Detection of multiple beta-lactamases in one strain

Diagnostic problems posed by coexistance of different classes of beta-lactamases in a single bacterial isolate could be solved by the combined use of various phenotypic detection methods. See below example with multiresistant *K. pneumoniae* from Taiwan and USA.

	Neo-Sensitabs				
K. pneumoniae producing:	Cefoxitin	Cefepime	Ceftazidime+ Clavulanate or Cefepime+ Clavulanate synergy	D.P.A. + Meropenem or Imipenem+ EDTA synergy	Boronic acid Cefotaxime/ Ceftazidime or Cloxacillin Cefotaxime/Ceftazidime synergy
AmpC	R	S	negative	negative	POSITIVE
ESBL	S (V)	I / R	POSITIVE	negative	negative
Metallo-β-lactamase	R	I / R	negative	POSITIVE	negative (V)
KPC*	R	I / R	negative	negative	Negative (V)
AmpC + ESBL	R	I / R	POSITIVE	negative	POSITIVE
AmpC + metallo-ß-lactamases	R	I / R	negative	POSITIVE	POSITIVE
AmpC + ESBL + metallo-ß-lactamases	R	I / R	POSITIVE	POSITIVE	POSITIVE

*KPC shows synergism between Boronic acid and Imipenem/Meropenem, but **no synergism** between Cloxacillin and Imipenem/Meropenem.

References:

1) Jing-Jou Yan et al: Complexity of *Klebsiella pneumoniae* isolates resistant to both cephamycins and extended spectrum cephalosporins at a teaching hospital in Taiwan. J. Clin. Microbiol., **42**, 5337-40, 2004.

2) Smith Moland E. at al: Klebsiella pneumoniae isolate producing at least 8 different beta-lactamases, including AmpC and KPC beta lactamases. Antimicr. Ag. Chemother., **51**, 800-801, 2007.