

Detection of resistance mechanisms using Neo-Sensitabs™ and Diatabs™

Detection of beta lactamases

Testing / Reporting of Susceptibility to Beta-lactams against Enterobacteriaceae and Non-fermenters

Use the table below for testing/reporting of susceptibility to beta-lactams against Enterobacteriaceae and non-fermenters causing serious infections when inducible beta-lactamases are present ^{a)}:

	AMP	AMC	CXM	CTX	CTR	CAZ	FEP	CFO	AZT	IMI	MRP	TIM	PI+TZ
<i>E. aerogenes/cloacae</i> <i>C. freundii</i> / <i>S. marcescens</i>	R	R	R	R	R	R	T	R	R	T	T	R	R
<i>Prov. stuartii/rettgeri</i> <i>Morg. morgani</i>	R	R	R	R	R	R	T	R	T	T	T	R	T
<i>P. vulgaris/penneri</i>	R	T	R	R	R	T	T	T	R	T	T	T	T
<i>Klebsiella oxytoca</i> ^{e)}	R	T	R	R	R	T	T	T	R	T	T	T	T
<i>Hafnia alvei</i>	R	R	R	R	R	R	T	R	R	T	T	R	R
Enterobacteriaceae with ESBL (no inducible β-lactamases)	R	T ^{b)}	R	R	R	R	R	R	R	T	T	T ^{b)}	T ^{b)}
Enterobacteriaceae with inducible β-lactamases and ESBL	R	R	R	R	R	R	R	R	R	T	T	R	R
<i>Aeromonas</i> with A2 ^{c)} (most <i>A. sobria</i>)	R	R	T	T	T	T	T	T	T	R	R	R	R
<i>Aeromonas</i> with A 1 and A 2	R	R	R	R	R	R	T	R	T	R	R	R	R
<i>Ps. aeruginosa</i> <i>Burkholderia</i> spp.	R	R	R	R	R	T	T	R	T	T	T	T	T
<i>S. maltophilia</i>	R	R	R	R	R	T	R	R	R	R	R	T	R
<i>A. baumannii</i>	R	T ^{d)}	R	R	R	T	T	R	R	T	T	T	T

AMC, Amoxicillin+Clavulanate; AMP, Ampicillin; AZT, Aztreonam; CXM, Cefuroxime; CTR, Ceftriaxone; CAZ, Ceftazidime; FEP, Cefepime; CFO, Cefoxitin; CTX, Cefotaxime, IMI, Imipenem; MRP, Meropenem; PI+TZ, Piperacillin+Tazobactam; TIM, Ticarcillin+Clavulanate.

A1 Inducible cephalosporinase, the enzyme is usually found in *A. hydrophila* and *A. caviae*. These species are considered resistant to cephalosporins and cephamycins.

A2 Penicillinase/carbapenemase that hydrolyses imipenem and meropenem. The expression may be heterogeneous.

- a) R, the microorganism is resistant and may possess a resistance mechanism not always detected by the diffusion method.
T, these antimicrobials may be used for testing.
- b) Test isolates from urine only. Isolates from other sites are considered resistant.
- c) Test also for Cefazolin. *A. caviae* does not possess a carbapenemase (A2) and can be tested against imipenem and meropenem.
- d) Use Ampicillin+Sulbactam.
- e) *K. oxytoca* producing a K-1 enzyme are susceptible to ceftazidime. They may show synergism between other third gen. cephalosporins and amoxicillin+clavulanate and may be mistaken as ESBL producers.

Adopted from CDS 2005 with modifications.

References:

- 1) Sanders C.C. and Sanders W.E.: Beta-lactam resistance in gram negative bacteria: global trends and clinical impact. Clin. Infect. Dis., **15**, 824-39, 1992.
- 2) Livermore D.M. et al.: Detection of beta-lactamase mediated resistance. J. Antimicrob. Chemother., **48**, Supp. S1, 59-64, 2001.