IVD solutions through partnership

Mast Group

mastdiscs® combi

Carba plus
Complete CPE and OXA-48 confirmation

- Detects and identifies MBL, KPC and OXA-48
- Ideal for confirmatory testing
- Simple and cost effective
- Supports antibiotic stewardship

Mastdiscs® *combi Carba plus*

Since the dawn of the antibiotic age, bacteria have adapted by developing new resistance mechanisms to antimicrobial agents. Mast remains at the forefront of the fight against these threats and is committed to providing effective laboratory solutions to aid antibiotic stewardship.

Introduction

The emergence and spread of carbapenem resistance in carbapenemase producing Enterobacteriaceae (CPE) poses a major healthcare threat. The high rate of transmissibility of genes conferring carbapenem resistance justifies the need for rapid identification in order to guide antibiotic therapy and help to prevent or control outbreak situations.

The effectiveness of carbapenem antibiotics, which are often used as a 'last resort' for critically ill patients, is increasingly threatened by the emergence of carbapenemase enzymes. Of particular concern is the future of modern surgical techniques including transplantation and high dependency unit, in which carbapenems play a major role in preventing life threatening infections.

What are carbapenemases?

Carbapenemases are bacterial enzymes that hydrolyse most beta-lactam antibiotics (see Figure 1). They are readily transferable and have disseminated amongst all members of Enterobacteriaceae worldwide. Carbapenem resistance can occur in AmpC producers with porin loss, although this is not a transferable mechanism.

Figure 1 - The 'Big 5' carbapenemases

Class	Carbapenemase
A ***Serine based hydrolytic mechanism***	***KPC***
B ***Metallo – Zinc catalysed at active site***	***MBL (including VIM, IMP and NDM)***
D ***Carbapenem-hydrolyzing class D β-lactamases***	***OXA-48-like***

Benefits of *Carba plus*

Confirmation of all CPEs including OXA-48

Carba plus is a five disc system for the detection of MBL, KPC and OXA-48-like carbapenemases produced by Enterobacteriaceae. Including the reliable discrimination of KPC from AmpC producing isolates. The addition of a temocillin disc incorporating MBL inhibitor (Disc E), rather than temocillin only disc improves OXA-48 identification, by removing the ambiguity of MBLs being incorrectly identified as OXA-48 (See Figure 2).

Easily integrated into laboratory workflow

Carba plus can be used in conjunction with CAT-ID, to confirm and differentiate enzymes expressed by CPE once screened positive for carbapenemase activity. Compatible with Mast's Discmaster disc dispenser, permitting smooth integration into the laboratory workflow. (See Figure 3) Additionally, *Carba plus* is provided as a stock product with an in-use shelf life of 4 weeks when stored in a Mast disc dispenser containing charged desiccant.

Supports antibiotic stewardship

Reliable identification helps to guide appropriate antibiotic usage, conserving carbapenems for complicated infections. This may allow selection of a targeted narrow spectrum antibiotic rather than those with broad spectrum activity, minimising the risk of selecting for, or promoting the development of resistance.

Quality

Optimised combinations for increased sensitivity and specificity, including detection of low level VIM producers. *Carba plus* combination discs are jointly manufactured and QC tested to prevent erroneous results arising from variations in content.

Interpretation of results

Carba plus - confirmation of MBL, KPC and OXA-48-like carbapenemases

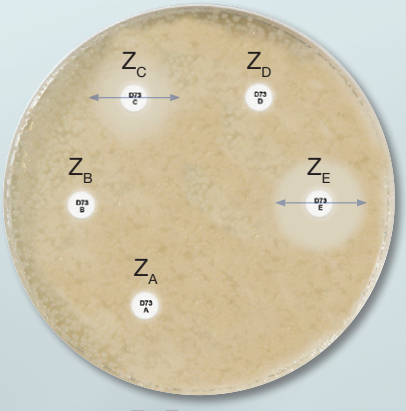
D73A - Penem
D73B - Penem + MβL inhibitor
D73C - Penem + KPC inhibitor
D73D - Penem + AmpC inhibitor
D73E - Temocillin + MβL inhibitor

Figure 2 - Interpretation of mastdiscs® *combi Carba plus*

MBL

Z_B-Z_A ≥ 5mm
and the difference of each
Z_C-Z_A and Z_D-Z_A < 5mm

KPC

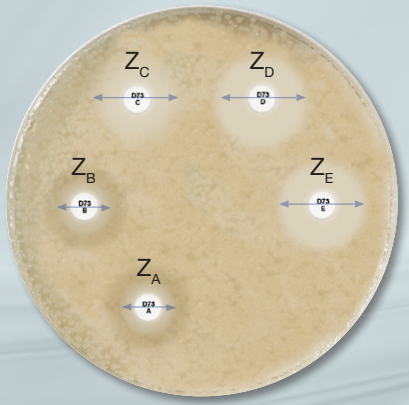


Z_C-Z_A ≥ 5mm
and the difference of each
Z_B-Z_A and Z_D-Z_A < 5mm

OXA-48

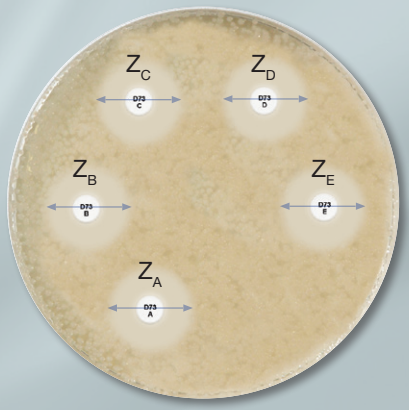
No zone increase on Z_A - Z_B, Z_C
or Z_D respectively
and Z_E ≤ 10mm

AmpC + porin loss



Z_C-Z_A ≥ 5mm and Z_D-Z_A ≥ 5mm
and the difference
of Z_B-Z_A < 4mm

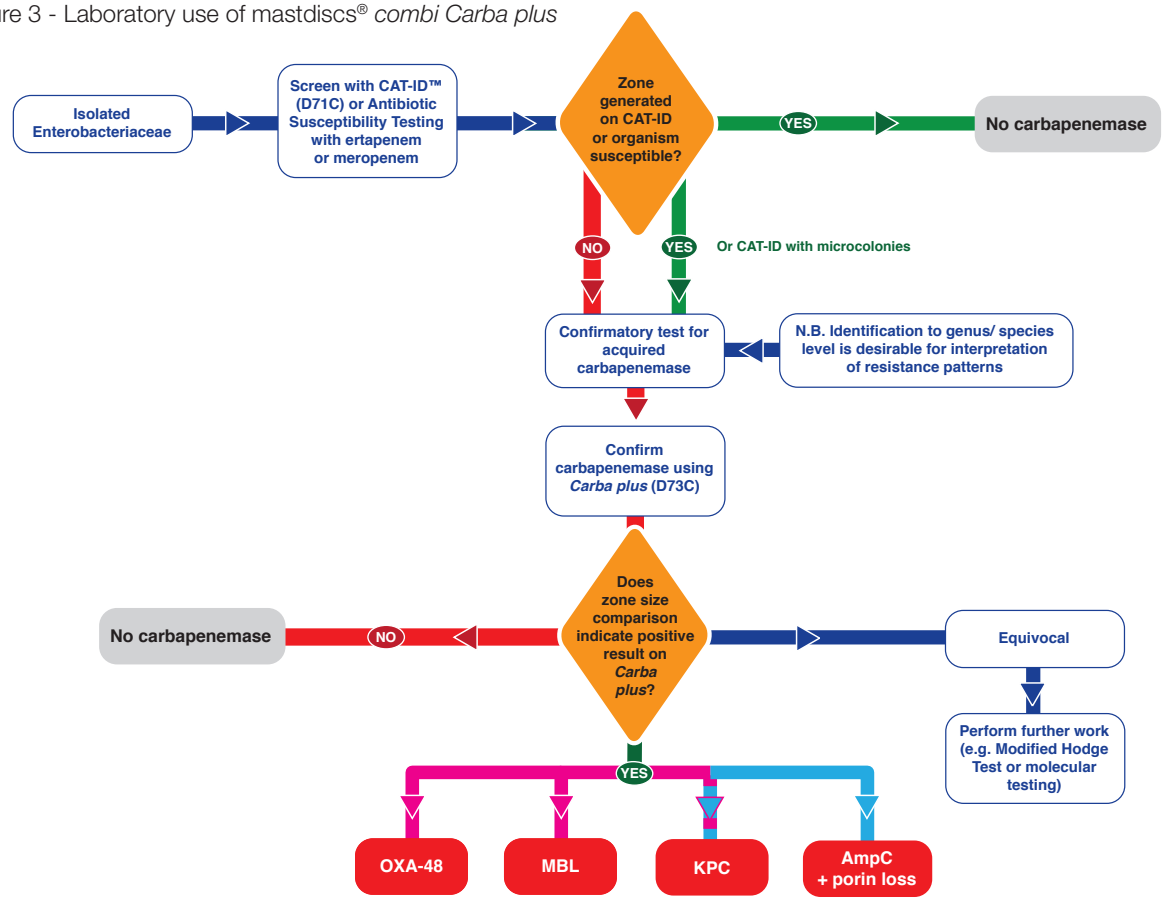
Negative



Z_A, Z_B, Z_C and Z_D all differ by ≤ 2mm
and Z_E > 10mm

Laboratory use *Carba plus*

Figure 3 - Laboratory use of mastdiscs® *combi Carba plus*



Ordering Information

Order Code	Product	Pack Size	No. Tests
D73C	Mastdiscs® *combi Carba plus*	5 × 50 discs	50

Additional products from Mast's ESBL range

Order Code	Product	Pack Size	No. Tests
D71C	CAT-ID™ – Carbapenemase screening disc	5 × 50 discs	250
D69C	AmpC Detection Set	3 × 50 discs	50
D68C	AmpC & ESBL Detection Set	4 × 50 discs	50
D52C	ESBL Set	6 × 50 discs	50
D67C	ESBL Set (Cefpodoxime 10ug)	6 × 50 discs	50
D62C	Cefotaxime 30 & Cefotaxime 30/Clavulanic Acid 10	6 × 50 discs	150
D63C	Cefepime 30 & Cefepime 30/Clavulanic Acid 10	6 × 50 discs	150
D64C	Ceftazidime 30 & Ceftazidime 30/Clavulanic Acid 10	6 × 50 discs	150
D66C	Cefpodoxime 10 & Cefpodoxime 10/Clavulanic Acid 1	6 × 50 discs	150

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