

# A TRAIL/IP-10/CRP host-protein assay for distinguishing between bacterial and viral infection has potential to reduce antibiotic overuse in adults with Lower Respiratory Tract Infection (LRTI): preliminary results from the OBSERVER clinical study



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## Background:

Lower respiratory tract infection (LRTI) is a clinical challenge due to the difficulty in pathogen sampling and the often indistinguishable symptoms of bacterial and viral etiologies. This diagnostic uncertainty leads to antibiotic misuse, potentially exposing the patient to unnecessary side effects and contributing to antimicrobial resistance. Previous studies showed that a host-protein assay comprising TNF-related apoptosis induced ligand (TRAIL), interferon gamma induced protein-10 (IP-10) and C-reactive protein (CRP) accurately differentiates between bacterial and viral infections. Here we examine the potential of the assay to reduce antibiotic misuse in adult patients with suspected LRTI.

## Methods:

Adults aged > 18 years with suspected LRTI were recruited in a prospective study at three emergency departments (ED) in Israel (OBSERVER; H2020 grant #684589; NCT03011515). Infection etiology was adjudicated by majority decision of three independent experts based on clinical, laboratory, radiological and follow-up data. The host-protein assay (ImmunoXpert™, MeMed) gives three possible outcomes: viral, bacterial or equivocal; equivocal is a valid result that does not provide clear-cut etiology determination.

## Results:

414 adults with suspected LRTI were included in this preliminary analysis (mean age 54.6) Clinical syndromes included: 29% pneumonia, 27% upper respiratory tract infection, 17% acute bronchitis, 6% asthma or chronic obstructive pulmonary disease exacerbation and 13% unspecified LRTI or viral infection. 190 were assigned viral etiology and of these, 104 were given antibiotics, representing an overuse rate of 55%. Adoption of the host-protein assay would lead potentially to only 30 out of the 190 viral patients being given unwarranted antibiotics (Table), a greater than 3-fold reduction in antibiotic overuse (p-value < 0.0001).

## Conclusions:

This study shows the potential of timely host-protein assay results to aid in determination of infection etiology and reduce unwarranted antibiotics among adults with suspected LRTI. Use of this new assay could help to improve adherence to antibiotic prescription guidelines.

Host-protein assay result	Antibiotic decision observed in study		Number of adults given antibiotics if host-protein assay adopted
	Abx-	Abx+	
<b>Bacterial</b>	4 (4.7%)	8 (7.7%)	12
<b>Equivocal</b>	13 (15.1%)	18 (17.3%)	18*
<b>Viral</b>	69 (80.2%)	78 (75.0%)	0

\*Physician decision about antibiotics would be unchanged when result is equivocal