

**MacConkey Agar**

Medical laboratories media for selective isolation and differentiation of Enterobacteriaceae, lactose fermenting and lactose non- fermenting enteric bacteria, and a variety of other Gram-negative rods from clinical specimens.

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| REF: V.1/MA1.100.0100 REF: V.1/MA1.250.0500  | 100 Gram 250 Gram  |  | REF: V.1/MA1.500.0500  | 500 Gram  |

# **CLINICAL SIGNIFICANCE**

MacConkey Agar is recommended for isolation, identification and enumeration of Staphylococcus aureus and Faecal

Streptococci.(1)MacConkey Agar is the earliest selective and differential medium for cultivation of enteric microorganisms from a variety of clinical specimens (2,3). Subsequently MacConkey Agar and Broth have been recommended for use in microbiological examination of foodstuffs (4) and for direct plating / inoculation of water samples for coliform counts (5). These media are also accepted by the Standard Methods for the Examination of Milk and Dairy Products (6) and pharmaceutical preparations (7).

# **METHOD PRINCIPLE**

Peptone provides nitrogeneous and carbonaceous compounds long chain amino acids, vitamins and other essential growth nutrients. Original medium contains protein, bile salts, sodium chloride and two dyes. The selective action of this medium is attributed to crystal violet and bile salts, which are inhibitory to most species of gram positive bacteria. Gram-negative bacteria usually grow well on the medium and are differentiated by their ability to ferment lactose. Lactose fermenting strains grow as red or pink and may be surrounded by a zone of acid precipitated bile. The red colour is due to production of acid from lactose, absorption of neutral red and a subsequent colour change of the dye when the pH of medium falls below 6.8. Lactose non-fermenting strains, such as Shigella and Salmonella are colourless and transparent and typically do not alter appearance of the medium. Yersinia enterocolitica may appear as small, non-lactose fermenting colonies after incubation at room temperature.Bacteria causing food poisoning are also isolated on MacConkey Agar, such as Staphylococcus aureus and Faecal Streptococci.

# MEDIA COMPOSITION

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| Ingredient  | Concentration (g/l)  |
| Peptone  | 20  |
| Lactose  | 10  |
| Bile Salts  | 5  |
| Sodium chloride  | 5  |
| Neutral redd  | 0.07  |
| Crystal violet  | 0.02 |
| Agar  | 15.000  |

***Final pH 7.3 ± 0.2 at 25°C.***

# **PRECAUTIONS AND WARNINGS**

Reagent to be handled by entitled and professionally educated person. Do not ingest or inhale as reagent contains sodium azide which is classified as dangerous substance for environment.

Good Laboratories practices using appropriate precautions should be followed in:

* Wearing personnel protective equipment (overall, gloves, glasses).
* Do not pipette by mouth.
* In case of contact with eyes or skin; rinse immediately with plenty of soap and water. In case of severe injuries; seek medical advice immediately.
* Respect country requirement for waste disposal. S56: dispose of this material and its container at hazardous or special waste collection point. S57: use appropriate container to avoid environmental contamination.

 S61: avoid release in environment.

For further information, refer to the MacConkey Agar material safety data sheet.

# **STORAGE AND STABILITY**

Lab.Vie. MacConkey Agar should be stored between 10-30°C in a firmly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to avoid lump development due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in a dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use. Product performance is best if used within stated expiry period.

**Deterioration**

Lab.Vie. MacConkey Agar medium is Light yellow to pink homogeneous free flowing powder. Prepared medium is Light red coloured clear to slightly opalescent gel forms in Petri plates. If there are any physical changes, discard the medium. Media should not be used if there are any signs of deterioration (shrinking, cracking, or discoloration), and contaminations

# **SPECIMEN COLLECTION AND PRESERVATION**

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (7,8). After use, contaminated materials must be sterilized by autoclaving before discarding.

**TYPE OF SPECIMEN**

Clinical samples

# **EQUIPMENT REQUIRED NOT PROVIDED**

* Sterile cups
* Sterile petri-dishes
* Incubator
* Autoclave

# **PROCEDURE**

1. Suspend 51.5 grams in 1000 ml purified / distilled water.
2. Adjust pH to pH 7.1 ± 0.2 at 25°C.
3. Heat to boiling to dissolve the medium completely.
4. Sterilize by autoclaving at 15 lbs. pressure (121°C) for 15 minutes.
5. Mix well and pour into sterile Petri plates.

# **PERFORMANCE CHARACTERISTICS**

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

# **QUALITY CONTROL**

To ensure adequate quality control, it is recommended that positive and negative control included in each run. If control values are found outside the defined range, check the system performance. If control still out of range please contact Lab.Vie. Technical support.

# **RESULTS AND INTERPRETATION**

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| Organisms  | Growth  | Colony color  |
| Escherichia coli ATCC 25922  | Luxuriant  | pink to red with bile precipitate  |
| Klebsiella aerogenes ATCC 13048  | Luxuriant  | pale pink to red  |
| Enterococcus faecalis ATCC 29212  | Fair-good  | pale pink to red  |
| Proteus vulgaris ATCC 13315  | Luxuriant  | Colorless  |
| Salmonella Paratyphi A ATCC 9150  | Luxuriant  | Colorless  |
| Shigella flexneri ATCC 12022  | Fair-good  | Colorless  |
| Salmonella Paratyphi B ATCC 8759  | Luxuriant  | Colorless  |
| Salmonella Enteritidis ATCC 13076  | Luxuriant  | Colorless  |
| Salmonella Typhi ATCC 6539  | Luxuriant  | Pink to red  |
| Staphylococcus aureus subsp. aureus ATCC 25923  | Inhibited  | -  |

# **REFERENCES**

1. Bureau of Indian Standards IS :5887 (Part II)- 1976, reaffirm 1986.
2. MacConkey, 1905, J. Hyg., 5:333.
3. MacConkey, 1900, The Lancet, ii:20.
4. Speck M.(Ed), 1985, Compendium of methods for the Microbiological Examination of Foods, 2nd ed., APHA, Washington , D.C. of Clinical Microbiology, 11th Edition. Vol. 1.
5. Baird R.B., Eaton A.D., and Rice E.W., (Eds.), 2015, Standard Methods for the Examination of Water and Wastewater, 23rd ed., APHA, Washington, D.C.
6. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
7. The United States Pharmacopoeia XXI and the National Formulary, 16th ed., 1985, United States Pharmacopoeial Convention, Inc, Washington, D.C.

1. Isenberg, H.D. Clinical Microbiology Procedures

Handbook. 2 nd Edition.

1. Jorgensen,J.H., Pfaller , M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015)
2. .Salfinger Y., and Tortorello M.L. Fifth (Ed.), 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.

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| SYMBOLS IN PRODUCT LABELLING |
|  IVD  | For in-vitro diagnostic use Batch Code/Lot number Catalogue Number  Temperature Limitation Expiration Date Manufactured by  |  Number of <n> test in the pack  Caution  Do not use if package is damaged   Consult Instruction for use   |
| LOT  |
| REF  |
|      |