Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

SARS-CoV-2–infected primary human airway epithelia illustrate mucus hypersecretion

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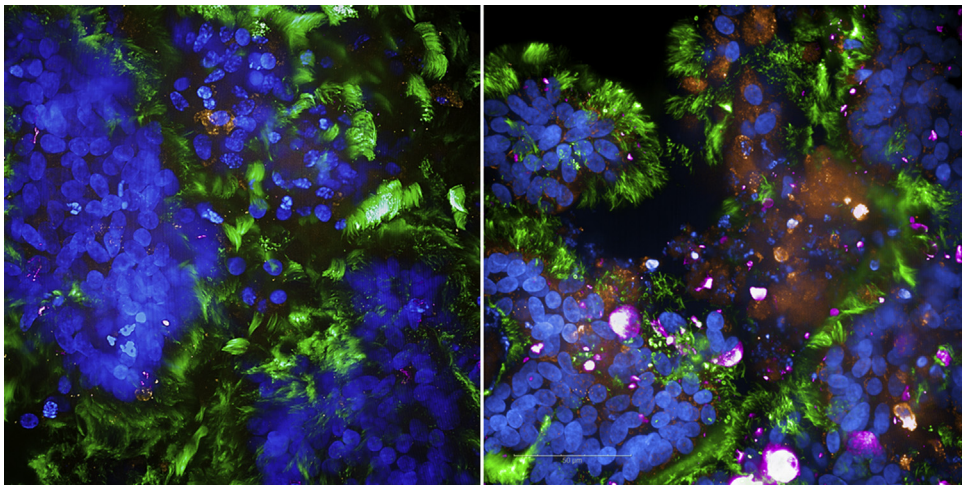

FIG 1. SARS-CoV-2 causes exaceberated mucus hypersecretion and plug formation. Visualization of mock-treated, uninfected or SARS-CoV-2 infected human airway tissues were analyzed after 2 days by immunofluorescence analyses (nuclei [blue], ciliated cells [green], mucous-producing cells [orange], SARS-CoV-2 [pink]).

Key word: *SARS-CoV-2*

To monitor first SARS-CoV-2 interactions with primary, fully differentiated, ciliated, and mucus-producing epithelial tissue models, infection with clinical isolates derived from patients with SARS-CoV-2 was performed and monitored after 2 days by using confocal microscopy (Fig 1 [*right*]). Mock-treated, uninfected (UI) cultures served as negative controls (*left*). Immunofluorescence analyses revealed a significant infection of the tissue model with SARS-CoV-2 (*pink* [*right*]) and significant destruction, as recently described by us[1] and as observed by high fragmentation of nuclei (*blue*) in particular within mucous areas (*orange* [*right*]). Infection with SARS-CoV-2 of both ciliated (*green* [*right*]) and mucus-producing cells (*orange* [*right*]) was detected. These analyses, which were performed by using the MUC5AC antibody for goblet cell staining in SARS-CoV-2–infected and UI tissues, revealed that infected human airway tissues showed an exaceberated mucus hypersecretion and mucus plugs (*orange* [right]), whereas in UI tissues no such plugs were monitored (*left*). UI tissues illustrated goblet cell staining (*orange* [*left*]) and intact, multilayered epithelia (*blue* [*left*]). Mucus plug formation was described when critically ill COVID-19 patients with airway obstruction and respiratory failure were analyzed (reviewed in Khan et al[2]), and mucus hypersecretion in combination with proinflammatory cytokine activation, which we recewntly illustrated in our model,[1] and reduced mucociliary clearance[3] shape a vicious circle resulting in airway tissue destruction. Of note, these clinical manifestations were not only reported in COVID-19 but also during other viral infections, colonization by pathogenic opportunistic bacteria, or asthma (reviewed in Khan et al[2]).

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Supported by the Austrian Science Fund (grants P 34070-B [to W.P.] and P33510-B [to D.W.]), the Anniversary Fund of the Austrian National Bank (grants P 17614 [to W.P.] and 17633 [to D.W.]), and the National Institute of Allergy and Infectious Diseases of the National Institutes of Health (grant UM1AI068618 [to D.W.]).

Disclosure of potential conflict of interest: The authors declare that they have no relevant conflicts of interest.

Received for publication April 15, 2021; revised April 28, 2021; accepted for publication May 4, 2021.

Available online July 17, 2021.

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J Allergy Clin Immunol 2021;148:909.

0091-6749/$36.00

https://doi.org/10.1016/j.jaci.2021.05.047

We thank Viktoria Zaderer, MSc, and Professor Rosa Bellmann-Weiler from the Internal Medicine II for their valuable support and for providing SARS-CoV-2 isolates. Written informed consent was obtained from all donors of leftover nasopharyngeal and oropharyngeal specimens and EDTA-treated blood by the participating clinics. The ethics committee of the Medical University of Innsbruck (ECS1166/2020) approved the use of anonymized leftover specimens from patients with COVID-19 for scientific purposes.

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