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LIAISON® MeMed BV®
The new diagnostic solution for a simple and quicker differentiation of infection aetiology

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As reported by many authors viral and bacterial infections are often clinically indistinguishable, leading to uncertain patient management and in frequent antibiotic misuse. Bacterial-induced host proteins such as Procalcitonin, C-reactive protein (CRP), and Interleukin-6, routinely used to support diagnosis, has their performance negatively affected by inter-patient variability, including clinical syndrome, time from symptom onset and pathogens. On the other hand drect pathogen search methods may be impacted by interferences, furthermore these methods are not tied to the phenotypical response.

Antibiotic overuse, from use of these drugs to treat viral infections, has severe global health and economic consequences, including the emergence of antibiotic-resistant bacteria. Antibiotic underuse due to delayed or missed diagnosis is also common, accounting for 24%-40% of all bacterial infections.

Aim of the study

While the quick and accurate identification of **infection aetiology is essential for targeted patient car**e and treatment management, the choice of the diagnostic methods has a **direct impact on laboratory efficiency and clinical decision-making.**
This study hence evaluates the performance of the new LIAISON® MeMed BV assay to differentiate bacterial from viral infections.

Materials and Methods

LIAISON® MeMed BV® is the first high-throughput, fully automated chemiluminescent solution designed to differentiate between bacterial and viral infections in a single procedure. The new test is indicated for use in adult and paediatric patients with suspected acute bacterial or viral infection and integrates three key host-immune protein measurements (TRAIL, IP-10 and CRP) with a powerful machine learning algorithm, to produce a **numeric score** that falls within discrete interpretation ranges based on the increasing likelihood of bacterial infection. **Human serum samples** with a microbiologically confirmed diagnosis of bacterial or viral infection based on reference standard assays (blood culture, PCR, viral IgM positive, PCT>8) were selected from the biobank of the Microbiology and Virology Laboratory of San Camillo Forlanini Hospital. They were retrospectively tested with LIAISON® MeMed BV®(DiaSorin S.p.A., Italy) and the **concurrence** between the LIAISON® MeMed BV® result and the previously confirmed infection aetiology classification was analysed.

Results

	Correlation (EQU Excl)										
	Valid Samples	Negative Agreement Viral & Viral Score + coinfect	Discordance Viral & Bact Score	Positive Agreement Bact & Bact Score + coinfect Bact score	Discordance Bact & Viral Score	Overall agreement	Negative Agreement Viral & Viral Score	Discordance Viral & Bact Score	Positive Agreement Bact & Bact Score	Discordance Bact & Viral Score	**Overall agreement**
	N						**%**				
First Pass Samples	**24**	4	1	17	2	21	80%	20%	89%	11%	**88%**
Follow Up Samples	**6**	0	0	6	0	6			100%		**100%**
Total	**30**	**4**	**1**	**23**	**2**	**27**	80%	20%	92%	8%	**90%**

A total of 61 samples were selected, of which 30 met the inclusion criteria (mean age 58 years, 40% female, 60% male). **Viral and bacterial infections were diagnosed for 17% (5) and 77% (23) samples, respectively; with 7% (2) classified as co-infection.**
LIAISON® MeMed BV® showed an overall agreement with the reference standard aetiology of 90% (27/30). **No equivocal results were obtained** and 83% (25/30) of samples analysed had a high likelihood score. The test also detected bacterial immune response in co-infected patients, with **all results available in just 40 minutes**.

Discussion

The initial findings have validated **the high performance of LIAISON® MeMed BV® in differentiating acute bacterial and viral infections**. This may translate into a significant reduction in the time needed to provide an accurate and reliable diagnostic response to assist patient treatment management, furthermore potentially reduce the misuse of antibiotics in viral infected patients.
The usability of the new test can thus drive laboratory operational efficiency and time-labour reductions via the fully automated, high-throughput approach.

Oved K et al.; PLoS One. 2015; A novel host-proteome signature for distinguishing between acute bacterial and viral infections.
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Ashkenazi-Hoffnung L et al.; Eur J Clin Microbiol Infect Dis. 2018; A host-protein signature is superior to other biomarkers for differentiating between bacterial and viral disease in patients with respiratory infection and fever without source: a prospective observational study.
Papan C et al.; Clin Microbiol Infect. 2021; A host signature based on TRAIL, IP-10, and CRP for reducing antibiotic overuse in children by differentiating bacterial from viral infections: A prospective, multicentre cohort study.

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