

Mannitol Salt Agar - Instructions for Use

Intended Use

BACGro™ Mannitol Salt agar (MSA) is a selective and differential medium used in the isolation of Staphylococci and the detection of *Staphylococcus aureus*.

Product Summary

In 1942 it was discovered by Koch that a 7.5% NaCl concentration is a selective agent for the isolation of staphylococci². Then in 1945, Chapman supplemented a 7.5% NaCl concentration into Phenol Red Mannitol Agar, and noted that the addition of a 75 g / Liter concentration of Sodium Chloride results in the partial or complete inhibition of bacterial organisms other than staphylococci¹. In Mannitol Salt Agar (MSA), mannitol fermentation helps differentiate between staphylococcal species with phenol red as an indicator. Coagulase positive staphylococci produce yellow colonies and agar color change from red to yellow, and coagulase negative staphylococci produce white colonies with no color change of the phenol red indicator. Peptones and beef extract act as a nutrient and vitamin source.

Mannitol Salt Agar conforms to the Harmonized United States Pharmacopeia (USP)³, European Pharmacopeia (EP)⁴ and Japanese Pharmacopeia (JP)⁵ Standards.

Formulation (per Liter)*

| | |
|-----------------|---------------|
| Beef Extract | 1.0 g |
| Casein Peptone | 5.0 g |
| Gelatin Peptone | 5.0 g |
| Sodium Chloride | 75.0 g |
| D-Mannitol | 10.0 g |
| Phenol Red | 0.025 g |
| <u>Agar</u> | <u>15.0 g</u> |
| Total | 111.0 g/L |

*Formula may be supplemented and/or adjusted as required to meet performance criteria

Directions

1. Add 111 g of MSA powder to 1 L of deionized water.
2. Stir while heating. Bring to a brief boil to dissolve completely.
3. Autoclave at 121°C for 15 minutes.
4. Pour plates and allow to solidify.

Precautions

This product is for laboratory use only and should only be used by qualified, trained laboratory personnel. Personnel should always use proper aseptic technique and observe all biohazardous precautions. All microbiological cultures should be presumed to be infectious.

Avoid ingestion, inhalation, or contact with skin and mucous membranes. If contact occurs, flush the area with clean water.

Quality Control Specifications

Gold Standard Diagnostics tests each lot of manufactured BACGro™ culture media utilizing appropriate control organisms and specifications as documented on the Certificate of Analysis. End users should perform quality control testing in accordance with government regulatory requirements and accreditation guidelines. The following specifications are routinely used for testing:

Appearance (dehydrated): Red-beige, free-flowing, homogenous. May contain dark particles.

Appearance (prepared): Red, slightly opalescent.

pH (prepared): 7.2 – 7.6 at 25°C

Organism Performance:

| Strain ID | Inoculum | Incubation | | | Result |
|--|-------------|-------------|-------|-------------|---|
| | | Time | Temp. | Environment | |
| Staphylococcus aureus (ATCC® 6538) | <100 CFU | 24 - 48 hr. | 35° C | Aerobic | Medium-sized yellow colonies, medium yellow |
| Staphylococcus aureus (ATCC® 25923) | <100 CFU | 24 - 48 hr. | 35° C | Aerobic | Medium-sized yellow colonies, medium yellow |
| Staphylococcus epidermidis (ATCC® 12228) | <100 CFU | 24 - 48 hr. | 35° C | Aerobic | Small to medium sized white colonies, medium red. |
| Escherichia coli (ATCC® 25922) | >10,000 CFU | 24 - 48 hr. | 35° C | Aerobic | Complete inhibition. |

| | | | | | |
|---------------------------------|-------------|-------------|-------|---------|---|
| Escherichia coli (ATCC® 8739) | >10,000 CFU | 24 - 48 hr. | 35° C | Aerobic | Complete inhibition. |
| Proteus mirabilis (ATCC® 12453) | >10,000 CFU | 24 - 48 hr. | 35° C | Aerobic | Partial inhibition. Colorless colonies. Swarming Inhibited. |

Limitations of the Procedure

This product is not labeled for use as a medical device, and is not intended to diagnose, treat, or prevent disease.

Due to variation in nutritional requirements, some species or strains may be encountered that grow poorly in this medium.

Further biochemical or serological testing is required for the identification of organisms grown in this medium.

Storage and Expiration

BACGro™ MSA should be stored at 2 – 30 degrees Celsius. Because of the hygroscopic nature of dehydrated culture media, it should be stored in a dry place and the lid should remain tightly sealed. Media should be discarded if it is not free flowing or shows discoloration.

The expiration date printed on the label is applicable to media stored as directed.

Catalog Numbers

DCM4601 – Mannitol Salt Agar, 500g

DCM4605 – Mannitol Salt Agar, 5kg

DCM4610 – Mannitol Salt Agar, 10kg

References

1. Chapman, G.H. 1945. The significance of sodium chloride in studies of staphylococci. J. Bacteriol. 50:201-203.
2. Koch, F.E. 1942. Zentr. Bakt. Labt. Orig.; 149:122.
3. United States Pharmacopeial Convention. United States Pharmacopoeia and National Formulary (USP-NF).
4. Directorate for the Quality of Medicines and the Council of Europe. The European Pharmacopoeia.
5. Pharmaceuticals and Medical Devices Agency, Ministry of Health, Labor, and Welfare. Japanese Pharmacopoeia

Revision History:

| Revision | Description | Effective Date |
|-----------------|---|-----------------------|
| 04 | Added part number DCM4605 | 23-AUG-2023 |
| 03 | Updating verbiage of chemical components in formulation | 17-AUG-2023 |
| 02 | Created part number DCM4610 | 16-NOV-2021 |
| 01 | Document creation | 13-APR-2021 |