

Yale University

Yale's One Step, Rapid in vitro Diagnostic System

Every year, citizens of the United States experience more than one billion infections of the upper respiratory tract. Both viruses and bacteria can cause these illnesses but only bacteria are susceptible to antibiotics. However, we do not have a simple, rapid, comprehensive diagnostic test to distinguish between viral and bacterial upper respiratory infections. Lack of such tests contributes to the fact that outpatient visits for acute respiratory infection are the most common setting for inappropriate antibiotic prescriptions in the U.S, with about half of these prescriptions (~35 million prescriptions annually) not indicated¹. Our recent findings indicate a way to develop a diagnostic test to rapidly distinguish between viral and bacterial causes of respiratory illness while the patient is in the doctor's office. Unlike current tests, which detect the presence of specific viruses, this approach measures the response of the patient's airway cells to the infection to indicate whether the body is fighting a viral infection or a bacterial infection. This approach has two major advantages over current approaches: (1) many different viruses and bacteria can cause similar respiratory symptoms, but the only tests currently available are pathogen-specific. Therefore a single test can easily miss the organism causing the patient's illness, and testing for large panels of pathogens is complex and can be prohibitively expensive; (2) unlike other proposed approaches to distinguish viral and bacterial infections based on the body's response, our approach does not require a blood sample, but will work with a nose or throat swab. This test has tremendous potential to transform ingrained practices of prescribing antibiotics for non-bacterial illnesses by demonstrating the cause of infection to physician and patient during the initial healthcare encounter, and therefore will provide a powerful tool for promoting antimicrobial stewardship.