

P.PORTO

ESCOLA
SUPERIOR
DE SAÚDE

3 EBtM

III ENCONTRO DE
BIOTECNOLOGIA
MEDICINAL

IIBERIAN CONGRESS ON
MEDICINAL
BIOTECHNOLOGY

BOOK OF ABSTRACTS



ENCONTRO DE
BIOTECNOLOGIA
MEDICINAL

18 DE MAIO DE 2018
ESCOLA SUPERIOR DE SAÚDE
POLITÉCNICO DO PORTO



IBERIAN CONGRESS ON
MEDICINAL
BIOTECHNOLOGY

MAY 18TH, 2018
SCHOOL OF HEALTH
POLYTECHNIC OF PORTO



III ENCONTRO DE
BIOTECNOLOGIA
MEDICINAL

III IBERIAN CONGRESS ON
MEDICINAL
BIOTECHNOLOGY

**COMISSÃO ORGANIZADORA
ORGANIZING COMMITTEE**

Ana Rita Costa
Ana Rita Dias
Cristina Prudêncio
Dulce Teixeira
Joana Almeida
Mónica Vieira
Pedro Coelho
Ricardo Ferraz
Sofia Cunha

**COMISSÃO CIENTÍFICA
SCIENTIFIC COMMITTEE**

Cristina Prudêncio
Mónica Vieira
Pedro Coelho
Ricardo Ferraz

ISBN: 978-989-20-8533-3

Flow cytometric antimicrobial susceptibility test for gram-negative bacilli directly from positives urines

JOANA SANTOS-OLIVEIRA^{1,2}, RITA TEIXEIRA-SANTOS³, SOFIA COSTA-DE-OLIVEIRA^{2,3}, ANA SILVA-DIAS³, INÊS MARTINS-OLIVEIRA³, ACÁCIO G RODRIGUES^{2,3}, CIDÁLIA PINA-VAZ^{2,3}

1- School of Applied Health Sciences of Porto, Polytechnic Porto, Portugal;

2- Department of Microbiology, Faculty of Medicine, University of Porto, Porto, Portugal;

3- FASTinov SA, Porto, Portugal.

Introduction: Urinary tract infections (UTIs) are the most frequent infections in both hospitalized and community patients. These infections may provoke serious complications especially in children, pregnant human and elderly. The rate of recurrent UTIs is high and the increasing number of resistant bacteria is intensified by incorrect or excessive use of antimicrobial drugs. Consequently, rapid antimicrobial susceptibility tests are urgent. FASTinov® kits allow the determination of antimicrobial susceptibility profile directly from biological products (time-to-result, TTR, 2h). In this work, we evaluated the performance of FASTinov® gramneg kit for AST on gram-negative bacilli directly from urine.

Material and methods: A total of 13 quality control strains (ATCC 35218, ATCC 25922, ATCC 8739, IMP NCTC 13476 *E.coli*, BAA 1705, BAA 1706, ATCC 700603, OXA-48, NCTC 13443 NDM-1 *K. pneumoniae*, CCUG 59627 *Enterobacter cloacae*, ATCC 27853, IMP-8 *Pseudomonas aeruginosa* and ATCC 13048 *E. aerogenes*) were included in this study. Bacteria were inoculated into 5 mL Mueller-Hinton Ca²⁺ broth and incubated overnight (37°C; shaking at 130 rpm). Human urine from healthy donors was collected and filtered (0.45 µM pore size). A total of 20 mL of urine was inoculated according with Roos V. et al. (2006), and incubated for ±120 min (until exponential growth phase). Bacteria was extracted from urine according to IFU, inoculated in a FASTinov® gramneg kit containing the main antimicrobial drugs, and incubated for 1h, at 37°C; afterwards, the kit was analyzed BD Accuri™ C6 Flow Cytometer. EUCAST and CLSI protocols were selected on the FASTinov dedicated software. Results obtained from FASTinov® kit and microdilution broth reference method were compared. All experiments were performed twice.

Results and conclusions: The overall agreement between FASTinov® gramneg kit and broth microdilution reference method was 96.1% for EUCAST and 95.5% for CLSI protocols. One major discrepancy was detected for gentamicin and ciprofloxacin, and one minor discrepancy was observed for amikacin and piperacillin/tazobactam. For imipenem were detected 3 minor discrepancies for EUCAST and 1 major discrepancy for CLSI protocol. There were no very major discrepancies. Regarding the screening for detection of enzymatic resistance mechanisms, the concordance was 100%.

We hereby presented a fast flow cytometric protocol which revealed to be an excellent tool for AST on gram-negative bacilli directly from positive urine in a TTR of 2 hours versus the 48h requires by the routine method, with high agreement with broth microdilution reference method.

Keywords: Antimicrobial susceptibility testing; Urine; Gram-negative bacilli; Flow cytometry