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Airway mucus accumulation in COPD: the cholinergic paradox!

Pierre-Régis Burgel ^{1,2}

Affiliations: ¹Institut Cochin, Université de Paris, INSERM U1016, Paris, France. ²Cochin Hospital, Dept of Respiratory Medicine, Assistance Publique Hôpitaux de Paris, Paris, France.

Correspondence: Pierre-Régis Burgel, Dept of Respiratory Medicine, Cochin Hospital, 27 rue du Faubourg Saint Jacques, 75014 Paris, France. E-mail: pierre-regis.burgel@aphp.fr



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Cholinergic stimulation increases mucociliary clearance but long-acting anti-muscarinic treatment remains one of the major therapies for patients with COPD <http://bit.ly/2RLXAwI>

Cite this article as: Burgel P-R. Airway mucus accumulation in COPD: the cholinergic paradox! *Eur Respir J* 2020; 55: 1902473 [<https://doi.org/10.1183/13993003.02473-2019>].

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Mucus accumulation, related to excess mucus production and secretion in proximal and distal airways, is an established characteristic in the airways of patients with COPD. Chronic bronchitis, a consequence of cigarette smoking that can be found in smokers with or without COPD, is a disabling symptom and has been associated with increased rates of exacerbations and hospitalisations in patients with COPD [1] and in subjects with normal spirometry [2]. Chronic bronchitis is usually ascribed to inflammation and airway mucus hypersecretion by airway epithelium and submucosal glands in proximal airways [3]. In distal airways, where submucosal glands are absent, airway mucus is believed to derive from airway epithelium and airway mucus plugging has been associated with airflow limitation [4] and survival [5]. Although targeting mucus accumulation could represent a therapeutic option in patients with COPD, current drugs have only limited effects on excess mucus production, secretion and/or clearance [6]. Difficulties in making progress in this area have included the absence of appropriate animal models (as rodents have few airway submucosal glands) and a complexity in studying regulation of mucus production, composition of airway mucus and mucociliary clearance. Development of novel animal models in larger animals, in which the airway structure is more similar to that in humans, and progress in the tools for studying mucus contents and mucociliary clearance, has led to recent progress in our understanding of this major feature of chronic airway diseases [7].