



MacCONKEY AGAR w/ CV

- For in vitro use only -

Catalogue No. PM18

Our MacConkey Agar with Crystal Violet is a selective and differential medium used for the isolation of gram-negative organisms from a variety of samples including clinical, food, water, and industrial sources.

Alfred MacConkey, a British bacteriologist, developed one of the first mediums for the selective isolation of enteric organisms. His original formulation contained a mixture of growth constituents along with bile salts, neutral red, and lactose. Our current formulation is an improvement on MacConkey's original recipe due to the addition of sodium chloride, reduction in the agar content, and modification in the concentrations of bile salts and neutral red. The APHA recommends this formulation for enumeration of coliforms from water, and for the examination of food samples where food poisoning is suspected, as well as the isolation of *Salmonella* and *Shigella* species in dairy products.

The various peptones contained in MacConkey Agar provide all the essential components needed for superior growth. The differential properties of the medium are due to the presence of the carbohydrate, lactose, and the color indicator, neutral red. Coliforms and other lactose-fermenting organisms form acid as they metabolize lactose. Neutral red is sensitive to the flux in pH and changes from colorless to red under acid conditions giving colonies a bright pink-red coloration.

Bile salts and crystal violet are the selective components that inhibit the growth of most gram-positive organisms. Crystal violet is especially potent against enterococci and staphylococci, although a breakthrough of enterococci is common after prolonged incubation.

Formula per Litre of Medium

Gelatin Peptone.....	17.0 g
Meat Peptone	3.0 g
Lactose	10.0 g
Bile Salts	1.5 g
Sodium Chloride	5.0 g
Agar.....	13.5 g
Neutral Red.....	0.03 g
Crystal Violet.....	0.001 g

pH 7.1 ± 0.2

Recommended Procedure

1. Allow medium to reach room temperature.
2. Using an inoculum from the specimen, perform a four-quadrant streak to obtain well-isolated colonies.
3. A non-selective medium should also be inoculated to ensure recovery of low levels of gram-negative bacteria and to characterize other bacterial species present in the sample.
4. Incubate aerobically at 35°C.
5. Examine plates after 24 hours and 48 hours.

Interpretation of Results

On MacConkey Agar with Crystal Violet, lactose-fermenting organisms produce pink to red colonies; if enough acid is produced a zone of pink, precipitated bile is also formed around the colonies.

Non-lactose-fermenting organisms produce translucent, colorless colonies and the surrounding medium typically turns slightly orange after incubation due to the release of alkaline end products.

Swarming by *Proteus* species is greatly reduced although not negated completely on this medium.

Additional biochemical and/or serological tests should be performed on isolated colonies from pure culture in order to complete identification.

- *Incubation in a CO₂ atmosphere inhibits growth of some Enterobacteriaceae*
- *Coliform organisms typically produce intense pink-red colonies after 18 hours of incubation*

Quality Control

After checking for correct pH, colour, depth, and sterility, the following organisms are used to determine the growth performance of the completed medium.

Organism	Expected Results
<i>Escherichia coli</i> ATCC 25922	Growth, pink colonies
<i>Proteus mirabilis</i> ATCC 12453	Growth, colorless colonies
<i>Salmonella typhimurium</i> ATCC 14028	Growth, colorless colonies
<i>Enterococcus faecalis</i> ATCC 29212	Partial inhibition

Storage and Shelf Life

Our MacConkey Agar w CV should be protected from light and stored at 4°C to 8°C. The medium side should be uppermost to prevent excessive accumulation of moisture on the agar surface. Under these conditions this medium has a shelf life of 12 weeks from the date of manufacture.

Ordering Information

Cat#	Description	Format
PM18	MacConkey Agar [Standard 15x100-mm plate]	10/pkg
PM18K	MacConkey Agar [Kirby 15x150-mm plate]	10/pkg
PM18R	MacConkey Agar [Contact 15x65-mm plate]	10/pkg

References

1. MacConkey AT. Lactose-fermenting bacteria in feces. J Hyg 1905; 5:333-79.
2. MacConkey AT. Bile salt media and their advantage in some bacteriological examinations. J Hyg 1908; 8:322.
3. Mazura-Reetz G, Neblett T, Galperin JM. MacConkey Agar: CO₂ vs. ambient incubation. Abst Ann Meet. ASM, 1979.
4. MacFaddin JF. Media for isolation-cultivation-maintenance of medical bacteria, Vol I. Baltimore: Williams & Wilkins, 1985.
5. Hitchins AD, Hartman PA, Todd ECD. Compendium of methods for the microbiological examination of foods. 3rd ed. Washington: APHA. 1992.
6. Eaton AD, Clesceri S, Greenberg AE Eds. Standard methods for the examination of water and wastewater. Washington: APHA, 1995.
7. Forbes BA, Sahm DF, Weissfeld AS. Bailey and Scott's diagnostic microbiology. 10th ed. St Louis: Mosby, 1998.

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