

Down with flu? A 10-minute blood test could tell if you need antibiotics

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Many of us often take an antibiotic without confirming the cause of illness. When a patient with sore throat or cough walks in to the clinic, there is no easy or direct way of discriminating a bacterial from viral infection. As a result, most clinicians prescribe an antibiotic without confirming whether it is necessary or not. According to a [study](#), 73% of ambulatory care patients in the United States with acute respiratory infection are prescribed an antibiotic, despite a viral etiology in majority of the cases.

The unfortunate abuse of antibiotics in healthcare is fuelling the emergence of [antibiotic resistance](#) in bacteria. The problem is much worse in [developing countries](#) where you can buy antibiotics over a counter without prescription. A [study](#) estimates that each year about 700,000 people die globally due to infection with antibiotic-resistant bacteria. Diagnostic tests, which can play a critical role in fighting against antibiotic resistance, are underutilized and underappreciated.

Conventional diagnostics tests work by identifying the infecting pathogen by time-consuming microbial cultures, antigen detection and/or PCR identification. Yet, these tests often need a focused clinical suspicion and are limited to the panel of pathogens being tested. [Low sensitivity](#) of the available tests is an added nuance. These tests can miss more than 50% infections in some cases. Also, commensal or healthy bacteria living in the body can lead to false positives and make it difficult to distinguish between infection and colonization.

Reading the host response to reduce antibiotic abuse

In the past decade, researchers have returned to reading the host immune response for infectious disease diagnostics. The hypothesis- changes in expression levels of specific genes or proteins can predict a class of illness. This offbeat approach can successfully distinguish between bacterial and viral or non-infectious illness. Additionally, these HostDx tests are faster as they use blood or serum, without the need for long culture periods, as required in conventional testing.

FebriDx®, by *RPS diagnostics*, is a simple 10-minute diagnostic test that measures levels of two proteins to classify bacterial vs. viral respiratory infections. The elegance of the product lies in a simple fingerstick blood sample platform at POC that doesn't need trained professionals. FebriDx® is [EC-approved](#) and is available for use in Europe, Canada, Singapore, Australia, and Gulf countries.

Recently, an Israeli firm *MeMed* won a [contract](#) worth up to \$9.2 million from the US Department of Defense (DoD) for their point-of-care (POC) diagnostic platform. Company's EC-approved test, ImmunoXpert™, can distinguish between viral and bacterial infections within minutes. It reads three immuno-biomarkers and uses pattern recognition to classify the illness.

Taking the tech beyond

Among the RNA-based PCR diagnostic platforms, [Immunexpress](#) and [Inflammatix](#) are working on POC platforms to discriminate illness source. In addition to distinguishing the bacterial/viral infections to inflammatory symptoms, they are working on establishing the severity of the disease. Not only will this provide a way to systematically prioritize patients, it can also generate emergency alerts when combined with a clinical decision support system (CDS) in the hospital.

Systemic inflammatory response syndrome (SIRS) due to an infection, or Sepsis, is a life-threatening condition and one of the major cause of deaths in hospitals. It is often difficult to distinguish sepsis to non-infectious causes of SIRS, leading to wrong treatments. A four-RNA biomarker, Septicyte Lab®, by *Immunexpress* was [FDA approved](#) for testing of Sepsis on first day of ICU admission. The acceptance of host response based Dx by government agencies has been a major boost for many companies.

According to WHO, antibiotic resistance is one of the [top 10 threats](#). Providing a sustainable low error-low cost diagnostic at POC could reduce the misuse of antibiotics. There is a strong need for public awareness campaigns along with high-quality diagnostics. Host response-based tests have the potential to assist antimicrobial stewardship in a clinically relevant time frame. Over the next 5-10 years, these tests can significantly aid the fight against the menace of antibiotic resistance in bacteria.

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