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3rd International Conference on

Chronic Obstructive Pulmonary Disease

July 11-12, 2016 Brisbane, Australia

Comparative assessment of lung inflammation, pulmonary function and emphysema caused by the aerosol from potential reduced risk products and cigarette smoke in mouse models of COPD

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Smoking cigarettes is a major risk factor in the development and progression of chronic obstructive pulmonary disease (COPD). Potential Reduced Risk Products (RRPs*), are being developed to reduce smoking-related health risks compared to smoking cigarettes. Here we report on mouse studies that have been conducted comparing different aspects of COPD after exposure of different strains to mainstream smoke (MS) from the reference cigarette 3R4F and aerosols from RRPs. Exposures were carried out for up to 8 months for several hours per day and at concentrations up to 30 µg nicotine/l test atmosphere. MS from 3R4F caused significant lung inflammation as evidenced by recruitment of inflammatory cells and pro-inflammatory cytokines in broncho-alveolar lavage fluid, changed pulmonary function parameters (e.g. resistance, PV-loops) indicative for emphysema and quantifiable emphysematous changes in the lung parenchyma. Exposure to high concentrations of aerosols from RRPs resulted in changes of a much lower magnitude and in a number of cases changes were not different from Sham (air)-exposed animals. Switching mice from exposure to MS for 2 months to aerosol from RRPs, resulted in the reversal of the emphysematous changes similar to those noticed when animals are switched from exposure of MS to fresh air. In summary, we have demonstrated in different mouse models that the RRPs, in contrast to 3R4F, cause a low level of lung inflammation and minimal pulmonary emphysema.

Biography

Patrick Vanscheeuwijck is the Director Pre-clinical Toxicology at Philip Morris International, Reduced Risk Products in Switzerland. He is responsible for the *in vitro* and *in vivo* assessment of Reduced Risk Products (RRPs). The focus of his career at PMI has been on the development of approaches for the assessment of hazard associated with cigarette smoke and aerosols from RRPs, inhalation toxicology and animal models of disease with more than 30 peer-reviewed publications. He has completed his PhD in Biochemical Pharmacology at University of Gent, Belgium and performed his Post doctorates at the University of Arizona, USA and the University of Leuven, Belgium in Molecular Pharmacology and Molecular Biology.

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