



# Literature overview

## MDR

### BD MAX Check-Points CPO

Van der Burg M, Bosboom RW, Van Beelen JH, Van Griethuysen AJ. Evaluation of the BD MAX Check-Points CPO assay for rapid detection of carbapenemase genes in Gram-Negative bacilli in spiked rectal swabs. Presented at: 28th ECCMID, 21-24 April 2018, Madrid, Spain.

García-Castillo M, García-Fernández S, Moroshini MI, Pérez-Viso B, Ruiz-Garbajosa P, Cantón R. Evaluation of the BD MAX Check-Points CPO assay for rapid detection of carbapenemase-producing organisms in rectal swab specimens from high-risk wards. Presented at: 28<sup>th</sup> ECCMID, 21-24 April 2018, Madrid, Spain.

### Check-Direct CPE

O'Connor C, Kiernan MG, Finnegan C, O'Hara M, Power L, O'Connell NH & Dunne CP. An optimized work-flow to reduce time-to-detection of carbapenemase-producing Enterobacteriaceae (CPE) using direct testing from rectal swabs. *Bioengineered*. 2017 Mar; 8(3): 217-224

Otter JA, Dyakova E, Bisnauthsing KN, Querol-Ribiera A, Patel A, Ahanonu C, Tosas Auguet O, Edgeworth D and Goldenberg SD. Universal hospital admission screening for carbapenemase-producing organisms in a low-prevalence setting. *J. Antimicrob Chemother* 2016 Aug; 71: 3556-3561

Antonelli A, Arena F, Giani T, Colavecchio OL, Valeva SV, Paule S, Boleij P, Rossolini GM. Performance of the BD MAX™ instrument with Check-Direct CPE real-time PCR for the detection of carbapenemase genes from rectal swabs, in a setting with endemic dissemination of carbapenemase-producing Enterobacteriaceae. *Diagn Microbiol Infect Dis* 2016 Sep; 86(1):30-34

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Op Den Buijs I et al. Molecular screening for ESBL and carbapenemase during a prevalence study in two Dutch hospitals. Presented at: 26th ECCMID, 9-12 April 2016, Amsterdam, The Netherlands.

Österblad M, Lindholm L, Jalava J. Evaluation of two commercial carbapenemase gene assays, the Rapidec Carba NP test and the in-house Rapid Carba NP test, on bacterial cultures. *J Antimicrob Chemother*. 2016 Mar 31. *Published online ahead of print*

Otter J, Goldenberg S, Walker C, Patel A, Edgeworth J, Ahanonu C, Tosas Auguet O, Querol-Rubiera A, Girdham S, Bisnauthsing K. Universal admission screening for CRE using PCR detects 14-fold more carriers than agar-based methods at a London hospital. Presented at: 25th ECCMID, 25-28 April 2015, Copenhagen, Denmark.

Lau AF, Fahle GA, Kemp MA, Jassem AN, Dekker JP, Frank KM. Clinical Performance of Check-Direct CPE, a Multiplex PCR for Direct Detection of blaKPC, blaNDM/VIM, and blaOXA48 from Perirectal Swabs. *J Clin Microbiol*. 2015 Dec;53(12):3729-37.

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Meunier D, Hopkins K, Findlay J, Woodford N. Evaluation of the Check-Direct CPE assay for detecting carbapenemase genes in multidrug-resistant Gram-negative bacteria. Presented at: 25th ECCMID, 25-28 April 2015, Copenhagen, Denmark.

Wohlwend N, Pires J, Droz S, Endimiani A, Risch L, Risch M, Bodmer T. Rapid screening for ESBL and carbapenemase genes by real-time PCR using the check-direct on the BD MAX™ open mode platform. Presented at: 25th ECCMID, 25-28 April 2015, Copenhagen, Denmark.

Saegeman V, Van den Eynde J, Niclaes L, De Ridder D, Schuermans A, Glupczynski Y. Performance of different culture methods and of a commercial molecular assay for the detection of carbapenemase-producing Enterobacteriaceae in nursing homes and rehabilitation centers. Eur J Clin Microbiol Infect Dis. 2015 May;34(5):991-7.

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## Check-Direct ESBL Screen for BD MAX

Engel T, Slotboom BJ, Van Maarseveen N, Van Zwet AA, Nabuurs-Franssen MH, Hagen F. A multi-centre prospective evaluation of the Check-Direct ESBL Screen for BD MAX as a rapid molecular screening method for extended-spectrum beta-lactamase-producing Enterobacteriaceae rectal carriage. J Hosp Infect. 2017 Nov; 97(3): 247-253.

Souverein D, Euser SM, Van der Reijden WA, Herpers BL, Kluytmans J, Rossen JWA and Den Boer JW.. Clinical sensitivity and specificity of the Check-Points Check-Direct ESBL Screen for BD MAX, a real-time PCR for direct ESBL detection from rectal swabs. J Antimicrob Chemother, 2017 June; 72: 2512:2518

Kirsi Gröndahl-Yli-Hannuksela et al. ESBL screening: Comparison of direct PCR from fecal swab with culture methods. Presented at: 26th ECCMID, 9-12 April 2016, Amsterdam, The Netherlands

Op Den Buijs I et al. Molecular screening for ESBL and carbapenemase during a prevalence study in two Dutch hospitals. Presented at: 26th ECCMID, 9-12 April 2016, Amsterdam, The Netherlands.

Slotboom B et al. A multi-centre prospective evaluation of the Check-Direct ESBL Screen™ as a rapid molecular screening method for extended-spectrum beta-lactamase producing Enterobacteriaceae rectal carriage. Presented at: 26th ECCMID, 9-12 April 2016, Amsterdam, The Netherlands.

Humaun Kabir M et al. Evaluation of check-direct ESBL real-time PCR kit for the detection of ESBL-producing Enterobacteriaceae from fecal sample. Presented at: 26th ECCMID, 9-12 April 2016, Amsterdam, The Netherlands.

Wohlwend N, Pires J, Droz S, Endimiani A, Risch L, Risch M, Bodmer T. Rapid screening for ESBL and carbapenemase genes by real-time PCR using the check-direct on the BD MAX™ open mode platform. Presented at: 25th ECCMID, 25-28 April 2015, Copenhagen, Denmark.

## Check-MDR Carba

Hanemaaijer NM, Nijhuis RH, Slotboom BJ, Mascini EM, van Zwet AA. New screening method to detect carriage of carbapenemase-producing Enterobacteriaceae in patients within 24 hours. J Hosp Infect. 2014 May;87(1):47-9.

Cuzon G, Naas T, Bogaerts P, Glupczynski Y, Nordmann P. Probe ligation and real-time detection of KPC, OXA-48, VIM, IMP, and NDM carbapenemase genes. Diagn Microbiol Infect Dis. 2013 Aug;76(4):502-5.

## Check-MDR ESBL

Nijhuis R, van Zwet A, Stuart JC, Weijers T, Savelkoul P. Rapid molecular detection of extended-spectrum  $\beta$ -lactamase gene variants with a novel ligation-mediated real-time PCR. *J Med Microbiol*. 2012 Nov; 61(11):1563-7.

Willemsen I, Hille L, Vrolijk A, Bergmans A, Kluytmans J. Evaluation of a commercial real-time PCR for the detection of extended spectrum  $\beta$ -lactamase genes. *J Med Microbiol*. 2014 Apr; 63(4):540-3.

## Check-MDR CT103 XL

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Bernasconi OJ, Principe L, Tinguely R, Karczmarek A, Perreten V, Luzzaro F, Endimiani A. Evaluation of a New Commercial Microarray Platform for the Simultaneous Detection of  $\beta$ -Lactamase and *mcr-1* and *mcr-2* Genes in *Enterobacteriaceae*. *J Clin Microbiol*, 2017 Oct, 55(10):3138-3141.

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Schwenk S, Platt G, Personne Y, Grgic L, Gant V, Zumla A, Enne V. Checking up on resistance: a phenotypic and genotypic analysis of extended spectrum beta-lactamase and carbapenemase-producing Enterobacteriaceae. Presented at: 25th ECCMID, 25-28 April 2015, Copenhagen, Denmark.

## Check-MDR CT102

Woodford N, Warner M, Pike R, Zhang J. Evaluation of a commercial microarray to detect carbapenemase-producing Enterobacteriaceae. *J Antimicrob Chemother*. 2011 Dec;66(12):2887-8.

Naas T, Cuzon G, Bogaerts P, Glupczynski Y, Nordmann P. Evaluation of a DNA microarray (Check-MDR CT102) for rapid detection of TEM, SHV, and CTX-M extended-spectrum  $\beta$ -lactamases and of KPC, OXA-48, VIM, IMP, and NDM-1 carbapenemases. *J Clin Microbiol*. 2011 Apr;49(4):1608-13.

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Somily AM, Arshad MZ, Garaween GA, Senok AC. Phenotypic and genotypic characterization of extended-spectrum  $\beta$ -lactamases producing *Escherichia coli* and *Klebsiella pneumoniae* in a tertiary care hospital in Riyadh, Saudi Arabia. *Ann Saudi Med*. 2015 Nov-Dec;35(6):435-9.

Somily AM, Garaween GA, Abukhalid N, Absar MM, Senok AC. Comparison of Molecular and Phenotypic Methods for the Detection and Characterization of Carbapenem Resistant Enterobacteriaceae. *Acta Microbiol Immunol Hung*. 2016 Mar;63(1):69-81.

## Check-MDR CT101

Wielders C, Van Hoek A, Hengeveld P, Veenman C, Dierikx C, Zomer T, Smit L, Van der Hoek W, Heederik D, De Greeff S, Maassen C, Van Duijkeren E. Extended-spectrum  $\beta$ -lactamase- and pAmpC-producing Enterobacteriaceae among the general population in a livestock-dense area. *Clin Microbiol Infect.* 2017; 23(2):120.e1-120.e8

Castanheira M, Mills JC, Costello SE, Jones RN, Sader HS. Ceftazidime-Avibactam Activity Tested against Enterobacteriaceae Isolates from U.S. Hospitals (2011 to 2013) and Characterization of  $\beta$ -Lactamase-Producing Strains. *Antimicrob Agents Chemother.* 2015 Jun;59(6):3509-17.

Bogaerts P, Hujer AM, Naas T, de Castro RR, Endimiani A, Nordmann P, Glupczynski Y, Bonomo RA. Multicenter evaluation of a new DNA microarray for rapid detection of clinically relevant bla genes from beta-lactam-resistant gram-negative bacteria. *Antimicrob Agents Chemother.* 2011 Sep;55(9):4457-60.

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## Previous products

### Check-MDR CT103

Cunningham SA, Vasoo S, Patel R. Evaluation of the Check-Points Check MDR CT103 and CT103 XL Microarray Kits Using Preparatory Rapid Cell Lysis. *J Clin Microbiol*. 2016 Feb 17. *Published online ahead of print*

Cuzon G, Naas T, Bogaerts P, Glupczynski Y, Nordmann P. Evaluation of a DNA microarray for the rapid detection of extended-spectrum  $\beta$ -lactamases (TEM, SHV and CTX-M), plasmid-mediated cephalosporinases (CMY-2-like, DHA, FOX, ACC-1, ACT/MIR and CMY-1-like/MOX) and carbapenemases (KPC, OXA-48, VIM, IMP, and NDM). *J Antimicrob Chemother*. 2012 Aug;67(8):1865-9.

Willemsen I, van Esser J, Kluytmans-van den Bergh M, Zhou K, Rossen JW, Verhulst C, Verduin K, Kluytmans J. Retrospective identification of a previously undetected clinical case of OXA-48-producing *K. pneumoniae* and *E. coli*: the importance of adequate detection guidelines. *Infection*. 2016 Feb;44(1):107-10.

Cunningham SA, Johnston B, Vasoo S, Johnson J, Patel R. Evaluation of Check-Points Check-MDR CT103 PCR-Microarray Kit for Detection and Classification of ESBL, AmpC and Carbapenemase Genes. Presented at: 54th ICAAC; 5 - 9 Sept 2014; Washington, DC.

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### Check-KPC ESBL

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## Check-ESBL

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Schoevaerds D, Bogaerts P, Grimmelprez A, de Saint-Hubert M, Delaere B, Jamart J, Swine C, Glupczynski Y. Clinical profiles of patients colonized or infected with extended-spectrum beta-lactamase producing Enterobacteriaceae isolates: a 20 month retrospective study at a Belgian University Hospital. *BMC Infect Dis*. 2011 Jan 12;11:12.

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Nijhuis RH, van Zwet AA, Savelkoul PH, Roovers EA, Bosboom RW, Postma B, van Griethuysen AJ. Distribution of extended-spectrum beta-lactamase genes using a commercial DNA micro-array system. *J Hosp Infect*. 2011 Dec;79(4):349-53.

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Leverstein-van Hall MA, Dierikx CM, Cohen Stuart J, Voets GM, van den Munckhof MP, van Essen-Zandbergen A, Platteel T, Fluit AC, van de Sande-Bruinsma N, Scharinga J, Bonten MJ, Mevius DJ; on behalf of the national ESBL surveillance group. Dutch patients, retail chicken meat and poultry share the same ESBL genes, plasmids and strains. *Clin Microbiol Infect*. 2011 Jun;17(6):873-80.