31st ECCMID Online 9 – 12 July 2021

ESCMID EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES

Evaluation of the Fast-Prep PBC system (Qvella) for accelerated species identification and antimicrobial susceptibility testing from positive blood culture bottles using the Bruker MALDI and bioMerieux Vitek 2

S. GRINBERG [1], K. HOCHAUF-STANGE [1], A. H. DALPKE [1], M. NARVAEZ ENCALADA [1]

1 Institute of Medical Microbiology and Virology, University Hospital Carl Gustav Carus, Medical Faculty, TU Dresden – Dresden (Germany)

Universitätsklinikum Carl Gustav Carus DIE DRESDNER.

INTRODUCTION

Diagnosis of bacteremia or septicaemia via blood culture is one of the most critical procedures in microbiology. Accelerated and accurate blood culture diagnosis is required in order to reduce mortality, morbidity and costs. The new FAST-Prep™ PBC device (Qvella, Ontario, Canada) promises to cut down time-to-results by employing an automated enrichment procedure on positive-flagged bottles.

OBJECTIVE

Evaluate species identification (ID) and antimicrobial susceptibility test (AST) using the FAST-Prep™ PBC system, which concentrates bacteria (Liquid Colony™) that can be used immediately for Downstream microbiological procedures.

FAST-Prep ™ PBC System.

METHOD

Fifty-six (56) PBCs from unique patients from 01/2021 through 02/2021 were processed using the FAST-Prep ™ PBC System. We compared ID and AST results generated from the routine workflow (overnight subculture on solid medium) with those using the Liquid Colony.

Fast-Prep ™ PBC System uses 2 ml of a PBC to deliver a Liquid colony ™ in less than 40 min. The System is able to process 2 PBCs at the same time.

ID and AST were performed using MALDI TOF-MS (Bruker, Bremen, Germany) and Vitek® 2 System (bioMerieux, Lyon, France) respectively.

Liquid Colony ™ delivered from a positive blood culture using the FAST-Prep ™ PBC System.

RESULTS

A total of 56 PBCs were processed in this study. 7 samples were polymicrobial and were excluded from the analysis. Results with FAST-Prep™ PBC system were compared to routine workflow.

SPECIES IDENTIFICATION RESULTS FROM THE LIQUID COLONY™

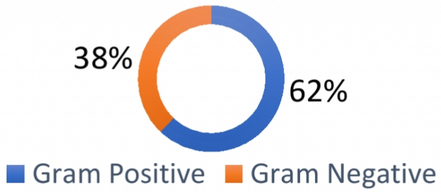
ELEGIBLE SAMPLES	49 (100%)
Agreement	45 (92%)
No Species ID	4 (8%)
Discordant ID	0 (0%)

MEAN MALDI SCORE FORM THE LIQUID COLONY™

GRAM STRAIN	Mean MALDI Score
Gram Positive	1.96
Gram Negative	2.16

Species Identification scores based on MALDI TOF Bruker rating numbers meaning.

GRAM STRAIN DISTRIBUTION OF THE SAMPLES



ANTIMICROBIAL SUSCEPTIBILITY TEST (AST) RESULTS

ANALYSED SAMPLES	38
Total of bug-drug tests	547
Categorical agreement	535 (97.8%)
Very major errors	3
Major errors	2
Minor errors	7

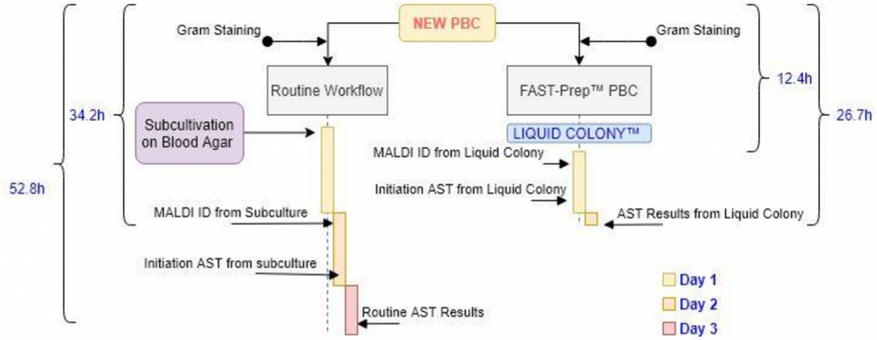
Very major error: FAST-Prep™ Liquid colony™ 'susceptible' AST result and routine workflow 'resistant' AST result.

Major Error: FAST-Prep™ Liquid colony™ 'resistant' AST result and routine workflow 'susceptible' AST result.

AVERAGE MEAN TIME RESULTS

	Time to species ID	Time to AST
Using the Liquid Colony™	12.4h	26.7h
Routine overnight workflow	34.2h	52.8h

Minor Error: FAST-Prep™ Liquid colony™ 'susceptible' or 'resistant' AST and routine workflow 'sensitive at increased exposure, "I" AST or vice versa.



Turnaround time of positive blood cultures after the introduction of FAST-Prep™ PBC System

CONCLUSIONS

This prospective analysis showed a high level of concordance in species ID and phenotypic AST results between FAST-Prep™ PBC and standard workflow. Workflow analysis also showed a marked improvement in turnaround time to results. The FAST-Prep ™ PBC System is a promising solution for accelerated blood culture diagnosis reducing the time to ID and to AST by approximately one day.

REFERENCES

Liu Vincent X et al. The timing of Early Antibiotics and Hospital Mortality in Sepsis. *American journal of Respiratory and Clinical Care Medicine* 2017; Volume 196, Number 7

ACKNOWLEDGEMENTS

The study was conducted by the Institute of Medical Microbiology and Virology, University Hospital Carl Gustav Carus, Medical Faculty, TU Dresden and was supported by Qvella who delivered consumables and prototype.

We thank Susanne Schubert and all the technical assistant team for their support in the study.

CONTACT

Marco Narvaez Encalada. Assistant Physician. Microbiology and Virology, University Hospital Carl Gustav Carus, Medical Faculty, TU Dresden – Dresden, marco.narvaez@tu-dresden.de

TECHNISCHE UNIVERSITÄT DRESDEN

DRESDEN concept