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Viral transport mechanisms in the respiratory tract and their role in infection dynamics HANA DOBROVOLNY, Texas Christian Univ, GILBERTO GONZALEZ-PARRA, Texas Christian University — Some respiratory viruses can lead to serious lower respiratory infection (LRI). LRI can cause longer infections, lingering respiratory problems, and higher incidence of hospitalization. We develop a mathematical model of viral dynamics to study the role of transport mechanisms in the occurrence of LRI. Our model uses two compartments to simulate the upper respiratory tract (URT) and the lower respiratory tract (LRT) and assumes two distinct types of viral transfer between the two compartments: diffusion and advection. We find that a range of diffusion and advection values lead to long-lasting infections in the LRT, elucidating a possible mechanism for the severe LRI infections observed in humans.

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