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COVID-19 and the nicotinic cholinergic system

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The prevalence of smoking among hospitalised COVID-19 patients is low. COVID-19 manifestations could be linked to impairment of the cholinergic anti-inflammatory pathway. Nicotinic cholinergic agonists should be examined as potential therapeutic options. <https://bit.ly/2zfUZ1S>

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To the Editor:

We have read with great interest the paper by LEUNG *et al.* [1] published in the *European Respiratory Journal*, the correspondence by RUSSO *et al.* [2], and also the subsequent comment by the first group [3]. Both research teams are reporting increased angiotensin-converting enzyme 2 (ACE-2) expression in airways of current smokers and those with COPD, with important implications for coronavirus disease 2019 (COVID-19) patients. Since ACE-2 has been shown to be the main receptor utilised by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) to enter the host cells [2], the authors conclude that nicotine is a risk factor for COVID-19. RUSSO *et al.* [2] have shown that nicotine upregulates ACE-2 through $\alpha 7$ -nAChRs which are present in neuronal and non-neuronal cells. LEUNG *et al.* [3] provided further evidence in support of this hypothesis and propose the repurposing of $\alpha 7$ -nAChR antagonists for the pandemic (*e.g.* methyllycaconitine, α -conotoxin), expecting that such treatment will alter ACE-2 expression and prevent SARS-CoV-2 entry.