LB Broth (Miller)

Luria-Bertani Broth, Miller Modification — General-Purpose Liquid Culture Medium

Catalogue Number: AS-1270

Application	Medium Type	Typical pH	HS Code
E. coli & molecular biology	Non-selective liquid broth	7.0 ± 0.2 at 25 °C	3821.00.00

Overview

LB Broth (Miller), Luria-Bertani Broth Miller modification, is a nutrient-rich, general-purpose liquid culture medium widely used for the cultivation and maintenance of *Escherichia coli* in molecular biology and recombinant DNA applications. It is a modification of the original Luria-Bertani formulation with a higher sodium chloride concentration (10.0 g/L), which supports osmotic balance and membrane transport across a broad range of laboratory *E. coli* strains.

The combination of tryptone and yeast extract supplies essential amino acids, peptides, vitamins, and growth factors, supporting robust growth of *E. coli* strains including K-12 derivatives with auxotrophic requirements. LB Broth (Miller) is commonly used as both a liquid culture medium and as a base for LB Agar (Miller) plate preparation.

Principle of the Medium

Tryptone (10.0 g/L)	Pancreatic digest of casein — primary source of peptides, amino acids, nitrogen, and carbon for rapid E. coli growth
Yeast Extract (5.0 g/L)	Supplies B-vitamins, trace elements, nucleotides, coenzymes, and growth factors essential for E. coli K-12
Sodium Chloride (10.0 g/L)	High-salt Miller formulation — maintains optimal osmotic strength for standard laboratory E. coli strains

Typical Composition (per litre)

Component	CAS Number	Function	Amount
Tryptone (Pancreatic Digest of Casein)	73049-73-7	Nitrogen, carbon, amino acids, peptides	10.0 g

Yeast Extract	8013-01-2	B-vitamins, growth factors, nucleotides	5.0 g
Sodium Chloride	7647-14-5	Osmotic balance — Miller high-salt formulation	10.0 g

Total per litre: 25.0 g | Final pH: 7.0 ± 0.2 at 25 °C

Comparison: LB Broth Formulations

Component	Miller (AS-1270)	Lennox (AS-1269)	Bertani
Tryptone	10.0 g/L	10.0 g/L	10.0 g/L
Yeast Extract	5.0 g/L	5.0 g/L	5.0 g/L
NaCl	10.0 g/L	5.0 g/L	0 g/L
Total solids	25.0 g/L	20.0 g/L	15.0 g/L
Best for	Standard E. coli — global default	Salt-sensitive strains	Very low osmolarity

Key Features

- Standard Miller formulation — global default for routine E. coli work
- Optimised sodium chloride concentration (10.0 g/L) for osmotic balance
- Supports rapid and reproducible E. coli growth to high optical density
- Suitable as liquid culture medium and as a base for LB Agar preparation
- Easily modified with antibiotics, IPTG, sugars, or other supplements
- Compatible with all standard E. coli K-12 and B strains

Applications

Molecular Biology & Recombinant DNA

- Routine cultivation of E. coli for cloning and plasmid propagation
- Overnight liquid cultures for miniprep, midiprep, and maxiprep
- Preparation of competent cells (chemical or electrocompetent)
- Plasmid maintenance, amplification, and expression
- Recovery broth after transformation (SOC can be substituted)

Protein Expression & Fermentation

- Pre-induction liquid culture for recombinant protein expression (BL21, Rosetta)
- Shake flask fermentation for small-scale protein production
- Microbial fermentation and research applications

Teaching & General Laboratory Use

- Standard liquid medium for molecular biology instruction
- General bacterial growth and propagation
- Quality control of competent cell preparations

Preparation Instructions

1. Dissolve 25.0 g of dehydrated medium in 1 litre of demineralised or purified water.
2. Mix or heat gently with agitation until fully dissolved.
3. Verify and adjust pH to 7.0 ± 0.2 if required using 1 M NaOH or 1 M HCl.
4. Sterilise by autoclaving at 121 °C for 15 minutes.
5. Cool to room temperature before use or inoculation.
6. Add filter-sterilised antibiotics or supplements aseptically as required.

Note: To prepare LB Agar (Miller), add 15.0 g/L agar before autoclaving. Cool to 45–50 °C before adding antibiotics and pouring plates.

Common Antibiotic Supplements

Antibiotic	Working Concentration	Stock Concentration	Storage
Ampicillin	100 µg/mL	100 mg/mL in water	−20 °C
Kanamycin	50 µg/mL	50 mg/mL in water	−20 °C
Chloramphenicol	25 µg/mL	25 mg/mL in ethanol	−20 °C
Tetracycline	12.5 µg/mL	12.5 mg/mL in ethanol	−20 °C, protect from light
Gentamicin	10 µg/mL	10 mg/mL in water	−20 °C
Spectinomycin	50 µg/mL	50 mg/mL in water	−20 °C

Incubation & Typical Growth

Inoculate with a single colony or from a frozen stock. Incubate with shaking (200–250 rpm) at 37 °C for 12–16 hours for overnight cultures, or 3–4 hours for mid-log phase (OD_{600} 0.4–0.8).

Organism	Expected Result	Incubation
E. coli K-12 (e.g. DH5α, TOP10)	Good growth — turbid broth, OD_{600} >2.0 overnight	37 °C, shaking, 12–16 h
E. coli BL21(DE3)	Good growth — suitable for protein expression	37 °C, shaking, 3–4 h to OD 0.6
E. coli DH10B	Good growth — high-efficiency transformation host	37 °C, shaking, 12–16 h
Salmonella typhimurium ATCC 14028	Good growth	37 °C, shaking, 12–16 h

Storage & Stability

Dehydrated powder	Store at 15–30 °C in a dry, tightly closed container
Protect from	Moisture, direct light, and extreme temperatures
Prepared broth	2–8 °C, use within 1 week
Shelf life (dehydrated)	As per labelled expiry date
Do not use if	Contamination, precipitation, turbidity, or pH shift observed

Quality & Compliance

Manufactured under controlled conditions for batch-to-batch consistency. Performance tested against ATCC reference organisms prior to release. Compatible with protocols described in Miller (1972) Experiments in Molecular Genetics, Sambrook & Russell (Molecular Cloning), and Current Protocols in Molecular Biology.

Reference

Miller, J.H. (1972). *Experiments in Molecular Genetics.* Cold Spring Harbor Laboratory, New York.

PRODUCT DESCRIPTION

AS-1270 | LB Broth (Miller)

www.ausamics.com.au

Customs & Trade Information

HS / AHECC Code	3821.00.00
Description	Prepared culture media for the development or maintenance of microorganisms
Country of Origin	Australia

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