

release and changes in the PNE responsiveness to the TRPA1 channel agonist cinnamaldehyde (100  $\mu$ M).

**Results** hDPSCs undergo a fibroblastic to neuronal phenotypic switch to PNEs which express the sensory neuronal proteins SP and CGRP. Using qPCR we confirm that PNEs express TLR3, TLR4 and TLR7 mRNA and functional expression of TRPA1 and TRPV1 channels. PNEs pre-treated with PolyI:C (2  $\mu$ g/ml) for 20 mins generated significantly larger inward (-10.8773 pA/pF;  $p < 0.01$ ) and outward (10.0507 pA/pF;  $p < 0.01$ ) currents in response to cinnamaldehyde (100  $\mu$ M) compared to untreated PNEs (-2.347 pA/pF and 2.872 pA/pF respectively). The electrophysiological events elicited by PolyI:C occurred rapidly, were not sustained and appeared independent of alteration in TRP channel gene expression. PNEs incubated with PolyI:C for 24 h released significantly greater IL6 (246.504 pg/ml;  $p < 0.01$ ) and IL8 (2140.83 pg/ml;  $p < 0.001$ ) levels compared to untreated PNEs.

**Conclusion** Using a novel human *in vitro* sensory neuronal model we observed that Poly I:C evoked sensory neuronal hyper-responsiveness with an accompanying pro-inflammatory response. Respiratory viruses may induce similar effects on sensory neurons during exacerbations of airways disease.

#### S89 HYPERSENSITIVITY TO ADENOSINE TRIPHOSPHATE IN CHRONIC COUGH PATIENTS

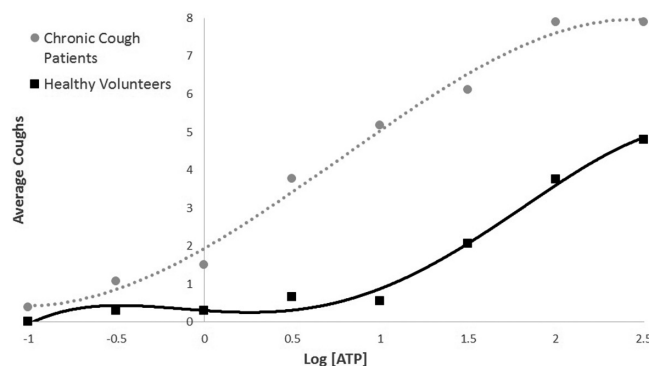
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**Introduction** Recent studies have suggested a role for adenosine triphosphate (ATP) activated P2 $\times$ 3 receptors in the pathophysiology of chronic cough. ATP has previously been used as an inhalational challenge substance in asthmatics and COPD patients, with the main focus being on bronchospasm. We have considered whether chronic cough patients are hypersensitive to inhaled ATP compared to healthy volunteers.

**Method** The recognised ERS standardised cough challenge using the Ko-Ko digidoser was performed with ATP and AMP as substrates. 20 Healthy volunteers and 20 chronic cough patients were randomised to the order of challenges. C5 (the concentration of substrate causing at least 5 coughs) was compared for ATP and AMP. Average cough response to ATP was compared between the 2 groups.

**Results** 6 male and 14 female volunteers in each group were randomised to receive cough challenges. Hull Airways Reflux Questionnaire score range was 0–8 in healthy volunteers and 21–52 in chronic cough patients. 1 healthy volunteer had a mild hypersensitivity reaction to ATP with urticaria. 1 patient withdrew after their first challenge due to worsening cough. No other side effects were reported. 2/19 healthy volunteers coughed with AMP, neither achieved C5. 8/20 chronic cough patients coughed with AMP, 2 achieved C5. 18/20 healthy volunteers coughed with ATP with 15 achieving C5. 19/19 chronic cough patients coughed with ATP, 18 achieved C5. The chronic cough patients had a greater cough response at lower concentrations of ATP as demonstrated in Figure 1.



**Abstract S89 Figure 1** Average cough response to ATP in healthy volunteers and chronic cough patients

**Discussion** Previous human ATP challenges have documented cough as a symptom but none have objectively measured the cough response in chronic cough patients. We present here the first results demonstrating that chronic cough patients have increased sensitivity to ATP compared to healthy volunteers. This supports a role for ATP driven receptors in the cough reflex arc and supports further research in this area as a target for treatments in chronic cough.

#### S90 'CHRONIC COUGH, CAUSE UNKNOWN': A QUALITATIVE STUDY OF PATIENT PERSPECTIVES OF IDIOPATHIC COUGH

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**Introduction and objectives** Idiopathic chronic cough patients have symptoms that persist despite trials of empirical treatment with no underlying cause found. Higher-order brain processes are involved in modulating the cough reflex, but very little is known about the psychological processes underlying idiopathic cough. As the first step in the development of a complex intervention, we sought to elicit an in-depth understanding of patient experience of this condition.

**Methods** Fourteen patients (12 females, mean age = 59 years) participated in qualitative interviews theoretically based upon the comprehensive cognitive-behavioural model. Interviews were thematically analysed and cross-validated using the guidelines outlined by Braun and Clark (2006).

**Results** Eight key themes emerged illustrating the complex, all-encompassing nature of idiopathic cough. 'Individual vulnerability' described precipitating factors possibly linked with cough onset. 'More than just a cough' highlighted the co-occurrence of severe physical and emotional experiences. 'Cough in the social sphere' highlighted the effort of dealing with others' reactions and concerns about the contagious image. 'Cough and Identity' described how the cough often defines the person. The occurrence of 'Vicious circles' became apparent, contributing to cough maintenance. 'The battle for control' highlighted the unpredictable nature of the cough, its subsequent impact and the management strategies employed to counter this. Framing the 'Cough in