

Explanation of Carbapenemase Testing Methods

Laboratories can conduct specific tests to determine whether *Enterobacterales*, *P. aeruginosa*, and *A. baumannii* are positive for carbapenemases. There are generally two types of testing methods with different goals.

	Phenotypic	Genotypic
Goal of test	To identify presence of <u>any</u> carbapenemase	To identify presence of a <u>specific</u> carbapenemase
What report may say	“carbapenemase detected” and/or “mCIM positive” (see example A, below)	“KPC gene detected” or “KPC positive” (see example B, below)
Examples of methods*	<ul style="list-style-type: none"> • Biomerieux Rapidec® Carba NP • BD Phoenix™ CPO Detect • Modified Carbapenem Inactivation Method (mCIM) with or without EDTA Carbapenem Inactivation Method (eCIM) 	<ul style="list-style-type: none"> • Cepheid Xpert® Carba-R • Hardy NG-Test® CARBA 5^ • Biofire® FilmArray® BCID Panel for positive blood cultures • VERIGENE® gene detection for positive blood cultures • Check-Points Check-Direct CPE for BD MAX™ • Real-Time PCR or Traditional PCR

*Note this list is not exhaustive nor an endorsement of specific products.

^Phenotypic immunological assay that detects specific antigens associated with the 5 main carbapenemases.

Example A:

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Specimen Source: URINE CULTURE
Collection Date: 03/10/2017 Receipt Date: 03/10/2017
Accession#: 27710687
ORG#1 >100,000 COLONIES/ML.
ORG#1 THIS ISOLATE DEMONSTRATES CARBAPENEMASE PRODUCTION
ORG#1 VERIFIED BY MODIFIED HODGE TEST (CARBAPENEMASE PRODUCTION)
ORG#1 MULTIPLE DRUG RESISTANT ORGANISM
ORG#1 ADDITIONAL SENSITIVITIES BY DISK METHOD
ORG#1 COLISTIN 10ug : S , POLYMYXIN B 300ug : S
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Example B:

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*****
POSITIVE for Klebsiella pneumoniae.
POSITIVE for KPC resistance gene.
Presumptive carbapenem resistant organism.
*****Comment*****
Preliminary identification performed using
Verigene nucleic acid test. Mixed infections
may not be detected by this method. Rare
cross-reactivity with organisms other than that
identified may occur for both identification
and resistance marker testing.
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