

Accepted Manuscript

Enhanced detection of Carbapenemase-Producing *Enterobacteriaceae* by an optimized phenol red assay

Jeremy Surre, Isabelle Canard, Pierrot Bourne Branchu, Estelle Courbiere, Christine Franceschi, Sonia Chatellier, Alex van Belkum, Mahendrasingh Ramjeet

PII: S0732-8893(17)30279-1
DOI: doi: [10.1016/j.diagmicrobio.2017.09.005](https://doi.org/10.1016/j.diagmicrobio.2017.09.005)
Reference: DMB 14423

To appear in: *Diagnostic Microbiology and Infectious Disease*

Received date: 26 July 2017
Revised date: 25 August 2017
Accepted date: 13 September 2017

Please cite this article as: Surre Jeremy, Canard Isabelle, Branchu Pierrot Bourne, Courbiere Estelle, Franceschi Christine, Chatellier Sonia, van Belkum Alex, Ramjeet Mahendrasingh, Enhanced detection of Carbapenemase-Producing *Enterobacteriaceae* by an optimized phenol red assay, *Diagnostic Microbiology and Infectious Disease* (2017), doi: [10.1016/j.diagmicrobio.2017.09.005](https://doi.org/10.1016/j.diagmicrobio.2017.09.005)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Enhanced detection of Carbapenemase-Producing *Enterobacteriaceae* by an optimized phenol red assay

Jeremy Surre, Isabelle Canard, Pierrot Bourne Branchu, Estelle Courbiere, Christine Franceschi, Sonia Chatellier, Alex van Belkum and Mahendrasingh Ramjeet

jeremy.surre@biomerieux.com; isabelle.canard@biomerieux.com; pierrot.bourne-branchu@biomerieux.com; estelle.courbiere@biomerieux.com; christine.franceschi@biomerieux.com; sonia.chatellier@biomerieux.com; alex.vanbelkum@biomerieux.com; kavi.ramjeet@biomerieux.com

Corresponding author : kavi.ramjeet@biomerieux.com; R&D Microbiology, 3 route de Port Michaud, 38390 La Balme-les-Grottes, France ; phone: +33 (0)4 74 95 79 81 / mobile : +33 (0)6 10 03 67 36.

Abstract

Screening for the detection of carbapenemase-producing bacteria still encounters issues related to workflow, limit of detection or qualitative interpretation. We developed a spectrophotometry-based version of the Carba NP phenol red assay (Nordmann *et al.*, 2012) in a microtiter plate format, compatible with low bacterial cell counts. We were able to detect highly active carbapenemases such as KPC and IMP in 30 min. A wider range of carbapenemases including OXA-48 were detected using higher inocula, still being competitive compared with currently available phenol red assays. Validation experiments of our test with a panel of 81 *Enterobacteriaceae* showed good performance with 93% of sensitivity and 92% of specificity. The compatibility of our routine-friendly protocol with automation offers great perspectives for high throughput screening in outbreak situations and/or in big laboratories.

Keywords: Carbapenemase, detection, assay, bacteria, phenol-red, spectrophotometry.

Abbreviations:

CLSI: Clinical & Laboratory Standards Institute guidelines.

CPE: carbapenemase-producing *Enterobacteriaceae*.

ESBL: Extended spectrum β -lactamases.

IMP: Imipenemase.

KPC: *Klebsiella pneumoniae* Carbapenemase.

NDM: New Delhi metallo- β -lactamase.

OD_{558nm}: Optical density at 558 nm.

OM: Outer Membrane.

OXA: Oxacillinase.

VIM: Verona Integron encoded Metallo- β -lactamase.

WT: Wild Type.

Acknowledgements: Authors thank the bioMérieux La Balme les Grottes strain collection team and Dominique Dechaume for help with phenotypic and molecular data collection.

Funding: This work was supported by bioMérieux, France.

Words counts abstract: 128.

Words count body (without tables and figure legends): 3448

Download English Version:

<https://daneshyari.com/en/article/8737350>

Download Persian Version:

<https://daneshyari.com/article/8737350>

[Daneshyari.com](https://daneshyari.com)