RELATED STORIES

Testing for Damage to Airways Caused by Drinking, Smoking Sep. 14, 2016 — Cells in the lung are constantly exposed to oxygen and intermittently exposed to other environmental factors, resulting in a susceptibility to oxidative injury. Both alcohol use disorders (AUDs) and ... **read more »**

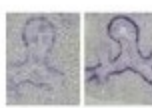


Protective Role for Specialized Cells in Intestinal, Respiratory Systems Revealed in Study

July 7, 2014 — Ripping a page from the 'Star Trek' script, specialized cells of the barrier that lines the inside of the intestines and airways of humans have invoked a biological version of Captain ... **read more »**

Want Spring Allergy Relief? Avoid Stress

Apr. 1, 2014 — Stress doesn't cause allergies, but easing your mind might mean less allergy flare-ups this spring. According to a study, allergy sufferers with persistent stress experience more allergy flares. ... **read more »**



Prenatal Vitamin A Deficiency Tied to Postnatal Asthma

Feb. 12, 2014 — Researchers have found the first direct evidence of a link between prenatal vitamin A deficiency and postnatal airway hyperresponsiveness, a hallmark of asthma. The study, conducted in mice, shows ... **read more »**

Most Popular

this week

PLANTS & ANIMALS



Does Consuming Low-Fat Dairy Increase the Risk of Parkinson's Disease?

Starving Prostate Cancer With What You Eat: Apple Peels, Red Grapes, Turmeric



Genetic Study Shakes Up the Elephant Family Tree



Neuroscientists Rewire Brain of One Species to Have Connectivity of Another

EARTH & CLIMATE



Pollution 'Devastating' China's Vital Ecosystem, Research Shows



The Mysterious Bend in the Hawaiian-Emperor Chain

Earliest Human-Made Climate Change Took Place 11,500 Years Ago

Culprit Hidden in Plain Sight in Alzheimer Disease Development

FOSSILS & RUINS



Homo Sapiens 100,000 Years Earlier: Ancestors' Diet of Game Revealed



7.2-Million-Year-Old Pre-Human Remains Found in the Balkans



Japan's Largest Complete Dinosaur Skeleton Discovered



Student Makes Big Discovery During Anthropology Dig on Battle Site

Strange & Offbeat

PLANTS & ANIMALS

Fractal Planting Patterns YieId Optimal Harvests, Without Central Control



Could Edible Insects Help Global Food Security?



Bee Buzzes Could Help Determine How to Save Their Decreasing Population

Cope's Gray Treefrogs Meet the Cocktail Party Problem

EARTH & CLIMATE



Guts to Glory? Newly Discovered Enzyme Complexes in Herbivore Digestive Tracts Show Promise for Sustainable Fuels, Medicines



Harnessing Energy from Glass Walls



Scientists Borrow from Electronics to Build Circuits in Living Cells



How Do Blind Cavefish Find Their Way? The Answer Could Be in Their Bones.

FOSSILS & RUINS



200 Years of the Bicycle: Computer Scientists Electrify Historic "dandy Horse"



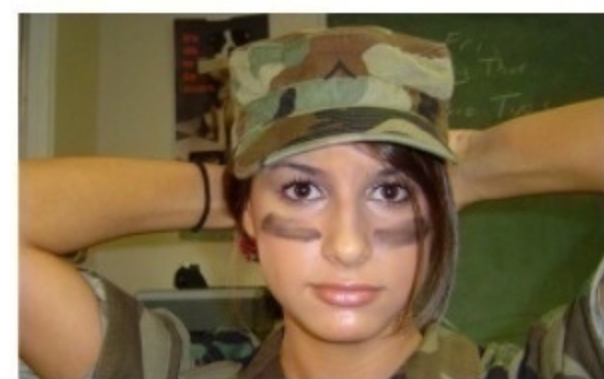
New Species of Bus-Sized Fossil Marine Reptile Unearthed in Russia



Space Weather Events Linked to Human Activity



Secrets Behind T. Rex's Bone Crushing Bites: T. Rex Could Crush With 8,000 Pound Bite Forces



The Most Gorgeous Female Soldiers Who ...

topbanger.com

Free Subscriptions

Get the latest science news with ScienceDaily's free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:

- Email Newsletters
- RSS Feeds

Follow Us

Keep up to date with the latest news from ScienceDaily via social networks:

- Facebook
- Twitter
- Google+
- LinkedIn

Mobile Apps

Get the latest news from ScienceDaily via our free mobile apps, available for download on the following platforms:

- iPhone/iPad
- Android

Have Feedback?

Tell us what you think of ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?

- Leave Feedback
- Contact Us