

ERS website

Respiratory Channel

ERS Publications

Login

 0 items

 **ERS | PUBLICATIONS**

Search within ERS publications

Conference Abstract  Free

## A new formulation of n-acetylcysteine, carnitine, curcumin and B2 vitamin exerts anti-oxidant and anti-inflammatory effects in a primary 3D bronchial epithelial model exposed to cigarette smoke extracts.

Serena Di Vincenzo | Maria Ferraro | Valentina Lazzara |  
Poala Pinto | Filippo Catalano | Elisabetta Pace |  
Maria Rosaria Bonsignore [See Less](#) 

European Respiratory Journal 2023 62(suppl 67): PA604; DOI:  
<https://doi.org/10.1183/13993003.congress-2023.PA604>



This article appears in:

European Respiratory  
Journal

Vol 62 Issue suppl 67

 Permissions  Add to Favourites

 Labels  Cite  Share  Alerts

 Focus  Previous  Next

Article

Info & Metrics

### Abstract

Cigarette smoke, the main risk factor for Chronic Obstructive Pulmonary Disease (CC a potent pro-oxidant stimulus. Increased oxidative stress within the airways is associated with

epithelial damage and amplification of inflammatory responses that in turn contribute to disease progression.

The aim of this in vitro study was to identify whether a new formulation of n-acetylcysteine, carnitine, curcumin and B2 vitamin could counteract oxidative stress and downstream pro-inflammatory events promoted by cigarette smoke extract (CSE) exposure in 3D primary bronchial epithelial cells (PBEC) cultured at the air-liquid interface (ALI) and differentiated to form a pseudostratified epithelium.

In 3D cultures exposed to CSE with or without 2 hours pre-incubation with the new formulation, we evaluated: a) cell viability by MTS; b) intracellular mitochondrial ROS production by flow cytometry; c) IL-8 and IL-6 protein release by ELISA on supernatants collected at apical and basal sides. CSE increased mitochondrial ROS production, basal and apical release of IL-8 and basal release of IL-6. The new formulation did not alter cell viability and was effective preventing the increase of mitochondrial ROS and of the basal and apical increase of IL-8 or of basal IL-6.

NAC did not counteract the CSE effects on mitochondrial ROS production and IL-6 release.

In conclusion, the tested formulation, exerting anti-oxidant and anti-inflammatory effects, can preserve airway epithelial homeostasis. Future studies are needed to validate its role as add-on treatment in COPD patients.

Proj Code:2017-NAZ-0244

 Focus < Previous Next >

## We recommend

Curcumin and grape pomace extract loaded in liposomes to counteract oxidative stress and inflammation induced by cigarette smoke in bronchial epithelial cells

Maria Ferraro, *European Respiratory Journal*, 2023

Antioxidant properties of N-acetylcysteine: their relevance in relation to chronic obstructive pulmonary disease


P.N.R. Dekhuijzen, *European Respiratory Journal*, 2004

Cigarette smoke extract induces barrier changes and senescence in primary bronchial epithelial cells


Cecilia Forss, *European Respiratory Journal*, 2019

Harmfull effects of cigarette smoke on a respiratory epithelium line (Calu 3): Prevention by N-acetylcysteine


Andrea Dugour, *European Respiratory Journal*, 2013

Innate antioxidant defense systems in the respiratory tract 

Vliet, Albert van der, *Biofactors*, 2001

Coenzyme Q<sub>10</sub> supplementation reduces corticosteroids dosage in patients with bronchial asthma 

Anna Gvozdjáčková, *Biofactors*, 2005

Olive oil supplemented with vitamin E affects mitochondrial coenzyme Q levels in liver of rats after an oxidative stress induced by adriamycin 

J.L. Quiles, *Biofactors*, 1999

DNA of neutrophil extracellular traps promote NF-κB-dependent autoimmunity via cGAS/TLR9 in chronic obstructive pulmonary disease 