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Proteinase activated receptor 2 (PAR2) modulation of airway smooth muscle function

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Chronic obstructive pulmonary disease (COPD) is a progressive lung condition characterised by airflow obstruction and irreversible lung damage. Hyperactivity and growth of airway smooth muscle (ASM) limit airflow and are key features of COPD. Proteinase activated receptor-2 (PAR2) is a key modulator of inflammatory responses in respiratory disease, such as asthma and promotes ASM relaxation. However, the precise role of the receptor in ASM in conditions such as COPD is not well understood (1). The aim of this study was to establish an *ex vivo* murine airway myograph assay for investigation of functional PAR2 responses to challenges relevant in COPD pathology.

To achieve this, murine trachea and bronchi tissue was either mounted on a wire myograph for dynamic tension recording or processed for immunohistochemical localisation of PAR2 expression.

PAR2 was present on both murine airway and lung tissue. Stimulation of PAR2 with trypsin (10 U ml^{-1}) or activating peptide was observed to induce relaxation responses in ASM tension.

Taken together this data verifies that PAR2 is present and functional in murine airways, and *ex vivo* modulation alters ASM tone. Ongoing experiments will investigate the effect of disease-relevant insults on this modulation in wild type and PAR2-deficient airways.

1. Sokolova E, Reiser G. A novel therapeutic target in various lung diseases: Airway proteases and protease-activated receptors. Pharmacol Ther. 2007;115(1):70–83.