

3rd International Conference on

Chronic Obstructive Pulmonary Disease

July 11-12, 2016 Brisbane, Australia



Tsuyoshi Shuto

Kumamoto University, Japan

Pharmacological and genetic approaches determine protease and oxidative stress as exacerbating factors in a mouse model of obstructive lung diseases

Protease-antiprotease imbalance and oxidative stress are considered to be major pathophysiological hallmarks of severe lung diseases including chronic obstructive pulmonary disease (COPD) and cystic fibrosis (CF), but their role in the regulation of mucus obstructive phenotypes including pulmonary emphysema and dysfunction of β ENaC-transgenic (Tg) mice, a murine model of COPD/CF, is unknown. Here, DNA microarray analysis revealed that protease and oxidative stress-dependent pathways are activated in the lung tissue of β ENaC-Tg mice. Treatments of β ENaC-Tg mice with a serine protease inhibitor ONO3403 and an antioxidant N-acetylcysteine significantly improved pulmonary emphysema and dysfunction. Moreover, depletion of a murine endogenous antioxidant vitamin C (VC), by genetic disruption of VC-synthesizing enzyme senescence marker protein-30 (SMP30) in β ENaC-Tg mice, increased inflammatory status in lung tissue and exaggerated pulmonary emphysema with a significant decrease in pulmonary function, possibly due to an increased oxidative stress. Thus, our results define protease and oxidative stress as factors that exacerbate mucus obstructive phenotypes of a mouse model of COPD/CF.

Biography

Tsuyoshi Shuto has received his PhD degree from Kumamoto University, Kumamoto, Japan, in 2006. He has joined Kumamoto University in 2001 as a Research Associate and in 2006 as a Lecturer/Assistant Professor in the Department of Molecular Medicine, Graduate School of Pharmaceutical Sciences of Kumamoto University, where he is currently an Associate Professor since 2013. During 1999 to 2001 he was at House Ear Institute, USA as a Research Associate. From 2004 to 2005, he was engaged as a Visiting Researcher at California Pacific Medical Center Research Institute, USA. He has published more than 75 papers in reputed journals.

tshuto@gpo.kumamoto-u.ac.jp

Notes: