**MICRO.CULT.19.0 METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS SCREEN (MRSAS)**

**PRINCIPLE**

Isolates of *Staphylococcus aureus*, both methicillin susceptible (MSSA) and Methicillin resistant (MRSA) are a significant cause of nosocomial and life-threatening infections. MRSA infections have been associated with high rates of mortality and morbidity. In the past, most patients acquired MRSA (methicillin resistant *Staphylococcus aureus*) in hospitals. At present, however, many patients become colonized in the community or in nursing homes. These patients may serve as unrecognized reservoirs and sources of nosocomial infections with MRSA. Surveillance testing for MRSA and MSSA colonization is a useful infection control tool to identify patients needing enhanced precautions. The Biomerieux chromID MRSA agar is a selective and differential chromogenic medium for the qualitative detection of MRSA to aid the prevention and control of MRSA infections in healthcare settings.

**OWNERS**

Supervisor, Regional Microbiology

**SPECIMEN**

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| --- | --- |
| **Acceptable Specimens** | Aerobic or anaerobic Culturette swabs from any source suspected of harboring MRSA (e.g. groin, axilla, nares, rectum).Sterile swabs in sterile containers from any source suspected of harboring MRSA. |
| **Unacceptable Specimens** | Swabs received in viral transport medium.GenProbe collection swabs.Swabs received >48 hrs after collection. |

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| --- | --- |
| **If** | Then |
| Multiple swabs are collected with one requisition order | Combine all the swabs for processing. |
| Multiple swabs are collected with multiple requisition orders | Process each swab separately. |

**MATERIALS**

1. chromID MRSA agar
2. Loop
3. Bacticinerator
4. 35oC-37ºCambient airincubator

**QUALITY CONTROL**

1. QC of the chromID MRSA agar is performed with each new lot/shipment as outlined below.

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| **QC strain** | **Expected reaction** |
| Staphylococcus aureus ATCC 43300 | Growth of green colonies within 24 hours |
| Staphylococcus aureus ATCC 29213 | No growth within 24 hours |

**PROCEDURE**

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| **Step** | Action |
| 1. | Allow the plates to come to room temperature |
| 2. | Inoculate the specimens directly onto the chromID MRSA agar. |
| 3. | Incubate the plates in the 35-37o C non-CO2 incubator. |
| 4. | Examine the culture after 24 hours of incubation. MRSA will appear as green colonies. The presence of at least one typical green colony gives the sample a positive MRSA status. Any shade of green should be interpreted as a positive result. The green color is more vivid if the colonies are observed through the agar.  |

**INTERPRETATION**

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| **Appearance of growth following 24 hours incubation** | **Interpretation** |
| One or more green colonies | Positive—MRSA colonization |
| No green colonies | Negative—No MRSA colonization |

**REPORTING RESULTS**

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| --- | --- | --- |
| If | Then | Code |
| This is a Sunquest screen that is negative | Report “No Methicillin Resistant Staph aureus” | NMRSA |
| This is a Sunquest screen that is positive | “Methicillin Resistant Staph aureus isolated” | MRSAI |
| This is a QLS MRSA screen that is negative | Report “No Methicillin Resistant *Staphylococcus aureus (MRSA)*  isolated” |  FR NMRSA |
| This is a QLS MRSA screen that is positive | Report “Methicillin resistant *Staphylococcus aureus*” | Workup panel: WMRSAFR MRSAI |

*Telephone results of all hospital inpatient positives with no previous positive MRSA results to nursing unit or submitting laboratory.*

**LIMITATIONS**

1. Certain strains of *S. aureus* which have the *mecA* gene but a low cefoxitin MIC (≤4 µg/ml) may not develop on this type of medium.
2. Rare strains of *S. aureus* which do not have the *mecA* gene may develop characteristic colonies on this type of medium after 24 hours incubation.
3. Occasional isolates from organisms other than *S. aureus*, i.e. *Acinetobacter baumanii*, *Bacillus cereus, Enterobacter cloacae, Pseudomonas aeruginosa, P. Putida, Staphylococcus haemolyticus, S. epidermidis* and *Micrococcus* spp. showed growth at 24 hours but did not produce green-pigmented colonies.
4. ESBL-producing strains may produce a limited number of green colonies at the inoculum point after 24 hours but are also easily differentiated from MRSA based on phenotypic appearance. If in doubt confirm with catalase, Gram stain and latex agglutination tests directly from colonies on the chromID MRSA plate.
5. If a susceptibility test is performed using colonies from chromID MRSA agar, the results obtained for the glycopeptides will not be interpretable. A tendency towards resistant results has been observed for these antibiotics.
6. Minimize exposure of chromID MRSA to light both before and during incubation as prolonged exposure may result in reduced recovery and/or coloration of isolates.
7. Surveillance testing determines the colonization status at a given time and could vary depending on patient treatment, patient status or exposure to high risk environments. Monitoring colonization status should be done according to hospital policies.

H. Results from chromID MRSA should be used as an adjunct to nosocomial infection control efforts to identify patients needing enhanced precautions. This device can be used to identify patients for isolation or removal from isolation to control nosocomial transmission of MRSA.

1. mecA-negative S. aureus may grow if the oxacillin or cefoxitin MICs are at or near the resistant breakpoint.
2. Incubation in 5% CO2 is not recommended and may result in false negative cultures.
3. Use of medicines that contain antiseptic agents may demonstrate partial inhibition however may still produce green colonies on the agar.

L. The growth requirements of certain MRSA can lead to their partial or complete inhibition in culture. Borderline oxacillin-resistant strains of S. aureus (BORSA) may demonstrate variable results on this media.

**REFERENCES**

1. Murray, P.R., Baron, E.J., Pfaller, M.A., Tenover, F.C., Yolken,R.H., *Manual of Clinical Microbiology*,
2. chromID MRSA package insert. Biomerieux. 03/2010.