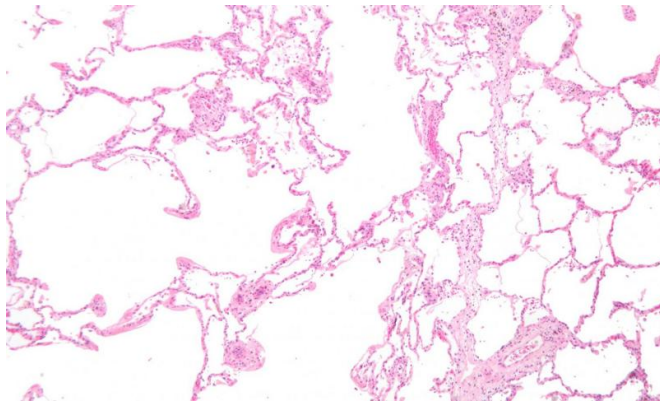


Higher levels of coronavirus 'entry point' enzyme in lungs of COPD patients and smokers

9 April 2020



Micrograph showing emphysema (left – large empty spaces) and lung tissue with relative preservation of the alveoli (right). Credit: Wikipedia, CC-BY-SA 3.0

People with chronic obstructive pulmonary disease (COPD) and people who currently smoke may have higher levels of a molecule, called angiotensin converting enzyme II (ACE-2), in their lungs according to a study published in the *European Respiratory Journal* today.

Previous research shows that ACE-2, which sits on the surface of lung cells, is the 'entry point' that allows coronavirus to get into the cells of the lungs and cause an [infection](#).

The new study also shows that levels of ACE-2 in former smokers is lower than in current smokers.

The research was led by Dr. Janice Leung at the University of British Columbia and St. Paul's Hospital, Vancouver, Canada. She said: "The data emerging from China suggested that patients with COPD were at higher risk of having worse outcomes from COVID-19. We hypothesised that this could be because the levels of ACE-2 in their

airways might be increased compared to people without COPD, which could possibly make it easier for the virus to infect the airway."

The team studied samples taken from the lungs of 21 COPD patients and 21 people who did not have COPD. They tested the samples to gauge the level of ACE-2 and compared this with other factors, such whether they were from people who never smoked, were current smokers or former smokers. Not only did they find higher levels of ACE-2 in COPD patients, they also found higher levels in people who were smokers.

The researchers then checked their new findings against two existing study groups, which together contain data on a further 249 people—some non-smokers, some current smokers and some former smokers. Again, they found levels of ACE-2 were higher in current smokers but lower in non-smokers and in those who were former smokers.

Dr. Leung said: "We found that patients with COPD and people who are still smoking have higher levels of ACE-2 in their airways, which might put them at an [increased risk](#) of developing severe COVID-19 infections. Patients with COPD should be counselled to strictly abide by social distancing and proper hand hygiene to prevent infection.

"We also found that former [smokers](#) had similar levels of ACE-2 to people who had never smoked. This suggests that there has never been a better time to quit smoking to protect yourself from COVID-19."

Professor Tobias Welte is an infections expert from the European Respiratory Society and is a coordinator for the national German COVID-19 task force and was not involved in the study. He said: "This study gives some interesting insight into why

some people may be at risk of more severe COVID-19 symptoms than others. What it does not tell us is whether it's possible to manipulate ACE-2 levels to improve survival in patients infected with COVID-19 or whether this would make a difference in COPD patients who contract the infection."

More information: Janice M. Leung et al, ACE-2 Expression in the Small Airway Epithelia of Smokers and COPD Patients: Implications for COVID-19, *European Respiratory Journal* (2020).
[DOI: 10.1183/13993003.00688-2020](https://doi.org/10.1183/13993003.00688-2020)

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