

# Researcher reviews influenza, bacterial superinfections in *Nature Reviews Microbiology*

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Le Bonheur Children's Hospital Pediatrician-in-Chief Jon McCullers, MD, was recently invited to submit a review in the April issue of *Nature Reviews Microbiology*, one of the world's foremost scientific publications. Dr. McCullers, a world-renowned infectious disease specialist, and chair of the Department of Pediatrics at the University of Tennessee Health Science Center, analyzed the epidemiology and microbiology of co-infections during the 1918, 1957 and 1968 pandemics, as well as more recent 2009 novel H1N1 pandemic.

He reviewed the co-pathogenesis of [influenza viruses](#) with bacteria in the lung. Bacterial superinfection in the lungs of those suffering from influenza is a key element that promotes severe disease and mortality.

The co-pathogenesis McCullers reviewed is characterized by complex interactions between co-infecting pathogens and the host, leading to the disruption of physical barriers, dysregulation of immune responses and delays in a return to homeostasis.

The net effect of this cascade can be the outgrowth of the pathogens, immune-mediated pathology and increased morbidity.

McCullers calls for large-scale studies involving consortia or clinical networks to unlock the next unanswered questions about co-infections and viruses in order to prevent the loss of life of a pandemic similar to

the one in 1918.

"There is increasing recognition that most pneumonia is caused by co-infections rather than a single pathogen, and the most severe disease seen in influenza pandemics is mediated by co-infecting bacteria working with the virus," said McCullers. "The scientific community must help the world prepare for the next pandemic by understanding a set of key, unanswered questions that are addressed in this review."

Provided by Le Bonheur Children's Hospital

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