



Detection of OXA-244 producing bacteria

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Statens serum Institut is the Public health institute in Denmark

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CPO have been reportable since September 5th 2018

Introduction to OXA-244

- One of the frequently detected carbapenemases in Europe is OXA-48.
- In comparison to OXA-48, **OXA-244** has a single amino acid substitution (Arg-222-Gly) and has **reduced carbapenemase** activity
- It was first described in Spain from a *Klebsiella pneumoniae* isolate in 2013
- Subsequently, OXA-244-producing *E. coli* isolates were reported the United Kingdom (UK), France and Egypt, Germany, Algeria and Lebanon



SURVEILLANCE

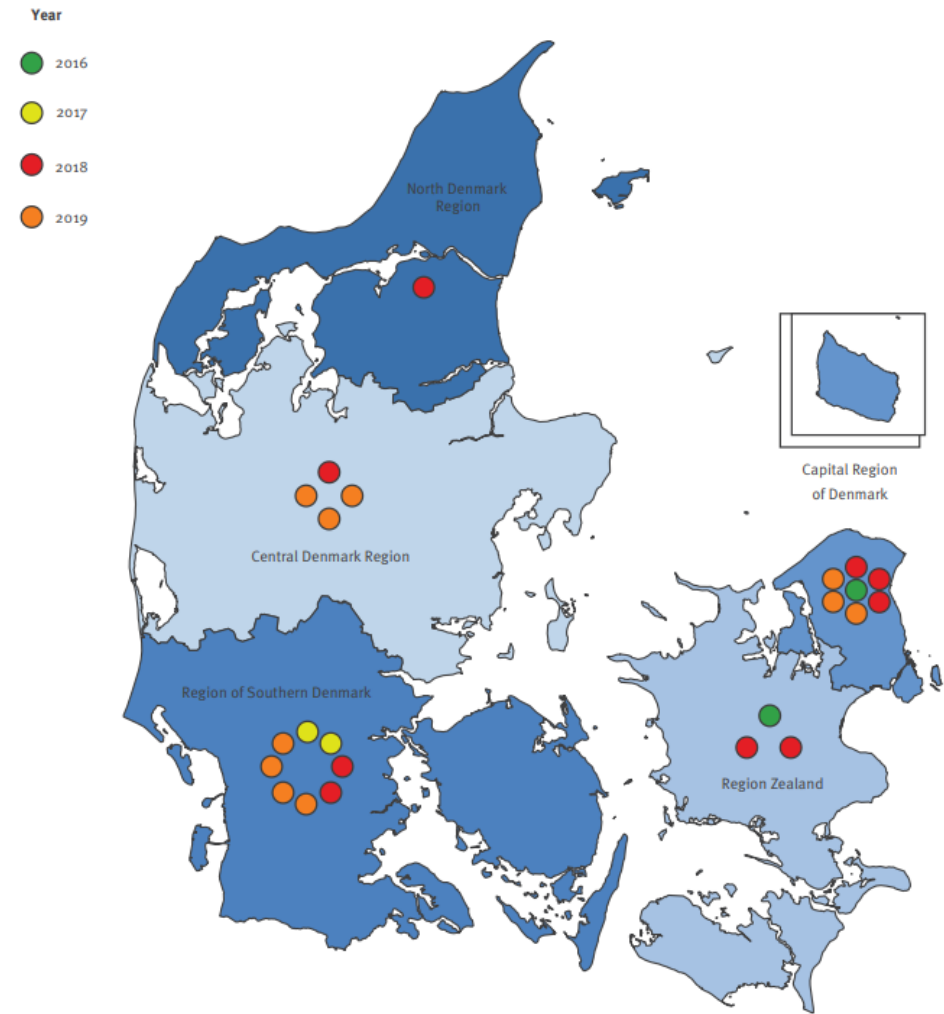
Surveillance of OXA-244-producing *Escherichia coli* and epidemiologic investigation of cases, Denmark, January 2016 to August 2019

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OXA-244-producing *Escherichia coli* by date of detection and region, Denmark, January 2016–August 2019



OXA-244 isolates and patients

- Most often from urinary tract infection
- Many females
- Younger than the other patients with other CPOs
- "Outbreaks" isolates are often from many Danish regions
- Community sources?

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Screening of OXA-244 producers, a difficult-to-detect and emerging OXA-48 variant?

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Background

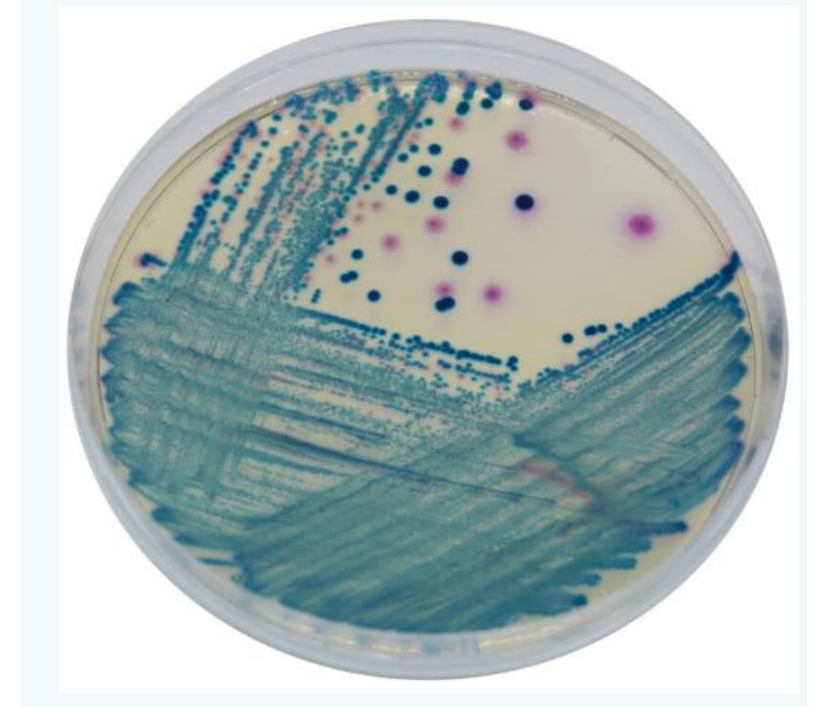
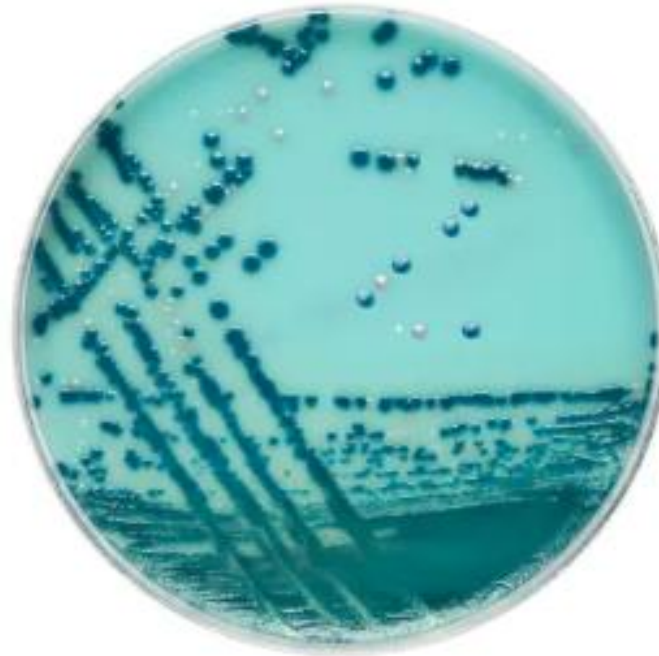
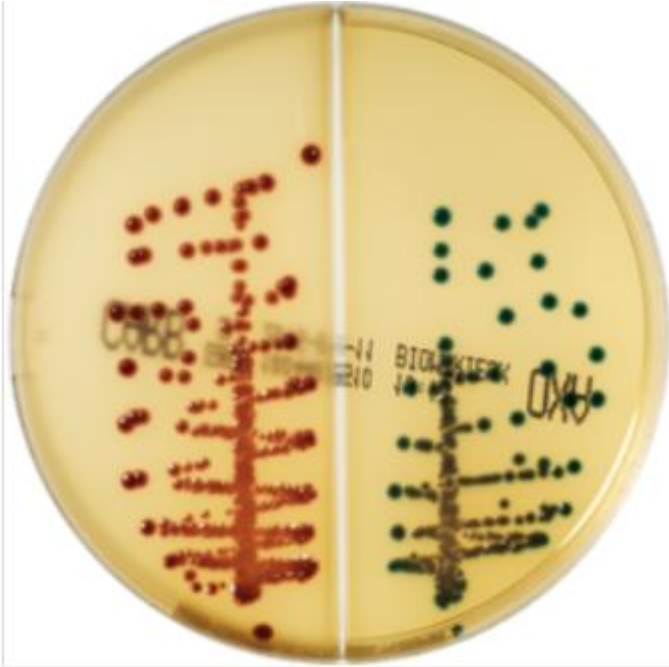
- OXA-244, a single amino acid variant of OXA-48, demonstrates **weaker hydrolytic activity** towards **carbapenems** and **temocillin** compared with OXA-48.
- Of note, **carbapenems** and **temocillin** are present in high concentrations in several carbapenemase-producing Enterobacterales (**CPE**) **screening media**.
- As a result, **some screening media fail** to grow **OXA-244-producing isolates**

Methods

- 3 commercially available CPE screening media
 1. ChromID CARBA SMART (bioMerieux),
 2. Brilliance™ CRE (Thermo Fisher)
 3. mSuperCARBA™ (MAST Diagnostic)

- OXA-244 producers (n = 101)

CHROMID™ CARBA SMART Brilliance™ CRE Agar mSuperCARBA™



Methods

- 3 commercially available CPE screening media
 1. ChromID CARBA SMART (bioMérieux),
 2. Brilliance™ CRE (Thermo Fisher)
 3. mSuperCARBA™ (MAST Diagnostic)
- OXA-244 producers (n = 101)

Result

Overall, the sensitivity of the detection of OXA-244 producers

1. ChromID CARBA SMART **14%** (95% CI = 8.1%–22.5%),
2. Brilliance™ CRE **54%** (95% CI = 43.3%–63.4%)
3. mSuperCARBA™ media **99%** (95% CI = 93.8%–100%)

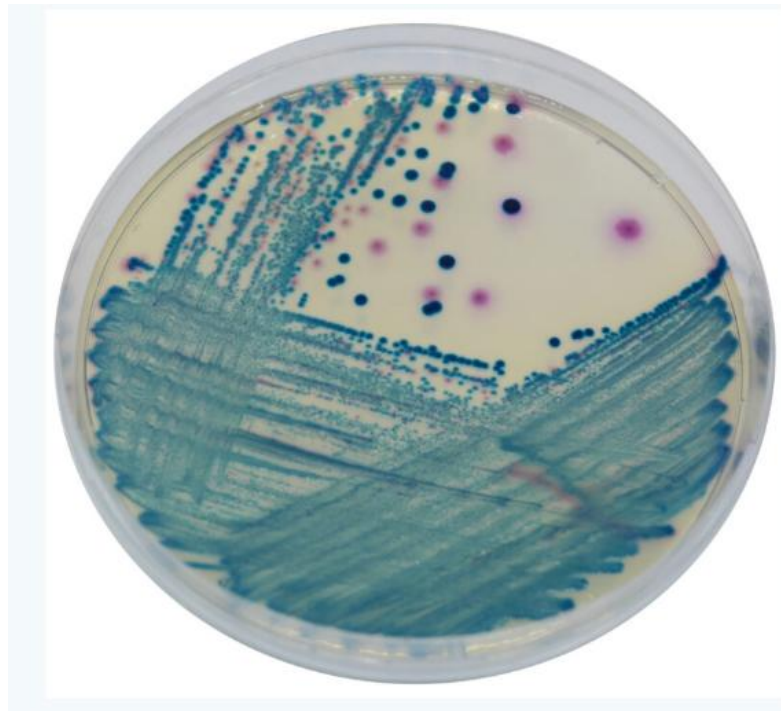
Detection of OXA-244

pilot study Statens Serum Institut, Denmark

ID	Carbapenemase	ESBL_AmpC	MLST	mSuperCARBA	CARBA SMART	
					OXA	CARBA
1	OXA-436		ST10227	2	1	0
2	OXA-244		ST648	1	0	0
3	OXA-244		ST10*	1	0	1
4	OXA-244		ST69*	0	0	0
5	OXA-244		ST38	2	0	0
6	OXA-244	CTX-M-27	ST38	2	0	0
7	OXA-244		ST69*	0	0	0
8	OXA-244	CTX-M-15	ST10	0	0	0
9	OXA-48		ST69	1	1	0
10	OXA-244	CTX-M-15	ST10	1	0	0
11	OXA-244	CTX-M-15	ST13730	1	0	0
12	OXA-244	CTX-M-15	ST167	1	2	0
13	OXA-244		ST10	2	1	0
14	OXA-244	CTX-M-15	ST131*	1	0	0
15	OXA-244		ST43	1	0	0
16	OXA-244	CMY-2	ST38	1	0	0
17	OXA-244		ST117*	1	0	0
18	OXA-244	CTX-M-15	ST4981*	3	0	0
19	OXA-244	CTX-M-27	ST38	3	1	0
Total				14/17	3/17	1/17

Conclusion

- mSuperCARBATM media is best for OXA-244 detection





**Thank you for
your attention**

