MAST ID™ INTRALACTAM STRIPS

A strip test for the rapid detection of β lactamase

Therapy of many infections has proved unsuccessful due to the emergence of organisms with the ability to produce β lactamase enzymes. In recent years β lactamase producing strains of Haemophilus influenzae type B have been isolated with increasing frequency from cases of life threatening meningitis and septicaemia.1-3 Similarly, β lactamase production has been demonstrated in penicillin resistant strains of Neisseria gonorrhoeae,4-7 Staphylococcus aureus and others.8

MAST ID™ INTRALACTAM STRIPS were developed at MAST Laboratories following original work by Slack, Wheldon and Turk9 who designed a strip test for the detection of β lactamase production in H. influenzae type B. The usefulness of Intralactam for this purpose has been confirmed by two of the original authors, most positive strains being detectable within 10 minutes.10

The basis of the test is the detection of penicilloic acid, produced by degradation of penicillin, by a pH indicator. A rapid colour change is usually shown with relatively few numbers of β lactamase producing organisms.

More recent work has shown that Intralactam can be used for the routine detection of β lactamase production in N. gonorrhoeae.11

Detection of β lactamase in staphylococci is more difficult, since enzymes are only produced in small amounts, unless induced by the presence of a β lactam antibiotic. However, Swann, Slack and Wheldon12 have shown that by extending the reading time of Intralactam, β lactamase detection in staphylococci is possible without prior induction. In their study 94% of β lactamase producing non-induced strains were detected within 1 hour, 98% within 2 hours, and 99.5% after 4 hours. The remaining strain gave a positive result after overnight incubation.

Shannon and Phillips13 have recently compared Intralactam with two other β lactamase detection tests. They reported that Intralactam is of some value with Pseudomonas aeruginosa and Staph. aureus but its main use is the detection of β lactamase producing strains of H. influenzae and N. gonorrhoeae, for which purpose it is as good as, and slightly more easily performed than the nitrocefin (chromagenic cephalosporin) method. None of the three methods tested was a reliable indicator of resistance to β lactam antibiotics in the Enterobacteriaceae.

The use of Intralactam is not recommended for the detection of β lactamase in Moraxella catarrhalis due to the high incidence of false negative reactions in this organism when testing with acidometric β lactamase assays. A chromogenic cephalosporin test is the preferred method14,15. However, extending the incubation time of the strip to 2 hours has been reported16 to considerably increase the detection rate of β lactamase producing strains of M. catarrhalis.

Description

Filter paper strips 5.7cm by 0.6cm, which are printed to identify the test, positive control and negative control areas. The strips are impregnated with benzyl penicillin and bromocresol purple at appropriate concentrations.
In Use

The MAST ID™ INTRALACTAM STRIP is placed on a clean microscope slide using forceps and a small drop of distilled water is placed on each area of the strip. The paper should be moist but not saturated. The surface of a young pure culture of the test isolate is swept with a loop and rubbed onto the test area of the strip. It is advisable to touch several colonies with the loop rather than take from one colony because of the existence of occasional non β-lactamase producing colonies within a resistant culture. It is not advisable to take colonies from media containing fermentable carbohydrates, since the acid they could produce may give false positives reactions.

For staphylococci the test can be performed by taking colonies from the zone edge of a β-lactam antibiotic disc, such as methicillin, ampicillin or penicillin, after overnight growth. Spots of growth from a penicillin agar dilution plate prepared with MAST ADATABS™ can also be used. The preferable method for non-induced staphylococcal strains is to extend the reading time of the normal test procedure. This can be achieved by the use of a wet box, which prevents the strip from drying out, as recommended by Swann et al.12

Positive control and negative control organisms should be used with all methods and applied to the appropriate areas of the strip. A change in colour from purple to yellow, usually within 10 minutes, is indicative of β-lactamase production. A β-lactamase positive organism should be reported as resistant to ampicillin, benzyl penicillin and all other β-lactamase sensitive antibiotics.

Packaging and Ordering Details

25 strips in a screw-top container with silica gel.

Order Code: ETO/1

References