INTERPRETACIÓN DEL ANTIBIOGRAMA 2023:
DEL LABORATORIO A LA PRÁCTICA CLÍNICA

MODULO 5:
P. aeruginosa DTR y *Acinetobacter*
"Resolución de conceptos críticos"

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redEMC

"Resolución de conceptos críticos"

- **1)** *P. aeruginosa* vs *Pseudomonas* spp: perfil esperado de resistencia.
- **2)** Definición de *P. aeruginosa* difícil de tratar (DTR).
- **3)** Detección de mecanismos de resistencia a carbapenemes en *P. aeruginosa*. Rol de nuevos antimicrobianos.
- **4)** Desafíos diagnósticos de las carbapenemasas en *Acinetobacter*.

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PSEUDOMONAS SPP

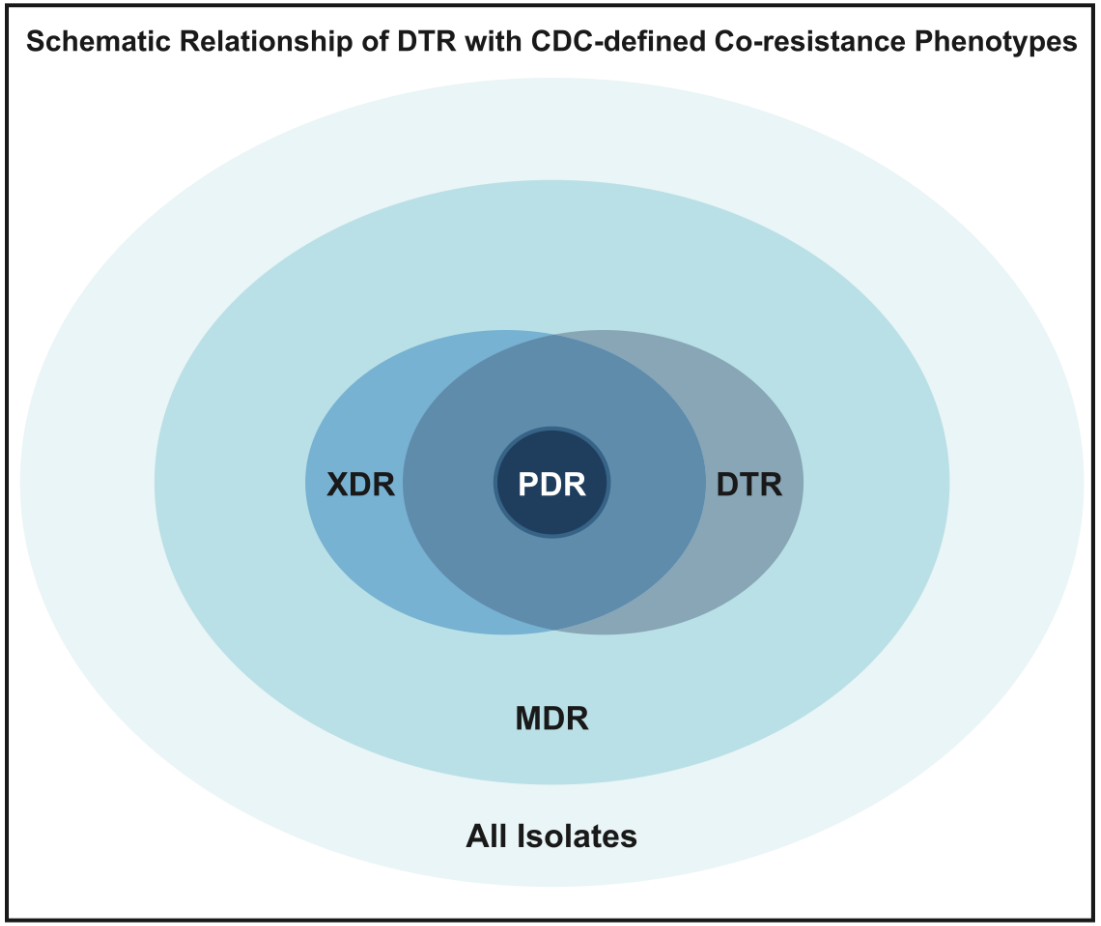
	P. aeruginosa	P. fluorescens gr	P. putida gr	P. stutzeri	P. luteola	P. otitidis	P. alcaligenes	P. chlororaphis
Aminopenicilinas					LUT-1 a -6	POM-1	PAM-1/AmpC	
Cefalosp. de 1a y 2a					LUT-1 a -6	POM-1	PAM-1/AmpC	
Cefamicinas					LUT-1 a -6	POM-1	PAM-1/AmpC	
Cefotaxima					LUT-1 a -6		PAM-1	
Cefepime							PAM-1	
Aztreonam		pbpC (homol fstI)			LUT-1 a -6			
Carbapenem		PFM-1, -2, -3	ArpABC			POM-1	PAM-1	phnP
Colistin								O-PS
Aminoglucósidos	excep. KAN y NEO							
Fluoroquinolonas								
Cloranfenicol	MexAB/oprM	EmhABC	Arp/MepABC					
Tetraciclinas	MexAB/oprM		TtgABC					
TMS	MexAB/oprM							

AmpC

PERFIL ESPERADO DE RESISTENCIA

SENSIBLE

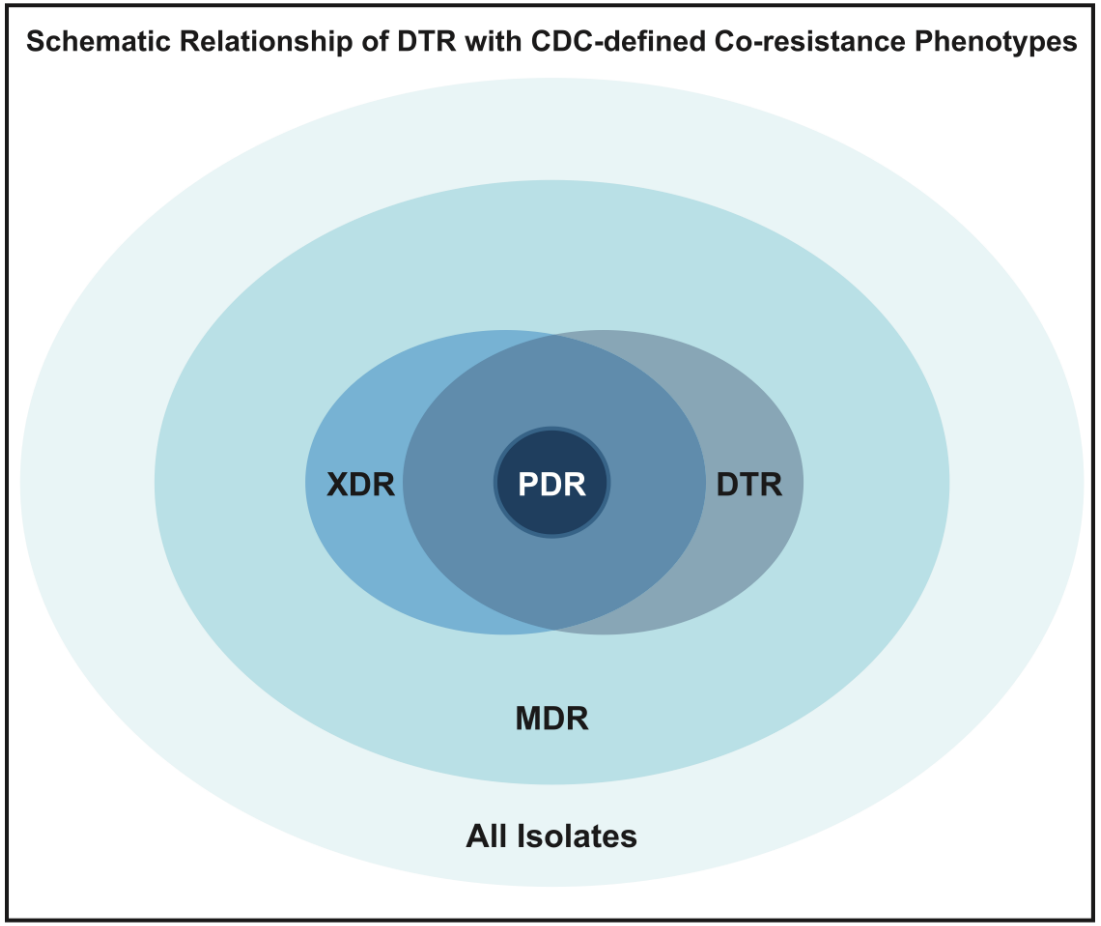
RESISTENTE



DTR
Resistencia simultánea a los agentes de primera línea de tratamiento: aztreonam, ceftazidima, cefepime, piperacilina+tazobacta mimipenem, meropenem y fluorquinolonas

UNADJUSTED MORTALITY, GNB-BSI

Sameer S. Kadri 10.1093/cid/ciy378



DTR
Resistencia simultánea a los agentes de primera línea de tratamiento: aztreonam, ceftazidima, cefepime, piperacilina+tazobacta mimipenem, meropenem y fluorquinolonas

UNADJUSTED MORTALITY,

DTR: 43% → **CR: 35%** → **MDR: 25%** → **FQR: 18%**

Sameer S. Kadri 10.1093/cid/ciy378

IDSA

WT: PTZ, CEE, FQ >>> CBP

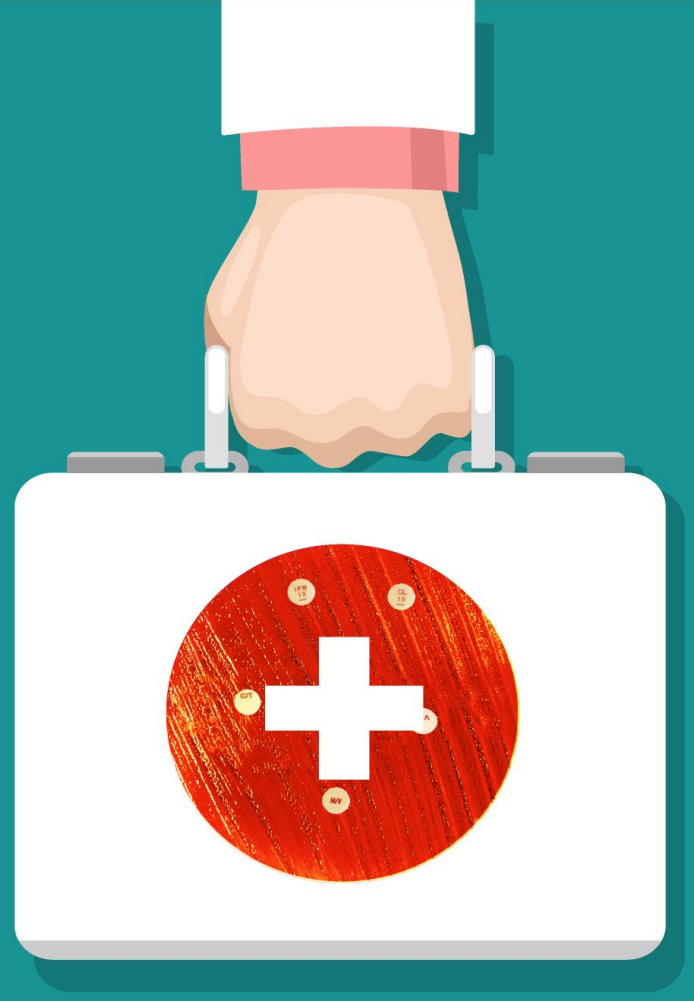
IMP/MER^{R} --> FEP 2g q8h, inf. 3 hs
--> mod/severa: CT, CZA, IMR

DT CISTITIS--> AAG single dose CT, CZA, IMR, CDFC

DT non-UTI --> CT, CZA, IMR >> CDFC

COMBINATION THERAPY not recommended if CT^{S}, IMR^{S}, CZA^{S}

Tamma Pra[illegible] et al, CID 2021
10.1093/[illegible]/ciab1013



WHAT OPTIONS DO WE HAVE TO TREAT DT-PAE?

DT= difficult to threat
IMP^{R} + MER^{R}+ PTZ^{R} + CAZ^{R}+ FEP^{R} + ATM^{R} + CIP/LEV^{R}

ESCMID

WT--> PTZ, CEE, FQ, CBP

CR-PAE ---> AAGs, COL or FOS
Si infeccion severa combinacion de 2 ATBs activos

DT-PAE ---> CT
evidencia insuficiente para CZA, IMR, CFDC

Mical Paul et al, CMI 2022.
10.1016/j.cmi.2021.11.025

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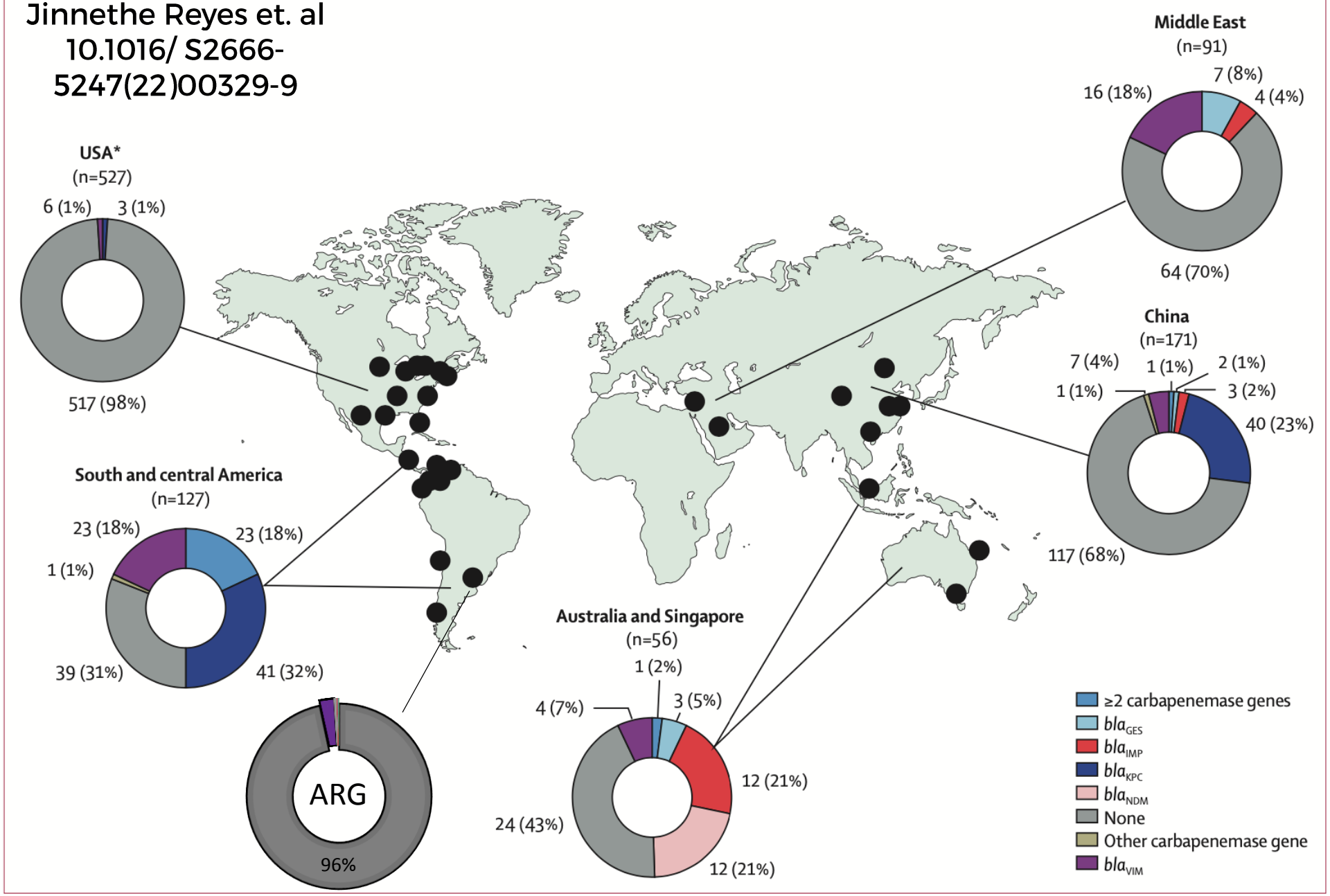
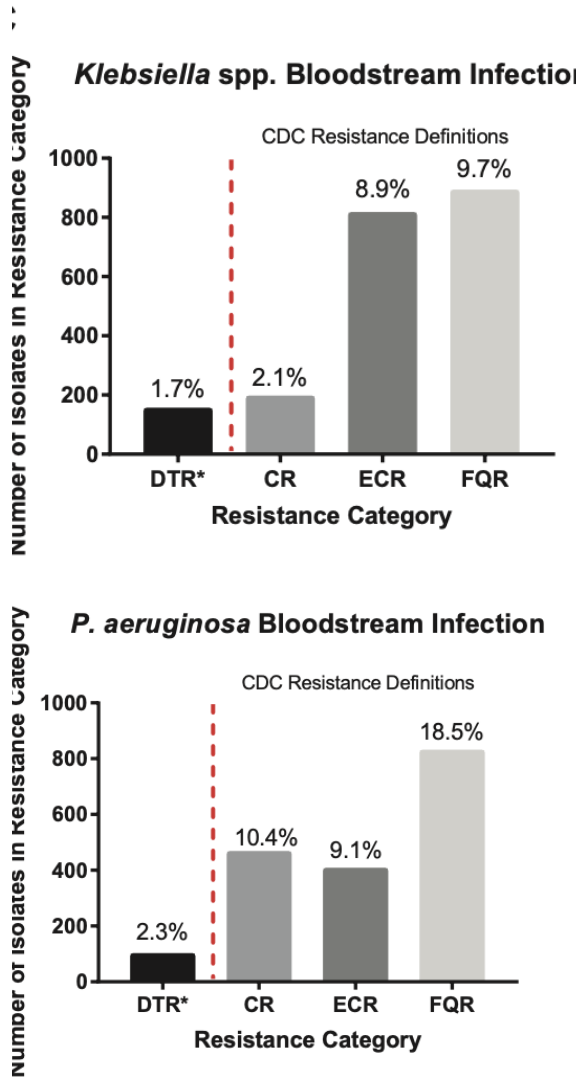
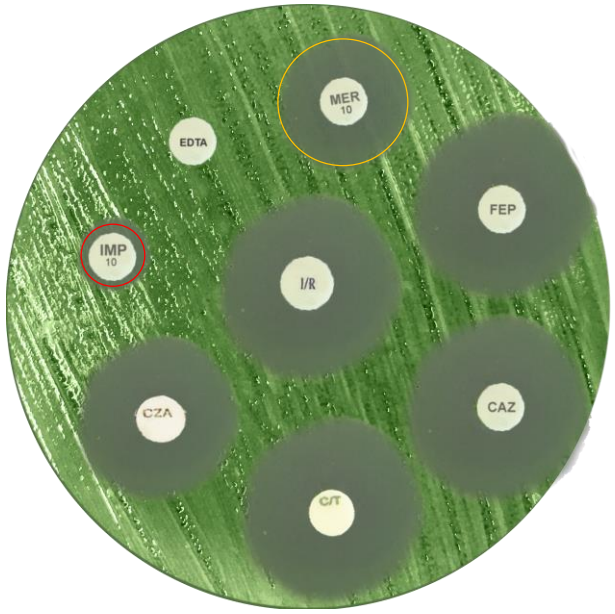
Jinnethe Reyes et. al
10.1016/ S2666-5247(22)00329-9





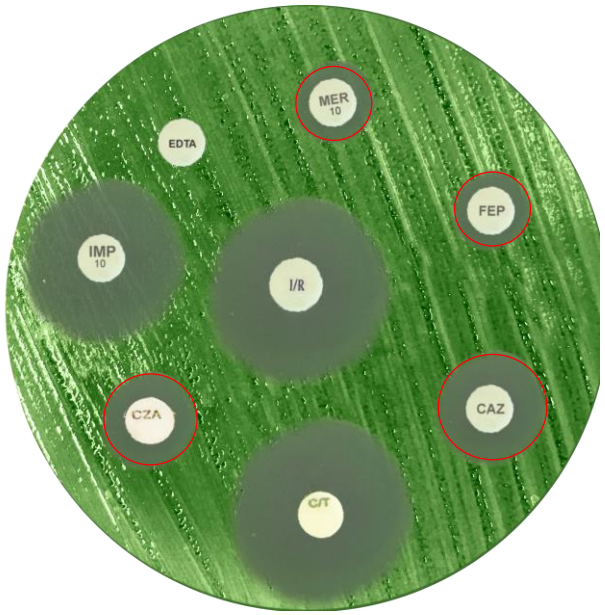
Sameer S. Kadri
10.1093/cid/ciy378

PAE 1



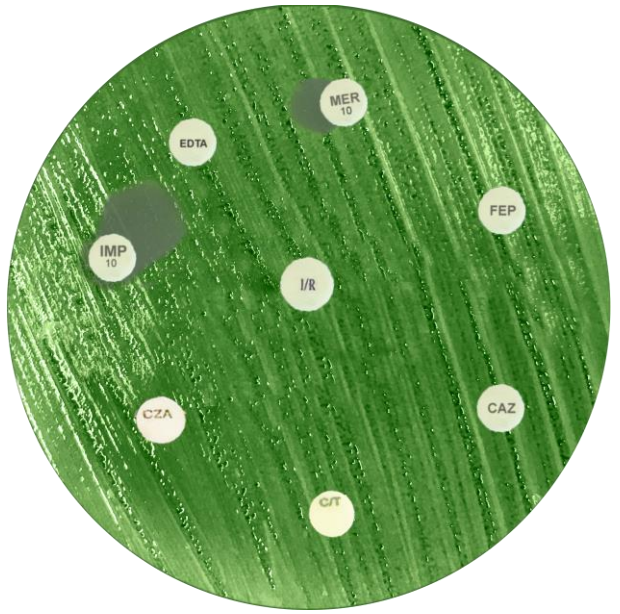
Déficit de porina OprD + Hiper AmpC

PAE 2



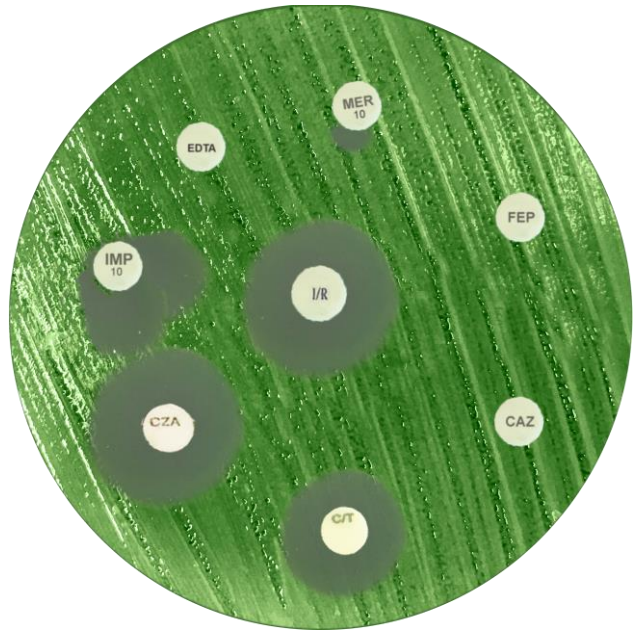
Hiper-expresión de eflujo MexAB-oprM

PAE 3



Carbapenemasa tipo MBL

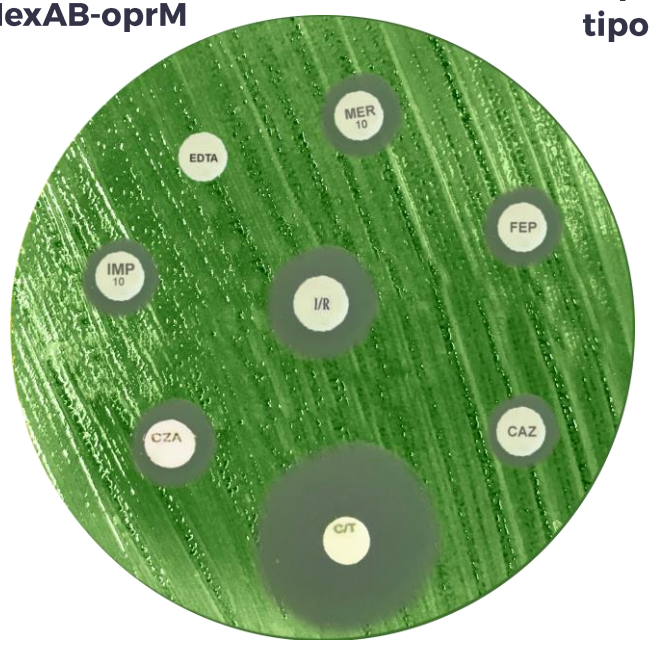
PAE 4



Carbapenemasa tipo KPC

PAE 5

Hiper-expresión de eflujo MexAB-oprM + Déficit de porina OprD + Hiper AmpC



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Fenotipos de resistencia en *P. aeruginosa*

Eficacia de diversos métodos fenotípicos para la detección de carbapenemasas en *P. aeruginosa* y *Acinetobacter* spp.

TABLE 2 Accuracy of 11 phenotypic assays for carbapenemase detection, including 67 carbapenem-resistant *Pseudomonas aeruginosa* isolates and 24 carbapenem-resistant *Acinetobacter baumannii* isolates

	% sensitivity (95% confidence interval)		% specificity (95% confidence interval)	
Assay	Carbapenemase-producing *Pseudomonas aeruginosa*[a] (n = 14)	Carbapenemase-producing *Acinetobacter baumanii*[b] (n = 14)	Non-carbapenemase-producing *Pseudomonas aeruginosa* (n = 53)	Non-carbapenemase-producing *Acinetobacter baumannii* (n = 10)
Rapidec Carba NP	100 (73–100)	86 (56–97)	91 (76–96)	70 (35–92)
Neo-Rapid Carb Screen	100 (73–100)	86 (56–97)	98 (89–100)	100 (66–100)
Rapid CARB Blue Screen	100 (73–100)	57 (30–81)	98 (89–100)	100 (60–100)
Manual Carba NP CLSI	93 (64–100)	21 (6–51)	100 (92–100)	100 (60–100)
Manual Blue Carba	100 (73–100)	57 (30–81)	77 (63–87)	90 (54–99)
Modified Carba NP	100 (73–100)	79 (49–94)	60 (46–73)	80 (44–96)
Boronic acid synergy test	50 (3–97)		57 (44–69)	96 (76–100)
Metallo-β-lactamase Etest	75 (43–93)	80 (30–99)	84 (71–92)	94 (71–100)
Modified Hodge test	64 (36–86)	71 (42–90)	98 (89–100)	70 (35–92)
Carbapenem inactivation method	79 (49–94)	29 (10–58)	100 (92–100)	80 (44–96)
Modified carbapenem inactivation method	100 (73–100)	71 (42–90)	98 (89–100)	70 (35–92)

[a]The carbapenemases harbored by the *P. aeruginosa* isolates were as follows: KPC (n = 2); VIM (n = 8); IMP (n = 3); SPM (n = 1).

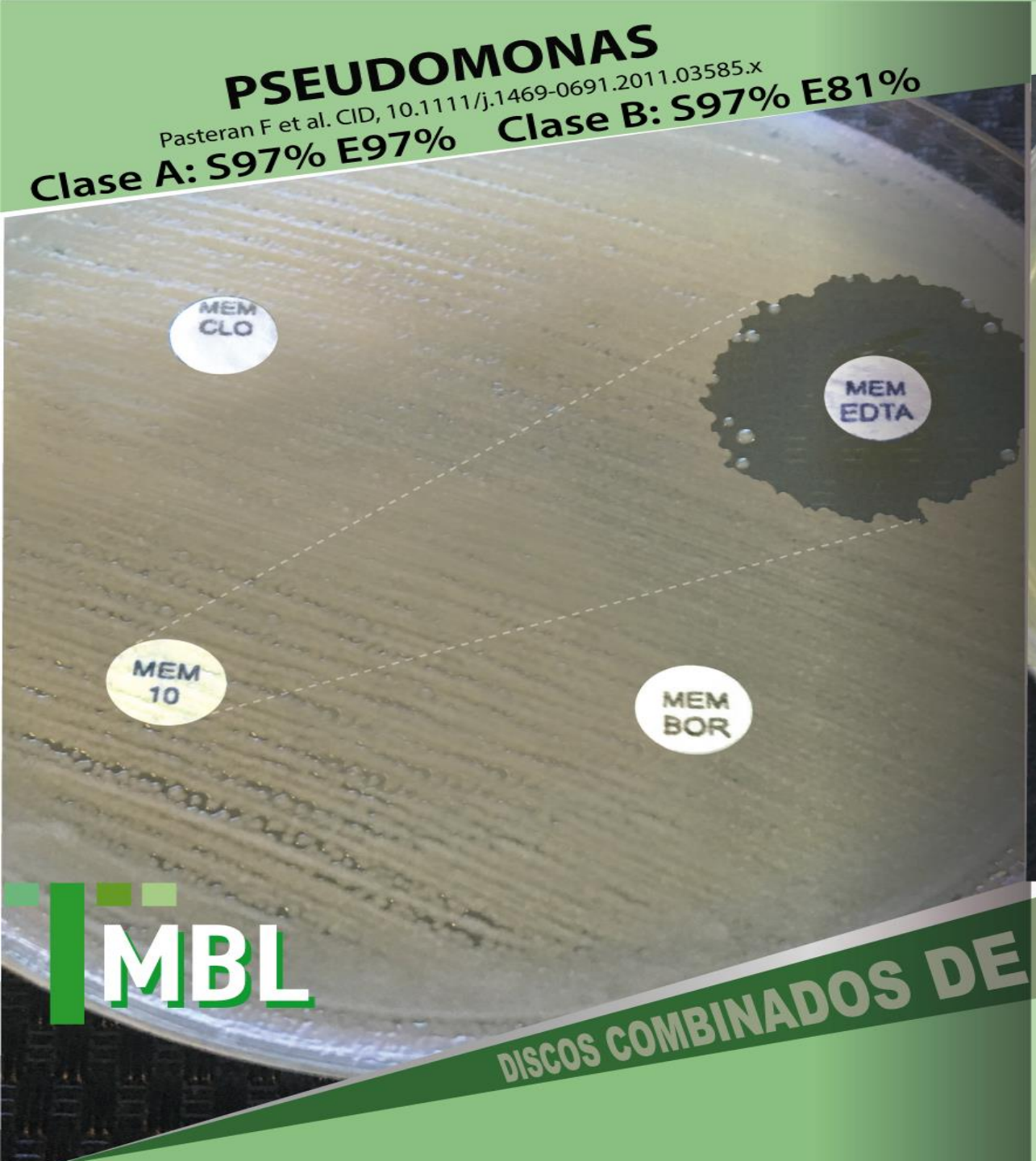
[b]The carbapenemases harbored by the *A. baumannii* isolates were as follows: NDM (n = 4); NDM and OXA-23 (n = 1); OXA-23 (n = 3); OXA-24 (n = 3); OXA-58 (n = 1); OXA-72 (n = 1); OXA-23 and OXA-24 (n = 1).

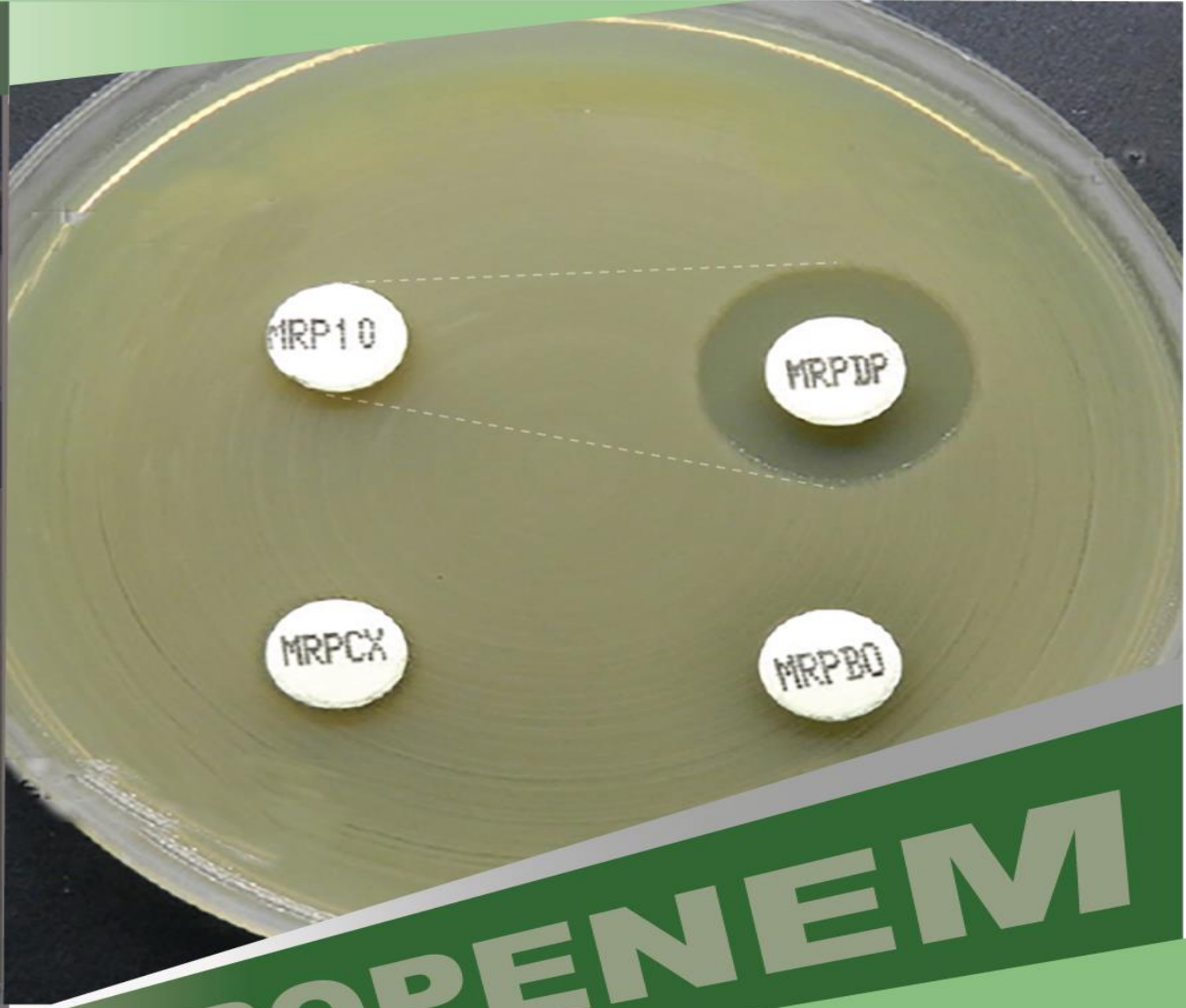
Simner P et al. 10.1128/JCM .00775-17

PSEUDOMONAS

Pasteran F et al. CID, 10.1111/j.1469-0691.2011.03585.x

Clase A: S97% E97% **Clase B: S97% E81%**





MBL

DISCOS COMBINADOS DE MEROPENEM

[1]Sensibilidad: 84%. Especificidad: 82% (DIP)

[2]Sensibilidad: 96%. Especificidad: 81% (EDTA)

[3]Sensibilidad: 100%. Especificidad: 100% (2-MPA)

[1]Peter S, 10.1007/s10096-014-2059-1. 2. Pitout J, 10.1128/JCM.43.7.3129–3135.2005. 3. Soo-Young Kim, 10.1128/JCM.02486-06

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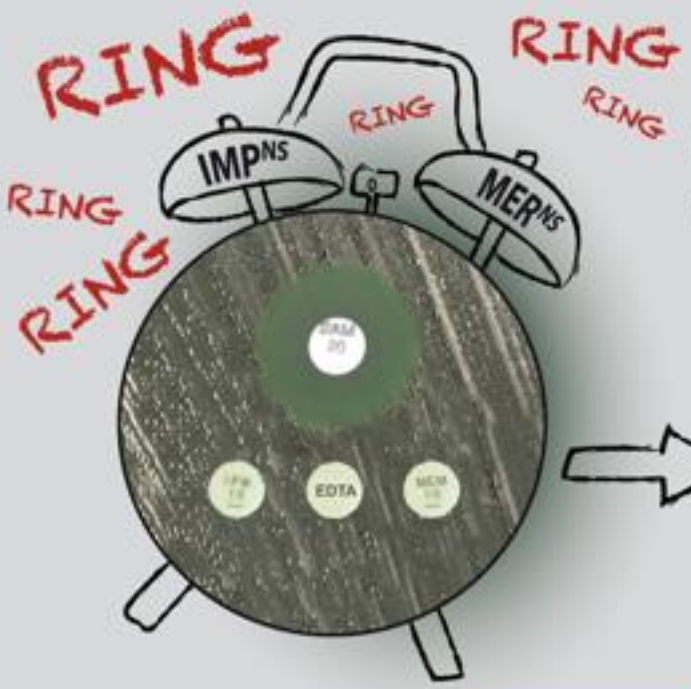
Simner P et al. 10.1128/JCM .00775-17

Acinetobacter resistente a carbapenem (2022): vigilancia de MBLs (NDM), KPC y dobles productores



CNP o BCT → EDTA → APB → PCR multiplex OXA-51Gr OXA-23 OXA-58 NDM → PCR multiplex VIM, IMP NDM KPC OXA-48

	KPC	POS	NEG	POS			√
	MBL	POS	POS	NEG	√	SI NDM NEG.	√
HLR-Aminoglucosidos**	MBL*	NEG	POS	NEG	√	SI NDM NEG.	√
	OXA	POS	NEG	NEG	√		
NDM+OXA-23 (ST2)	COMBO	POS < 30min	NEG	NEG	√	SI NDM NEG.	√
	OXA/WT	NEG	NEG	NEG	√		

* Métodos colorimétricos sin detergentes biológicos y/o sin sistemas de pre-extracción.
** Co-producción de ArmA + NDM-1: 52% casos

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MUCHAS GRACIAS!

Fernando Pasteran

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