

4<sup>th</sup> International Conference on

## CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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**Novel pharmacological strategies for the treatment of COPD and its comorbidities****Ross Vlahos**

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**Statement of the Problem:** Reactive oxygen species (ROS) are a family of highly reactive molecules that are produced by a variety of cell types in the lung in response to chemical and physical agents in the environment. It is well known that ROS are critical in host defense as they kill invading pathogens, but their excessive accumulation in the lung results in oxidative damage. Oxidative stress, which is defined as the persistent overproduction of ROS that overwhelms endogenous antioxidant defense systems, has been implicated in both acute (e.g. respiratory virus infections, exacerbations of asthma and COPD) and chronic (e.g. COPD) lung diseases.

**Aims & Methods:** The purpose of this study was to determine whether inhibiting oxidative stress and ROS production may be a novel way to treat acute and chronic lung diseases using clinically relevant models of lung disease.

**Findings:** We have shown that targeting oxidative stress with the Nox2 oxidase inhibitors and ROS scavengers, apocynin and ebselen can ameliorate influenza A virus (IAV)-induced lung inflammation and pathology, cigarette smoke-induced lung inflammation and acute exacerbations of COPD (AECOPD). In addition, we have found that treating mice with apocynin reduced cigarette smoke-induced skeletal muscle wasting in mice suggesting that this strategy can be useful in treating comorbidities associated with COPD.

**Conclusion & Significance:** Targeting oxidative stress may be a novel strategy to treat both acute and chronic lung diseases.

**Biography**

Ross Vlahos is a Principal Research Fellow and Head of the Respiratory Research Group in the School of Health and Biomedical Sciences, RMIT University. His research aims to identify novel strategies for the prevention and treatment of Chronic Obstructive Pulmonary Disease (COPD) and its co-morbidities with a focus on the cellular and molecular pathways that underpin cigarette smoke-induced lung inflammation and damage. He has co-authored more than 80 publications in peer reviewed journals, he has had continuous NHMRC Australia funding since 2001 and has played a major role in commercially funded work that has confidentiality/patent agreements. He has served on numerous national and international research funding bodies, several editorial boards, various conference committees and chaired sessions at international meetings.

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