Meet the Scientist

Finding Causes for Respiratory Infections in Children and Infants

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Pediatricians know that virtually all children get a "respiratory syncytial virus," or RSV in their first two years of life. What they don't know is why most children recover in a few days, while a small percentage develop pneumonia and even require hospitalization.

"We don't understand why one child is at risk and the rest aren't," said Dr. David Topham. "Is there some combination of viruses that sets one child up to have an extreme reaction, while others do not?"

Dr. Topham serves as principal investigator for the Respiratory Pathogens Research Center at URMC, the only center of its kind in the United States. At any given time, scientists at the center are conducting more than 20 different studies on both viral and bacterial pathogens to better understand how these microorganisms affect immune system development.

Much of this research focuses on babies born prematurely. "These infants have a lot of respiratory problems," said Dr. Topham. "Their lungs and immune systems don't fully develop normally. We are collecting massive amounts of data about their immune response, what bacteria they are colonized with, and the viruses they are infected with. Some of them are infected with two or three viruses that we didn't even know about. This will change the way we look at viruses in infants."

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The results of this research could lead to ways to protect premature infants from some of these pathogens, helping to boost their chances of survival and reduce the number of health issues they have later in life. Beyond pediatrics, this knowledge could improve our understanding of all kinds of allergic reactions, as well as pneumonia, influenza, and bronchiolitis, leading to preventative measures that will decrease the breathing issues for adults as well as children.