

ICAAC 2014

54th Interscience Conference on Antimicrobial Agents and Chemotherapy
September 5 -9, 2014 | Washington, DC

Blue Carba Test (BCT) for Rapid Detection of Carbapenemases in Gram-negative Species: Performance against a Panel of Challenging Carbapenemases

Author Block F. Pasteran, O. Veliz, C. Lucero, M. Rapoport, P. Ceriana, A. Corso; Antimicrobianos, INEI-ANLIS “Dr. C. Malbrán”, Buenos Aires, Argentina

Background: BCT is a novel phenotypic method developed for rapid carbapenemase detection (< 2h). It is based on *in vitro* hydrolysis of imipenem by bacterial colonies (direct inoculation), which is detected by changes in pH values using the indicator bromothymol blue (blue to green/yellow). **Aim:** to challenge the BCT using carbapenemase and non-carbapenemase producers of various Gram-negative species, including combinations of bacterial species/resistance mechanisms that were not previously evaluated. **Methods:** a panel of 237 unique clinical isolates, carbapenem non-susceptible, was used: 149 *Enterobacteriaceae*-ENT, 66 *Pseudomonas* spp., 23 *Acinetobacter* spp. *blas* were characterized by PCR/DNA sequencing. The carbapenemases represented were (n): Ambler Class A [38; KPC-2 (31), Sme-1b (2), GES-5 (2), IMI-1 (2), KPC-3 (1)]; Class B [63; VIM-2 (15), NDM-1 (10), IMP-1 (8), IMP-8 (6), IMP-13 (6), VIM-like (6), IMP-16 (3), *P. otitidis* MBL (3), VIM-11 (2), IMP-like (2), SPM-1 (1), IMP-18 (1)]; Class D [46; OXA-163 (32), OXA-48 (5), OXA-23 (3), OXA-58 (2), OXA-247 (1), OXA-143 (1), OXA-181 (1)]. Carbapenemase nonproducers were (89): CTX-M-2 (33), efflux overproduction plus oprD loss (17), cephalosporinase overproduction (11), CTX-M-15 (7), plasmid-mediated cephalosporinases (4), GES-1 (4), OXA-1 (3), OXA-51 (2), PER-2 (2), SHV-18 (1), VEB-1 (1). **Results:**

BCT performance for carbapenemase detection				
Carbapenemase	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
All Classes (A+B+D)	82	99	99	77
Class A	100	99	97	100
Class B	98	99	98	99
Class D	46	99	95	78

False negative results: one NDM-1-producing *A. pittii* and several ENT with either, OXA-163 (23), OXA-247 (1) or OXA-48 (1). False positive result: GES-1-producing *P. aeruginosa*. **Conclusions.** The BCT resulted an accurate, inexpensive and rapid method to unequivocally identify Class A and B carbapenemases, as was described. However, in our hands, the BCT gave suboptimal results for identification of OXA-48-like producers. Thus, in scenarios with increasing prevalence of OXA-48-like producers, a negative result with the BCT will require additional testing to define the presence of this carbapenemase.