

The Respiratory Mucus Barrier: Friend or Foe in Zoonotic Influenza Transmission?

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The ongoing spread of a highly pathogenic avian influenza virus (H5N1) in wild birds and poultry has increased global concern regarding the potential for zoonotic and pandemic spread of emerging influenza A viruses (IAV). Before viruses can infect epithelial cells, they must overcome the respiratory mucus barrier. Mucus in the airways can trap particles and promote their removal via mucociliary clearance. Beyond this physical barrier function, mucins can interact with viral surface proteins, influencing virus mobility, attachment, and infectivity. To study how respiratory mucus influences IAVs, we have collected native respiratory mucus from relevant host species. We have developed standardized biophysical and biochemical methods to quantify the penetration of IAVs through species-specific mucus. This allows us to analyze the penetration behavior and subsequent infection potential of multiple IAV strains. The findings indicate that mucus exerts a differential effect on the penetration efficiency and infectivity of avian- and human-origin influenza strains. These observations suggest that respiratory mucus plays a multifaceted role. Our research revealed that virus-mucus interactions enhance the efficacy of virus infection by potentially protecting against viral degradation. Research into the interaction between respiratory viruses and native mucus samples is crucial to understand how the mucus barrier influences the emergence and transmission of influenza viruses.

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PhD student

Junior scientist status

Yes, I am a junior scientist.

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