PRODUCT SPECIFICATION SHEET

MacConkey Agar w/o CV w/1.2% Agar (DM144A)

Intended Use
MacConkey Agar w/o CV, w/ 1.2% Agar (DM144A) is recommended for selective isolation and differentiation of lactose fermenting and lactose non fermenting enteric bacteria.

Product Summary and Explanation
MacConkey Agar is based on the bile salt-neutral red-lactose agar of MacConkey.[1] The original MacConkey medium was used to differentiate strains of *Salmonella typhosa* from members of the coliform group. Formula modifications improved the growth of *Shigella* and *Salmonella* strains. These modifications included the addition of 0.5% sodium chloride, decreased agar content, and altered bile salts and neutral red concentrations. The formula improvements gave improved differential reactions between these enteric pathogens and the coliform group. MacConkey Agar Medium is the earliest selective and differential medium for cultivation of enteric microorganisms from a variety of clinical specimens.[1, 2] MacConkey agars are slightly selective and differential plating media mainly used for the detection and isolation of gram-negative organisms from clinical,[3] dairy,[4] food,[5, 6] water,[7] pharmaceutical[8, 9] and industrial sources.[10] It is also recommended for the selection and recovery of the *Enterobacteriaceae* and related enteric gram-negative bacilli. MacConkey Agar without Crystal Violet is a differential medium that is less selective than MacConkey Agar. The lack of crystal violet permits the growth of *Staphylococcus* and *Enterococcus*, *Staphylococci*, and *Mycobacterium* spp.

Principles of the Procedure
MacConkey Agar w/o CV, w/ 1.2% Agar contains peptic digest of animal tissue and proteose peptone which provides nitrogen and other growth nutrients. Lactose is the fermentable carbohydrate. Bile salts attributes to the selective action of this medium, which is 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. Neutral red is the indicator dye. Lactose fermentation produces acid, which causes absorption of neutral red and a subsequent colour change of the dye giving pink to red colour colonies, when the pH of medium falls below 6.8. Sodium chloride in the medium helps to maintain osmotic balance of the cells.

Formula / Liter

Ingredients	Gms / Liter
Peptic digest of animal tissue	17.00
Proteose peptone	3.00
Lactose	10.00
Bile salts	1.50
Sodium chloride	5.00
Neutral red	0.03
Agar	12.00
Final pH: 7.1 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions
1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions
1. Suspend 48.5 grams of the medium in one liter of distilled water.
2. Heat to boiling with gentle swirling to dissolve the agar completely.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle. Avoid overheating.
4. Cool to 45 - 50°C and dispense approximately 20ml pour amounts into sterile Petri plates.
5. The surface of the medium should be dry when inoculated.

Quality Control Specifications

Dehydrated Appearance	Light yellow to pink homogeneous free flowing powder
Prepared Medium	Orange red coloured clear to slightly opalescent gel forms in Petri plates
Reaction of 4.85% Solution	pH : 7.1 ± 0.2 at 25°C
Gel Strength	Firm, comparable with 1.2% Agar gel

Expected Cultural Response: Cultural characteristics observed after an incubation at 35 - 37°C for 18 - 24 hours.

Sr. No.	Organisms		Results to be achieved		
		Inoculum (CFU)	Growth	Recovery	Colour of Colony
1.	*Escherichia coli ATCC 25922*	50 - 100	good-luxuriant	>=50%	pink to red with bile precipitate
2.	*Enterobacter aerogenes ATCC 13048*	50 - 100	good-luxuriant	>=50%	pink to red
3.	*Enterococcus faecalis ATCC 29212*	50 - 100	fair	30-40%	pale pink to red
4.	*Proteus vulgaris ATCC 13315*	50 - 100	good-luxuriant	>=50%	colourless
5.	*Salmonella Paratyphi A ATCC 9150*	50 - 100	good-luxuriant	>=50%	colourless
6.	*Shigella flexneri ATCC 12022*	50 - 100	good-luxuriant	>=50%	colourless
7.	*Salmonella Paratyphi B ATCC 8759*	50 - 100	good-luxuriant	>=50%	colourless
8.	*Salmonella Enteritidis ATCC 13076*	50 - 100	good-luxuriant	>=50%	colourless
9.	*Salmonella Typhi ATCC 6539*	50 - 100	good-luxuriant	>=50%	colourless
10.	*Staphylococcus aureus ATCC 25923*	>=10^3	inhibited	0%	--

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Refer to appropriate references and standard test procedures for selective isolation and differentiation of lactose fermenting and lactose non-fermenting enteric bacteria.

Results

1. Lactose fermenting strains grow as pink to red colonies and may be surrounded by a zone of acid precipitated bile.
2. Lactose non-fermenting strains, such as *Shigella* and *Salmonella* are colourless and transparent and typically do not alter appearance of the medium.

Storage

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Although, MacConkey media are selective primarily for gram-negative enteric bacilli, for complete identification, biochemical and, if indicated, serological testing using pure cultures are recommended. Consult appropriate texts for detailed information and recommended procedures.
2. Incubation of MacConkey Agar plates under increased CO_2 has been reported to reduce the growth and recovery of a number of strains of gram-negative bacilli.

Packaging

Product Name : MacConkey Agar w/o CV, w/ 1.2% Agar

Product Code : DM144A
Available Pack sizes : 500gm

References

1. MacConkey, 1905, J. Hyg., 5:333.
2. MacConkey, 1900, The Lancet, ii:20.
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4. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
5. Downes F. P. and Ito K., (Eds.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., APHA, Washington, D.C
6. FDA Bacteriological Analytical Manual, 2005, 18th Ed., AOAC, Washington, D.C.
7. Eaton A. D., Clesceri L. S. and Greenberg A. W.,(Eds.), 2005, Standard Methods for the Examination of Water and Wastewater, 21st Ed., APHA, Washington, D.C.
8. The United States Pharmacopoeia, 2006, USP29/NF24, The United States Pharmacopeial Convention, Rockville, M.D.
9. British Pharmacopoeia, 2007, The Stationery office British Pharmacopoeia.
10. Williams, (Ed.), 2005, Official Methods of Analysis of the Association of Official Analytical Chemists, 19th Ed., AOAC, Washington, D.C.

Further Information

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