MacCONKEY AGAR (7102)

Intended Use
MacConkey Agar is used for the isolation and differentiation of Gram-negative enteric bacilli.

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 growth of *Shigella* and *Salmonella* strains. These modifications include the addition of 0.5% sodium chloride, decreased agar content, altered bile salts, and neutral red concentrations. The formula modifications improved differential reactions between enteric pathogens and coliforms.

MacConkey Agar is recommended for the detection and isolation of Gram-negative organisms from clinical,[2] dairy,[3] food,[4,5] water,[6] pharmaceutical,[7] and industrial[8] sources.

Principles of the Procedure
Enzymatic Digest of Gelatin, Enzymatic Digest of Casein, and Enzymatic Digest of Animal Tissue are the nitrogen and vitamin sources in MacConkey Agar. Lactose is the fermentable carbohydrate. During Lactose fermentation a local pH drop around the colony causes a color change in the pH indicator, Neutral Red, and bile precipitation. Bile Salts Mixture and Crystal Violet are the selective agents, inhibiting gram-positive cocci and allowing Gram-negative organisms to grow. Sodium Chloride maintains the osmotic environment. Agar is the solidifying agent.

Formula / Liter
Enzymatic Digest of Gelatin	17 g
Enzymatic Digest of Casein	1.5 g
Enzymatic Digest of Animal Tissue	1.5 g
Lactose	10 g
Bile Salts Mixture	1.5 g
Sodium Chloride	5 g
Neutral Red	0.03 g
Crystal Violet	0.001 g
Agar	13.5 g

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.
2. IRRITANT. Irritating to eyes, respiratory system and skin.

Directions
1. Suspend 50 g of the medium in one liter of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
3. Autoclave at 121°C for 15 minutes.
4. Cool to 45 - 50°C and dispense into sterile petri dishes.

Quality Control Specifications
Dehydrated Appearance: Powder is homogeneous, free flowing, and pink-beige.

Prepared Appearance: Prepared medium is red-purple and slightly opalescent.

Expected Cultural Response: Cultural response on MacConkey Agar at 37°C after 18 - 24 hours incubation.

Microorganism	Response	Reactions	Bile ppt
Enterococcus faecalis ATCC® 29212	marked to complete inhibition	--	-
Escherichia coli ATCC® 25922	growth	pink colonies	+
Proteus mirabilis ATCC® 12453	growth with partial inhibition of swarming	colorless colonies	-
Salmonella typhimurium ATCC® 14028	growth	colorless colonies	-

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

Test Procedure

Refer to appropriate references using MacConkey Agar for the isolation and identification of enteric organisms.

Results

Lactose-fermenting organisms grow as pink to brick red colonies with or without a zone of precipitated bile. Non-lactose fermenting organisms grow as colorless or clear colonies.

Storage

Store dehydrated medium at 2 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

Expiration

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

Limitations of the Procedure

1. Due to nutritional variation, some strains may be encountered that grow poorly or fail to grow on this medium.
2. Although MacConkey Agar is a selective medium primarily for Gram-negative enteric bacilli, biochemical and serological testing using pure cultures are recommended for complete identification.
3. Incubation of MacConkey Agar plates under increased CO_2 has been reported to reduce growth and recovery of a number of strains of Gram-negative bacilli.[9]

Packaging

MacConkey Agar	**Code No.**	**7102A**	**500**	**g**
		7102B	**2**	**kg**
		7102C	**10**	**kg**

References

1. **MacConkey, A.** 1905. Lactose-fermenting bacteria in feces. J. Hyg. **5**:333-379.
2. **Murray, P. R., E. J. Baron, M. A. Pfaller, F. C. Tenover, and R. H. Yolken (eds.).** Manual of clinical microbiology, 6th ed. American Society for Microbiology, Washington, D.C.
3. **Marshall, R. T. (ed.).** Standard methods for the examination of dairy products, 16th ed. American Public Health Association, Washington, D.C.
4. **U.S. Food and Drug Administration.** 1995. Bacteriological analytical manual, 8th ed., AOAC International, Gaithersburg, MD.
5. **Vanderzant, C., and D. F. Splittstoesser (eds.).** 1992. Compendium of methods for the microbiological examination of food, 3rd ed. American Public Health Association, Washington, D.C.
6. **Eaton, A. D., L. S. Clesceri, and A. E. Greenberg (eds.).** 1995. Standard methods for the examination of water and wastewater, 19th ed. American Public Health Association, Washington, D.C.
7. **United States Pharmacopeial Convention, Inc.** 1995. The United States pharmacopeia, 23rd ed. The United States Pharmacopeial Convention, Rockville, MD.
8. **Association of Official Analytical Chemists.** 1995. Official methods of analysis of AOAC International, 16th ed. AOAC International. Arlington, VA.
9. **Mazura-Reetz, G. T. Neblett, and J. M.Galperin.** 1979. MacConkey Agar: CO_2 vs. ambient incubation. Abst. Ann. Mtg. American Society for Microbiology. C179.

Technical Information

Contact Acumedia Manufacturers, Inc. for Technical Service or questions involving dehydrated culture media preparation or performance at (410)780-5120 or fax us at (410)780-5470.