Hy Resistance

A system for detecting resistant bacteria in nosocomial environments

Introduction –

- As a consequence of exposing to heavy antibiotic use, a high density patient population in frequent contact with healthcare staff and the attendant risk of cross infection, hospitals, and particularly intensive care units, are an important breeding ground for the development and spread of antibiotic resistant bacteria and yeasts,[gram positive cocci (MRSA, VRE) Candida and MDR gram negative bacteria (CPE, Acinetobacter baumannii)].

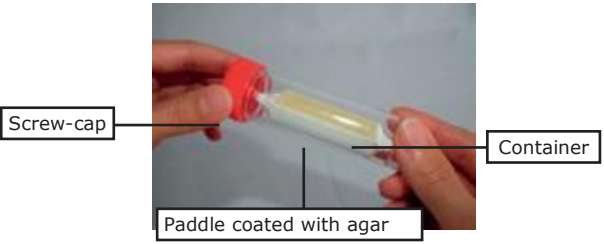
- Active surveillance is necessary to control the spread of these resistant organisms in the facilities, to reduce the risk of cross contamination and to identify the carriers.

- Hy Resistance is a microbiological test system for infection control that allows the early detection and identification of those resistant bacteria. It is based on a double-slided paddle coated with chromogenic agar that can be used by the dipping or contact surface methods. The selective chromogenic media include substrate molecules for specific enzymes that result in a change of colour after substrate degradation and allow colonies of specific microorganisms to be recognized by their unique colour at a glance.

Product description -

.1 - Plastic tube
2 - Flexible plastic paddle with culture media on both sides of 9 cm2 each, as detailed in the lists below.

- 3 Plastic screw cap



- Additional equipment required
- TT244- BHI Broth tubes
- Incubator
- Disposable autoclave bags , autoclave.

Test principle

- Sampling is done by pressing the paddle (both sides) with the agar on a surface (Direct Contact Method). (See instructions below).

- Alternatively, for monitiring larger areas, sample by wiping a swabb over a target surface and then seeding on one agar side with a zig zag mouvement. The operation shoud bee repeated for the second agar side after sampling an additional surface.

- For increasing test‘s sensitivity, sample large areas with a sponge and perform a pre-enrichment step transferring the sponge to a BHI broth tube. After overnight incubation of the broth, transfer the culture to a beaker or any other sterile container and use the Hy Resistance system designed for the target by the Dipping Method.

- The system‘s chromogenic technology is based on soluble colourless molecules (called chromogens), composed of a substrate (targeting a specific enzymatic activity) and a chromophore. When the target organism’s enzyme cleaves the colourless chromogenic conjugate, the chromophore is released. In its unconjugated form, the chromophore exhibits its distinctive colour and, due to reduced solubility, forms a precipitate.and the target organism grows in unique specific colored colonies.

- Single colonies can be picked from the agar for further differentiation.

Hy Resistance is available in

DS080	MDR Acinetobacter/mSuperCARBA
DS073	MDR/MDR
DS078	ESBL/ESBL
DS074	MRSA/MRSA
DS075	VRE/VRE

Package

20 units in a box containing Instructions for Use

Storage

2 - 8º C, at dark

Culture media description

DS080 and DS073 – MDR ACINETOBACTER

- Acinetobacter has the capacity to survive in dry as well as moist environments. *Acinetobacter baumannii* is becoming a major hospital-acquired infection issue because of its often multi-drug resistance (MDR : resistance to C3G, quinolones, carbapenem etc).

- The product is composed of a base and 2 supplements.
- Base (gr/L): Agar 15.0 Peptone and yeast extract 12.0 Salts 4.0 Chromogenic mix 1.8
- Supplement 1 – Growth and reluator factors (4 ml/L)
- Supplement 2 – MDR inhibitor agents (1 vial /L)

DS080 - mSuperCARBA

- Carbapenems are effectively last-line antibiotics for the treatment of infections. During the last decade, carbapenem resistance has been increasingly reported and carbapenemase-producing Enterobacteriaceae (CPE) is emerging as a great impact on the health care system.

- The product is composed of a base and 2 supplements.
- Base (gr/L): Agar 15.0 Peptone 20.0 Salts 5.0 Growth factors 1.7 Chromogenic and selective mix 0.8
- Supplement 1 – (2 ml/L)
- Supplement 2 – (0.25gr/L)

DS078 ESBL

- ESBL (Extended Spectrum β-Lactamases) are enzymes that mediate resistance to penicillins, extended-spectrum third generation cephalosporins (C3G) and monobactams. ESBL-producing Enterobacteriaceae started to appear in the 1980s, and have since emerged as some of the most significant hospital-acquired infections with Escherichia coli and Klebsiella spp. being the main actors, but other Gram-negative species have also been observed.
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- The product is composed of a base and 1 supplement.
  Base (gr/L): Agar 15.0 Peptone and yeast extract 17.0.0 Chromogenic mix 1.0
  Supplement (Inhibitor agent) (0.57gr/L)

DS074 MRSA

- Over recent years, the occurrence of hospital infections caused by methicillin resistant Staphylococcus aureus (MRSA) has been increasing steadily, representing around 20 to 55% of the isolates in Europe and in the USA. The major issue with this pathogen is its resistance to a large panel of antibiotics, among them beta-lactam antibiotics, limiting the therapeutic options for clinicians.

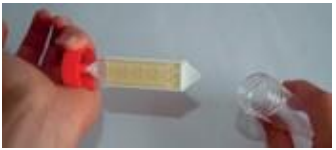
- The product is composed of a base and 1 supplement.
- Base (gr/L): Agar 15.0 Peptone and yest extract 40.0 Salts 25.0 chromogenix mix 2.5
- Supplement (Iinhibitor agent) (20ml/L)

DS075 VRE

- There are two types of vancomycin resistance in enterococci. The first type is intrinsic resistance (mostly vanC type but also vanD, vanE, vanF etc) found in *E. gallinarum* and *E. casseliflavus/E. flavescens* and demonstrates a low-level resistance to vancomycin. The second type of vancomycin resistance in enterococci is acquired resistance (vanA & vanB types), mostly seen in *E. faecium* and *E. faecalis*.

- The product is composed of a base and 1 supplement.
- Base (gr/L): Agar 15.0 Peptone and yest extract 20.0 Salts 5.0 chromogenix mix 27.3
- Supplement (Iinhibitor agent) (60mg/L)

- **Test Procedures -**
- **Direct Contact Surface**



1- Open the screw-cap. Take the paddle out of the container.

2- Hold the paddle by the cap and the terminal side of the paddle with your finger tip of the other hand. Be careful not to touch the agar. Keep container in your hand as being shown.

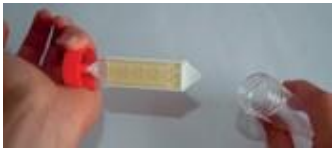
3- Press the paddle firmly onto the surface. Do not wipe with the agar over the surface!

4- Place the paddle back into the container and close it tightly. Label the container with a sticker showing the location, time and other sample data.

Staff hygiene control

Hands should be tested frequently to ensure that they have been properly cleaned and disinfected by washing. For this, perform tests of the surfaces of fingers, skin and coats.

Dipping Method
To be used after the pre-enrichement step in BHI Broth



1- Open the screw-cap. Take the paddle out of the container. Please be careful to hold the paddle with one hand on the cap and do not

touch the agar. Keep the container in your second hand.

2, 3- Hold the paddle by the cap and immerse the agar fully into the sample (container with the BHI culture). The agar of the paddle has to be totally covered by the liquid. Drain off any excess liquid and remaining droplets on the terminal tip at the rim of the beaker glass.

Incubation –For both Direct Contact Surface and Dipping methods, open the system's screw-cap in a 3/4 turn to ventilate. Incubate in an upright position with the cap on top, 18-24 hours at 35 – 37 °C.

Interpretation of Results

MDR Acinetobacter
MDR Acinetobacter → red
Non-MDR Acinetobacter → inhibited

Other gram (-) → mostly inhibited
Gram posiotive bacteria and yeasts → inhibited

mSuperCARBA
CPE E.coli → dark pink to reddish
CPE Coliforms → metallic blue
CPE Pseudomonas → translucent, +/- natural pigmentation cream to green
CPE Acinetobacter → Cream
Other Gram negative CPE → colourless, natural pigmentation
Non-CPE E.coli/ Coliforms → inhibited
Other Gram negative non-CPE → inhibited

MRSA
Methicillin Resistant *Staphylocuccus aureus* (MRSA) → rose to mauve
Methicillin Susceptible *Staphylocuccus aureus* (MSSA) → inhibeted
Other bacteria → blue, colourless or inhibited

VRE
VRE *faecalis*/VRE *faecium* → pink to mauve
E. gallinarum/E. casseliflavus → blue or inhibited
other bacteria → inhibited

General remarks

- Please follow the storage instructions on the packaging.
- Do not touch the agar surface! To ventilate at incubation, open the cap in a 3/4 turn. The container should be tightly closed with the screw-cap before transporting and always maintained in an upright position with cap on top.
- After obtaining the results, dispose the paddles by autoclaving (121 °C, 2 bar, 30 min or any other sterilization method).
- The product is not classified as hazardous (EC 1272 / 2008)