

102c Controlling the Production of Exhaled Bioaerosols

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Many infectious diseases, such as influenza, tuberculosis, and anthrax are known to spread via exhaled airborne droplets from the lungs of an infected individual. However, remarkably little is known about the underlying mechanisms of airborne pathogen transmission. Recent experiments have shown that exhaled bioaerosols vary significantly between normal healthy individuals and can be suppressed by delivery of modest amounts of saline to the upper airways. We have investigated the effects of various nebulized solutions (salts, surfactants, and sugars) on lung mucus mimetic properties, such as bulk and surface rheology. Using interfacial stress rheology, we have seen significant changes in the surface storage and loss moduli of the mucus mimetic with the addition of nebulized solutions. We will discuss how changes in mucus properties may correlate to bioaerosol suppression and propose that surface elasticity has a primary influence on suppression. We believe these studies will lead to a new understanding of how to effectively control the transmission of airborne pathogens.