

Coinfection of influenza A and B and human OC43 coronavirus in normal human bronchial epithelial cells

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Abstract

Background Influenza viruses and seasonal coronaviruses are pathogens transmitted via an airborne route that can cause respiratory diseases in humans that have similar symptoms such as fever, cough, and pneumonia. These two viruses can infect similar human tissues, such as the respiratory tract and nasal, bronchial, and alveolar epithelial cells. Influenza virus and seasonal coronavirus coinfections are poorly understood. **Methods** Here, we coinfect normal human bronchial epithelial (NHBE) cells with influenza A/California/04/09 (IAV) or B/Victoria/504/2000 (IBV) strains and the seasonal human beta-coronavirus OC43 and evaluated viral replication capacities. We also examined changes in the expression of various cytokines/chemokines by qPCR and Luminex assay. **Results** We observed that replication of IAV and IBV was not affected by coinfection with OC43. However, coinfection reduced OC43 titers (~ 3-fold) compared to infection with OC43 alone. Select cytokine/chemokine expression was increased in coinfecting cells compared to all single infections with greater differences seen between coinfecting cells and cells infected with OC43 alone compared to IAV- or IBV-infected cells. In addition, IL-8 and IL-1RA showed the highest expression among a panel of 22 cytokines by Luminex. **Conclusions** As the rate of influenza and seasonal coronavirus coinfection continue to increase, our findings may help set guidelines for the treatments of the individuals coinfecting with both viruses.



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To the Editor of *Influenza and Other Respiratory Viruses* ,

Please find attached the manuscript “Coinfection of influenza A and B and human OC43 coronavirus in normal human bronchial epithelial cells” by JungHyun Kim, Brady T. Hickerson, and Natalia A. Ilyushina, submitted for consideration as an *Original Article* in *Influenza and Other Respiratory Viruses* .

We confirm that neither the manuscript nor any parts of its content are currently under consideration or published in another journal. All authors have approved the manuscript and agree with its submission to *Influenza and Other Respiratory Viruses* .

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Thank you for your consideration of this manuscript.

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