PRODUCT INFORMATION

Product Type: PD032 - PETRI DISHES 90mm
DD002 - Divided Petri Dishes 90mm (DD)

Cat No. PD032 - MACCONKEY AGAR

DD002 - MACCONKEY AGAR / MACCONKEY AGAR

Intended Use:

MacConkey Agar is used for isolating and differentiating lactose-fermenting from lactose-nonfermenting gram-negative enteric bacilli.

Principle:

MacConkey Agar is based on the bile salt-neutral red-lactose agar of MacConkey. 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, CS ("Controlled Swarming") contains carefully selected raw materials to reduce swarming of *Proteus spp.,* which could cause difficulty in isolating and enumerating other Gram-negative *bacilli.* It is only slightly selective since the concentration of bile salts, which inhibits gram-positive microorganisms, is low in comparison with other enteric plating media. Crystal violet also is included in the medium to inhibit the growth of gram-positive bacteria, especially enterococci and staphylococci.

Differentiation of enteric microorganisms is achieved by the combination of lactose and the neutral red indicator. Colorless or pink to red colonies are produced depending upon the ability of the isolate to ferment the carbohydrate.

MacConkey Agar is based on the bile salt-neutral red-lactose agar of MacConkey.

MacConkey Agar contains crystal violet and bile salts that inhibit gram-positive organisms and allow gram-negative organisms to grow. Isolated colonies of coliform bacteria are brick red in color and may be surrounded by a zone of precipitated bile. This bile precipitate is due to a local pH drop around the colony due to lactose fermentation. Colonies that do not ferment lactose (such as typhoid, paratyphoid and dysentery bacilli) remain colorless. When lactose non-fermenters grow in proximity to coliform colonies, the surrounding medium appears as cleared areas. MacConkey Agar is listed as one of the recommended media for the isolation of *E. coli* from nonsterile pharmaceutical products.

Peptones are sources of nitrogen and other nutrients. Yeast extract is a source of trace elements, vitamins, amino acids and carbon. Lactose is a fermentable carbohydrate. When lactose is fermented, a local pH drop around the colony causes a color change in the pH indicator (neutral red) and bile precipitation. Bile salts, bile salts no. 3, oxgall and crystal violet are selective agents that inhibit growth of gram-positive organisms. Sodium chloride maintains osmotic balance in the medium. Magnesium sulfate is a source of divalent cations. Agar is the solidifying agent.

Procedures

Observe aseptic techniques. The agar surface should be smooth and moist, but without excessive moisture. Streak the specimen as soon as possible after it is received in the laboratory. The streak plate is used primarily to isolate pure cultures from specimens containing mixed flora. A nonselective medium should also be streaked to increase the chance of recovery when the population of gram-negative organisms is low and to provide an indication of other organisms present in the specimen. Alternatively, if material is being cultured directly from a swab, roll the swab over a small area of the surface at the edge; then streak from this inoculated area.

Incubate plates, protected from light, at 35 ± 2 °C (do not use CO_2-enriched atmosphere with MacConkey II Agar) or other appropriate temperature for 18–24 h

Procedures Limitations
Not all strains of *E. coli* ferment lactose.
For identification, organisms must be in pure culture. Morphological, biochemical, and/or serological tests should be performed for final identification. A single medium is rarely adequate for detecting all organisms of potential significance in a specimen. Cultures of specimens grown on selective media should, therefore, be compared with specimens cultured on nonselective media to obtain additional information and help ensure recovery of potential pathogens.
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.

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

Composition
Pancreatic Digest of Gelatin - 17.0 g/L
Peptones (meat and casein) - 3.0 g/L
Lactose - 10.0 g/L
Bile Salts - 1.5 g/L
Sodium Chloride - 5.0 g/L
Agar - 13.5 g/L
Neutral Red - 0.03 g/L
Crystal Violet - 1.0 mg/L

Storage: 2-8°C
pH: 6.9 - 7.3
Appearance: reddish-purple, slightly opalescent

Package contents: 10 plates in a package
Exp. Date: Printed on label and on the item.
Required materials not supplied: Laboratory equipment as required.

Warning and Precautions - For professional use only. Follow good microbiological lab practices while handling specimens and culture. Do not use Petri dishes if they show evidence of microbial contamination, discoloration, drying, cracking, or other signs of deterioration. Avoid freezing and overheating. The Petri Dishes may be used / inoculated up to the expiration date and incubated for the recommended incubation times. After use and prior to discarding, specimen containers and all contaminated material, including the used culture media and contaminated culture containers, must be sterilized or incinerated by validated procedures. Since the nutritional requirements of organisms vary, some strains may be encountered that fail to grow or grow poorly on this medium.
If excessive moisture is observed, invert the bottom over an off-set lid and allow to air dry in order to prevent formation of a seal between the top and bottom of the plate during incubation. Storage Instructions: On receipt, store plates in the dark at 2–8 °C. Avoid freezing and overheating. Do not open until ready to use.

Waste Disposal
After interpretation all items should be destroyed by standard incineration methods.

Hy Laboratories Ltd.
6 Menachem Plaut St., Park Tamar, Rehovot 7670606, Israel
Tel. +972.8.9366475 **Email.** hylabs@hylabs.co.il

Implementation Date: 15/09/25
Version Number: 02

Performance Testing Results:
GPT: inoculum 10-100 cfu.
Inhibitory properties: inoculum 10000 cfu
PD032

Test	ATCC NO	Incubation Temp. (℃)	Incubation Cond.	Reaction 1	
Escherichia coli	8739	30-35 ℃	Aerobic, 18 hours	Growth	Pink with slight precipitate
Proteus mirabilis	4630	30-35 ℃	Aerobic, 18 hours	Growth	Colorless, non-swarming
Salmonella typhimurium	14028	30-35 ℃	Aerobic, 18 hours	Growth	Colorless
Shigella sonnei	29930	30-35 ℃	Aerobic, 18 hours	Growth	Colorless
Pseudomonas paraeruginosa	9027	30-35 ℃	Aerobic, 18 hours	Growth	Colorless
Enterococcus faecalis	29212	30-35 ℃	Aerobic, 72 hours	Inhibited	

DD002

Test	ATCC NO	Incubation Temp. (℃)	Incubation Cond.	Reaction 1	
Escherichia coli	25922	33-37 ℃	Aerobic, 18 hours	Growth	Red-pink, slight precipitate
Klebsiella pneumoniae	13883	33-37 ℃	Aerobic, 18 hours	Growth	Pink-red, mucoid
Proteus mirabilis	4630	33-37 ℃	Aerobic, 18 hours	Growth	Colorless, non-swarming
Salmonella typhimurium	14028	33-37 ℃	Aerobic, 18 hours	Growth	Colorless
Shigella flexneri	29903	33-37 ℃	Aerobic, 18 hours	Growth	Colorless
Pseudomonas paraeruginosa	9027	33-37 ℃	Aerobic, 18 hours	Growth	Colorless
Staphylococcus aureus	25923	33-37 ℃	Aerobic, 18 hours	Inhibited	

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