AmpC Detection Set
Combination disc set for the identification of AmpC producing Enterobacteriaceae

- Definitive identification of AmpC producers
- Detects all AmpC types
- Helps guide appropriate carbapenem usage
- Minimises reporting of false cephalosporin susceptibility
What is AmpC?

AmpC beta-lactamases are bacterial enzymes that hydrolyse 3rd generation extended spectrum cephalosporins and cephemycins engendering resistance to these categories of antibiotic.

(Fig 1) Expression of ampC

Importance of AmpC detection

Diagnostically, all types of AmpC producers are equally significant and may lead to therapy failure in critically ill patients.

The onslaught of AmpC resistance represents a major challenge for clinicians as it renders 3rd generation cephalosporins increasingly ineffective.

Of particular concern are the limited treatment options for Gram negative resistant bacteria leading to antibiotic selection pressure and resultant risk of the emergence of carbapenem resistance.

Confirmation of AmpC production supports susceptibility information, permitting carbapenems to be reserved 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.

When to suspect AmpC

AmpC can be suspected in E.coli and Klebsiella spp. when resistance to cephalosporins, including cefoxitin, is detected.

Suspect isolates may generate an unexpected result for ESBL confirmatory tests due to the induction of AmpC activity caused by ESBL inhibitors.

AmpC can be suspected in strains that have an intrinsic chromosomal ampC gene, where the initial susceptibility screen may not indicate resistance.
Benefits of Mast AmpC Detection Set

- **Detection of ALL mechanisms of AmpC resistance**
  Combining an AmpC inducer with both ESBL and AmpC inhibitors simultaneously promotes AmpC enzyme induction whilst selectively blocking the enzyme active site. In consequence, plasmid and intrinsic de-repressed, inducible or hyperproduced AmpCs can be detected, irrespective of how ampC genes are encoded or expressed (fig.1).

- **98% sensitivity, 100% specificity**
  Reliable phenotypic AmpC detection minimises the risk of erroneously reporting cephalosporin susceptibility, diminishing any potentially serious consequences.

- **Easy to interpret**
  A simple calculation based on zone size comparison indicates the presence of an AmpC producer (Fig.2).

- **Flexibility for multiple applications**
  AmpC Detection Set can be used in conjunction with Mast’s AmpC and ESBL Detection Set (D68C) to confirm AmpC production, or as a standalone test to screen *E. coli* and *Klebsiella* spp. isolates for plasmid acquired ampC genes.

- **Definitive Identification of AmpC producers**
  The resultant increase in sensitivity and specificity afforded by the novel use of an inducer compound permits a definitive identification, diagnostically superior to more presumptive methods.

- **Combination discs manufactured in matched pairs**
  To prevent erroneous results arising from variations in content, the UK Health Protection Agency (HPA)* recommend using only corresponding antibiotic and antibiotic/inhibitor combinations which have been jointly manufactured and QC tested.

  (*HPA AMRL, Summer 2005)

- **Available from Stock**
  In common with the current range of Mast ESBL detection discs, the AmpC Detection Set is provided as a stock product with 12 months shelf life.

- **Compatible with Mast disc dispenser**
  Permits consistent orientation of paired discs aiding standardisation for routine testing.

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### Interpretation

**AmpC Positive**

- **ZC–ZA** and **ZC–ZB ≥ 5mm**

<table>
<thead>
<tr>
<th><strong>A</strong></th>
<th>Cefpodoxime 10ug + AmpC inducer</th>
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</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>Cefpodoxime 10ug + AmpC inducer + ESBL inhibitor</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Cefpodoxime 10ug + AmpC inducer + ESBL inhibitor + AmpC inhibitors</td>
</tr>
</tbody>
</table>

**AmpC Negative**

- **All zones differ by ≤ 3mm**

(Fig 2)
### Ordering Information:

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Description</th>
<th>Pack Size</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>D69C</td>
<td>AmpC Detection Set</td>
<td>3 x 50 discs</td>
<td>Confirmation of plasmid and chromosomally encoded AmpC</td>
</tr>
</tbody>
</table>

### Additional products from Mast’s ESBL detection range

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Description</th>
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<th>Usage</th>
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<tbody>
<tr>
<td>D68C</td>
<td>AmpC &amp; ESBL Detection Set</td>
<td>4 x 50 discs</td>
<td>Confirmation of AmpC and/or ESBL production</td>
</tr>
<tr>
<td>D52C</td>
<td>Extended Spectrum (\beta) lactam Set</td>
<td>6 x 50 discs</td>
<td>Confirmation of ESBL production in isolates with no chromosomal de-repressed or inducible AmpC</td>
</tr>
<tr>
<td>D67C</td>
<td>Extended Spectrum (\beta) lactam Set (CPD10)</td>
<td>6 x 50 discs</td>
<td>Confirmation of ESBL production in isolates with no chromosomal de-repressed or inducible AmpC</td>
</tr>
<tr>
<td>D62C</td>
<td>Cefotaxime 30 &amp; Cefotaxime 30/Clavulanic Acid 10</td>
<td>6 x 50 discs</td>
<td>Confirmation of ESBL production in isolates with no chromosomal de-repressed or inducible AmpC (*use concurrently with D64C)</td>
</tr>
<tr>
<td>D63C</td>
<td>Cefepime 30 &amp; Cefepime 30/Clavulanic Acid 10</td>
<td>6 x 50 discs</td>
<td>Confirmation of ESBL production in isolates with chromosomal AmpC</td>
</tr>
<tr>
<td>D64C</td>
<td>Ceftazidime 30 &amp; Ceftazidime 30/Clavulanic Acid 10</td>
<td>6 x 50 discs</td>
<td>Confirmation of ESBL production in isolates with no chromosomal de-repressed or inducible AmpC (*use concurrently with D62C)</td>
</tr>
<tr>
<td>D66C</td>
<td>Cefpodoxime 10 &amp; Cefpodoxime 10/Clavulanic Acid 1</td>
<td>6 x 50 discs</td>
<td>Confirmation of ESBL production in isolates with no chromosomal de-repressed or inducible AmpC</td>
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