CRITERION™ MACCONKEY AGAR

Cat. no. C6130	CRITERION™ MacConkey Agar	105gm
Cat. no. C6131	CRITERION™ MacConkey Agar	500gm
Cat. no. C6132	CRITERION™ MacConkey Agar	2kg
Cat. no. C6133	CRITERION™ MacConkey Agar	10kg
Cat. no. C6134	CRITERION™ MacConkey Agar	50kg

INTENDED USE

Hardy Diagnostics CRITERION™ MacConkey Agar is recommended for use as a selective and differential medium for the isolation of gram-negative bacilli (including coliform organisms and enteric pathogens), on the basis of lactose-fermentation.

This dehydrated culture medium is a raw material intended to be used in the making of prepared media products, which will require further processing, additional ingredients, or supplements.

SUMMARY

MacConkey Agar is a modification of Neutral Red Bile Salt Agar developed by MacConkey. It was one of the earliest culture media for the cultivation and identification of enteric organisms.[5] It has also been used in the isolation of pathogens from foods and coliforms in water samples.[8,9] The MacConkey Agar formulation presently in use is a modification of the original. In addition to containing sodium chloride, the modified formula has a lowered agar content and an adjusted concentration of bile salts and neutral red. Differentiation of enteric microorganisms is achieved by the combination of the neutral red indicator and lactose. Lactose-fermenting organisms form pink colonies surrounded by a zone of bile salt precipitation. Color change is due to the production of acid which changes the neutral red pH indicator from colorless to red. Acid production is also responsible for the formation of bile salt precipitation. Non-lactose-fermenters (*Salmonella* spp. and *Shigella*spp.) develop into transparent, colorless colonies with no precipitated zone.

Peptones are incorporated into MacConkey Agar to provide amino acids and nitrogenous compounds. Sodium chloride is present to maintain osmotic equilibrium. Lactose is added as a possible carbon source for energy, and the acids produced from this activity precipitate out the bile salts. Bile salts and crystal violet are added to inhibit the growth of most gram-positive organisms.

FORMULA

Gram weight per liter:	50.0gm/L
Peptone	17.0gm

Lactose	10.0gm
Sodium Chloride	5.0gm
Bile Salts No. 3	1.5gm
Proteose Peptone	3.0gm
Neutral Red	30.0mg
Crystal Violet	1.0mg
Agar	13.5gm

Final pH 7.1 +/- 0.2 at 25ºC.

* Adjusted and/or supplemented as required to meet performance criteria.

STORAGE AND SHELF LIFE

Store the sealed bottle(s) containing culture medium at 2-30ºC. Dehydrated culture medium is very hygroscopic. Keep lid tightly sealed. Protect dehydrated culture media from moisture and light. The dehydrated culture media should be discarded if it is not free-flowing or if the color has changed from its original light pinkish-beige.

Store the prepared culture media in plates at 2-8ºC.

The expiration dating on the product label applies to the product in its intact packaging when stored as directed. The product may be used and tested up to the expiration date on the product label and incubated for the recommended quality control incubation times.

Refer to the document "Storage" for more information.

PRECAUTIONS

This product may contain components of animal origin. Certified knowledge of the origin and/or sanitary state of the animals does not guarantee the absence of transmissible pathogenic agents. Therefore, it is recommended that these products be treated as potentially infectious, and handle observing the usual universal blood precautions. Do not ingest, inhale, or allow to come into contact with skin.

This product is for laboratory use only. It is to be used only by adequately trained and qualified laboratory personnel. Observe approved biohazard precautions and aseptic techniques. All laboratory specimens should be considered infectious and handled according to "standard precautions." The "Guidelines for Isolation Precautions" is available from the Centers for Disease Control and Prevention at www.cdc.gov/ncidod/dhqp/gl_isolation.html.

For additional information regarding specific precautions for the prevention of the transmission of all infectious agents from laboratory instruments and materials, and for recommendations for the management of exposure to infectious disease, refer to CLSI document M-29: *Protection of Laboratory Workers from Occupationally Acquired Infections: Approved Guideline.*

Sterilize all biohazard waste before disposal.

Refer to the document "Precautions When Using Media" for more information.

Refer to the document SDS Search instructions on the Hardy Diagnostics' website for more information.

METHOD OF PREPARATION FOR DEHYDRATED CULTURE MEDIA

1. Suspend 52.49gm of the dehydrated culture media in 1 liter of distilled or deionized water.

2. Heat to boiling and mix to dissolve completely.

3. Sterilize in the autoclave at 121ºC. for 15 minutes. Avoid overheating.

4. Cool to 50-55ºC. and dispense approximately 20ml into sterile petri dishes.

PROCEDURE AND INTERPRETATION OF RESULTS

For information on procedures and interpretation of results, consult listed references or refer to the prepared media Instructions for Use (IFU) for Cat. No. G35.

LIMITATIONS

It is recommended that biochemical, immunological, molecular, or mass spectrometry testing be performed on colonies from pure culture for complete identification.

Some formulations may require a settling period before pH testing of the prepared medium. If the pH is tested immediately after preparation and is out of specification, retest the medium after 24 hours to obtain final pH results.

The concentration of bile salts in MacConkey Agar is relatively low in comparison with other enteric plating media. The parallel use of more selective media for gram-negative enterics, such as HE or XLD is recommended in order to increase the chances of pathogen isolation.

Some strains of *Proteus* may swarm on this medium.

Serial inoculation may be required to assure adequate isolation of mixed flora samples.

Refer to the document "Limitations of Procedures and Warranty" for more information.

MATERIALS REQUIRED BUT NOT PROVIDED

Standard microbiological supplies and equipment such as autoclaves, incinerators, incubators, tubes, bottles, petri dishes, etc., are not provided.

QUALITY CONTROL

Hardy Diagnostics tests each lot of commercially manufactured media using appropriate quality control microorganisms and quality specifications as outlined on the Certificates of Analysis (CofA). The following organisms are routinely used for testing at Hardy Diagnostics:

Test Organisms	Inoculation Method*	Incubation			Results
		Time	Temperature	Atmosphere	
Escherichia coli ATCC ® 25922	A	24hr	35°C	Aerobic	Growth; colonies pink to red with bile salt precipitate surrounding the colonies
*Escherichia coli*** ATCC ® 8739	J	18-24hr	35°C	Aerobic	Growth; colonies pink to red with bile salt precipitate surrounding the colonies
Proteus mirabilis ATCC ® 12453	A	24hr	35°C	Aerobic	Growth; colonies colorless with no swarming

Salmonella enterica ATCC ® 14028	A	24hr	35°C	Aerobic	Growth; colonies colorless
*Pseudomonas aeruginosa*** ATCC ® 9027	J	18-24hr	35°C	Aerobic	Growth; colonies colorless
Enterococcus faecalis ATCC ® 29212	B	24hr	35°C	Aerobic	Partial to complete inhibition
*Staphylococcus aureus*** ATCC ® 6538	B	18-24hr	35°C	Aerobic	Partial to complete inhibition

* Refer to the document "Inoculation Procedures for Media QC" for more information.

USER QUALITY CONTROL

Users of dehydrated culture media should perform QC testing in accordance with applicable government regulatory agencies, and in compliance with accreditation requirements. Hardy Diagnostics recommends end users check for signs of contamination and deterioration and, if dictated by laboratory quality control procedures or regulation, perform quality control testing to demonstrate growth or a positive reaction and to demonstrate inhibition or a negative reaction, if applicable. Hardy Diagnostics quality control testing is documented on the certificates of analysis (CofA) available from Hardy Diagnostics Certificates of Analysis website. In addition, refer to the following document "Finished Product Quality Control Procedures," for more information on QC or see reference(s) for more specific information.

PHYSICAL APPEARANCE

CRITERION™ MacConkey Agar powder should appear homogeneous, free-flowing, and light pinkish-beige in color. The prepared media should appear translucent, and pink in color.

REFERENCES

1. Anderson, N.L., et al. *Cumitech 3B; Quality Systems in the Clinical Microbiology Laboratory,* Coordinating ed., A.S. Weissfeld. American Society for Microbiology, Washington, D.C.

2. Versalovic, J., et al. *Manual of Clinical Microbiology.* American Society for Microbiology, Washington, D.C.

3. Tille, P., et al. *Bailey and Scott's Diagnostic Microbiology*, C.V. Mosby Company, St. Louis, MO.

4. Isenberg, H.D. *Clinical Microbiology Procedures Handbook*, Vol. I, II & III. American Society for Microbiology, Washington, D.C.

5. MacConkey, A.T. 1905. Lactose-fermenting bacteria in faeces. *J. Hyg.*; 5:333-379.

6. MacFaddin, J.F. 1985. *Media for Isolation, Cultivation, Identification, Maintenance of Bacteria*, Vol. I. Williams & Wilkins, Baltimore, MD.

7. *Quality Assurance for Commercially Prepared Microbiological Culture Media,* M22. Clinical and Laboratory Standards Institute (CLSI - formerly NCCLS), Wayne, PA.

8. American Public Health Association. *Standard Methods for the Examination of Dairy Products,* APHA, Washington, D.C.

10. *United States Pharmacopoeia and National Formulary* (USP-NF). Rockville, MD: United States Pharmacopeial Convention.

ATCC is a registered trademark of the American Type Culture Collection.

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The Hardy Diagnostics manufacturing facility and quality management system is certified to ISO 13485.

HDQA 2207B [C]