



UNIVERSITY HOSPITAL OF NORTH NORWAY
UNIVERSITETSSYKEHUSET NORD-NORGE

Evaluering av Total MBL Confirm Kit (ROSCO) for deteksjon av metallo- β -laktamaser (ESBL_{CARBA-B}) hos *Pseudomonas aeruginosa* og *Acinetobacter baumannii*

**NordicAST workshop
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**Kompetansetjeneste for påvisning av antibiotikaresistens (K-res)
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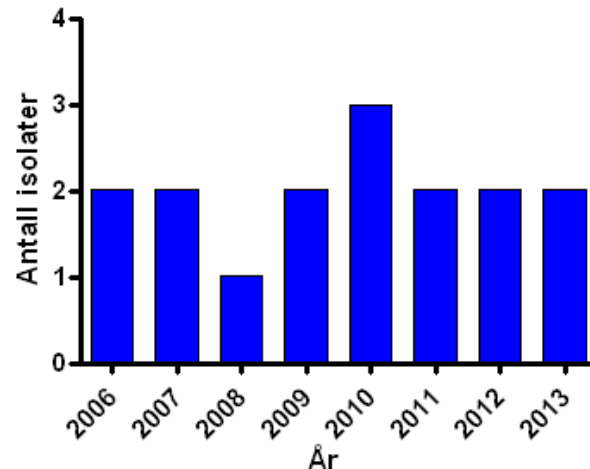


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ESBL_{CARBA-B} (MBL): *P. aeruginosa*

ESBL_{CARBA} *Pseudomonas* spp. Norge



Danmark:

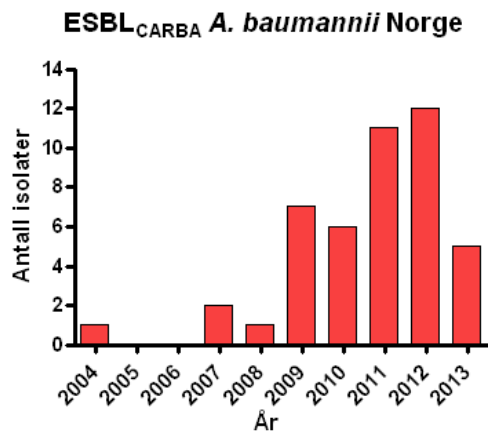
- Januar 2011 – juli 2011: 116 karbapenem ikke-følsomme *P. aeruginosa*
- ~7% ESBL_{CARBA-B}-positive

Sample ID	DCM	Specimen	Hospitalized abroad	Acquired β-lactamase	Serotype	MLST	Clonal Cluster	PFGE type
Psa-43	Hvidovre	urine (catheter)	No	VIM-2	O12	ST111	CC111	17
Psa-49	Herlev	urine (catheter)	No	VIM-2	O12	ST111	CC111	18
Psa-53	Viborg	tracheal secret	No	VIM-2	O12	ST111	CC111	50
Psa-60	Slagelse	urine (catheter)	No	VIM-2	O6	ST233	CC233	95
Psa-72	Skejby	expectorated sputum	No	VIM-2	O12	ST111	CC111	10
Psa-89	Rigshosp.	urine	No	VIM-2	O12	ST111	CC111	49
Psa-116	Skejby	expectorated sputum	No	VIM-2	O12	ST111	CC111	2
Psa-122	Skejby	urine	Yes; Thailand	VIM-2	O6	ST654		31

F. Hansen *et al.* upubliserte data.



ESBL_{CARBA-B} (MBL): *A. baumannii*



ESBL_{CARBA-D} (OXA-23, OXA-24/40, OXA-58)

NDM etablert hos *A. baumannii*?

- Hammerum AM. *et al.* Patients transferred from Libya to Denmark carried OXA-48-producing *Klebsiella pneumoniae*, [NDM-1-producing *Acinetobacter baumannii*](#) and methicillin-resistant *Staphylococcus aureus*. Int. J. Antimicrob. Agents 2012;40:191-192.

PubMed: "ndm and acinetobacter":

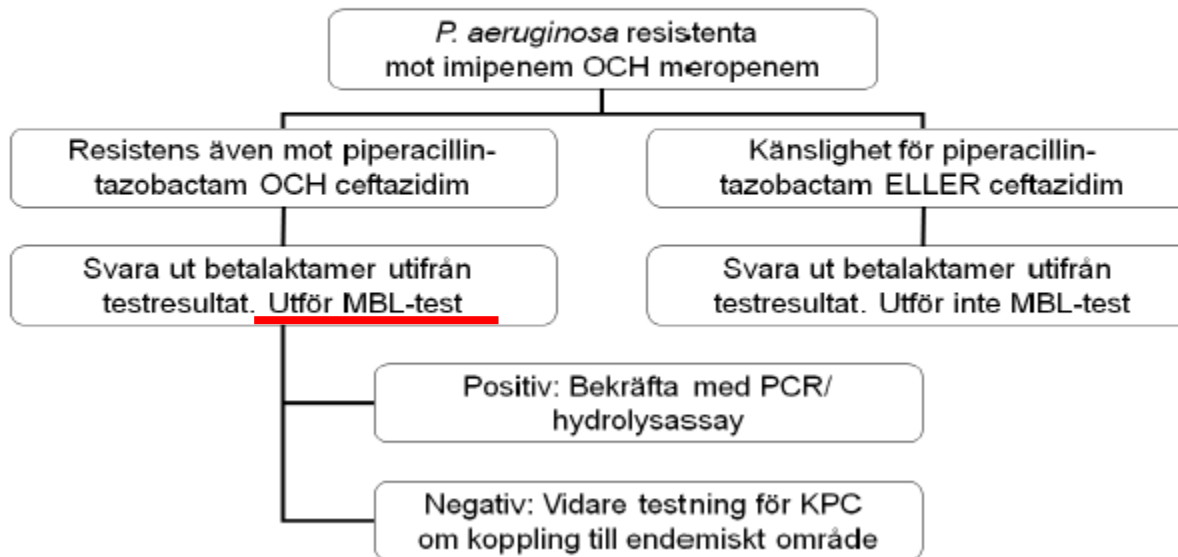
India, Canada, Kina, Japan, Sveits, Slovenia, Tyskland, Frankrike, Tsjekkia, Bangladesh, Belgia, Danmark, Algeria, Forente Arabiske Emirater, Israel, Egypt.....



Hvordan identifisere ESBL_{CARBA}: *P. aeruginosa* & *A. baumannii*?



Pseudomonas aeruginosa ALGORITM FÖR DETEKTION AV KARBAPENEMASER



NordicAST v. 3.0

- *A. baumannii*?



Material og metode

- **Total MBL Confirm Kit (ROSCO)**
 - Imipenem 10µg (IMI10)
 - Imipenem 10µg + **EDTA** (IM10E)
 - Imipenem 10µg + **dipikolinsyre** (IMIDP)
 - Meropenem 10µg (MRP10)
 - Meropenem 10µg + **dipikolinsyre** (MRPDP)
- **Stammemateriale:**
 - *P. aeruginosa*:
 - ESBL_{CARBA-B}-positive (n=28): VIM (n=23), GIM-1 (n=1), IMP (n=3), AIM-1 (n=1)
 - Karbapenem ikke-følsomme, ESBL_{CARBA}-negative (n=43)
 - *A. baumannii*:
 - ESBL_{CARBA-B}-positive (n=5): NDM (n=2), SIM (n=2), IMP (n=1)
 - ESBL_{CARBA-D}-positive (n=39): OXA-23 (n=33), OXA-58 (n=3), OXA-24 (n=3)
 - Karbapenem ikke-følsomme, ESBL_{CARBA}-negative (n=9)
- Inokulum: 0.5 McFarland
- **MH-agar**



Resultater

	<i>P. aeruginosa</i>			<i>A. baumannii</i> *		
	Meropenem + dipikolinsyre	Imipenem + dipikolinsyre	Imipenem + EDTA	Meropenem + dipikolinsyre	Imipenem + dipikolinsyre	Imipenem + EDTA
Sensitivitet	89%	86%	100%	100%	80%	80%
Spesifisitet	14%	67%	5%	67%	100%	42%
PPV	40%	63%	41%	24%	100%	13%

*Antall ESBL_{CARBA-B}-positive isolater lavt (n=5)

- Sensitivitet: 80-100%
- Spesifisitet: 5-100%
- Positiv prediktiv verdi: 13-100%



MH agar vs. MacConkey agar

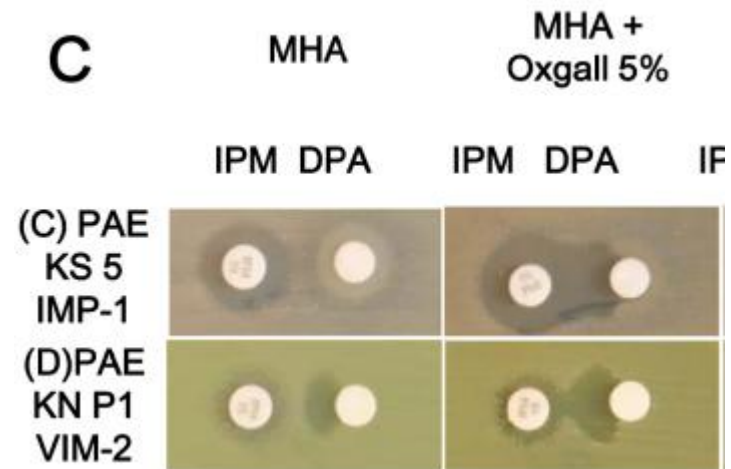
- ROSCO 30.04.2013:
 - “The synergistic performance of DPA is improved by the use of MacConkey agar, instead of Mueller – Hinton. Therefore, use MacConkey agar”



Evaluation of Double-Disk Potentiation and Disk Potentiation Tests Using Dipicolinic Acid for Detection of Metallo- β -Lactamase-Producing *Pseudomonas* spp. and *Acinetobacter* spp.

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- Oxgall → økt friskillelse av β -laktamase til medium.
 - Økt synergistisk effekt med imipenem og dipikolinsyre
 - Liten effekt på meropenem og dipikolinsyre



Konklusjon

- Sensitivitet >80%
- Lav spesifisitet og positiv prediktiv verdi
- Bruk av MacConkey agar må evalueres



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