

70186 EMB Agar (Eosin Methylene Blue Agar)

EMB Agar is a very versatile solid medium. Originally developed by Levine for the differentiation of *Escherichia coli* and *Aerobacter aerogenes*, it turned out to be effective for the rapid identification of *Candida albicans* and was found useful for the identification of coagulase-positive Staphylococci.

Composition:

Ingredients	Grams/Litre
Peptone	10.0
Lactose	10.0
Dipotassiummonohydrogenphosphate	2.0
Methylene Blue	0.065
Eosine Y	0.4
Agar	15.0
Final pH 7.1 +/- 0.2 at 25°C	

Store prepared media below 8°C and protected from direct light. Store dehydrated powder in a dry place, in tightly-sealed containers at 2-25°C.

Appearance: Faintly violet to pink, homogeneous, hygroscopic powder.
Gelling: Firm
Color and Clarity: Deep red-brown, clear to slightly turbid

Directions:

Suspend 37.5 g in 1 litre of distilled water. Heat to dissolve completely, sterilize by autoclaving at 121°C for 15 minutes. Cool to 60°C and shake the medium in order to oxidize the methylene blue and to suspend the precipitate.

Principle and Interpretation:

The presence of the colorants Eosine Y and Methylene Blue inhibits the growth of most of the common accompanying Gram-positive microorganisms. Levine described this classical method to identify *E.coli* from other coliforms as *Aerobacter aerogenes* (2). Lactose is added as distinctive carbon and energy source. In combination with the added dyes it allows to distinguish between lactose-positive and lactose-negative organisms. Lactose positive cultures are generally dark violet (*Enterobacter*, *Klebsiella*, *E.coli*), while lactose negative organisms (*Salmonella*, *Shigella*) have only peptone as energy source are colourless.

Some gram-positive bacteria, such as fecal streptococci, staphylococci will may grow on this medium as inhibited small colonies. A number of nonpathogenic, lactose-nonfermenting gram-negative bacteria will grow on this medium and must be distinguished from the pathogenic strains by additional biochemical tests.



Cultural characteristics after 24-48 hours at 35°C.

Organisms (ATCC)	Growth	Appearance of Colony
<i>Staphylococcus aureus</i> (25923)	-/+	colorless
<i>Escherichia coli</i> (11775)	+++	Ø 2-3mm, dark violet cultures with black center and green metallic shine
<i>Escherichia coli</i> (25922)	+++	Ø 2-3mm, dark violet cultures with black center and green metallic shine
<i>Enterobacter aerogenes</i> (13048)	+++	large, pink with blue center
<i>Klebsiella pneumoniae</i> (33495)	+++	large, pink with blue center
<i>Salmonella abony</i> (NCTC 6017)	+++	large, colorless
<i>Shigella flexneri</i> (12022)	+++	large, colorless
<i>Enterococcus faecalis</i> (29212)	+	punctiform, dark violet cultures
<i>Pseudomonas aeruginosa</i> (27853)	+++	irregular, colorless
<i>Candida albicans</i> (10231)*	++	colorless, cotton like (other yeasts look classical)

* key: incubated in 10% carbodioxide

References:

1. J.E. Holt-Harris, 1916, A new Culture Medium for the Isolation of *Bacillus typhosus* from stools, O.A. Teague J. Infect. Dis. 18, 596,
2. M. Levine, 1918, Differentiation of *E.coli* and *Aerogenes* on simplified Eosin-Methylene Blue Agar, J. Infect. Dis. 23, 43,
3. N.J. Menolasino et al., 1960, Isolation and Identification of coagulase positive staphylococci on Levines EMB Agar J. Lab. Clin. Med. 56, 908
4. APHA-AWWA-WPCF, 1995, Standard Methods for the Examination of Water and Wastewater, 19th ed. APHA Washington D.C.
5. Y. Henis et al., 1989, Microb. Ecol. 17, 171
6. Weld, Julia, 1953, *Candida albicans* : Rapid Identification in cultures made directly from human materials, Arch. Dermat. Syph. 67(5), 473-478
7. Windle Taylor, E. 1958, The Examination of Water and Water Supplies, Churchill Ltd. 7th ed. London
8. U.S. Pharmacopoeia, Microbial Limit Test, The United States Pharmacopoeial Convention, Rockville, Md. (2002)

Precautions and Disclaimer

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