Product catalogue

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GMExpression

General Molecular Expression Serviced Pty Ltd

Index

Part I. Culture Media

We offer customised and standard media for protein expression, routine laboratory experiments and industrial scale expression.

I.I. Bacteria Culture Media

I.I.I. Eukaryotic Bacteria Media

5-FOA Medium

Product Code. GMNB-FOA122
Vol. 47.7 g
Form. Powder

Components, 5-FOA medium, per litre

Yeast nitrogen base w/o amino acids	6.7 g
Amino acid dropout mix w/o uracil	0.87 g
Uracil	10 mg
Agar	20 g
Dextrose (glucose)	20 g

Preparation

Suspend all (47.7 g, whole bottle) in distilled water, make it 1000 ml.
Sterilise by autoclaving at 121°C for 15 minutes. Aliquot as needed.

ATCC medium 2693, Modified Dixon medium, mDixon, with Agar

Product Code. GMNB-MDM01
Vol. 250 g
Form. Powder + liquid
Application For fungal culturing.

Components, mDixon medium, per litre

Malt Extract	36 g
Desiccated Oxbile	20 g
Peptone	6 g
Glycerol	2 ml
Oleic Acid	2 ml
Agar	15 g
Tween 40	10 ml

Preparation

Weigh 81.0 g of Bottle A, take 10ml of Tween 40 (Bottle B), heat and dissolve in 1000ml of distilled water, subpackage. Autoclave at 121°C for 15 minutes.

When cooled to around 50°C, add 50 mg of filter-sterilised Chloramphenicol per 1000 ml of the culture medium. Mix well, and pour into the sterile plate to be prepared for use.

Note: This medium contains much oleic acid, and there will be a small amount of flocculent precipitate after sterilisation.

ATCC medium 2693, Modified Dixon medium, mDixon, without Agar

Product Code. GMNB-MDM02
Vol. 250 g

Form.	Powder + Liquid
Application	For fungal culturing.

Components, mDixon medium, per litre

Malt Extract	36 g
Desiccated Oxbile	20 g
Peptone	6 g
Glycerol	2 ml
Oleic Acid	2 ml
Tween 40	10 ml

Preparation

Weigh 66.0 g of Bottle A, take 10 ml of Tween 40 (Bottle B), heat and dissolve in 1000ml of distilled water, subpackage. Autoclave at 121°C for 15 minutes.

Note: This medium contains much oleic acid, and there will be a small amount of flocculent precipitate after sterilisation.

Galactose Induction Medium

Product Code.	GMNB-GIM121
Vol.	Make it 5L
Form.	Powder + liquid
Application	Basic medium for Galactose induction.

Components, mDixon medium, per litre

Malt Extract	6 g
Desiccated Oxbile	20 g
Peptone	6 g
Glycerol	2 ml
Oleic Acid	2 ml

Preparation

Weigh 66.0 g of Bottle A, take 10ml of Tween 40 (Bottle B), heat and dissolve in 1000ml of distilled water, subpackage. Autoclave at 121°C for 15 minutes.

Note: This medium contains much oleic acid, and there will be a small amount of flocculent precipitate after sterilisation.

Lysine (LYS) medium

Product Code.	GMNB-LYS01
Vol.	250 g
Form.	Powder
Application	For isolation and enumeration of wild yeasts in pitching yeasts.

Components, LYS medium, g/L

Dextrose	44.5
Monopotassium phosphate	1.78
Magnesium sulphate	0.89
Calcium chloride	0.178
Sodium chloride	0.089
Adenine	0.00178

DL-Methionine	0.000891
L-Histidine	0.000891
DL-Tryptophan	0.000891
Boric acid	0.0000089
Zinc sulphate	0.0000356
Ammonium molybdate	0.0000178
Manganese sulphate	0.0000356
Ferrous sulphate	0.0002225
L-Lysine	1.00
Inositol	0.02
Calcium pantothenate	0.002
Aneurine	0.0004
Pyridoxine	0.0004
p-Aminobenzoic acid	0.0002
Nicotinic acid	0.0004
Riboflavin	0.0002
Biotin	0.000002
Folic acid	0.000001
Agar	17.80

Preparation

Suspend 6.6 g of Lysine Medium in 100 ml of distilled water containing 0.84 ml of potassium lactate solution ~60% (Cat. No. 60389). Boil to dissolve the medium completely. Cool to 50°C. Adjust the pH to 5.0 with a 10% solution of Lactic Acid (Cat. No. 69778) and pour into sterile petri plates.

Note: The degree of contamination is expressed as the number of wild yeast cells per million cells of the original inoculum. The number of cells in the inoculum is important as a small number (100~1000) grows to a limited extent, while 10,000 brewing yeast cells provide a direct measure of contaminant wild yeasts.

Pichia Adenine Dropout (PAD) Agar

Product Code.	GMNB-PAD124
Vol.	250 g + 9.2g
Form.	Powder
Application	For selecting ADE2 gene-deficient Pichia Pastoris colonies.

Why use PAD rather than minimal media for ADE-deficient Pichia selection?

Although minimal media (MY), minimal media with glycerol/methanol (MGY/MM) and complex media (CY) can also be used to select ADE mutant colonies. However, MY and even CY are much slower and less efficient at picking out white/red colonies compared to PAD media because Pichia growth on MY is slow (small colonies are difficult to compare visually) and CY contains yeast extract, and yeast extract contains adenine, so all colonies initially appear the same white, making it difficult to achieve high-resolution colour assays (the contrast between pure white/white/pink/red) between colonies. Besides, MY & CY are a bit complex to prepare because the complex trace elements stock & vitamins stock need to be prepared separately.

Components, per litre

Yeast Nitrogen Base w/o amino acids and ammonium sulphate	3.4 g
Dextrose	20 g
$(NH_4)_2SO_4$	10 g

Uracil	20 mg
L-Tryptophan	20 mg
L-Histidine HCl	20 mg
L-Arginine HCl	20 mg
L-Methionine	20 mg
L-Tyrosine	30 mg
L-Leucine	30 mg
L-Isoleucine	30 mg
L-Lysine HCl	30 mg
L-Phenylalanine	50 mg
L-Glutamic acid	100 mg
L-Aspartic acid	100 mg
L-Valine	150 mg
L-Threonine	200 mg
L-Serine	400 mg

Preparation

[Standard preparation, recommended]

1. Prepare 0.5 litre of 10X SD stock solution:
   Dissolve 167 g mixture A in distilled or Milli-Q water and mix well, make it 500 ml. Sterilise by 0.22μm filtration (recommended) or autoclave at 115°C for 30 minutes. Store the stock at room temperature. The shelf life of this solution is approximately one year.
2. Stir the powder in bottle B well with a spoon or glass rod[1] and take out 1.22 g of mixture B, suspend with a suitable amount of agar[2] in distilled or Milli-Q Water, make it 900ml. Sterilise by autoclaving at 121°C for 15 minutes.
3. Add 100 mL of sterile 10X SD stock into the freshly autoclaved (no longer boiling) mixture B solution. Mix well and pour the plates while hot. Store the PAD agar plates at 4°C. The shelf life is several months.

[1] Do not mix by shaking, as this will cause the lysine (red particles), which is much lighter than the other substances, to settle on the top of the mixture.

[2] 1~2% w/v recommended

[Fast preparation, may cause a dark colour of the agar]

First, stir the powder in bottle B well with a spoon or glass rod[1] and take out 1.22 g of mixture B, suspend with 33.4 g of mixture A (SD medium), plus a suitable amount of agar[2] in distilled or Milli-Q Water, make it 1000ml.

Sterilise by autoclaving at 121°C for 15 minutes [3]. Aliquot as needed.

[1] Do not mix by shaking, as this will cause the lysine (red particles), which is much lighter than the other substances, to settle on the top of the mixture.

[2] 1~2% w/v recommended

[3] If equipment allows. Autoclave at 115°C for 30 minutes to prevent the darkening of the solution due to a Maillard reaction on glucose catalysed by ammonium sulphate and heat.

Regeneration Dextrose Medium, w/o Agar | RD medium

For the version with 500 g Sorbitol (in bottle B), please request a quote.

Product Code.	GMNB-RD01
Vol.	250 g
Form.	Powder
Application	Regeneration Dextrose Medium (RD medium, RDB Agar) is a liquid medium used for the regeneration of protoplasts of Pichia Pastoris competent cells; it can also be used to screen nutrient-deficient (transformed with a vector containing HIS4

gene) Pichia Pastoris transformants. Suitable his4 strains include GS115, KM71, SMD1168, and so on.

Add 2% Agar to RD medium can make RDB agar.
Add 1% agarose to RD medium can make RD top agar.
Add L-histidine to RD medium can make RDH medium.
Add both L-histidine and 2% Agar to RD medium can make RDBH agar.
Add L-histidine and 1% agarose to RD medium can make RDH top agar.

Components, RD medium, per litre

Sorbitol[1]	186 g
Glucose	20 g
YNB	13.4 g
D-Biotin	0.4 mg
L-Glutamic acid	0.005 g
L-Methionine	0.005 g
L-Lysine	0.005 g
L-Leucine	0.005 g
L-Isoleucine	0.005 g

[1] Customer prepared or in Bottle B of RD Medium with Sorbitol version (to be purchased separately).

Preparation

Suspend Dissolve 186 g of sorbitol (prepared separately by the customer or in Bottle B of RD Medium with Sorbitol version) in 900 mL of deionised water. Add 20g of agar (or agarose) if preparing solid media. Autoclave at 121°C for 20 min, then place in a 45°C water bath to maintain temperature.

Dissolve 33.43 g of RD medium in 100 mL of deionised water by heating, sterilise by 0.22 μm filtration and preheat to 45°C in a water bath.

Mix the above two solutions. If culturing HIS4 strain, add sterilised 10 mL of 0.4% histidine solution (prepared separately by the end user).

Potato Dextrose Agar (PDA Medium)

Product Code. GMNB-PDA01
Vol. 250 g
Form. Powder

Product Description:

Potato Dextrose Agar is a medium used for the cultivation of bacteria, fungi, yeasts and moulds.

The relatively low pH of the PDA medium allows the selective cultivation of acid-tolerant yeasts, fungi, bacteria and moulds, making it suitable for the study of ascospore dispersal.

Potato extract acts as a source of carbon, nitrogen, minerals, vitamins and other essential growth nutrients, while dextrose acts as a source of carbohydrate.

Application:

- Isolation and enumeration of yeasts and moulds from food and dairy products
- Stimulation of sporulation
- Maintaining stock cultures of fungi
- Differentiation of various dermatophytes based on pigment production

Components, per 1000 ml of PDA media

Potato Extract (premium grade)	6 g
Glucose	20 g
Agar (Tissue Culture Grade - Gel strength (15g/L, 20°C)⩾1400g/cm^2)	15 g
Chloramphenicol **(Optional)**	0.1 g

Microbial sensitivity test:

Prepare the Potato dextrose agar (containing chloramphenicol) according to the standard formula, inoculate the following quality control strains, and aerobic culturing at 28±1 °C for 48-96 hours.

Quality control strain	Strain number	Inoculum volume (CFU)	Method	Quality control results	Appearance characteristics
Aspergillus niger	ATCC16404	20-200	Quantitative	PR > 0.7	There are black spores and white hyphae
Saccharomyces cerevisiae	ATCC9763	20-200	Quantitative	PR > 0.7	cream colored colonies
Candida albicans	ATCC10231	20-200	Quantitative	PR > 0.7	cream colored colonies

Preparation

Weigh 41 g of PDA medium, dissolve in distilled or MQ water and make the final volume to 1L. Autoclave at 121°C for 15 minutes.

Sabouraud Dextrose Agar (SDA Medium)

Product Code. GMNB-SDA01

Vol. 250 g

Form. Powder

Product Description

Sabouraud Dextrose Agar is a medium is a type of agar growth medium containing peptones. It is used to cultivate dermatophytes and other types of fungi, and can also grow filamentous bacteria such as Nocardia. It has utility for research and clinical care.

Components, per 1000 ml of PDA media

Potato Extract (premium grade)	6 g
Glucose	20 g
Agar (Tissue Culture Grade - Gel strength (15g/L, 20°C)⩾1400g/cm^2)	15 g
Chloramphenicol **(Optional)**	50 mg
Gentamicin **(Optional)**	25 mg

Preparation

Weigh 65 g of SDA medium, dissolve in distilled or MQ water and make the final volume to 1L. Autoclave at 121°C for 15 minutes.

SPM Sporulation Medium, SPM media

Product Code. GMNB-SPM120

Vol. 250 g

Form. Powder + liquid

Components, SPM medium, per litre

KOAc	30 g
Raffinose	(0.2 g) 1 ml
Agar	20 g

Preparation

Suspend 50.0 g of A and 1 ml of B (Raffinose) in distilled water, making up to 1000 ml.

Sterilise by autoclaving at 121°C for 15 minutes. Aliquot as needed.

TSA Medium

TSA Medium (Soybean–Casein Digest Agar, Trypticase Soy Agar Medium)

Product Code.	GMNB-TSA01
Vol.	250 g
Form.	Powder
Application	TSA media can be universally used for the cultivation of bacteria. Tryptone and plant peptone provide nitrogen sources, vitamins and growth factors; sodium chloride maintains a balanced osmotic pressure; agar is a coagulant.

Components, TSA medium, g/L

Tryptone (Casein peptone)	15
Soya papain hydrolysate (Soybean papain digest)	5
Sodium chloride	5
Agar	15

Final pH 7.3 ± 0.2

Preparation

Add 40g of TSA Medium into distilled water, make it 1L, stir and heat to boil until completely dissolved, 121°C autoclave sterilisation for 15min.

Yeast Synthetic Drop-out Medium, without His-Leu-Ade, (SD-His-Leu-Ade, SDHLA)

Product Code.	GMNB-SDHLA01
Vol.	250 g
Form.	Light yellow powder. When in the form of liquid: light amber, transparent, no precipitation or slight precipitation (insoluble calcium sulphate).

Product Description:

Although Yeast SD-His-Leu-Ade Defective Medium, also known as Yeast SD-HLA Medium, is a synthetic drop-out medium for screening various nutritionally-deficient types of Saccharomyces cerevisiae for use in yeast protein expression, yeast hybrid, double-hybrid system, and so on.

SD deficient medium lacks of corresponding components compared to yeast complete medium, which results in yeast strains that cannot synthesise the corresponding components and are not able to grow in the related defective type of medium.

This product does not contain sugar, and users can add Glucose, Raffinose or Galactose according to the purpose of the experiment.

Application:

- SD-HLA is used to screen for nutritionally deficient Saccharomyces cerevisiae.
- SD-HLA can be used as a protein expression medium for Saccharomyces cerevisiae when Galactose is added.
- SD-HLA added with glucose can be used as a medium for the enrichment of defective yeast.
- Since the composition of SD-HLA is known, it can be used to identify nutritionally deficient types of Saccharomyces cerevisiae.

Components, g/L

Yeast Nitrogen Base w/o amino acids and ammonium sulphate	1.7
Ammonium sulphate	5
Uridine	0.1
L-Arginine	0.1
L-Cysteine	0.1
L-Lysine	0.1
L-Threonine	0.1

L-Asparagine	0.05
L-Isoleucine	0.05
L-Phenylalanine	0.05
L-Proline	0.05
L-Serine	0.05
L-Tyrosine	0.05
L-Methionine	0.05
L-Valine	0.05
L-Tryptophan	0.1

Preparation

[Standard preparation, recommended]

1. Prepare 0.5 litre of 10X SC stock solution:
   Dissolve 33.5 g mixture A with a suitable amount of sugar [2][3] in distilled or Milli-Q water and mix well, make it 500 ml. Sterilise by 0.22µm filtration (recommended) or autoclave at 115°C for 30 minutes. Store the stock at room temperature. The shelf life of this solution is approximately one year.
2. Stir the powder in bottle B well with a spoon or glass rod[1] and take out 1 g of mixture B, suspend with a suitable amount of agar in distilled or Milli-Q Water, make it 900ml. Sterilise by autoclaving at 121°C for 15 minutes.
3. Add 100 mL of sterile 10X SC stock into the freshly autoclaved (no longer boiling) mixture B solution. Mix well and pour the plates while hot. Store the SD-HLA agar plates at 4°C. The shelf life is several months.

[1] Do not mix by shaking, as this will cause the lysine (red particles), which is much lighter than the other substances, to settle on the top of the mixture.

[2] 50 g recommended.

[3] Pre-prepared sugar stock, like 20% dextrose stock (Sterilised by 0.22µm filtration), also works.

[Fast preparation, may cause a dark colour of the agar]

First, stir the powder in bottle B well with a spoon or glass rod[1] and take out 1 g of mixture B, suspend with 6.7 g of mixture A (SC medium), plus a suitable amount of agar and sugar[2] in distilled or Milli-Q Water, make it 1000ml.

Sterilise by autoclaving at 121°C for 15 minutes [3]. Aliquot as needed.

[1] Do not mix by shaking, as this will cause the lysine (red particles), which is much lighter than the other substances, to settle on the top of the mixture.

[2] 10 g recommended.

[3] If equipment allows. Autoclave at 115°C for 30 minutes to prevent the darkening of the solution due to a Maillard reaction on glucose catalysed by ammonium sulphate and heat.

Note: A variety of yeast SD-Dropout media is available. Customers can request a quote and order less commonly used SD-Dropout media via support@gmexpression.com.

Yeast Synthetic Drop-out Medium, without His-Met, (SD-His-Met Medium, SD-HM)

Product Code.	GMNB-SDHM01
Vol.	250 g
Form.	Light yellow powder. When in the form of liquid: light amber, transparent, no precipitation or slight precipitation (insoluble calcium sulphate).

Product Description:

Yeast SD-His-Met Defective Medium, also known as SD-HM Medium, is a synthetic drop-out medium for screening nutritionally-deficient Saccharomyces cerevisiae for use in yeast protein expression, yeast hybrid, double-hybrid system, and so on.

SD deficient medium lacks of corresponding components compared to yeast complete medium, which results in yeast strains that cannot synthesise the corresponding components and are not able to grow in the related defective type of medium.

This product does not contain sugar, and users can add Glucose, Raffinose or Galactose according to the purpose of the experiment.

Application:

- SD-HM is used to screen for nutritionally deficient Saccharomyces cerevisiae.
- SD-HM can be used as a protein expression medium for Saccharomyces cerevisiae when Galactose is added.
- SD-HM added with glucose can be used as a medium for the enrichment of defective yeast.
- Since the composition of media is known, it can be used to identify nutritionally deficient types of Saccharomyces cerevisiae.

Components, g/L

Yeast Nitrogen Base w/o amino acids and ammonium sulphate	1.7
Ammonium sulphate	5
Adenine	0.1
Uridine	0.1
L-Arginine	0.1
L-Cysteine	0.1
L-Lysine	0.1
L-Threonine	0.1
L-Asparagine	0.05
L-Isoleucine	0.05
L-Phenylalanine	0.05
L-Proline	0.05
L-Serine	0.05
L-Tyrosine	0.05
L-Valine	0.05
L-Tryptophan	0.1
L-Leucine	0.1

Preparation

[Standard preparation, recommended]

4. Prepare 0.5 litre of 10X SC stock solution:
   Dissolve 33.5 g mixture A with a suitable amount of sugar [2][3] in distilled or Milli-Q water and mix well, make it 500 ml. Sterilise by 0.22μm filtration (recommended) or autoclave at 115°C for 30 minutes. Store the stock at room temperature. The shelf life of this solution is approximately one year.
5. Stir the powder in bottle B well with a spoon or glass rod[1] and take out 1.15 g of mixture B, suspend with a suitable amount of agar in distilled or Milli-Q Water, make it 900ml. Sterilise by autoclaving at 121°C for 15 minutes.
6. Add 100 mL of sterile 10X SC stock into the freshly autoclaved (no longer boiling) mixture B solution. Mix well and pour the plates while hot. Store the SD-HM agar plates at 4°C. The shelf life is several months.

[1] Do not mix by shaking, as this will cause the lysine (red particles), which is much lighter than the other substances, to settle on the top of the mixture.
[2] 50 g recommended.
[3] Pre-prepared sugar stock, like 20% dextrose stock (Sterilised by 0.22μm filtration), also works.

[Fast preparation, may cause a dark colour of the agar]

First, stir the powder in bottle B well with a spoon or glass rod[1] and take out 1.15 g of mixture B, suspend with 6.7 g of mixture A (SC medium), plus a suitable amount of agar and sugar[2] in distilled or Milli-Q Water, make it 1000ml.

Sterilise by autoclaving at 121°C for 15 minutes [3]. Aliquot as needed.

[1] Do not mix by shaking, as this will cause the lysine (red particles), which is much lighter than the other substances, to settle on the top of the mixture.

[2] 10 g recommended.

[3] If equipment allows. Autoclave at 115°C for 30 minutes to prevent the darkening of the solution due to a Maillard reaction on glucose catalysed by ammonium sulphate and heat.

Note: A variety of yeast SD-Dropout media is available. Customers can request a quote and order less commonly used SD-Dropout media via support@gmexpression.com.

Yeast Synthetic Minimal Medium, YSMM / SD Media

Product Code.	GMNB-YSM123
Vol.	250 g
Form.	Powder

Components, g/L

Yeast Nitrogen Base w/o amino acids and ammonium sulphate	3.4
Dextrose	20
$(NH_4)_2SO_4$	10

Preparation

Suspend 33.4g of the medium in distilled water, make it 1000 ml.

Autoclave at 116°C for 30 minutes.

YNB media, Yeast Nitrogen Base, without Amino Acids

Product Code.	GMNB-YNB110
Vol.	**250 g,** up to make 18.6L liquid media (10X stock)
	500 g, up to make 37L liquid media (10X stock)
Form.	Powder
Application	For Saccharomyces cerevisiae, Pichia pastoris culturing.

Components, per litre

Ammonium sulphate	5.0 g
Biotin	2 µg
Calcium pantothenate	400 µg
Folic acid	2 µg
Inositol	2000 µg
Niacin	400 µg
p-Aminobenzoic acid	200 µg
Pyridoxine hydrochloride	400 µg
Riboflavin	200 µg
Thiamine hydrochloride	400 µg
Boric acid	500 µg
Copper sulphate	40 µg
Potassium iodide	100 µg

Ferric chloride	200 µg
Manganese sulphate	400 µg
Sodium molybdate	200 µg
Zinc sulphate	400 µg
Potassium phosphate monobasic	1 g
Magnesium sulphate	500 mg
Sodium chloride	100 mg
Calcium chloride	100 mg

Preparation

Preparation of 13.4% (10 X stock) yeast nitrogen base with ammonium sulphate without amino acids

1. Dissolve 13.4 g of YNB with ammonium sulphate and without amino acids in 950ml of distilled water. Mix well and heat the solution to dissolve YNB completely, and make it 1000ml.
2. 0.22 µm filter sterilise and store at 4°C.

Dissolve 1 volume of YNB 10X stock in 9 volumes of million-Q water, and use directly.

After opening, the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

YPAc media, Yeast Extract Peptone Acetate

Product Code. GMNB-YPA119
Vol. 250 g
Form. Powder

Components, g/L

KOAc	10
Yeast extract (premium)	20
Peptone	20
Agar	20

Preparation

Suspend 70 g of the medium in distilled water, make it 1000 ml.

Autoclave at 121°C for 15 minutes.

YPD media, Yeast Extract Peptone Dextrose

Product Code. GMNB-YPD111
Vol. 250 g, 500 g
Form. Powder

Components, g/L

Yeast extract (premium)	10
Peptone	20
Glucose	20

Final pH 6.5 ± 0.2

Preparation

Suspend 50.0 g in 1000 mL of distilled water. Heat to dissolve the medium completely. Sterilise by autoclaving at 115°C for 30 minutes. Aliquot as needed.

* Monosaccharides are susceptible to the Maillard reaction with amino acids in a high-temperature environment; therefore, sterilisation at 121°C for 15 minutes is not recommended. Alternatively, 0.22 µm filtration can be used as a substitute for autoclaving if conditions permit.

YPDA medium, Yeast Peptone Dextrose Adenine medium

Product Code.	GMNB-YPDA01
Vol.	250 g
Form.	Powder

Components, g/L

Yeast extract (premium)	10
Peptone	20
Glucose	20
Adenine sulphate	0.03

Preparation

Weigh 50.03 g of YPDA medium, dissolve in 1000 mL of distilled water, divide and autoclave at 116°C for 30 minutes.

YPG media, Yeast Extract Peptone Glycerol

Product Code.	GMNB-YPG118
Vol.	250 g, 500 g
Form.	Powder + Liquid

Components, YPG medium, per litre

Yeast extract (premium)	10 g
Peptone	20 g
Glucose	20 g
Agar	20 g
Glycerol	30 ml

Preparation

Suspend 50.0 g of A and 30 ml of B (Glycerol) in distilled water, make it 1000 ml.

Sterilise by autoclaving at 121°C for 15 minutes. Aliquot as needed.

BMGY Medium, 1 X stock, Buffered Glycerol- complex Medium

Product Code.	GMNB-BMGY502
Vol.	500 ml
Form.	Prepared liquid
Application	For Pichia pastoris culturing and recombination protein expression, which is induced by menthol (BMMY).
Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, BMGY medium, final work solution

Yeast extract (premium)	1 %
Peptone	2 %
Potassium phosphate (pH 6.0)	0.1 M
YNB (yeast nitrogen bases)	1.34 %
Biotin	0.0004 %
Glycerol	1 %

Preparation

Use directly after opening; the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

BMMY Medium, 1 X stock, Buffered Methanol - complex Medium

Product Code.	GMNB-BMMY501
Vol.	500 ml
Form.	Prepared liquid
Application	For Pichia pastoris culturing and recombination protein expression, which is induced by menthol.
Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, BMMY medium, final work solution

Yeast extract (premium)	1 %
Peptone	2 %
Potassium phosphate (pH 6.0)	0.1 M
YNB (yeast nitrogen bases)	1.34 %
Biotin	0.0004 %
methanol (separate stock)	0.5 %

Preparation

To prolong the shelf life of BMMY, it is recommended to mix the methanol stock prior to each use.

After opening the bottle and pouring out the medium. Mix 1.25 ml of 80X methanol stock per 100 ml of medium and use immediately; the remaining liquid should be sealed immediately and stored in a refrigerator at 4°C. The use of a sterile bench is recommended.

Note:

Due to the volatile nature of methanol, the shelf life of the 40% methanol stock (80X M 10ml) attached in the package is up to 3 months, and the accuracy of the concentration cannot be guaranteed after the expiry date.

It is recommended that users prepare their own 50X or 80X methanol stock after the expiry date.

Due to air freight restrictions for flammable & volatile chemicals, it is strongly recommended that international buyers confirm shipping availability prior to purchase.

YNB media, Yeast Nitrogen Base, without Amino Acids | 10X Stock

Product Code.	GMNB-YNB110L
Vol.	500 ml, 10X Stock
Form.	Prepared liquid
Application	For Saccharomyces cerevisiae, Pichia pastoris culturing.
Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, Yeast Nitrogen Base (YNB), per litre

Ammonium sulphate	5.0 g
Biotin	2 µg
Calcium pantothenate	400 µg
Folic acid	2 µg
Inositol	2000 µg
Niacin	400 µg
p-Aminobenzoic acid	200 µg
Pyridoxine hydrochloride	400 µg
Riboflavin	200 µg
Thiamine hydrochloride	400 µg

Boric acid	500 µg
Copper sulphate	40 µg
Potassium iodide	100 µg
Ferric chloride	200 µg
Manganese sulphate	400 µg
Sodium molybdate	200 µg
Zinc sulphate	400 µg
Potassium phosphate monobasic	1 g
Magnesium sulphate	500 mg
Sodium chloride	100 mg
Calcium chloride	100 mg

Preparation

Dissolve 1 volume of YNB 10X stock in 9 volumes of million-Q water, and use directly.

After opening, the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

YNB media, Yeast Nitrogen Base, without Amino Acids | 20X Stock

Product Code.	**GMNB-YNB120L**
Vol.	**500 ml, 20X Stock (13.4% w/w)**
Form.	**Prepared liquid**
Application	For Saccharomyces cerevisiae, Pichia pastoris culturing.
Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, Yeast Nitrogen Base (YNB), per litre

Ammonium sulphate	5.0 g
Biotin	2 µg
Calcium pantothenate	400 µg
Folic acid	2 µg
Inositol	2000 µg
Niacin	400 µg
p-Aminobenzoic acid	200 µg
Pyridoxine hydrochloride	400 µg
Riboflavin	200 µg
Thiamine hydrochloride	400 µg
Boric acid	500 µg
Copper sulphate	40 µg
Potassium iodide	100 µg
Ferric chloride	200 µg
Manganese sulphate	400 µg
Sodium molybdate	200 µg
Zinc sulphate	400 µg
Potassium phosphate monobasic	1 g
Magnesium sulphate	500 mg

Sodium chloride	100 mg
Calcium chloride	100 mg

Preparation

Dissolve 1 or 2 volumes of YNB 20X stock in 16~18 volumes of million-Q water, with a suitable amount of Dextrose stock, and amino acids stock, make up to the final volume and use directly.

Minimal Dextrose Medium (MD media) for *Saccharomyces cerevisiae*

0.67% YNB

5% Dextrose (by adding 5X D stock | 25% D-glucose)

Minimal Dextrose Medium (MD media) for *Pichia pastoris*

1.34% YNB

0.00004% Biotin (by adding 500X B stock | 0.02% Biotin)

2% Dextrose (by adding 10X D stock | 20% D-glucose)

Minimal Methanol Medium （MM media) for *Pichia pastoris*

1.34% YNB

0.00004% Biotin (by adding 500X B stock | 0.02% Biotin)

0.5% Methanol (by adding 10X M stock | 5% Methanol)

Minimal Glycerol Medium （MG media) for *Pichia pastoris*

1.34% YNB

0.00004% Biotin (by adding 500X B stock | 0.02% Biotin)

1% Glycerol (by adding 10X GY stock | 10% Glycerol)

For plates

Add 15 g agar to 800 mL of MQ water and autoclave for 20 minutes on the liquid cycle. Cool to about 60°C and then add sterile YNB/B/D/GY stock for a specific medium, make the final volume and pour the plates immediately.

After opening, the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

YPD Liquid Medium (Yeast Extract Peptone Dextrose)

Product Code.	GMNB-YPD111L
Vol.	500 ml
Form.	Prepared liquid
Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, g/L

Yeast extract (premium)	10
Peptone	20
Glucose	20

Final pH 6.5 ± 0.2

Preparation

Use directly after opening; the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

YPDS Liquid Medium (Yeast Extract Peptone Dextrose Sorbitol)

Product Code.	GMNB-YPDS111L
Vol.	500 ml
Form.	Prepared liquid
Application	For the preparation of Saccharomyces cerevisiae/Pichia pastoris competent cells. For Saccharomyces cerevisiae/Pichia pastoris Agar plate selection.

Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, YPDS medium, per litre

Yeast extract (premium)	10 g
Peptone	20 g
Glucose	20 g
Sorbitol	182.2 g

Final pH 6.5 ± 0.2

Preparation

For the preparation of the selection agar plate

Add 10g agar and a suitable amount of antibiotics (such as Zeocin) to 500 ml YPDS Liquid, heat to 60~65°C and stir well. Aliquot into plates as needed. Operation on a sterile bench is recommended.

For the preparation of competent cell

Use directly after opening; the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

YPG Liquid Medium (Yeast extract peptone glycerol)

Product Code.	GMNB-YPG118L
Vol.	500 ml
Form.	Prepared liquid
Application	For the expression of recombinant proteins in yeast, which uses glycerol as a carbon source.
Information	0.22 µm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggested storage in a 4°C / 39.2 °F refrigerator.

Components, YPG medium, per litre

Yeast extract (premium)	10 g
Peptone	20 g
Agar	20 g
Glycerol	30 ml

Preparation

Use directly after opening; the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

I.I.II. Prokaryotic Bacteria Media

BG-11 medium, without Agar

Product Code.	GMNB-BG1101
Vol.	250 g
Form.	Powder
Application	For culturing cyanobacteria, including Synechococcus elongates.

Microbiological sensitivity test of BG11 medium.

Inoculate with the following quality control strains and aerobic culture at 25 ~ 32°C for 48 ~ 72 hours.

QC strain	Inoculum Growth
Cyanobacteria	+++

Components, per litre

Sodium nitrate	1.5 g
Dipotassium hydrogen phosphate trihydrate	40 mg
Magnesium sulphate heptahydrate	75 mg
Calcium chloride dehydrate	36 mg
Citric acid	6 mg
Ammonium iron citrate	6 mg
EDTA	1 mg
Sodium carbonate	20 mg
Boric acid	2.86 mg
Manganese chloride monohydrate	1.81 mg
zinc sulphate heptahydrate	0.222 mg
copper sulphate pentahydrate	0.079 mg
sodium molybdate dehydrate	0.39 mg
cobalt nitrate hexahydrate	0.049 mg

Final pH 7.1 ± 0.1 at 25°C

Preparation

Weigh 1.70 g (to be more precise, 1.69g) of this product (and 10.0 g Agar, if needed), dissolve it in 1000 mL of distilled water, divide it into portions, and autoclave it at 121°C for 15 minutes.

Vitamin B12 may be added for those species that require it. Use f/2 vitamin solution.

Adjusting the pH of the medium to approximately 7.1 - 7.5 will avoid heavy precipitation.

Brucella Agar with Hemin & VK1 / Defibrinated Blood

Product Code.	GMNB-BA01
Vol.	For 6 L
Form.	Powder + Liquid

Application

For microbiological culture. Brucella Agar is a standard formulation used for the isolation of fastidious bacteria, Streptococci, Pneumococci, Listeria, Brucella, Neisseria meningitidis and Haemophilus influenzae. It is also recommended as a primary nonselective isolation medium for Helicobacter pylori.

- For strict anaerobes, especially Bacteroides, Prevotella and Porphyromonas, when incubated anaerobically, including isolation of strict anaerobes from clinical specimens and anaerobic susceptibility testing using the E test method. Brucella blood agar with haemin and vitamin K1 is preferred.

- For isolation and growth of fastidious and non-fastidious bacterial species by detection of haemolytic reactions, including isolation of Brucella from clinical specimens. Brucella agar with 5% Sheep/Horse Defibrinated Blood is preferred.

Caution

- Laboratory procedures involving Brucella require special equipment and techniques to minimise biohazards.
- Biosafety level 3 is required for handling samples and cultures.
- This medium should not be used as a universal primary isolation medium.

Package contains	
Mixture A	260 g (make up to 6 L medium)
Stock B	60 ml
Stock C - optional	300 ml
Stock D - optional	300 ml

Components, per 1000mL of YCFA Modified Media

Mixture A	
Casitone	15.0 g
Yeast extract	2.0 g
Glucose	1.0 g
Peptone	5.0 g
Sodium Chloride	5.0 g
Sodium Bisulfite	0.1 g
Agar	15.0 g

Stock B	
Vitamin K1	10 mg
Hemin	5 mg

Stock C (optional) *	
Sheep/Horse Blood, defibrinated	50 ml (5% w/w)

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

* Blood products have a maximum shelf life of 35 days， and the Item requires temperature control for storage and delivery with additional fees. It's not eligible for return due to safety and quality concerns. Please consider the requirements before purchasing.

Stock D (optional) ** - Blood alternative	
Bovine albumin	0.2 g
Bovine serum freeze-dried powder	3.3 g
Hemin	5 mg

** Haemolytic reactions are unavailable if using Blood Alternative to prepare the media.

Preparation

- Dissolve 43.1 g of mixture A in 930 mL of MQ water in a closed container. Adjust the pH to 6.8~7.2 using 1M NaOH or 1M HCl.
- Autoclave at 121°C for 15 minutes (Nitrogen blanket autoclave recommended [1] [2]; if the condition does not allow, see [3]).

- Add 10 ml of stock B, and 50 ml of optional stock C or Stock D if required, to the 930 ml solution and make it 1000 ml at 50~55°C. Shake well and pour the agar plate aseptically while the liquid is still hot.
  - [1] Inert gas blanketing, also known as nitrogen gas protection, is a safe and reliable method of preserving volatile or oxidatively sensitive substances.
  - [2] A simple method of inert gas blanketing in the laboratory:
    - GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket)
    - Squeeze as much air out of the bag as possible, then introduce carbon dioxide or nitrogen into the bag using a flexible tube and seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) when it is inflated to about half its maximum volume.
    - Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.
    - Be aware of the risk of asphyxiation from high concentrations of carbon dioxide or nitrogen and ensure that the operation is carried out in a ventilated room.
  - [3] If inert gas protection is not intended,
    - GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket).
    - Squeeze as much air out of the bag as possible, then seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) immediately.
    - Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.

Note.

It is strongly recommended to operate within a clean bench when preparing the solution & agar plate.

Double yeast extract medium (2x YT)

Product Code.	GMNB-2YE01
Vol.	250 g, 500 g
Form.	Powder
Application	2xYT is a standard microbial growth medium used for the cultivation of E. coli and M13 bacteriophage. This nutrient-rich microbial broth contains peptides, amino acids, and water-soluble vitamins in a low-salt formulation. Suitable for non-selective cultivation of M13 bacteriophage, and E. coli strains for cloning, DNA plasmid production and production of recombinant proteins. Also suitable for selective cultivation when appropriate antibiotics are added.

Components, g/L

Tryptone	16
Yeast extract (premium)	10
Sodium chloride	5

Preparation

Suspend 31.0 g of 2x YT (or with Agar for preparing solid media) in distilled water. Mix well and make it 1000 ml.

Autoclave at 121°C for 15 minutes. Aliquot as needed.

Eugonic Agar

Product Code.	GMNB-EUGA
Vol.	250 g
Form.	Powder
Application - 1	Eugonic Agar is recommended for the cultivation of fastidious microorganisms like Haemophilus, Neisseria, Pasteurella, Brucella and Lactobacillus species. The colony appears larger on Eugonic agar than on Tryptone-Soy Agar due to the high concentration of sulphur and carbon sources. The combination of high carbohydrate content and high sulphur (cystine) content improves growth with chromogenicity.
Application - 2	For sterility testing in production processes (Acumedia method).

Eugonic Agar Microbiological Sensitivity Test:

Inoculate with the following quality control strains and place at 30 ~ 35°C for 24 ~ 72 hours of aerobic incubation.

QC strain	Strain No.	Inoculum size	Growth status	Description
Escherichia coli	ATCC25922	/	+++	Good growth
Salmonella	ATCC14028	/	+++	Good growth
Staphylococcus aureus	ATCC25923	/	-	Inhibited

Components, g/L	
Peptone	5
Yeast extract	2
Crystalline Violet	0.002
Skimmed milk powder	1
Streptococcus lactis peptide (Nisin)	0.0016
Agar	15

Final pH 7.4 ± 0.2 at 25°C

Preparation

Weigh 23.0 g of this product, dissolve in 1000 mL of distilled water with heating and stirring, divide into triangular flasks, 200ml per bottle. Autoclave at 121°C for 15 minutes, when it cools down to 45-50°C, add 1 piece of sterile penicillin solution (containing penicillin G 96 units) to each bottle. Mix well and pour it into the sterile petri dish.

Gifu Anaerobic Medium - modified, GAM modified

See Gifu Anaerobic Medium.

Gram-negative bacteria (G-) selective medium

Product Code.	GMNB-GNSM01
Vol.	250 g
Form.	Powder
Application	For the selective culture of Gram-negative bacteria.

Characteristics of bacterial growth on (G-) selective medium:

Inoculate with the following quality control strains and place at 30-35°C for 24-72 hours of aerobic incubation.

QC strain	Strain No.	Inoculum size	Growth status	Description

Escherichia coli	ATCC25922	/	+++	Good growth
Candida albicans	ATCC10231	/	+++	Good growth
Aspergillus Niger	ATCC16404	/	+++	Good growth

Components, g/L

Tryptone	15
Soy Peptone	5
Sodium chloride	4
L-Cystine	0.7
Sodium sulphate	0.2
Glucose	5.5
Agar	15

Final pH 7.1 ± 0.2 at 25°C

Preparation

Weigh 45.4 g of Eugonic Agar, dissolve in 1000 mL of distilled water. Autoclave at 115°C for 30 minutes.

Helicobacter Pylori Medium

See Helicobacter Pylori Medium.

Luria-Bertani Broth, LB Broth, Powder (Miller's)

Product Code.	**GMNB-LBB115**
Vol.	**250 g,** up to make 10L liquid media
	500 g, up to make 20L liquid media
Form.	**Powder**
Application	LB is a microbial growth medium commonly used for the cultivation of E. coli. This broth contains peptides, amino acids, water-soluble vitamins and carbohydrates. It is suitable for the non-selective culture of E. coli strains for cloning, DNA plasmid preparation and expression of recombinant proteins. It is also suitable for selective cultures when appropriate antibiotics are added

Components, g/L

Sodium chloride	10
Tryptone (vegetable)	10
Yeast extract (premium)	5

Final pH 7.0 ± 0.1 at 25°C

Preparation

Suspend 25.0 g of LB Broth (or with Agar for preparing solid media) in distilled water. Mix well and make it 1000 ml.

Sterilise by autoclaving at 121°C for 15 minutes. Aliquot as needed.

Nitrogen-free Medium

Product Code.	GMNB-NFM01
Vol.	250 g
Form.	Powder
Application	For culturing autochthonous nitrogen-fixing bacteria and potassium bacteria.

Components, per 1000 ml of Nitrogen-free Media

Mannitol	10.0 g
$MgSO_4 \cdot 7H_2O$	0.2 g
$CaCl_2 \cdot 2H_2O$	0.2 g
$CaCO_3$	5.0 g
KH_2PO_4	0.2 g
NaCl	0.2 g
Agar	200 g

Preparation

- Dissolve 35.8 g of media in 900 ml of MQ water， and make it to 1000 ml with MQ water. Adjust the pH to 7.0-7.2 using 1M KOH or 1M HCl.
- Autoclave at 115°C for 30 minutes.
- After autoclaving, calcium carbonate will precipitate at the bottom of the solution. It is recommended to shake well at 65~70°C just before pouring agar plates.

Potato Dextrose Agar (PDA Medium)

See Potato Dextrose Agar.

Sabouraud Dextrose Agar (SDA Medium)

See Sabouraud Dextrose Agar.

SOB Medium, Super Optimal Broth

Product Code.	GMNB-SOB110
Vol.	250 g, up to make 9L liquid media
	500 g, up to make 18L liquid media
Form.	Powder
Application	Super Optimal Broth is a nutrient-rich bacterial growth medium used for microbiological culture, generally of Escherichia coli.

Components

Sodium chloride	0.05 %
Tryptone	2 %
Yeast extract (premium)	0.5 %

Preparation

Suspend 25.5 g in 950 mL of distilled water, shake well and then make it 1000ml.

Sterilise by autoclaving at 121°C for 15 minutes. Aliquot as needed.

SOC Media, Super Optimal broth with Catabolite repression

Product Code.	GMNB-SOC117
Vol.	**250 g,** up to make 7.9L liquid media
	500 g, up to make 15.9L liquid media
Form.	Powder
Application	For transforming bacteria.

Components

Yeast extract (premium)	0.5 %
Tryptone	2 %
NaCl	10 mM
KCl	2.5 mM
$MgCl_2$	10 mM
$MgSO_4$	10 mM
Glucose	20 mM

Preparation

Suspend 31.4 g in 950 mL of distilled water. Mix well and then make it 1000ml.

Sterilise by autoclaving at 115°C for 30 minutes [1]. Aliquot as needed.

[1] Monosaccharides are susceptible to the Maillard reaction with amino acids in a high-temperature environment; therefore, sterilisation at 121°C for 15 minutes is not recommended. Alternatively, 0.22 μm filtration can be used as a substitute for autoclaving if conditions permit.

Terrific Broth, TB Media, without Glycerol

Product Code.	GMNB-TBM116
Vol.	**250 g,** up to make 5L liquid media
	500 g, up to make 10.5L liquid media
Form.	Powder

Product Description.

Terrific broth is a buffered and enriched medium used to cultivate recombinant strains of E.coli. It is a nutrient-rich medium containing glycerol, peptides, amino acids, water-soluble vitamins, and carbohydrates. Terrific broth (TB) contains more Tryptone and Yeast extract than the standard LB medium. Terrific broth can be used for almost all applications involving liquid bacterial culturing steps, such as protein expression and cloning.

Principle.

The terrific broth is a nutrient-rich growth medium that supports the high cell density of E.coli. It maintains growth in the logarithmic phase, resulting in larger yields of plasmid DNA and heterologous proteins. Tryptone and yeast extract act as the sources of carbon, nitrogen, vitamins, and amino acids required for the growth of bacteria. The potassium phosphate buffer system acts as the source of potassium and prevents cell death and, eventually, the drop in pH. Glycerol is added to the medium instead of glucose as a carbon source. Glycerol is not reduced to acetic acid. Glucose acts as a repressor in various protein expression systems, whereas glycerol promotes growth.

Application.

It provides a higher plasmid yield per volume compared with LB media.

TB (not to be confused with T broth) can obtain higher yields of recombinant protein expression in E.coli. However, some proteins require slow E.coli growth for proper folding. For such cases, it would be better to use M9 media.

Recipe same as the Cold Spring Harbour's protocol, with more nitrogen source and buffer capability.

Components, per litre

Yeast extract (premium)	24 g
Tryptone	20 g
KH_2PO_4	0.017 mol
K_2HPO_4	0.072 mol

Preparation

Suspend 47.6 g of the medium in distilled water. Add in 4ml glycerol (up to 8ml if prolonged culture needed). Mix well with continuous stirring and make it 1000ml. Autoclave at 121°C for 15 minutes.

Terrific Broth, TB Medium, with Glycerol

Product Code.	GMNB-TBM116-01
Vol.	**250 g,** up to make 5L liquid media
	500 g, up to make 10.5L liquid media
Form.	Powder

Product Description.

Terrific broth is a buffered and enriched medium used to cultivate recombinant strains of E.coli. It is a nutrient-rich medium containing glycerol, peptides, amino acids, water-soluble vitamins, and carbohydrates. Terrific broth (TB) contains more Tryptone and Yeast extract than the standard LB medium. Terrific broth can be used for almost all applications involving liquid bacterial culturing steps, such as protein expression and cloning.

Principle.

The terrific broth is a nutrient-rich growth medium that supports the high cell density of E.coli. It maintains growth in the logarithmic phase, resulting in larger yields of plasmid DNA and heterologous proteins. Tryptone and yeast extract act as the sources of carbon, nitrogen, vitamins, and amino acids required for the growth of bacteria. The potassium phosphate buffer system acts as the source of potassium and prevents cell death and, eventually, the drop in pH. Glycerol is added to the medium instead of glucose as a carbon source. Glycerol is not reduced to acetic acid. Glucose acts as a repressor in various protein expression systems, whereas glycerol promotes growth.

Application.

It provides a higher plasmid yield per volume compared with LB media.

TB (not to be confused with T broth) can obtain higher yields of recombinant protein expression in E.coli. However, some proteins require slow E.coli growth for proper folding. For such cases, it would be better to use M9 media.

Recipe same as the Cold Spring Harbour's protocol, with more nitrogen source and buffer capability.

Components, per litre

Yeast extract (premium)	24 g
Tryptone	20 g
Glycerol	4 ml
KH_2PO_4	0.017 mol
K_2HPO_4	0.072 mol

Preparation

Suspend 47.6 g of the medium in distilled water. Add in 4ml glycerol (up to 8ml if prolonged culture needed). Mix well with continuous stirring and make it 1000ml. Autoclave at 121°C for 15 minutes.

TSA Medium

See TSA Medium.

YCFA (Yeast Casitone Fatty Acids Broth) without Vitamins & Fatty Acids

See YCFA (Yeast Casitone Fatty Acids Broth) without Vitamins & Fatty Acids.

YCFA Medium - Modified

See YCFA Medium - Modified.

YCFA Medium - Full Recipe

See YCFA Medium - Full Recipe.

YEP medium - Modified (Yeast Extract Peptone - Modified)

Product Code.	GMNB-YEP02
Vol.	250 g
Form.	Powder
Application	For Agrobacterium culture.

Components, g/L

Yeast extract (premium)	1.0
Magnesium sulphate	0.5
Sucrose	5.0
Peptone	5.0
Beef Extract	5.0

Final pH 7.2 ± 0.1 at 25°C

Preparation

Weigh 16.5g of YEP medium, dissolve in distilled water. Adjust pH to 7.2, and make the final volume to 1L. Autoclave at 115°C for 30 minutes.

YEP medium (Yeast Extract Peptone)

Product Code.	GMNB-YEP01
Vol.	250 g
Form.	Powder
Application	For Agrobacterium culture.

Components, g/L

Yeast extract (premium)	10
Peptone	10
NaCl	5

Final pH 7.0 ± 0.2 at 25°C

Preparation

Weigh 25 g of YEP medium, dissolve in distilled water. Adjust pH to 7.0, and make the final volume to 1L. Autoclave at 115°C for 30 minutes.

DNA Booster | 50X Stock | Without LB

Product Code.	DBV-SK
Vol.	50ml, to prepare up to 2.5L Liquid media
	100ml, to prepare up to 5L Liquid media
Form.	Liquid

Type.	High-copy number plasmid, Low-copy number plasmid
Application	This is a unique Media Enhancement Stock developed by GMExpression. It has been designed to increase the yield of the bacterial plasmid for the most commonly used liquid media. It provides an optimum yield of transformed bacteria in culture, resulting in a much higher plasmid yield per volume compared to traditional LB media.
Information	0.22 μm filtration plus 5 min 275/365 nm UV treatment sterilised.

Recommended to use

Suitable for the preparation of plasmids of bacteria such as E. coli in the laboratory.

It is suitable for the recovery of electroporation-transformed bacteria.

Also suitable for the preparation of competent cells.

Composition, Booster formula

High-density cell growth maintenance component (Commercial confidential)

Plasmid/gDNA Anabolic Enhancement Component (Commercial confidential)

Preparation

For high-copy number plasmid preparation, use the dark colour stock, and for low-copy number plasmid, use the light colour one.

After opening, the remaining liquid should be sealed immediately and stored in the 4°C (39.2 ℉) refrigerator. Operation on a sterile bench is recommended.

Users need to prepare either LB, SOB, or 2YT sterilised liquid media in advance.

Dilute 1 volume of 50X stock to 49 volumes of liquid media (LB, SOB or 2YT; e.g. add 10 ml of 50X stock to 490 ml of LB medium to make 500 ml DNA Booster medium), shake well and use in the same way as a normal LB medium. For E.coli (like TOP10, DH5a strain) incubation. Incubate for 2-3 hours to obtain highly active bacteria (in the log phase of growth), for 4 hours of rapid incubation (plateau growth) or for overnight incubation.

Caution

This stock solution should not be autoclaved. It should only be sterilised by 0.22μm filtration.

Note

The formulas for our proprietary products are constantly updated as our back-end research continues, with newer versions of the products being released to the shelves when the results of subsequent development show improved performance.

The data shown in the figure is the actual performance of the version 1.0 product (as of February 2023), the version 1.2 product has a 10~20% better performance compared to version 1.0.

DNA Booster | Plasmid Specific Media

Product Code.	DBV-01
Vol.	500 ml
Form.	Liquid
Type.	High-copy number plasmid, Low-copy number plasmid
Application	This is a unique Media Enhancement Stock developed by GMExpression. It has been designed to increase the yield of the bacterial plasmid for the most commonly used liquid media. It provides an optimum yield of transformed bacteria in culture, resulting in a much higher plasmid yield per volume compared to traditional LB media.
Information	0.22 μm filtration plus 5 min 275/365 nm UV treatment sterilised.

Recommended to use

Suitable for the preparation of plasmids of bacteria such as E. coli in the laboratory.

It is suitable for the recovery of electroporation-transformed bacteria.

Also suitable for the preparation of competent cells.

Composition

[LB base formula], g/L

Yeast extract (premium)	5
Tryptone	10
NaCl	10

[Booster formula]

High-density cell growth maintenance component (Commercial confidential)

Plasmid/gDNA Anabolic Enhancement Component (Commercial confidential)

Preparation

For high-copy number plasmid preparation, please purchase the high-copy number version, and for low-copy number plasmid, use the low-copy number one.

- Use directly after opening, the remaining liquid should be sealed immediately and stored in the 4°C (39.2 °F) refrigerator. Operation on a sterile bench is recommended.
- Use this medium in the same way as a normal LB medium. For E.coli (like TOP10, DH5a strain) incubation. Incubate for 2-3 hours to obtain highly active bacteria (in the log phase of growth), for 4 hours of rapid incubation (plateau growth) or for overnight incubation.

Caution

This mixed medium should not be autoclaved. It has already been sterilised and should only be re-sterilised by 0.22μm filtration (in case of contamination).

Note

The formulas for our proprietary products are constantly updated as our back-end research continues, with newer versions of the products being released to the shelves when the results of subsequent development show improved performance.

The data shown in the figure is the actual performance of the version 1.0 product (as of February 2023), the version 1.2 product has a 10~20% better performance compared to version 1.0.

SOC Liquid Medium, Super Optimal broth with Catabolite repression

Product Code.	GMNB-SOC117L
Vol.	500 ml
Form.	Liquid
Application	For transforming bacteria.
Information	0.22 μm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggest storage in a 4°C / 39.2 °F refrigerator.

Components

Yeast extract (premium)	0.5 %
Tryptone	2 %
NaCl	10 mM
KCl	2.5 mM
$MgCl_2$	10 mM
$MgSO_4$	10 mM
Glucose	20 mM

Preparation

Use directly after opening; the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

Terrific Broth, Liquid TB Medium, with Glycerol

Product Code.	GMNB-TBM116L
Vol.	500 ml
Form.	Liquid
Information	0.22 μm filtration plus 5 min 275/365 nm UV treatment sterilised. Suggest storage in a 4°C / 39.2 °F refrigerator.

Product Description.

Terrific broth is a buffered and enriched medium used to cultivate recombinant strains of E.coli. It is a nutrient-rich medium containing glycerol, peptides, amino acids, water-soluble vitamins, and carbohydrates. Terrific broth (TB) contains more Tryptone and Yeast extract than the standard LB medium. Terrific broth can be used for almost all applications involving liquid bacterial culturing steps, such as protein expression and cloning.

Principle.

The terrific broth is a nutrient-rich growth medium that supports the high cell density of E.coli. It maintains growth in the logarithmic phase, resulting in larger yields of plasmid DNA and heterologous proteins. Tryptone and yeast extract act as the sources of carbon, nitrogen, vitamins, and amino acids required for the growth of bacteria. The potassium phosphate buffer system acts as the source of potassium and prevents cell death and, eventually, the drop in pH. Glycerol is added to the medium instead of glucose as a carbon source. Glycerol is not reduced to acetic acid. Glucose acts as a repressor in various protein expression systems, whereas glycerol promotes growth.

Application.

It provides a higher plasmid yield per volume compared with LB media.

TB (not to be confused with T broth) can obtain higher yields of recombinant protein expression in E.coli. However, some proteins require slow E.coli growth for proper folding. For such cases, it would be better to use M9 media.

Recipe same as the Cold Spring Harbour's protocol, with more nitrogen source and buffer capability.

Components, per litre

Yeast extract (premium)	24 g
Tryptone	20 g
Glycerol	4 ml
KH_2PO_4	0.017 mol
K_2HPO_4	0.072 mol

Preparation

Use directly after opening; the remaining liquid should be sealed immediately and stored in the 4°C refrigerator. Operation on a sterile bench is recommended.

I.I.III. Anaerobic & Hypoxic Culture Media

ATCC medium 2693, Modified Dixon medium, mDixon, with Agar

See ATCC medium 2693, Modified Dixon medium, mDixon, with Agar.

ATCC medium 2693, Modified Dixon medium, mDixon, without Agar

See ATCC medium 2693, Modified Dixon medium, mDixon, without Agar.

ATCC Trace Mineral & Vitamin Supplement

Product Code.	GMNB-ATCC-TMVS
Vol.	250 mL + 250 mL
Form.	Liquid
Application	The ATCC Vitamin and Trace Mineral Mix is supplied in two 250 mL sterile stock solutions, integrating all essential vitamins and trace minerals for various ATCC-recommended media, particularly in extremophile cultivation. This consolidated formulation streamlines media preparation and minimises handling errors.

Package contains	
ATCC Vitamin stock	250 mL sterile stock
ATCC Trace Mineral stock	250 mL sterile stock

Components, per 1000mL of stock

Vitamin Stock (based on Wolfe's solution)	
Folic acid	2 mg
Pyridoxine·HCl	10 mg
Riboflavin	5 mg
Biotin	2 mg
Thiamine·HCl	5 mg
Nicotinic acid	5 mg
D-Ca-pantothenate	5 mg
Vitamin B12	0.1 mg
α-Lipoic acid	5 mg
Monopotassium phosphate	900 mg

Trace Mineral Stock (based on Wolfe's solution)	
EDTA	0.50 g
$MgSO_4 \cdot 7H_2O$	3.00 g
$MnSO_4 \cdot H_2O$	0.50 g
NaCl	1.00 g
$FeSO_4 \cdot 7H_2O$	0.10 g
$Co(NO_3)_2 \cdot 6H_2O$	0.10 g
$CaCl_2$	0.10 g
$ZnSO_4 \cdot 7H_2O$	0.10 g
$CuSO_4 \cdot 5H_2O$	0.01 g
$AlK(SO_4)_2$	0.01 g
H_3BO_3	0.01 g
$Na_2MoO_4 \cdot 2H_2O$	0.01 g
Na_2SeO_3	0.001 g

$Na_2WO_4 \cdot 2H_2O$	0.01 g
$NiCl_2 \cdot 6H_2O$	0.02 g

Preparation

Conduct all procedures within a clean bench or a fully sterilised anaerobic glovebox.

- Aseptically aliquot the stock solution into sterile small tubes (e.g., 10 mL conical tubes with screw cap) before use to prevent the stock from being contaminated.
- Anaerobic Supplementation

  Option 1. In an anaerobic glovebox or chamber, pipette the required volume of Vitamin Mix and Trace Mineral Mix from aliquoted tubes into the target medium.

  Option 2. If an anaerobic environment isn't available, use a sterile 0.5 mL or 1 mL insulin syringe [1] to pierce the septum or rubber stopper of anaerobic bottles/Hungate tubes and inject the Vitamin & Mineral supplements.
- Gently invert or swirl to mix thoroughly, then inoculate with the bacterial sample.
- Transfer to the incubator under appropriate anaerobic conditions.

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[1] Disposable mini-Insulin syringes are available from our store.

Storage.

The unused stock and aliquoted tubes for multi-use are suggested to be stored at 4 °C, which will better prevent the stock from becoming contaminated.

Differential Reinforced Clostridial Broth (DRCM)

Product Code. GMNB-DRCM01

Vol. 250 g, 500 g

Form. Powder

Description

Differential Reinforced Clostridial Broth is an enhanced version of the Reinforced Clostridial Medium, which was used to isolate and enumerate *Clostridium* species.

The formulation of the medium includes the redox indicator resazurin for the verification of anaerobic conditions. A primary characteristic of this medium is its ability to provide a distinct visual checkpoint for the cultivation of *Clostridia*. During their metabolic activity, *Clostridia* reduce sulphite to sulphide, leading to the formation of an iron sulphide precipitate that turns the medium black. The selective isolation of these anaerobic, spore-forming microorganisms is further enhanced by the addition of polymyxin (70 IU/mL), which effectively suppresses the growth of contaminating non-spore-forming bacteria, such as non-clostridial organisms, that are also capable of sulphide production.

Application

Enumeration & Cultivation: For isolating and quantifying *Clostridia* from food, clinical, and environmental samples.

Food Microbiology: Detection of *Clostridium* spp. in dairy, canned, and processed foods.

Clinical Diagnostics: Isolation of *Clostridia* from clinical specimens.

Pharmacopoeial Testing: Compliant with USP and EP standards for non-sterile product testing.

Components, g/L

Beef extract	8.0
Beef peptone	5.0
Casein peptone	5.0
Yeast extract	1.0
Soluble starch	1.0
Glucose	1.0

L-Cysteine hydrochloride	0.5
Sodium acetate	0.5
Sodium disulfite	0.5
Ammonium iron(iii) citrate	0.5
Resazurin sodium salt	0.002

Adjusted PH 6.9~7.3 as required

DRCM may be supplemented with polymyxin B for selective applications.

Preparation

Suspend 23 g of the media powder in 1 L of distilled or Milli-Q water.

Heat till boiling with agitation until fully dissolved. Adjust PH to 6.9~7.3 as required.

Mix thoroughly and dispense 7 mL into Hungate tubes or 1/5~1/4 volume of anaerobic culture bottles under an anaerobic gas atmosphere (e.g., N_2-80%/H_2-10%/CO_2-10%, or N_2-100%).

Autoclave at 121 °C for 15 minutes.

For a solid medium, add 15.0g Agar. For a semi-solid medium, add 0.5g Agar to make 1000 mL of media.

Enriched Anaerobe medium (ATCC Medium 2210)

Product Code. **GMNB-ATCC-EAM01**

Vol. **For 5 L**

Form. **Powder + Liquid, up to make 5 L of liquid media.**

Application Enriched Anaerobe Medium (ATCC Medium 2210) serves as a cost-effective substitute for Chopped Meat Broth Medium (ATCC Medium 1490), where Chopped Meat Medium is the preferred formulation for culturing fastidious anaerobic bacterial species.

Enriched Anaerobe medium (ATCC Medium 2210) is suitable for:

- Pre-reduced, anaerobically sterilised (PRAS) media applications
- Cultivation, maintenance, and metabolic profiling of spore-forming and non-spore-forming obligate anaerobes
- Use as a holding medium for anaerobic cultures
- Promoting sporulation and toxin production in *Clostridium* species
- Gas-liquid chromatography (GLC) analysis of bacterial metabolic end products.

Package contains	
Mixture A	300 g
Mixture B	12.8 g
Stock C (0.22μm filter sterilised)	100 ml

Components, per 1000mL

Mixture A	
Casitone	30.0 g
Defatted Beef Heart Extract	20.0 g
Yeast Extract (Premium Grade)	5.0 g
K_2HPO_4	5.0 g
Resazurin	1.0 mg

Mixture B	
$NaHCO_3$	2.0 g
L-Cysteine-HCl	0.5 g

Hemin	5.0 mg

Stock C	
Vitamin K_1 in Ethanol 0.05 mg/mL [1]	20 ml

[1] Optional alternatives: Viscous liquid state of 98% Vitamin K_1 that has a longer shelf life at RT is also available, reagent pre-aliquoted into centrifuge tubes, each containing a sufficient amount to prepare a 20 mL stock solution at a final concentration of 0.05 mg/ml.

Preparation

1. Dissolve 60 g of Mixture A powder in 980 mL of Milli-Q water and mix well
2. Boil the broth in a water bath or microwave for 5 minutes, and then cool the mixture under an anaerobic gas atmosphere (e.g., 80% N_2, 10% H_2, 10% CO_2, or 100% N_2).
3. Add 2.5 g of Mixture B powder and 20 mL of Stock C
4. Adjust the pH to 7.0.
5. Dispense 7 mL into Hungate tubes or 1/5–1/4 volume of anaerobic culture bottles containing meat particles (1 part meat to 4–5 parts fluid) under the same anaerobic gas phase.
6. Autoclave at 121 °C for 30 minutes.

For a solid medium, add 15.0g Agar. For a semi-solid medium, add 0.5g Agar. Dissolve together with Mixture A, to make 1000 mL of medium.

Storage

Mixture A and Mixture B: Store at RT. Shelf life: 3 years.

Stock C: Store in a brown bottle at 2~8 °C, protected from light. Shelf life: 6 months.

Fastidious Anaerobe Agar (FAA, ATCC Medium: 2895)

Product Code.	GMNB-ATCC-FAA01
Vol.	For 7 L
Form.	Powder + Liquid, up to make 7 L of liquid media.
Application	Fastidious Anaerobe Agar (F.A.A.) is a Primary Isolation Medium for clinically significant anaerobes. It is optimised for the cultivation of anaerobic microorganisms and outperforms brain heart infusion agar, Brucella agar, and Wilkins-Chalgren agar, supporting the growth of over 80 fastidious strains with reduced hazing and improved visibility of beta-lactam endpoints, making it ideal for advanced clinical microbiology. Fastidious Anaerobe Agar is suitable for culturing: *Actinomyces, Anaerobes, Bacteroides, Brucella, Clostridium, Eubacterium, Fusobacterium, Haemophilus, Helicobacter, Neisseria, Peptostreptococcus, Porphyromonas, Propionibacterium,* and *Streptococci*.

Package contains	
Mixture A	260 g
Mixture B	10 g
Powder C	10 g
Stock D (0.22μm filter sterilised)	40 ml

Components, per 1000mL

Mixture A	
Tryptone	23 g
Yeast Extract	5 g
Sodium Chloride	5 g
Soluble Starch	1 g

Glucose	1 g
L-Arginine	1 g
Sodium Succinate	0.5 g
Sodium Pyrophosphate	0.25 g
Agar (Optional)	12 g

Mixture B	
$NaHCO_3$	0.4 g
L-Cysteine-HCl	0.5 g
Hemin	10 mg

Powder C	
Sodium Pyruvate	1 g

Stock D	
Vitamin K_1 in Ethanol 0.05 mg/mL [1][2]	5 ml

Optional Stocks	**Total packed**
Horse/Sheep defibrinated whole blood	500 ml
L-Cysteine·HCl solution[2]	100 ml

[1] Optional alternatives:

- Vitamin K_3 Stock
- Viscous liquid state of 98% Vitamin K_1 that has a longer shelf life at RT is also available, reagent pre-aliquoted into centrifuge tubes, each containing a sufficient amount to prepare a 20 mL stock solution at a final concentration of 0.05 mg/ml.

[2] 0.22µm filter sterilised

Preparation

1. Dissolve 36.75 g of Mixture A powder in 950 mL of Milli-Q water.
2. [Optional] If required, supplement with additional yeast extract
3. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
4. Add 0.91 g of Mixture B and 1.00 g of Powder C to the broth. Mix well. Adjust the pH to 7.0–7.4.
5. For a solid medium, add 12~15.0g Agar. For a semi-solid medium, add 0.5g Agar. Adjust the final volume to 1,000 mL with Milli-Q water.
6. [Optional] Vacuum deoxygenate the broth before autoclaving, if desired.
7. Autoclave at 121°C for 15 minutes.
8. Cool the autoclaved FAA medium to 50–55 °C. Under an anaerobic atmosphere (AAE; e.g., N_2 80% / H_2 10% / CO_2 10%, or N_2 100%), aseptically add 5 ml of Vitamin K solution (Stock D) per 1,000 mL of medium (5µL/ml).
9. [Optional] Blood Agar Preparation (if required). For 5–10% blood agar, aseptically add the appropriate volume of sterile defibrinated blood to melted sterile agar medium.
10. Spray anaerobe sample on top of the agar, incubate at 35 ± 2°C under anaerobic atmosphere (AAE) and examine for growth after 48 - 72 hours.
11. Refrigerate (4 °C) the unused sterile medium; the shelf life is no more than 2~3 weeks.

Storage

Mixture A and Mixture B: Store at RT. Shelf life: 3 years.

Powder C and Vitamin K stock: Store at 2~8 °C, protected from light. Shelf life: 6 months.

Fat-Free, Freeze-Dried Beef Granules, for Chopped Meat Broth

Product Code.	GMNB-ATCC-GB01
Vol.	250 g | 500 g of Beef or Beef Heart
Form.	Granules

Application

These fat-free, freeze-dried granules—produced via sodium hydroxide defatting—serve as nutrient-rich substrates for anaerobic cultivation. The inclusion of chopped, defatted beef supports as the proteolytic enzymatic substrate of cultured bacteria, while the sulfhydryl groups in muscle proteins help maintain a highly reduced, oxygen-depleted environment optimal for anaerobic growth.

Beef Heart Granules offer specific advantages over standard beef granules, including:

- Lower residual fat content
- Higher levels of muscle tissue and creatinine
- Milder saponification reaction, less loss of nutrients in the meat
- Enhanced reductive potential, favouring the cultivation of fastidious anaerobic bacterial species

Storage

Unopened granules should be stored in a dry, light-protected environment at -20 °C. If possible, storage at -65 °C is recommended. Under these conditions, the product has a shelf life of 2~3 years.

Once opened, the granules must be immersed in 25mM sodium hydroxide (NaOH) solution and stored at -20 °C. The shelf life under these conditions is 3 months.

Gifu Anaerobic Medium - modified, GAM modified

Product Code.	GMNB-GAM01
Vol.	250 g
Form.	Powder
Application	For anaerobic bacteria culturing.

Components, g/L

Peptone	10
Soy Peptone	3
Yeast extract	5
Beef extract	2.2
Digestive serum powder	13.5
Beef liver powder	1.2
Glucose	3
Potassium phosphate dehydrate	2.5
Sodium chloride	3
Soluble starch	5
L-cysteine	0.3
Sodium thioglycolate	0.3

Final pH 7.3 ± 0.1 at 25°C

Preparation

Weigh 49.0 g of this product, heat and dissolve in 1000 ml of distilled water. Autoclave at 121°C for 15 minutes, cool to about 50°C, add 1 ml of sterile 0.1% vitamin K1 solution and 1 ml of haemoglobin chloride (5mg/ml) to every 1000 ml of medium. Mix well.

Note: Add an appropriate amount of agar to make a semi-solid or solid culture medium.

Helicobacter Pylori Medium | W / WO Defibrinated Blood

Product Code.	GMNB-HPSM01
Vol.	For 5 L
Form.	Powder + Liquid
Application	Helicobacter Pylori Medium is a selective medium for cultivating Helicobacter Pylori.

Package contains	
Mixture A	260 g (make up to 5 L medium)
Stock B	10 ml
Stock C - optional	350 ml
Stock D	350 ml

Components, per 1000mL of Helicobacter Pylori Media

Mixture A	
Casitone	15.0 g
Bovine Brain Extract Powder	2.0 g
Bovine Brain Extract Powder	2.0 g
Glucose	1.0 g
Tryptone	5.0 g
Sodium Chloride	5.0 g
Disodium Phosphate	0.1 g
Agar	15.0 g

Stock B	
Nalidixic Acid	10 mg
Trimethoprim	5 mg
Vancomycin	3 mg
Amphotericin B	2 mg

Stock C (optional) *	
Sheep/Horse Blood, defibrinated	70 ml

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

* Blood products have a maximum shelf life of 35 days， and the Item requires temperature control for storage and delivery with additional fees. It's not eligible for return due to safety and quality concerns. Please consider the requirements before purchasing.

Stock D (Blood alternative)	
Bovine albumin	0.3 g
Bovine serum freeze-dried powder	4.7 g
Hemin	5 mg

Preparation

- Dissolve 52 g of the mixture in 930 mL of MQ water in a closed container. Adjust the pH to 7.2~7.6 using 1M NaOH or 1M HCl.
- Autoclave at 121°C for 15 minutes (Nitrogen blanket autoclave recommended [1] [2]; if the condition does not allow, see [3]).

- Add 2 ml of stock B and 70 ml of Stock D (or stock C if pursuit for better performance) to the 930 ml solution and make up to 1000 ml at 50~55°C. Shake well and pour the agar plate aseptically while the liquid is still hot.
    - [1] **Inert gas blanketing**, also known as nitrogen gas protection, is a safe and reliable method of preserving volatile or oxidatively sensitive substances.
    - [2] **A simple method of inert gas blanketing in the laboratory:**
        - GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket)
        - Squeeze as much air out of the bag as possible, then introduce carbon dioxide or nitrogen into the bag using a flexible tube and seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) when it is inflated to about half its maximum volume.
        - Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.
        - Be aware of the risk of asphyxiation from high concentrations of carbon dioxide or nitrogen and ensure that the operation is carried out in a ventilated room.
    - [3] **If inert gas protection is not intended,**
        - GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket).
        - Squeeze as much air out of the bag as possible, then seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) immediately.
        - Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.

Note.
It is strongly recommended to operate within a clean bench when preparing the solution & agar plate.

Modified Chopped Meat Broth Medium

Product Code.	**GMNB-ATCC-CMB01**
Vol.	**For 5 L**
Form.	**Granules + Powder + Liquid, up to make 5 L of liquid media.**
Application	Modified Chopped Meat Broth Medium (ATCC Medium 1490) is suitable for:

- Pre-reduced, anaerobically sterilised (PRAS) media applications
- Cultivation, maintenance, and metabolic profiling of spore-forming and non-spore-forming obligate anaerobes
- Use as a holding medium for anaerobic cultures
- Promoting sporulation and toxin production in *Clostridium* species
- Gas-liquid chromatography (GLC) analysis of bacterial metabolic end products.

Package contains	
Defatted Ground Beef	500 g
Mixture A	200 g
Mixture B	12.8 g
Stock D (0.22μm filter sterilised)	100 ml

Components, per 1000mL

Defatted Ground Beef (Fat-Free), Freeze-Dried Granules
• Packaged in vacuum-sealed units, 50g each • 100 g of freeze-dried granules is equivalent to 500 g of fresh chopped meat, suitable for preparing 1 L of chopped meat broth • Beef Heart Granules (Refer to GMNB-ATCC-GB01) can be selected in the options

Mixture A	Per 1000 ml
Casitone	30.0 g
Yeast Extract	5.0 g
K_2HPO_4	5.0 g
Resazurin	1.0 mg

Mixture B	Per 1000 ml
$NaHCO_3$	2.0 g
L-Cysteine-HCl	0.5 g
Hemin	5.0 mg

Stock C	Per 1000 ml
Vitamin K_1 in Ethanol 0.05 mg/mL [1]	20 ml

Optional Stocks	Per 1000 ml
Clindamycin Hydrochloride Stock 1 mg/mL [2]	5 ml
Pre-Reduced Mixture [3]	20 g
Defatted Beef Heart Extract [4]	20 g

[1] Optional alternatives:
- Vitamin K_3 Stock
- Viscous liquid state of 98% Vitamin K_1 that has a longer shelf life at RT is also available, reagent pre-aliquoted into centrifuge tubes, each containing a sufficient amount to prepare a 20 mL stock solution at a final concentration of 0.05 mg/ml.

[2] 0.22μm filter sterilised. Adding Clindamycin Hydrochloride Stock will achieve ATCC medium 2124, Modified chopped meat medium with clindamycin. Select the corresponding option to purchase.

[3] Adding 10g/L of Iron Filings, Dextrose 5.0g/L, and Sodium Chloride 5.0g/L will achieve Pre-reduced Chopped Meat medium, used specifically for culturing Clostridium species like Clostridium perfringens (ATCC® 13124) and Bacteroides fragilis (ATCC® 25285); Streptococcus pyogenes (ATCC® 19615). Select the corresponding option to purchase.

[4] Replacing Defatted Ground Beef with Defatted Beef Extract will achieve ATCC medium 2210, Enriched Anaerobe medium.

Preparation

1. Dissolve 100 g defatted ground beef granules and 40 g of Mixture A powder in 980 mL of Milli-Q water and mix well.
2. Boil the broth in a water bath or microwave for 15 minutes, then cool the mixture under an anaerobic gas atmosphere (e.g., N_2 -80% / H_2 -10% / CO_2 -10%, or N_2 -100%).
3. Add 2.5 g of Mixture B powder and 20 mL of Stock C.
4. Adjust the pH to 7.0.
5. Dispense 7 mL into Hungate tubes or 1/5–1/4 volume of anaerobic culture bottles containing meat particles (1 part meat to 4~5 parts fluid) under the same anaerobic gas phase.
6. Autoclave at 121 °C for 30 minutes.

For a solid medium, add 15.0 g of Agar. For a semi-solid medium, add 0.5 g of Agar. Dissolve together with Mixture A to make 1000 mL of media.

Storage

- **Unopened Granules:** Store at –20 °C in a dry, light-protected environment. For extended shelf life, –65 °C is recommended. Shelf life: 2~3 years.
- **Opened Granules:** Immerse in 25 mM NaOH solution and store at –20 °C. Shelf life: 3 months.
- **Stock C:** Store in a brown bottle at 2~8 °C, protected from light. Shelf life: 6 months.

Peptone Yeast Extract Glucose Broth (PYG)

Product Code.	GMNB-PYGB01
Vol.	For 6L
Form.	Powder + Liquid, to make 6 L of liquid media.
Application	Peptone Yeast Glucose (PYG) Broth is a pre-reduced, anaerobically sterilised (PRAS) medium designed for the maintenance, enumeration, and physiological studies of anaerobic bacteria. Enriched and nonselective, it is supplemented with hemin and vitamin K to support fastidious anaerobes such as *Prevotella* spp., *Porphyromonas* spp., and the *Bacteroides fragilis* group. By incorporating specific biochemicals, PYG Broth can be used to assess utilisation, stimulation, or inhibition of target metabolic pathways.

Package contains	
Mixture A	245 g
Mixture B	6 g
Stock C (0.22μm filter sterilised)	120 ml

Components, per 1000mL

Mixture A	**Per 1000 ml**
Casitone	20.0 g
Yeast Extract	10.0 g
Glucose	10.0 g
$MgSO_4$	0.008 g
$CaCl_2$	0.008 g
K_2HPO_4	0.04 g
KH_2PO_4	0.04 g
NaCl	0.08 g

Mixture B	**Per 1000 ml**
$NaHCO_3$	0.4 g
L-Cysteine-HCl	0.5 g
Hemin	0.5 mg

Stock C	**Per 1000 ml**
Vitamin K_1 in Ethanol 0.05 mg/mL	20 ml

Final pH 7.0±0.2 at 25°C

Optional supplements	**Per 1000 ml**
Bile oxgall	20.0 g
Arginine	10.0 g
Sodium formate	3.0 g
Fumaric acid	3.0 g
Tween 80	1.0 ml

Preparation

1. Dissolve 40.1 g of Bottle A powder in 980 mL of Milli-Q water and mix well
2. Boil the broth in a water bath or microwave for 15 minutes, and then cool the mixture under an anaerobic gas atmosphere (e.g., 80% N_2, 10% H_2, 10% CO_2, or 100% N_2).

3. Add 0.95 g of Bottle B powder and 20 mL of Stock C
4. Adjust the pH to 7.0.
5. Dispense 7 mL into Hungate tubes or 1/5–1/4 volume of anaerobic culture bottles containing meat particles (1 part meat to 4–5 parts fluid) under the same anaerobic gas phase.
6. Autoclave at 121 °C for 30 minutes.

For a solid medium, add 15.0 g of Agar. For a semi-solid medium, add 0.5 g of Agar. Dissolve together with Mixture A to make 1000 mL of media.

Storage and Handling

Store the dry powder in a cool, dry place. Once reconstituted, maintain anaerobic conditions throughout use. Ensure solutions of vitamin K are filter-sterilised and protected from light.

Reinforced Clostridial Medium (RCM)

Product Code. GMNB-RCM01

Vol. 250 g, 500 g

Form. Powder

Description

Reinforced Clostridial Medium (RCM) is a non-selective, nutrient-rich medium formulated for the cultivation and enumeration of *Clostridium* spp. and other obligate anaerobes. It is widely used in food and clinical microbiology, as well as in the microbiological examination of non-sterile products in accordance with the US and European Pharmacopoeia.

For the selective cultivation of *Clostridia*, the Differential Reinforced Clostridial Broth (DRCM) is recommended.

Application

Enumeration & Cultivation: For isolating and quantifying anaerobes from food, clinical, and environmental samples.

Food Microbiology: Detection of *Clostridium* spp. in dairy, canned, and processed foods.

Clinical Diagnostics: Isolation of anaerobes from clinical specimens.

Pharmacopoeial Testing: Compliant with USP and EP standards for non-sterile product testing.

Components, g/L

Yeast extract	13.0
Tryptone	10.0
Soluble starch	1.0
Glucose	5.0
L-Cysteine hydrochloride	0.5
Sodium chloride	5.0
Sodium acetate	3.0

RCM may be supplemented with polymyxin B for selective applications.

Preparation

Suspend 37.5 g of the media powder in 1 L of distilled or Milli-Q water.

Heat till boiling with agitation until fully dissolved. Adjust PH to 6.6~7.0 as required.

Mix thoroughly and dispense 7 mL into Hungate tubes or 1/5~1/4 volume of anaerobic culture bottles under an anaerobic gas atmosphere (e.g., N_2-80%/H_2-10%/CO_2-10%, or N_2-100%).

Autoclave at 121 °C for 15 minutes.

For a solid medium, add 15.0g Agar. For a semi-solid medium, add 0.5g Agar to make 1000 mL of media.

YCFA (Yeast Casitone Fatty Acids Broth) without Vitamins & Fatty Acids

Product Code.	GMNB-YCFA01
Vol.	250 g
Form.	Powder
Application	For microbiological culture. YCFA Medium is an enriched nonselective medium for the cultivation of most anaerobic bacteria and other fastidious microorganisms.

Components, g/L

Casein peptone	10
Yeast extract	2.5
Resazurin	0.001
Dipotassium hydrogen phosphate	0.45
Potassium dihydrogen phosphate	0.45
Sodium chloride	0.9
Sodium bicarbonate	4
Magnesium sulphate	0.044
Calcium chloride	0.09

Preparation

Weigh 18.44 g of this product, heat and dissolve in 1000 mL of distilled water, and autoclave at 121°C for 15 minutes.

Note

1. It's a common option to add an appropriate amount of sugar (glucose, maltose and cellobiose, each with a final concentration of 2.0 g/L; or only glucose with a final concentration of 5.0 g/L), amino acid (L-cysteine HCl 1.0g/L), vitamins and volatile fatty acids according to the use.
2. Add an appropriate amount of agar (1~2% w/w) to prepare a semi-solid or solid culture medium.

YCFA Medium - Modified

Product Code.	GMNB-YCFA02
Vol.	13 L
Form.	Powder + Liquid, up to make 13 L of liquid media.
Application	For microbiological culture. YCFA (Modified) Medium is an enriched nonselective medium for cultivating most anaerobic bacteria and other fastidious microorganisms. It can be used for microbial culturomics & mimicking the gut environment to obtain gut microbiota isolates, specifically anaerobic strains (reference materials).

Package contains	
Mixture A	255 g (make up to 13 L medium)
Mixture B	65 g
Stock C | Volatile fatty acids	40 ml
Stock D | Vitamin solution (0.22μm filter sterilised)	200 ml

Components, per 1000mL of YCFA Modified Media

Mixture A	
Casitone	10 g
Yeast extract	2.5 g
Glucose	5 g

$MgSO_4 \cdot 7H_2O$	45 mg
$CaCl_2 \cdot 2H_2O$	90 mg
K_2HPO_4	0.45 g
KH_2PO_4	0.45 g
NaCl	0.9 g
Resazurin	1 mg

Mixture B	
$NaHCO_3$	4 g
L-Cysteine-HCl	1 g
Hemin	10 mg

Stock C | Volatile fatty acids	
Acetic acid	1.9 ml
Propionic acid	0.7 ml
iso-Butyric acid	90 µl
n-Valeric acid	100 µl
iso-Valeric acid	100 µl

Stock D | Vitamin solution - mg/1000ml	
Biotin	2 mg
Folic acid	2 mg
Pyridoxine-HCl	10 mg
Thiamine-HCl	5 mg
Riboflavin	5 mg
Nicotinic acid	5 mg
D-Ca-pantothenate	5 mg
Vitamin B12	0.1 mg
p-Aminobenzoic acid	5 mg
Lipoic acid	5 mg

Preparation

It is strongly recommended to operate within a fume cupboard when preparing the solution.

- Dissolve 19.44 g of mixture A and 2.9 mL of stock C in 900 mL of MQ water.
- Boil the prepared 900ml stock for 10 minutes, then cool to room temperature (it is recommended to work under nitrogen [1][3] or carbon dioxide blanket [2][3]; if the condition does not allow, see [4]).
- Add 5 g of mixture B into the 900 ml of prepared stock, make it 1000 ml with MQ water, and adjust pH to 6.7 ~ 6.8 with 1M KOH or 1M HCl.
- Transfer the 1000 ml stock to 10 ml Hungate tubes and autoclave at 121°C for 15 minutes (Nitrogen blanket autoclave recommended [1][3]; if the condition does not allow, see [4]).
- Aseptically add 100 µl of vitamin stock D solution per Hungate tube before use (operate on a clean bench).

[1] **Inert gas blanketing**, also known as nitrogen gas protection, is a safe and reliable method of preserving volatile or oxidatively sensitive substances.

[2] **Carbon dioxide blanketing** can be easily achieved by placing a small amount of dry ice in a small beaker and evaporating at RT in a sealed container.

[3] **A simple method of inert gas blanketing in the laboratory:**

- GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket)

- Squeeze as much air out of the bag as possible, then introduce carbon dioxide or nitrogen into the bag using a flexible tube and seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) when it is inflated to about half its maximum volume.
- Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.
- Be aware of the risk of asphyxiation from high concentrations of carbon dioxide or nitrogen and ensure that the operation is carried out in a ventilated room.

[4] If inert gas protection is not intended,

- GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket).
- Squeeze as much air out of the bag as possible, then seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) immediately.
- Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.

Note.

An appropriate amount of agar (1~2% w/w) may also be added to produce a semi-solid or solid culture medium.

YCFA Medium - Full Recipe

Product Code.	GMNB-YCFA03
Vol.	13 L
Form.	Powder + Liquid, up to make 13 L of liquid media.
Application	For microbiological culture. YCFA (Modified) Medium is an enriched nonselective medium for cultivating most anaerobic bacteria and other fastidious microorganisms. It can be used for microbial culturomics & mimicking the gut environment to obtain gut microbiota isolates, specifically anaerobic strains.

Package contains	
Mixture A	280 g (make up to 13 L medium)
Mixture B	70 g
Stock C | Volatile fatty acids	85 ml
Stock D | Vitamin solution 1 (0.22μm filter sterilised)	20 ml
Stock E | Vitamin solution 2 (0.22μm filter sterilised)	20 ml

Components, per 1000mL of YCFA Medium - Full Recipe contains

Mixture A	
Tryptone	10.0 g
Yeast extract	2.5 g
Glucose	2.0 g
Maltose	2.0 g
Cellobiose	2.0 g
$MgSO_4 \cdot 7H_2O$	0.09 g
$CaCl_2 \cdot 2H_2O$	0.09 g
K_2HPO_4	0.46 g
KH_2PO_4	0.46 g
$(NH_4)_2SO_4$	0.92 g
NaCl	0.92 g
Resazurin	1 mg

Mixture B	
$NaHCO_3$	4 g
L-Cysteine-HCl	1 g
KOH	0.115 g
Hemin	0.041 g

Stock C | Volatile fatty acids	
Acetic acid	4.05 ml
Propionic acid	1.43 ml
iso-Butyric acid	0.24 ml
n-Valeric acid	0.24 ml
iso-Valeric acid	0.24 ml

Stock D | Vitamin solution	
Biotin	5 mg
Folic acid	25 mg
Pyridoxine-HCl	75 mg
Vitamin B12	5 mg
p-Aminobenzoic acid	15 mg

Stock E | Vitamin solution	
Thiamine-HCl	25 mg
Riboflavin	25 mg

Preparation

It is strongly recommended to operate within a fume cupboard when preparing the solution.

- Dissolve 21.44 g of mixture A and 5.16 g of mixture B in 800 mL of MQ water in a closed container. Add 6.2 ml of stock C and 1 ml of stock D to the mixture and make it 1000 ml with MQ water. Seal the container and shake it well. Adjust the pH to 7.4-7.5 using 1M KOH or 1M HCl.
- Autoclave at 121°C for 15 minutes (Nitrogen blanket autoclave recommended [1] [2]; if the condition does not allow, see [3]).
- Aseptically add 1 ml of vitamin stock E solution into 1000 ml autoclaved stock and transfer the stock to 10 ml Hungate tubes before use (operate on a clean bench).
  - [1] **Inert gas blanketing**, also known as nitrogen gas protection, is a safe and reliable method of preserving volatile or oxidatively sensitive substances.
  - [2] **Carbon dioxide blanketing** can be easily achieved by placing a small amount of dry ice in a small beaker and evaporating at RT in a sealed container.
  - [3] **If inert gas protection is not intended,**
    - GL45-cap reagent bottles or Hungate tubes filled with the liquid to be treated are placed in an airtight PP autoclave bag - provided in the pack (the bag is best placed on top of a stainless steel tray or in a steel mesh basket).
    - Squeeze as much air out of the bag as possible, then seal the bag (by tying a knot at the neck of the bag or using a heat-resistant rubber band - provided in the pack) immediately.
    - Place the tray in a microwave oven to boil the liquid or in an autoclave chamber to sterilise.

Note.

An appropriate amount of agar (1~2% w/w) may also be added to make a semi-solid or solid culture medium.

I.I.IV. Mycoplasma Culture Media

Mycoplasma Growth Supplement 10x stock

Product Code.	GMNB-MGS1001
Vol.	250 mL
Form.	Liquid
Application	Mycoplasma Growth Supplement is used in broth and agar media to culture mycoplasma species. The 10x solution is an ingredient in ATCC Medium 988 (Spiroplasma SP-4 Medium). It can also work with PPLO Broth for general Mycoplasma culturing. Used for: Enrichment and isolation of Mycoplasma spp. in broth and agar media; Formulation ingredients for ATCC Medium 988 (Spiroplasma SP-4); Compatible with PPLO Broth for general mycoplasma culture.

Components, per 1000mL of 10x solution

Amino Acids	
L-Alanine	0.025 g
L-Arginine	0.0579 g
L-Aspartic acid	0.03 g
L-Cysteine-HCl	0.26 g
L-Cystine	0.02 g
L-Glutamic acid	0.075 g
L-Glutamine	0.1 g
Glycine	0.05 g
L-Histidine	0.02 g
Trans-4-Hydroxy-L-Proline	0.01 g
L-Isoleucine	0.02 g
L-Leucine	0.06 g
L-Lysine	0.07 g
L-Methionine	0.015 g
L-Phenylalanine	0.025 g
L-Proline	0.04 g
L-Serine	0.025 g
L-Threonine	0.03 g
L-Tryptophan	0.01 g
L-Tyrosine	0.04 g

Vitamins and Cofactors	
L-Ascorbic acid	50 mg
p-Aminobenzoic acid (PABA)	0.05 mg
D-Biotin	0.01 mg
Choline chloride	0.5 mg
Coenzyme A · Na	2.5 mg
Cocarboxylase (thiamine pyrophosphate)	0.1 mg
Flavin adenine dinucleotide · 2Na	0.106 mg
Folic acid	0.01 mg
Niacinamide	0.025 mg
Nicotinic acid	0.025 mg
D-Pantothenic acid (hemicalcium)	0.01 mg
Pyridoxal-HCl	0.025 mg

Pyridoxine-HCl	0.025 mg
Riboflavin	0.01 mg
Thiamine-HCl	0.01 mg

Nucleosides	
2'-Deoxyadenosine	0.01 g
2'-Deoxyguanosine	0.01 g
2'-Deoxycytidine-HCl	0.0116 g
Thymidine	0.01 g
Uridine-5'-Triphosphate · Na	0.001 g
5-Methyldeoxycytidine	0.0001 g

Salts and Carbon Sources	
$CaCl_2$	0.2 g
$MgSO_4$	0.0977 g
KCl	0.4 g
CH_3COONa	0.05 g
NaCl	6.8 g
NaH_2PO_4	0.122 g
Glucose	1.0 g

Other Components	
Glutathione	10 mg
D-Glucuronic acid · Na	3.88 mg
Cholesterol	0.2 mg
Tween 80	5 mg
Phenol red · Na	21.24 mg

Storage.

Aliquot unused portions into sterile tubes.

Store at 4 °C. Use within recommended shelf-life to maintain sterility and activity.

I.II. Plant Culture Media

1/2 Murashige and Skoog Medium with Agar and Sucrose

Product Code.	GMNB-MSM120
Vol.	250 g
Form.	Powder

Product Description.

1/2 Murashige and Skoog medium (1/2 MS or Half-strength MS Basal media) is a plant growth medium used for plant cell culture.

The 1/2 MS medium has macroelements at half strength, but microelements and vitamins at full strength, as described by MURASHIGE & SKOOG (1962).

This modification is often used for the cultivation of plant species that are sensitive to high salt concentrations, and is commonly used for plant cuttings and rooting.

Application.

The principal component of in vitro plant cultivation.

Plant tissue culture media, like calli induction, shoot regeneration, and root formation.

For the germination of seeds of different plant species, like Arabidopsis thaliana, Nicotiana benthamiana, under sterile growth conditions.

Components, mg per litre

Micro Elements	
KI	0.83
H_3BO_3	6.2
$MnSO_4.H_2O$	22.3
$ZnSO_4.7H_2O$	8.6
$Na_2MoO_4.2H_2O$	0.25
$CoCl_2.6H_2O$	0.025
$CuSO_4.5H_2O$	0.025
EDTA. 2Na	37.3
$FeSO_4$	27.8

Macro Elements	
KNO_3	950
NH_4NO_3	825
KH_2PO_4	85
$MgSO_4.7H_2O$	185
$CaCl_2.2H_2O$	220

Vitamins	
Inositol	100.0
Glycine	2.0
Thiamine HCl	0.1
Pyridoxine HCl	0.5
Nicotinic acid	0.5

Sucrose & Agar	
Sucrose	30000
Agar	7000

Above is the universal formula. Adjust Ingredients according to any specific protocols if needed.

Preparation

Suspend 39.47 g of the medium in distilled water. Mix well and make it 1000ml. Heat with continuous stirring, and aliquot into tubes or flasks. Autoclave at 115°C for 30 minutes (the media with Sucrose may turn dark at over 115°C).

Note: Avoid naked flames during preparation.

Storage

The media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant.

1/2 Murashige and Skoog Medium without Agar and Sucrose

Product Code.	GMNB-MSM120-1
Vol.	250 g
Form.	Powder

Product Description.

1/2 Murashige and Skoog medium (1/2 MS or Half-strength MS Basal media) is a plant growth medium used for plant cell culture.

The 1/2 MS medium has macroelements at half strength, but microelements and vitamins at full strength, as described by MURASHIGE & SKOOG (1962).

This modification is often used for the cultivation of plant species that are sensitive to high salt concentrations, and is commonly used for plant cuttings and rooting.

Application.

The principal component of in vitro plant cultivation.

Plant tissue culture media, like calli induction, shoot regeneration, and root formation.

For the germination of seeds of different plant species, like Arabidopsis thaliana, Nicotiana benthamiana, under sterile growth conditions.

Components, mg per litre

Micro Elements	
KI	0.83
H_3BO_3	6.2
$MnSO_4.H_2O$	22.3
$ZnSO_4.7H_2O$	8.6
$Na_2MoO_4.2H_2O$	0.25
$CoCl_2.6H_2O$	0.025
$CuSO_4.5H_2O$	0.025
EDTA. 2Na	37.3
$FeSO_4$	27.8

Macro Elements	
KNO_3	950
NH_4NO_3	825
KH_2PO_4	85
$MgSO_4.7H_2O$	185
$CaCl_2.2H_2O$	220

Vitamins	
Inositol	100.0

Glycine	2.0
Thiamine HCl	0.1
Pyridoxine HCl	0.5
Nicotinic acid	0.5

Above is the universal formula. Adjust Ingredients according to any specific protocols if needed.

Preparation

Suspend 2.47 g of the medium in distilled water. Mix well and make it 1000ml. Heat with continuous stirring, and aliquot into tubes or flasks. Autoclave at 121°C for 15 minutes.

Note: During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances vigorously.

Storage

The media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant.

Chu N6 medium | W / WO Vitamins

Product Code.	**GMNB-CN6M01**
Vol.	**50L, 100L**
Form.	**Powder, up to make 50L / 100L liquid media.**
Type.	**With Vitamins, Without Vitamins**
Application	For plant cell culture, defined to improve the formation, growth and differentiation of pollen callus in rice & cereal crops.

Components, mg per litre

Micro Elements	
FeNaEDTA	36.7
H_3BO_3	1.6
KI	0.8
$MnSO_4.H_2O$	3.33
$ZnSO_3.7H_2O$	1.5

Macro Elements	
$CaCl_2$	125.33
KH_2PO_4	400
KNO_3	2830
$MgSO_4$	90.27
$(NH_4)_2SO_4$	463

Vitamins*	
Glycine	2
Thiamine HCl	1
Pyridoxine HCl	0.5
Nicotinic acid	0.5

Total concentration Micro and Macro elements including -vitamins: 3956.53 mg/l

Sucrose & Agar (optional)**	
Sucrose	20000
Agar	A.C.D.

* Select before purchase.

** To request a quote and order a customised version, please contact support@gmexpression.com

Preparation

Suspend 3.95 g of the Chu N6 medium W/O Vitamins (3.95~3.96g Chu N6 medium With Vitamins) into distilled water [1]. Mix well and make it 1000ml. Heat with continuous stirring. Adjust the medium to the desired pH using 1M HCl/NaOH and aliquot into tubes or flasks. Autoclave at 121°C for 15 minutes (the media with Sucrose should be autoclaved at 115°C for 20 minutes or may turn dark at over 115°C).

[1] During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances such as sucrose in powder form (they must be dissolved in liquid in sequence when preparing).

Storage

Media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant and refrigerated at 2~8 °C.

Gamborg B5 medium | W / WO Vitamins

Product Code.	GMNB-GB5M01
Vol.	50L, 100L
Form.	Powder, up to make 50L / 100L liquid media.
Type.	With Vitamins, Without Vitamins
Application	For plant cell culture and micropropagation.

Components, mg per litre

Micro Elements	
$CoCl_2.6H_2O$	0.1
$CuSO_4.5H_2O$	0.2
FeNaEDTA	19.8
H_3BO_3	5.0
KI	1.0
$MnSO_4.H_2O$	10.0
$Na_2MoO_4.2H_2O$	0.1
$ZnSO_4.7H_2O$	1.0

Macro Elements	
$CaCl_2$	113.23
KNO_3	2500.00
$MgSO_4$	121.56
NaH_2PO_4	130.44
$(NH_4)_2SO_4$	134.0

Vitamins*	
Myo-inositol	1000.0
Nicotinic acid	1.0
Pyridoxine HCl	1.0
Thiamine HCl	10.0

The total concentration of Micro and Macro elements, including vitamins: 3150mg/l

Auxins (Optional)**	
2,4-D	0.5

Sucrose & Agar (Optional)**	
Sucrose	20000
Agar	A.C.D.

* Select before purchase.

** To request a quote and order a customised version, please contact support@gmexpression.com

Preparation

Suspend 3.04 g of the Gamborg B5 medium WO Vitamins (3.15g Gamborg B5 medium with Vitamins) in distilled water [1]. Mix well and make it 1000ml. Heat with continuous stirring. Adjust the medium to the desired pH using 1M HCl/NaOH and aliquot into tubes or flasks. Autoclave at 121°C for 15 minutes (media with Sucrose should be autoclaved at 115°C for 20 minutes or may turn dark at over 115°C).

[1] During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances such as sucrose in powder form (they must be dissolved in liquid in sequence when preparing).

Storage

Media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant and refrigerated at 2~8 °C.

Hoagland's Complete Nutrient Solution

Product Code.	GMNB-HS01
Vol.	100L
Form.	Powder, up to make 100L liquid media.
Type.	Solution 1, Solution 2
Application	For plant cell culture and micropropagation.

Components, mg per litre

Hoagland Solution 1

Micro Elements	
H_3BO_3	2.86
$MnCl_2.4H_2O$	1.81
$ZnSO_4.7H_2O$	0.22
$CuSO_4.5H_2O$	0.08
$Na_2MoO_4.2H_2O$	0.12

Macro Elements	
KNO_3	505
$Ca(NO_3)_2.4H_2O$	1180
$MgSO_4.7H_2O$	493
KH_2PO_4	136

Iron	
NaFeEDTA	20
Ferrous Sulfate.$7H_2O$	2.5

Hoagland Solution 2

Micro Elements	
H_3BO_3	2.86
$MnCl_2 \cdot 4H_2O$	1.81
$ZnSO_4 \cdot 7H_2O$	0.22
$CuSO_4 \cdot 5H_2O$	0.08
$H_2MoO_4 \cdot H_2O$	0.02

Macro Elements	
KNO_3	606
$Ca(NO_3)_2 \cdot 4H_2O$	944
$MgSO_4 \cdot 7H_2O$	493
$NH_4H_2PO_4$	115

Iron	
NaFeEDTA	20
Ferrous Sulfate.$7H_2O$	2.5

Preparation

Suspend 2.31 g of the Hoagland Solution 1 (2.19g Hoagland Solution 2) into distilled water [1]. Mix well and make it 1000ml. Heat with continuous stirring. Adjust the medium to the desired pH using 1M HCl/NaOH and aliquot into tubes or flasks. Autoclave at 121°C for 15 minutes.

[1] During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances such as sucrose in powder form.

Storage

Media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant and refrigerated at 2~8 °C.

Knudson C Orchid Medium Basal Salt | WO Vitamins & Sucrose

Product Code. GMNB-KNDC-S01

Vol. 100L

Form. Powder, up to make 100L of liquid media.

Type. Without Vitamins

Application For plant cell culture and micropropagation.

Description.

Knudson C Orchid Medium consists of the macroelements and microelements as described by Knudson (1946). The medium was originally developed for the in vitro germination of Cymbidium orchid seeds, but can also be used for other orchid species.

It is a low-salt formulation of the inorganic salts and carbohydrate. Ammonium sulphate and calcium nitrate serve as sources of nitrogen and stimulate seed germination and differentiation. Microelements like Manganese, Molybdenum, Copper, Iron and Zinc enhance metabolism and help in germination. Boron plays a key role in carbohydrate metabolism.

Components, mg per litre

Micro Elements	
$Fe_2EDTA \cdot 3H_2O$	42.11
$MnSO_4 \cdot H_2O$	5.68
H_3BO_3	0.06
$CuSO_4$	0.04

$Na_2MoO_4.2H_2O$	0.34
$ZnSO_4.H_2O$	0.218

Macro Elements	
$(NH_4)NO_3$	500.00
$Ca(NO_3)_2. 4H_2O$	694.80
$MgSO_4$	122.09
KH_2PO_4	250.00

Vitamins (optional)

Auxins (optional)

Sucrose & Agar (optional)	
Sucrose (as carbohydrate)	20000
Agar	A.C.D.
Charcoal	(suggest 2,000) A.C.D.
Banana powder	(suggest 25,000) (100,000 for fresh banana) A.C.D.

Preparation

Suspend 1.62 g of the Knudson C Orchid Medium Basal Salt into distilled water[1]. Mix well and make it 1000ml. Heat with continuous stirring. Adjust the medium to the desired pH using 1M HCl/NaOH and aliquot into tubes or flasks. Autoclave at 121°C.

[1] During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances such as sucrose in powder.

Storage

Media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant and refrigerated at 2~8 °C.

Knudson C Orchid Medium with morel modification | WO Vitamins & Sucrose

Product Code.	**GMNB-KNDC-M01**
Vol.	**100L**
Form.	**Powder, up to make 100L liquid media.**
Type.	**Without Vitamins and Sucrose**
Application	For plant cell culture and micropropagation.

Description.

Knudson C Orchid Medium with morel modification consists of the macroelements and microelements as described by Knudson (1946) and Morel (1965). The medium was originally developed for the in vitro germination of Cymbidium orchid seeds, but can also be used for other orchid species.

Components, mg per litre

Micro Elements	
$FeSO_4.7H_2O$	25.00
$MnSO_4.H_2O$	5.68

Macro Elements	
$Ca(NO_3)_2$	241.30
KCl	250.00
KH_2PO_4	250.00
$MgSO_4$	122.15
NH_4NO_3	500.00
$(NH_4)_2SO_4$	500.00

The total concentration of Micro and Macro elements, including vitamins: 1894 mg/l

Vitamins (optional)

Auxins (optional)

Sucrose & Agar (optional)	
Sucrose (as carbohydrate)	20000
Agar	A.C.D.
Charcoal	(suggest 2,000) A.C.D.
Banana powder	(suggest 25,000) (100,000 for fresh banana) A.C.D.

Preparation

Suspend 1.89 g of the Knudson C Orchid Medium in distilled water [1]. Mix well and make it 1000ml. Heat with continuous stirring. Adjust the medium to the desired pH using 1M HCl/NaOH and aliquot into tubes or flasks. Autoclave at 121°C. (The Knudson C Orchid Medium with Sucrose should be autoclaved at 115°C for 20 minutes, or may turn dark at over 115°C).

[1] During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances such as sucrose in powder.

Storage

Media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant and refrigerated at 2~8 °C.

Murashige and Skoog Medium with Agar and Sucrose

Product Code.	GMNB-MSM125
Vol.	250 g
Form.	Powder

Application.

Murashige and Skoog medium (MS or MSO/MS0 (MS-zero)) is a plant growth medium used in the laboratory for culturing plant cells.

The principal component of in vitro plant cultivation.

Plant tissue culture media, like calli induction, shoot regeneration, and root formation.

For the germination of seeds of different plant species, like Arabidopsis thaliana, Nicotiana benthamiana, under sterile growth conditions.

Components, per litre

Potassium nitrate	1.9 g
Ammonium nitrate	1.65 g
Potassium dihydrogen phosphate	170 mg
Magnesium sulphate	370 mg
Calcium chloride	440 mg

Potassium iodide	0.83 mg
Boric acid	6.2 mg
Manganese sulphate	22.30 mg
Zinc sulphate	8.6 mg
Sodium molybdite	0.25 mg
Copper sulphate	0.025 mg
Cobalt chloride hexahydrate	0.025 mg
Ethylenediamine tetraacetic acid disodium	37.3 mg
Ferrous sulphate	27.8 mg
Inositol	100 mg
Glycine	2 mg
Thiamine hydrochloride	0.1 mg
Pyridine Hydrochloride	0.5 mg
Nicotinic acid	0.5 mg
Sucrose	30 g
Agar	7 g

Final pH 5.7±0.1 at 25°C

Preparation

Suspend 41.74 g of the medium in distilled water. Mix well and make it 1000ml. Heat with continuous stirring, and aliquot into tubes or flasks. Autoclave at 115°C for 30 minutes (the media may turn dark at over 115°C).

Note: Avoid naked flames during preparation.

Murashige and Skoog Media without Agar and Sucrose

Product Code. **GMNB-MSM125-1**
Vol. **250 g, up to make 50L liquid media.**
Form. **Powder**

Application.

Murashige and Skoog medium (MS or MSO/MS0 (MS-zero)) is a plant growth medium used in the laboratory for the cultivation of plant cell culture.

The principal component of in vitro plant cultivation.

Plant tissue culture media, like calli induction, shoot regeneration, and root formation.

For the germination of seeds of different plant species, like Arabidopsis thaliana, Nicotiana benthamiana, under sterile growth conditions.

Components, per litre

Potassium nitrate	1.9 g
Ammonium nitrate	1.65 g
Potassium dihydrogen phosphate	170 mg
Magnesium sulphate	370 mg
Calcium chloride	440 mg
Potassium iodide	0.83 mg
Boric acid	6.2 mg
Manganese sulphate	22.30 mg
Zinc sulphate	8.6 mg

Sodium molybdite	0.25 mg
Copper sulphate	0.025 mg
Cobalt chloride hexahydrate	0.025 mg
Ethylenediamine tetraacetic acid disodium	37.3 mg
Ferrous sulphate	27.8 mg
Inositol	100 mg
Glycine	2 mg
Thiamine hydrochloride	0.1 mg
Pyridine Hydrochloride	0.5 mg
Nicotinic acid	0.5 mg

Preparation

Suspend 4.74 g of the medium in distilled water. Mix well and make it 1000ml. Heat with continuous stirring, and aliquot into tubes or flasks. Autoclave at 115°C for 30 minutes.

Note:

- The original pH is 3.51. Adjust pH as necessary to meet performance criteria.
- There are traces of insolubles at room temperature.
- Avoid naked flames during preparation

Schenk and Hildebrandt Medium | W / WO Vitamins

Product Code. GMNB-SH01
Vol. 50L, 100L
Form. Powder, up to make 50L / 100L liquid media.
Type. With Vitamins, Without Vitamins
Application For plant cell culture and micropropagation.

Components, mg per litre

Micro Elements	
$CoCl_2.6H_2O$	0.1
$CuSO_4.5H_2O$	0.2
FeNaEDTA	19.8
H_3BO_3	5.0
KI	1.0
$MnSO_4.H_2O$	10.0
$Na_2MoO_4.2H_2O$	0.1
$ZnSO_4.7H_2O$	1.0

Macro Elements	
$CaCl_2$	151.0
KNO_3	2500.0
$MgSO_4$	195.05
$(NH_4)H_2PO_4$	300.0

Vitamins*	
Myo-inositol	1000.0
Nicotinic acid	5.0
Pyridoxine HCl	0.5

Thiamine HCl	5.0

The total concentration of Micro and Macro elements, including vitamins: 4193.75 mg/l

Auxins (Optional)**	
2,4-D (For monocotyledonous cell)	0.5
4 - CPA (For monocotyledonous cell)	2.0
Cytokin (For dicotyledonous cell)	0.1
Kinetin (For dicotyledonous cell)	0.1

Sucrose & Agar (Optional)**	
Sucrose	20000
Agar	(As Customer Demands) A.C.D.
Element deletion	A.C.D.

* Select before purchase.

** To request a quote and order a customised version, please contact support@gmexpression.com

Preparation

Suspend 3.18 g of the S&H medium WO Vitamins (4.19g S&H medium with Vitamins) in distilled water ^. Mix well and make it 1000ml. Heat with continuous stirring. Adjust the medium to the desired pH using 1M HCl/NaOH and aliquot into tubes or flasks. Autoclave at 121°C for 15 minutes (the media with Sucrose should be autoclaved at 115°C for 20 minutes or may turn dark at over 115°C).

[1] During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances vigorously.

Storage

Media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant and refrigerated at 2~8 °C.

Woody Plant Medium with Agar and Sucrose

Product Code.	GMNB-WPM01
Vol.	250 g
Form.	Powder

Product Description.

Lloyd and McCown formulated Woody Plant Medium in 1981 for culturing Mountain Laurel (Kalmia latifolia) shoot tips.

Woody Plant Medium (WPM) contains all the necessary macro and microelements. Potassium dihydrogen phosphate is used as a phosphate source, while calcium is also present. Nitrate provides nitrogen to the plant. Microelements such as Boron, Manganese, Iron, Molybdenum, and Zinc play a vital role in plant metabolism. Boron plays a key role in carbohydrate metabolism. Thiamine, pyridoxine, and nicotinic acid act as enzymatic cofactors in universal metabolism. Plants have pathways for glycolysis and the TCA cycle, which are involved in primary and secondary metabolism. Glycine is used as an amino acid source.

Application.

The WPM is commonly used to propagate various woody plant species.

Plant tissue culture media for shoot regeneration and root formation.

Components, mg per litre

Micro Elements	
H_3BO_3	6.2

$MnSO_4.H_2O$	22.3
$ZnSO_4.7H_2O$	8.6
$Na_2MoO_4.2H_2O$	0.25
$CuSO_4.5H_2O$	0.25
EDTA. 2Na	37.3
$FeSO_4$	27.8

Macro Elements	
KNO_3	990
NH_4NO_3	556
$Ca(NO_3)_2.4H_2O$	400
KH_2PO_4	170
$MgSO_4.7H_2O$	370
$CaCl_2.2H_2O$	96

Vitamins	
Myo-inositol	100.0
Glycine	2.0
Thiamine HCl	1.0
Pyridoxine HCl	0.5
Nicotinic acid	0.5

Sucrose & Agar	
Sucrose	20000
Agar	7000

Above is the universal formula. Adjust Ingredients according to any specific protocols if needed.

Preparation

Suspend 29.78 g of the medium in distilled water. Mix well and make it 1000ml. Heat with continuous stirring, and aliquot into tubes or flasks. Autoclave at 115°C for 30 minutes (the media with Sucrose may turn dark at over 115°C).

Note: During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances vigorously.

Storage

The media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant.

Woody Plant Medium without Agar and Sucrose

Product Code. GMNB-WPM02

Vol. 250 g

Form. Powder

Product Description.

Lloyd and McCown formulated Woody Plant Medium in 1981 for culturing Mountain Laurel (Kalmia latifolia) shoot tips.

Woody Plant Medium (WPM) contains all the necessary macro and microelements. Potassium dihydrogen phosphate is used as a phosphate source, while calcium is also present. Nitrate provides nitrogen to the plant. Microelements such as Boron, Manganese, Iron, Molybdenum, and Zinc play a vital role in plant metabolism. Boron plays a key role in carbohydrate metabolism. Thiamine, pyridoxine, and nicotinic acid act as enzymatic cofactors in universal metabolism. Plants have pathways for glycolysis and the TCA cycle, which are involved in primary and secondary metabolism. Glycine is used as an amino acid source.

Application.

The WPM is commonly used to propagate various woody plant species.

Plant tissue culture media for shoot regeneration and root formation.

Components, mg per litre

Micro Elements	
H_3BO_3	6.2
$MnSO_4.H_2O$	22.3
$ZnSO_4.7H_2O$	8.6
$Na_2MoO_4.2H_2O$	0.25
$CuSO_4.5H_2O$	0.25
EDTA. 2Na	37.3
$FeSO_4$	27.8

Macro Elements	
KNO_3	990
NH_4NO_3	556
$Ca(NO_3)_2.4H_2O$	400
KH_2PO_4	170
$MgSO_4.7H_2O$	370
$CaCl_2.2H_2O$	96

Vitamins	
Myo-inositol	100.0
Glycine	2.0
Thiamine HCl	1.0
Pyridoxine HCl	0.5
Nicotinic acid	0.5

Above is the universal formula. Adjust Ingredients according to any specific protocols if needed.

Preparation

Suspend 2.78 g of the medium in distilled water. Mix well and make it 1000ml. Heat with continuous stirring, and aliquot into tubes or flasks. Autoclave at 121°C for 15 minutes.

Note: During preparation, avoid naked flames and do not mix the basal salt mixture with reducing substances vigorously.

Storage

The media powder is extremely hygroscopic and should be protected from atmospheric moisture. If possible, the unused powder should be stored in a sealed box with silica desiccant.

I.III. Insect Media

Drosophila medium, Fruit fly feed

Product Code.	GMNB-DMFF01
Vol.	250 g
Form.	Powder. Liquid.

Application

For routine breeding of Drosophila (Fruit fly) in the laboratory.

Components, per 1000mL of Drosophila Media

Mixture A	
Sucrose	81.5 g
Yeast extract	9.2 g
Sodium benzoate	1.3 g
Corn flour	108.5 g
Agar	8.2 g

Stock B | Vitamin solution - mg/1000ml	
Propionic acid	0.65 ml

Preparation

Dissolve 20.87 g of Mixture A in 100 ml of preheated MQ or distilled water and bring to a boil in a closed container. Cool the liquid to 65-70°C, add 0.65 ml of stock solution B, seal the container immediately and shake well. Aliquot the liquid into the incubation bottles while still hot.

Note

It is strongly recommended to operate within a fume cupboard when preparing the solution containing propionic acid.

I.IV. Algology Media

Algae Culture Broth

Product Code.	GMNB-ACB01
Vol.	250 g, 500 g
Form.	Powder
Application	For the cultivation of algae from soil, water and sewage.

Components, mg/L

Ammonium chloride	50
Calcium chloride	58
Dipotassium phosphate	250
Ferric chloride	3
Magnesium sulphate	513
Sodium nitrate	1000
Cobalt chloride	25, as per customer demand

Preparation

Suspend 1.87 g in 1000 mL of distilled water. Boil to dissolve the medium completely. Dispense as desired. Autoclave at 121°C for 15 minutes.

BG-11 medium

See BG-11 Medium.

Bold Modified Freshwater Nutrient Solution (Modified Bold Basal Medium)

Product Code.	GMNB-BMFNS01
Vol.	250 g, 500 g
Form.	Powder, up to make 333L / 666L liquid media.

Application

Modified Bold Basal Medium is an axenic-culture maintenance medium in phycology/algae studies.

Commonly used for the cultivation of a variety of freshwater algae cultures (e.g. Trichosarcina, Chlorococcum, and Chlorella) without the need for soil extract or vitamins (Brown et al., 1964; Nichols and Bold, 1965). Other algae species like Zygnemataceae (Zygogonium ericetorum) can also be grown in Bold's Basal Medium (Stancheva et al., 2014)

Components, mg per litre

Micro Elements	
H_3BO_3	11.42
$ZnSO_4.7H_2O$	8.82
$FeSO_4.7H_2O$	4.98
$Co(NO_3)_2.6H_2O$	0.49
$CuSO_4.5H_2O$	1.57
$MnCl_2.4H_2O$	1.44
$Na_2MoO_4.2H_2O$	1.19

Macro Elements	
$NaNO_3$	250
KH_2PO_4	175

K_2HPO_4	75
$MgSO_4.7H_2O$	75
$CaCl_2.2H_2O$	25
NaCl	25
KOH	31
EDTA.2Na	63.61

Trace Elements	
Nickel chloride. $6H_2O$	0.003
Potassium iodide	0.003
Sodium selenite	0.002
Stannic chloride	0.001
Vanadium sulphate. $3H_2O$	0.0022

Preparation

Suspend 1.0 mL of 0.1% Sulphuric Acid solution in 1000 mL of ion-free water or MQ water along with 0.75 g of Modified Bold Basal Medium.

The final solution pH should be adjusted to 6.6 +/- 0.1 with 5M KOH.

Guillard's (F/2) Marine Enriched Water

Product Code. GMNB-2F01

Vol. 150g, up to make 1500 L of liquid solution

Form. Powder

Application. Commonly used for culturing diatoms and their external frustule (Lund, 1950; Paasche, 1973).

Components, mg/L

Sodium Nitrate	75
Sodium Phosphate, Monobasic	5
Sodium Metasilicate, Anhydrous	12.94
EDTA, disodium salt	4.36
Ferric Chloride, Anhydrous	1.9
Zinc Sulfate·$7H_2O$	0.022
Manganese Chloride·$4H_2O$	0.18
Cobalt Chloride·$6H_2O$	0.01
Cupric Sulfate·$5H_2O$	0.01
Molybdic Acid, disodium salt	0.006
Thiamine HCl	0.1
Vitamin B12	0.0005
Biotin	0.0005

Preparation

Dissolve 0.1 g of the mixture in 990 mL of seawater and adjust the pH to 7.2 +/- 0.1 or the customer's desired range by 5M HCl / 5M KOH. Bring the final volume to 1000 mL with seawater and autoclave at 121°C for 15 minutes.

Shake well to disperse the sodium metasilicate within the medium before use or dispense.

I.V. Gel Material

Agar Powder | Premium (1400 g/cm², white)

Product Code.	GEL-AGAR-P01
CAS No.	9002-18-0
Vol.	250 g
Form.	Powder
Description.	Thoroughly deproteinised, finely purified agar with a very low protein content, a high polysaccharide content and a good consistency of molecular weight.
Application	For the preparation of a wide range of bacterial or plant tissue culture media. Specially designed for high water retention plant media & high elasticity bacterial culture media. Particularly suitable for use in microbiological nutritional control experiments.

Properties

Loss on drying	≤15 %
Residual on ignition	≤5 %
Water-insoluble matter	≤1 %
Starch test	Pass
The density test of microbial colonies	Pass
Water absorption	~75ml/(g dry gel)
Gel strength (2.8-3.5g/L, 20°C)	≥1400 g/cm²
Curing temperature	35 ~ 40 °C
Shelf life	3 years

Caution

Strong acids and prolonged heating may cause the agar molecules to break down into oligosaccharides and lose their physical properties.

Agar Powder | Tissue Culture (1400 g/cm²)

Product Code.	GEL-AGAR-T01
CAS No.	9002-18-0
Vol.	250 g
Form.	Powder
Description.	Bacteriological Grade
Application	For the preparation of a wide range of bacterial or plant tissue culture media.

Properties

Loss on drying	≤12 %
Residual on ignition	≤1.4 %
Water-insoluble matter	≤0.3 %
As	≤0.0005 %
Heavy metals (Pb)	≤0.002 %
Starch test	Pass
The density test of microbial colonies	Pass
Water absorption	~75ml/(g dry gel)
Gel strength (10 g/L, 20°C)	≥1400 g/cm² (1.5% gel)
Curing temperature	35 ~ 40 °C

Shelf life	3 years

Caution

Strong acids and prolonged heating may cause the agar molecules to break down into oligosaccharides and lose their physical properties.

Agar Powder | Super strength (1800 g/cm²)

Product Code. GEL-AGAR-H01
CAS No. 9002-18-0
Vol. 250 g
Form. Powder
Description. Bacteriological Grade
Application For the preparation of a wide range of bacterial or plant tissue culture media.

Properties

Loss on drying	≤12 %
Residual on ignition	≤1.4 %
Water-insoluble matter	≤0.3 %
As	≤0.0005 %
Heavy metals (Pb)	≤0.002 %
Starch test	Pass
The density test of microbial colonies	Pass
Water absorption	~75ml/(g dry gel)
Gel strength (10 g/L, 20°C)	≥1800 g/cm² (1.5% gel)
Curing temperature	35 ~ 40 °C
Shelf life	3 years

Caution

Strong acids and prolonged heating may cause the agar molecules to break down into oligosaccharides and lose their physical properties.

Gellan (Phytagel)

Product Code. GEL-GPG01
CAS No. 71010-52-1
Vol. 250 g, 500 g
Form. Powder
Description. Agar substitute gelling agent for the production of gellan gel, a high-water retention culture medium.
Application For plant tissue and fast-setting setting high elasticity bacterial culture media.

Properties

Loss on drying	≤20 %
Residual on ignition	≤5 %
Starch test	Pass
The density test of microbial colonies	Pass
Gel strength (10 g/L, 20°C)	≥1700 g/cm²
Curing temperature	~ 45 °C
Shelf life	3 years

Preparation

When using the autoclaving method, we recommend autoclaving at 113 °C for 25 minutes.

Caution

Strong acids and prolonged heating may cause the agar molecules to break down into oligosaccharides and lose their physical properties.

Gellan and Pullulan Composite Hydrogel

Product Code.	GEL-GPHG01	
CAS No.	Gellan (low acyl gellan)	CAS: 71010-52-1
	Pullulan	CAS: 9057-02-7
Vol.	250 g, 500 g	
Type.	Pre-mixed (Gellan and Pullulan Molar ratio 1:1), Separate package	
Form.	Powder	
Application	For the preparation of plant tissue high water retention culture media, and quick-setting, high elasticity bacterial culture media.	

Properties

Loss on drying	≤20 %
Residual on ignition	≤5 %
Starch test	Pass
The density test of microbial colonies	Pass
Water absorption	~95ml/(g dry gel)
Gel strength (10 g/L, 20°C)	≥1900 g/cm^2
Curing temperature	35 ~ 45 °C
Shelf life	3 years

Preparation

This product is available in two packaging forms: premixed powder for the preparation of equal proportions of gels (follow 3a as below), and separately packaged for the preparation of customised gels (follow 3b as below)

1. Prepare nutrition media stock solution, like MS or LB, 2~5X Stock suggested.

2. Prepare CaCl2 and NaOH 100X stock separately, sterilise with 0.22um filter.

3a. Dissolve 20~40g (1~2% gel) Pullulan & Gellan per-mix powder in about 400~700ml preheated MQ water (~80°C) while stirring the solution at 600 rpm to obtain a homogeneous solution, sterilise with a 0.22 μm filter[1].

3b. Pullulan & gellan stock solution (4%) was prepared separately by dissolving in lukewarm water (>50°C) and stirring at 600 rpm to ensure a complete solution. Sterilise through a 0.22 μm filter*.

4. Swiftly mix the polysaccharide solution (pre-mix solution or separate stock) with CaCl2 and NaOH 100X stock, make it 1000 ml by adding MQ water or nutrition media Stock to a final concentration of 0.01 mM CaCl2 and 0.01 mM NaOH, resting for 1 to 2 minutes at room temperature until the gel is fully cured.

[1] When using the autoclaving method, we recommend autoclaving at 113 °C for 25 minutes.

Caution

Strong acids and prolonged heating may cause the agar molecules to break down into oligosaccharides and lose their physical properties.

Low / High acyl gellan

Product Code.	Low acyl gellan	GEL-GPG02
	High acyl gellan	GEL-GPG03
	Low + High acyl gellan	GEL-GPG04
CAS No.	71010-52-1	
Vol.	50g, 50g + 50 g	
Form.	Powder	
Purity.	Low acyl gellan	≥ 97 %
	High acyl gellan	≥ 99 %
Application	For the preparation of composite Gellan gel, a premium high water retention culture medium used for plant tissue and fast-setting high elasticity bacterial culture media.	

Properties

Loss on drying	≤20 %
Residual on ignition	≤5 %
Starch test	Pass
The density test of microbial colonies	Pass
Curing temperature	~ 45 °C
Shelf life	3 years

Preparation

When using the autoclaving method, we recommend autoclaving at 113 °C for 25 minutes.

Caution

Strong acids and prolonged heating may cause the agar molecules to break down into oligosaccharides and lose their physical properties.

I.VI. Peptones & Extracts

Banana Extract

Product Code.	**GMNB-BANE**
Vol.	**250 g, 500 g**
Form.	**Powder, light yellow**
Grade.	**Biochemical grade**
Description.	Banana Extract is produced from fresh banana flesh by crushing, pulping, extraction and processing by low-temperature freeze-drying technology. It maintains most of the original vitamins and organic molecules, retaining the fruit's nutrients up to 90%.
Application	Banana extract is commonly used as a supplement to plant growth media. It is used to promote root formation, plantlet strengthening and replenishment efficiency.

Properties

Processing technology	vacuum freeze-drying technology
Ingredient content	≥ 99 %
Particle size	60 mesh
Inclusions (non-feedstock or its cracks)	Not detected
Residue on ignition	≤ 5.0 %
Loss on drying	≤ 5.0 %
Solubility	readily forms a suspension in water
Microbiological content	
- Total colony count	< 500
- E.coli	< 10/100 g
- Pathogenic bacteria	Not detectable
Heavy metal content	
- As	< 1.0 mg/kg
- Pb	< 2.0 mg/kg
- Cu	< 60 mg/kg

Storage. Keep in a cool, dry and ventilated place, avoid direct sunlight.

Casein peptone

Product Code.	**GMNB-CP01**
Vol.	**250 g**
Form.	**Powder**
Description.	Casein Peptone is a dry, light yellow powder made of high-quality casein protein by trypsin hydrolysis. Ideal for general bacterial culture purposes.
Application	Commonly used to replenish dilute amino acid distribution in other types of peptones.

Properties

Physical Characteristics	Results	Standard specification
Appearance	Straw powder	Straw powder
pH at 25°C	N/A	4.0 ~ 7.5
Clarity	Clear	Clear

Loss on drying	≤ 6 %	≤ 7 %
Ash	≤ 10 %	≤ 17 %
Total nitrogen (N) basis	≥ 12 %	≥ 8 %
Amino-nitrogen basis	≥ 3 %	≥ 2 %

Solubility. H_2O: 2%, clear, light yellow

Malt Extract

Product Code. GMNB-ME101
Vol. 250 g
Form. Powder
Properties

Total nitrogen (N) basis	≥ 1.1 %
Amino-nitrogen basis	≥ 0.1 %
Loss on drying	≤ 6.0 %
Residual on ignition	≤ 10.0 %

pH 5.0 ~ 7.0

Peptone from Beef and Beef bones

Product Code. GMNB-BFP102
Vol. 250 g
Form. Powder
Description. Extract from beef and beef bones.

Due to the low capacity of food production and inflation, peptones made from pure beef are rarely available on the market today, and even when they are available, they are expensive. Most peptones available today are derived from fish and shrimp sludge, a by-product of seafood production, or from feathers or offal, a by-product of poultry production; the former contains chitin, which inhibits bacterial growth, and the latter has an uneven distribution of amino acid content.

This peptone is made from a mixture of beef and beef bones and has a slightly higher calcium content than pure beef peptones, with the disadvantages of slight turbidity of the medium solution at elevated pH and the possible effect of calcium chloride (from the presence of sodium chloride in LB, SOC, etc.) on the stability of cell membranes. Nevertheless, it is competent for general bacterial culture purposes.

Properties

Physical Characteristics	Results	Standard specification
Appearance	Straw powder	Straw powder
pH at 25°C	4.5 ~ 7.0	4.0 ~ 7.5
Clarity	Clear	Clear
Loss on drying	≤ 6 %	≤ 7 %
Ash	≤ 10 %	≤ 17 %
Total nitrogen (N) basis	≥ 13 %	≥ 8 %
Amino-nitrogen basis	≥ 2 %	≥ 2 %

Solubility. H_2O: 2%, clear, yellow

Peptone, Extract from Beef

Product Code. GMNB-BFP101
Vol. 250 g
Form. Powder
Description. Extract from beef.
Application Ideal for general bacterial culture purposes.

Properties

Physical Characteristics	Results	Standard specification
Appearance	Straw powder	Straw powder
pH at 25°C	N/A	4.0 ~ 7.5
Clarity	Clear	Clear
Loss on drying	≤ 6 %	≤ 7 %
Ash	≤ 15 %	≤ 17 %
Total nitrogen (N) basis	≥ 13.5 %	≥ 8 %
Amino-nitrogen basis	≥ 2.5 %	≥ 2 %

Solubility. H_2O: 2%, clear, yellow

Peptone, Whey Protein Hydrolysate

Product Code. GMNB-WPH101
Vol. 250 g
Form. Powder

Description.

Derived from whey protein concentrate, it has an exceptional amino nitrogen base and a well-balanced AA distribution.

The premium nitrogen source for most microorganisms, ideal for general culture purposes, is best suited for high/fast yield protein expression media (such as TB, YPD, etc.).

This is a new product, we are just starting trial production, and have less stock. Please enquire via support@gmexpression.com before ordering.

Whey protein is very rare, only ~7g per 1kg of milk, and its components include α-lactalbumin, β-lactoglobulin, serum albumin, immunoglobulin, and a small amount of lactoferrin. Whey protein concentrate is a by-product of the cheese-making process. It contains a fair amount of protein (80~85%) and a small amount of fat, as well as trace amounts of lactose, vitamins and minerals.

This GMES-exclusive product is made from whey protein concentrate purified by GMES's unique technology through protease enzymatic digestion, acid hydrolysis, desalting and vacuum powdering.

- No endogenous microbial growth inhibitors (e.g. lactotransferrin or antibacterial peptides).
- No exogenous antibiotics, functional small molecule impurities.
- Amino nitrogen content (~12%) is 3 to 4 times that of conventional peptones.
- Uniform distribution of amino acids
- Excellent solubility in water/non-polar solvents
- Nitrogen source in the form of amino acids and a trace of short peptides, without long-chain peptides; ideal for absorption and utilisation by micro-organisms, which can significantly reduce the lag time in bacterial cultivation.

Properties

Physical Characteristics	Results	Standard specification
Appearance	Straw powder	Straw powder
pH at 25°C	~ 6.5	4.0 ~ 7.5

Clarity	Clear	Clear
Loss on drying	≤ 4.5 %	≤ 7 %
Ash	≤ 7.5 %	≤ 17 %
Total nitrogen (N) basis	≥ 15 %	≥ 8 %
Amino-nitrogen basis	≥ 12 %	≥ 2 %

Solubility. H_2O: > 3.5 %, clear, light yellow

Potato Extract

Product Code. GMNB-PE-P01

Vol. 250 g

Form. Powder, light yellow

Grade. Biochemical grade

Description. Potato extract is produced from fresh potatoes via crushing, pulping, extraction, enzymolysis, filtration, and low-temperature spray drying.

Application Potato extract is a high-quality source of nitrogen for microbial fermentation, primarily utilised as a raw material for fungal culture medium. It is frequently employed in the laboratory to prepare PDA culture medium.

Properties

Physical Characteristics	Results
Total nitrogen (N) basis	≥ 8.0 %
Amino-nitrogen basis	≥ 2.0 %
Loss on drying	≤ 8.5 %
Residue on ignition	≤ 6.0 %
Solubility	Readily soluble in water

Storage. Keep in a cool, dry and ventilated place, avoid direct sunlight.

Soy Peptone

Product Code. GMNB-SOP103

Vol. 250 g, 500 g, 1 kg

Form. Powder

Properties

Physical Characteristics	Results	Standard specification
Appearance	Straw powder	Straw powder
pH at 25°C	5.43	4.0 ~ 7.5
Clarity	Clear	Clear
Loss on drying	≤ 4.5 %	≤ 7 %
Ash	≤ 7.62 %	≤ 17 %
Total nitrogen (N) basis	≥ 12.05 %	≥ 8 %
Amino-nitrogen basis	≥ 2.53 %	≥ 2 %

Solubility. H_2O: 2%, yellow

Tryptone

Product Code. GMNB-TRT102
Vol. 250 g
Form. Powder
Description. This Tryptone is made from hydrolysing casein by trypsin.
Properties

Total nitrogen (N) basis	≥ 12.7 %
Amino-nitrogen basis	≥ 3.7 %
Sodium chloride	≤ 0.4 %
pH (2 % in H_2O) at 25°C	7.3 ± 0.2

Yeast Extract, Premium grade

Product Code. GEL-YE100
Vol. 250 g
Form. Powder
Description. This yeast extract is a fresh cellular component extracted from brewer's yeast cells after autolysis, pasteurisation, concentration and vacuum powdering processes. The extract is fully enzymatically digested, and without prolonged heat treatment, it has a premium protein nitrogen content in the form of free amino acids and balanced nutrients (>5% compared to about 4% in ordinary yeast extracts). Suitable as a nutritional source for refined cell cultures.

Properties

Total nitrogen (N) basis	≥ 10 %
Amino-nitrogen basis	≥ 5 %
Loss on drying	≤ 6 %
Residual on ignition	≤ 15 %
Sodium chloride	≤ 2.0 %
pH (2 % in H_2O) at 25°C	5.3 ~ 7.2
Heavy metal content	
Lead	< 1.9 mg/kg
Arsenic	< 2 mg/kg
Microbiological indicators	
Total number of bacterial colonies	< 10k CFU/g
Escherichia coli	0.3 MPN/g
Salmonella enterica	Not detected
Staphylococcus aureus	Not detected

Solubility. H_2O: 2%, yellow

Part II. Buffer solution

PBS | 1x Stock | Cell Culture Grade

Product Name.	Phosphate-buffered saline (PBS) solution
Product Code.	GMNB-B-PBS-1
Vol.	500 ml
Form.	Liquid
Information	Prepared with Million-Q water, 0.22 µm filtered, stored at room temperature.

Components, g/L

NaCl	8
KCl	0.2
KH_2PO_4	0.24
Na_2HPO_4	1.44

pH 7.4 (PH can be adjusted to 7.2 with HCL if needed.)

Preparation

Use directly after opening; the remaining liquid should be sealed immediately and stored at room temperature or in the 4°C / 39.2 °F refrigerator. Operation on a sterile bench is recommended.

PBS Buffer Solution | 10X Stock

Product Name.	Phosphate-buffered saline (PBS) solution, 10X stock
Product Code.	GMNB-B-PBS
Vol.	500 ml
Form.	Liquid
Information	Prepared with Million-Q water, 0.22 µm filtered, stored at room temperature.

Components, g/L

NaCl	8
KCl	0.2
KH_2PO_4	0.24
Na_2HPO_4	1.44

pH 7.4 (pH can be adjusted to 7.2 with HCL if needed.)

Preparation

Dissolve 1 volume of PBS buffer 10X stock in 9 volumes of million-Q water, and use directly.

Caution

The use of this product (10X PBS) is not recommended for cell culture purposes, as it is easy contamination during dilution. For cell culture, it is recommended to choose Cell Culture Grade 1X PBS.

S30 buffer solution | 20X stock

Product Code.	GMNB-B-S30
Vol.	500 ml
Form.	Liquid
Application.	For cell lysate generation and protein extraction. Not for dialysis use, dialysis use S30 is prepared at 5mM Tris-Acetate and 1mM DTT.
Information.	0.22 µm filter sterilised.

Components, per 1000ml of 20 X S30 buffer

Tris-Acetate	36.24 g (200 mM, final concentration of 1X stock is 10mM)
Magnesium acetate tetrahydrate	60 g
Potassium acetate	117.8 g

pH 8.2

Preparation

Dissolve 1 volume of S30 buffer 20X stock in 19 volumes of million-Q water, and use directly.

Before use, add 1 mL of 1 M DTT (Dithiothreitol 2 mM, final concentration) to 500 mL S30 buffer.

Caution

Heat the solution in a water bath to over 30 degrees Celsius if precipitates appear at the bottom of the solution. Do not use until the precipitate is completely dissolved.

S30A Buffer Solution | 20X Stock

Product Code.	GMNB-B-S30A
Vol.	500 ml
Form.	Liquid
Application.	For cell lysate generation and protein extraction. S30A/B provides additional glutamate compared to S30, which can support the tricarboxylic acid cycle to produce more energy molecules (e.g. ATP) and provide a longer active window for cell lysates.
Information.	0.22 µm filter sterilised.

Components, per 1000ml of S30A buffer

Tris Base	6.057 g
Mg-Glutamate	5.44 g
K-Glutamate	12.194 g

pH 7.7

Preparation

Dissolve 1 volume of S30A buffer 20X stock in 19 volumes of million-Q water, and use directly.

Before use, add 1 mL of 1 M DTT (2mM, final concentration) to 500 mL S30A buffer.

Caution

Heat the solution in a water bath to over 30 degrees Celsius if precipitates appear at the bottom of the solution. Do not use until the precipitate is completely dissolved.

S30B Buffer Solution | 20X Stock

Product Code.	GMNB-B-S30B
Vol.	500 ml
Form.	Liquid
Application.	For cell lysate generation and protein extraction. S30A/B provides additional glutamate compared to S30, which can support the tricarboxylic acid cycle to produce more energy molecules (e.g. ATP) and provide a longer active window for cell lysates.
Information.	0.22 µm filter sterilised.

Components, per 1000ml of S30B buffer

Tris Base	0.606 g
Mg-Glutamate	5.44 g

K-Glutamate	12.194 g

pH 8.2

Preparation

Dissolve 1 volume of S30B buffer 20X stock in 19 volumes of million-Q water, and use directly.

Before use, add 1mL of 1 M DTT (2 mM, final concentration) to 500 mL S30B buffer.

Note: Customers can contact us to customise the HEPES version S30B Buffer.

Caution

Heat the solution in a water bath to over 30 degrees Celsius if precipitates appear at the bottom of the solution. Do not use until the precipitate is completely dissolved.

TAE Buffer Solution | 50X Stock

Product Code.	GMNB-B-TAE
Vol.	500 ml
Form.	Liquid
Information.	0.22 μm filter sterilised.

Preparation

Dissolve 1 volume of TAE buffer 50X stock in 49 volumes of million-Q water, and use directly.

TBE Buffer Solution | 10X Stock

Product Code.	GMNB-B-TBE
Vol.	500 ml
Form.	Liquid
Information.	0.22 μm filter sterilised.

Preparation

Dissolve 1 volume of TBE buffer 10X stock in 9 volumes of million-Q water, and use directly.

TBS Buffer Solution | 10X Stock

Product Name.	Tris Buffered Saline (TBS) solution, 10X stock
Product Code.	GMNB-B-TBS
Vol.	500 ml
Form.	Liquid
Information.	0.22 μm filter sterilised. Store at 4°C.

Components, per 1000ml of TBS buffer

Tris Base	0.182 g
Tris hydrochloride	1.34 g
NaCl	8.76 g

pH 7.4

Preparation

Dissolve 1 volume of TBS buffer 10X stock in 9 volumes of million-Q water, and use directly.

TBST Buffer Solution | 10X Stock

Product Code.	GMNB-B-TBST
Vol.	500 ml
Form.	Liquid
Information.	Prepared with Million-Q water. 0.22 μm filter sterilised. Store at 4°C.

Preparation

Dissolve 1 volume of TBST buffer 10X stock in 9 volumes of million-Q water, and use directly.

Tris-Glycine Buffer | 10X Stock

Product Code.	GMNB-B-TBG10
Vol.	500 ml, 1000 ml
Form.	Liquid
Application.	Tris-Glycine Buffer is commonly used for Western blots or as a running buffer for native protein gel electrophoresis. For SDS PAGE gel semi-dry blotting, adding 20% methanol is optional.
Information.	Prepared with Million-Q water. 0.22 μm filter sterilised. Store at 4°C.

Preparation

Dissolve 1 volume of Tris-Glycine buffer 10X stock in 9 volumes of million-Q water, and use directly.

Tris-HCI Buffer | 1M PH 8.0

Product Code.	GMNB-B-THCL
Vol.	500 ml
Form.	Liquid
Information.	Prepared with Million-Q water. 0.22 μm filter sterilised. Store at 4°C.

TSS Buffer Solution

Product Name.	Transformation and Storage Solution
Product Code.	GMNB-B-TSS
Vol.	100ml, 20 preparations 500 ml, 100 preparations
Form.	Liquid
Application.	For the one-step preparation of competent E. coli cells and to transform the cells without heat-shock.
Information.	0.22 μm filtration plus 5min 275/365nm UV treatment sterilised. Can be stored at room temperature. Suggest storage at 4°C / 39.2 °F refrigerator

This buffer recipe is modified by GMExpression to maximise the transformation rate.

Components, per 100ml of TBS buffer

PEG 8000	3 g
PEG 6000	4 g
PEG 4000	3 g
$MgCl_2$	0.476 g
DMSO	5 ml
Sorbitol	0.1 g
Phospholipid membrane stabiliser	90 μm
Viscosity modifiers	10 mg
Add SOC to 100 ml	

Preparation

Inoculate 1 mL of SOC medium with E. coli strain of choice in a 1.5mL PP tube (snap-cap) and culture overnight at 37 °C with rotation.

Prepare 100mL of liquid medium LB in a sterile 250mL Erlenmeyer flask.

Seed the 1mL culture into the 250mL flask and incubate at 37 °C with 225 rpm rotation until the OD600 reaches 0.3 to 0.4 (0.3 ⩽ OD600 ⩽ 0.4) (approximately 2~4h).

Once the proper optical density has been achieved, transfer the 100mL of culture into 2 x 50 mL PP centrifuge tubes and centrifuge under 3,000g for 10 min at 4°C.

Resuspend each tube in 5mL of ice-chilled TSS buffer with gentle vortexing.

Chill TSS-suspended cells on ice for 15 min. Prepare/label/pre-chill 50x 1.5mL PP tubes (snap-cap) during this time.

Distribute 100~200 µL of TSS suspended cells to each 1.5mL PP tube while ensuring the cells remain well mixed.

Cells can be used immediately or stored at -80°C.

Part III. Antibiotics & Fungicides

III.I. Mycoplasma Specific | Quinoline Derivative

Ciprofloxacin HCL | Mycoplasma Eliminating reagent

Alias.	Ciloxan; Ceprimax; Oftacilox; Ciprofloxacin hydrochloride monohydrate
Product Code.	ATB-M-CIPRHCL01
CAS No.	86393-32-0
Molecular Formula.	$C_{17}H_{18}FN_3O_3$-HCl-H_2O
Molecular weight.	385.82
Purity.	⩾99%
Vol.	25 g
Form.	White powder
Solubility.	25mg/ml in water
Storage condition.	RT, valid for 2 years.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Ciprofloxacin | Mycoplasma Eliminating reagent

Product Code.	ATB-M-CIPR01
CAS No.	85721-33-1
Molecular Formula.	$C_{17}H_{18}FN_3O_3$
Molecular weight.	331.34
Vol.	5 g
Form.	White crystalline powder
Storage condition.	2 ~ 8 °C, sealed and dry, protected from light and moisture.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Difloxacin hydrochloride | Mycoplasma Eliminating reagent

Alias.	Difloxacin hydrochloride; Difloxacin hydrochloride
Product Code.	ATB-M-DFXC01
CAS No.	91296-86-5
Molecular Formula.	$C_{21}H_{20}ClF_2N_3O_3$
Molecular weight.	435.85
Purity.	⩾98%
Vol.	1 g
Form.	White powder
Storage condition.	2 ~ 8 °C, valid for 3 years.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Enrofloxacin | Mycoplasma Eliminating reagent

Product Code.	ATB-M-ENRF01
CAS No.	93106-60-6
Molecular Formula.	$C_{19}H_{22}FN_3O_3$
Molecular weight.	359.4
Purity.	⩾98%
Vol.	5 g

Form.	White to light yellow powder
Solubility.	10mg/ml in water
Storage condition.	RT, valid for 2 years.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Levofloxacin | Mycoplasma Eliminating reagent

Product Code.	ATB-M-LVFC01
CAS No.	138199-71-0
Molecular Formula.	$C_{18}H_{21}ClFN_3O_4$
Molecular weight.	370.38
Purity.	⩾98%
Vol.	5 g
Form.	Off-white to light yellow crystalline powder
Storage condition.	RT, sealed and dry, protected from light and moisture
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Mycoplasma Eliminating Cocktail

Product Code.	ATB-M-MEC01
Vol.	10 ml (2.5 μmol), 20 ml, 50 ml
Description.	Rapid elimination of multiple mycoplasma species Prevent (re)contamination of cell cultures Compatible with most mammalian cell lines Very low cytotoxicity and preserves cell viability Very low resistance escape rate of mycoplasma

Active ingredient: 3 Quinoline derivatives with a total of 250 pmol in 1 ml of water.

4-oxo-1,4-dihydro-3-quinolinecarboxylic acid	CAS No. 34785-11-0	42.5μg/ml (225 pmol/ml)
Ofloxacin	CAS No. 82419-36-1	4.5μg/ml (12.5 pmol/ml)
Levofloxacin	CAS No. 138199-71-0	4.5μg/ml (12.5 pmol/ml)

Information:

Mycoplasma Elimination Cocktail (MEC) is an effective reagent for the elimination of various types of mycoplasma from contaminated cell cultures.

MEC can also be used to prevent contamination of cured cultures by mycoplasma.

The product is a combination of 3 different types of 4-oxo-quinoline-3-carboxylic acid derivatives that inhibit mycoplasma replication by inhibiting the topoisomerase enzyme of mycoplasma DNA, thereby eliminating mycoplasma infection.

MEC is very robust, easy to use and fast-acting, for most cell cultures contaminated with mycoplasma, simply add the appropriate amount of MEC to cell cultures and incubate for one week.

This product should be stored undiluted. Store at room temperature, protected from light.

Instructions:

1. Add MEC at a final concentration of 2.5 pmol/ml to cell cultures contaminated with mycoplasma and incubate for one week.
2. For media replacement or culture transfer (passage), use a medium containing MEC at 2.5 pmol/ml.
3. Transfer the cell cultures several times without MEC and confirm that there has been no regrowth of the contaminating mycoplasma.

MEC at a concentration of 1.25 pmol/ml may be added to the media to prevent mycoplasma contamination of cell cultures that are exposed to serum or trypsin.

Note:

The typical treatment is recommended to use MEC at a concentration of 2.5 pmol/ml; this concentration may be increased to 7.5 pmol/ml only if the recommended concentration is not effective in eliminating mycoplasma.

Although MEC is very low cytotoxic when used at the recommended concentration, for the specific function of cultured cells, confirmation of the maintenance of the desired cellular characteristics after MEC treatment is advised.

Norfloxacin | Mycoplasma Eliminating reagent

Synonyms.	1-Ethyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinolinecarboxylic acid; 1-Ethyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinolinecarboxylic acid
Product Code.	ATB-M-NOFC01
CAS No.	70458-96-7
Molecular Formula.	$C_{16}H_{18}FN_3O_3$
Molecular weight.	319.33
Purity.	⩾98%
Vol.	5 g
Form.	White to yellow powder
Solubility.	50mg/ml 1M NaOH
Storage condition.	2 ~ 8 °C, valid for 3 years.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Ofloxacin | Mycoplasma Eliminating reagent

Product Code.	ATB-M-OFOXC01
CAS No.	82419-36-1
Molecular Formula.	$C_{18}H_{20}FN_3O_4$
Molecular weight.	361.368
Purity.	⩾99%
Vol.	1 g
Form.	White powder
Storage condition.	2 ~ 8 °C, valid for 3 years.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

III.II. Other Antibiotics & Fungicides

Amphotericin B Solubilised

Product Code.	ATB-AMPHT01
CAS No.	1397-89-3
Molecular Formula.	$C_{47}H_{73}NO_{17}$
Molecular weight.	924.08
Vol.	100 mg
Form.	Yellow powder
Storage condition.	4 °C, valid for 2 years.
Application.	Research reagent, widely used in Cell culture, molecular biology, and other scientific research.

Azithromycin

Product Code.	ATB-AZIT01

CAS No.	83905-01-5
Molecular Formula.	$C_{38}H_{72}N_2O_{12}$
Molecular weight.	748.996
Potency.	⩾900 mg/g
Grade.	Bio reagent grade
Vol.	5 g
Form.	White to off-white powder
Storage.	Ambient
Application.	For biochemical research. Azithromycin is a broad-spectrum and efficient antimicrobial reagent.
Caution.	Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Carboxybenzylpenicillin (Carbenicillin) disodium salt

Synonyms.	[6S-(2a,5a,6b)]-6-(Carboxyphenyl-acetamido)-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid disodium salt; Carboxybenzylpenicillin disodium salt; α-Carboxybenzylpenicillin disodium salt
Product Code.	ATB-CARB01
CAS Number.	4697-36-3
Molecular formula.	$C_{17}H_{18}N_2O_6S$
Molecular weight.	378.40 g/mol
Storage.	2 ~ 8°C refrigeration
Vol.	2g, 5g, 10g
Grade.	USP grade
Potency.	⩾750mcg/mg
Moisture.	⩽6.0%

Properties.

White or off-white to light yellow crystalline powder, easily soluble in water (50mg/ml) and methanol, slightly soluble in ethanol, almost insoluble in benzene or ether. Strong hygroscopicity, unstable to heat, slight odour, bitter taste.

Application.

For biochemical research. Broad-spectrum semi-synthetic penicillin. Inhibits bacterial cell wall synthesis by inactivating transpeptidases at the inner level of the bacterial cell membrane. Similar to penicillin.

Antibacterial spectrum: Gram-negative and positive (limited coverage) bacteria, Pseudomonas spp.

Carbenicillin is commonly used in plant histoculture & bacterial colony selection.

Low toxicity to plant cells, Plant cell toxicity threshold ~1000ug/ml.

Working concentration:	Plant histoculture ~ 150-500 µg/ml
	Bacterial selection ~ 50~200 µg/ml

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Cefotaxime

Synonyms.	Claforan, Cefamycin, (6R,7R)-3-[(Acetyloxy)methyl]-7-[2-amino-4-thiazolyl-(methoxyimino)acetamido]-8-oxo-5-thia-1-azabicyclo[4-2-0]oct-2-ene-2-carboxylic acid sodium salt
Product Code.	ATB-CEFOM01
CAS Number.	64485-93-4
Molecular formula.	$C_{16}H_{16}N_5NaO_7S_2$
Molecular weight.	477.45 g/mol

Storage. 2 ~ 8°C refrigeration

Vol. 2g, 5g, 10g

Grade. USP grade

Potency. 916-964 μg /mg

Moisture. ⩽5.0%

Properties.

White or off-white crystalline powder.

Application.

For biochemical research. As a β-galactosidase-inhibiting antimicrobial agent that inhibits the cross-linking of peptidoglycan, thereby inhibiting bacterial cell walls, Cefotaxime is active against Gram-positive and Gram-negative bacteria, it inhibits bacterial cell wall synthesis.

Cefotaxime is commonly used in plant histoculture & bacterial colony selection, mainly used to inhibit Agrobacterium in plant tissue culture.

Antibacterial spectrum: Gram-negative and positive bacteria.

Some phytotoxicity, Plant cell toxicity threshold ~100ug/ml.

Working concentration: Plant histoculture ~ 100-300 μg/ml

Bacterial selection (rESBL / rPMQR) ~ 50~200 μg/ml

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Chloramphenicol

Product Code. ATB-CHLO01

CAS Number. 56-75-7

Molecular formula. $C_{11}H_{12}CL_2N_2O_5$

Molecular weight. 323.13 g/mol

Storage. Ambient

Vol. 10g

Grade. USP grade

Potency. ⩾950 mg/mg

Moisture. ⩽5.0%

Properties. White powder.

Application.

For biochemical research. Chloramphenicol is a Broad-spectrum antibiotic.

Antibacterial spectrum: Gram-negative and positive bacteria.

High toxicity to plant cells, Plant cell toxicity threshold ~1μg/ml

Working concentration: Bacterial selection ~ 25 ~ 50 μg/ml

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Cycloheximide (Actidione/Naramycin A)

Synonyms. Actidione/Naramycin A, 4-[2-(3,5-Dimethyl-2-oxo-cyclohexyl)-2-hydroxyethyl]-2,6-piperidinedione

Product Code. ATB-CHX01

CAS Number. 66-81-9

Molecular formula. $C_{15}H_{23}NO_4$

Molecular weight. 372.4 g/mol

Storage. 2 ~ 8°C refrigeration

Vol. 1 g

Grade.	USP grade
Potency.	⩾900 mg/mg
Moisture.	⩽5.0%
Properties.	White powder.

Application.

For biochemical research.

Cycloheximide is a selective inhibitor of eukaryotic (over prokaryotic) protein synthesis, blocking tRNA binding and release from ribosomes. Induces apoptosis in a variety of transformed and normal cell lines, including T cells. Competitively inhibits the PPIase. Also inhibits ferroptosis. Cycloheximide is a specific and effective antifungal antibiotic.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

G418 disulphate salt

Product Code.	ATB-G418-1
CAS Number.	108321-42-2
Molecular formula.	$C_{20}H_{40}N_4O_{10} \cdot 2H_2SO_4$
Molecular weight.	692.71 g/mol
Storage.	2 ~ 8°C refrigeration
Vol.	1g, 2g, 5g
Grade.	USP grade
Potency.	⩾850 mg/mg
Moisture.	⩽5.0%
Properties.	White to off-white powder.
Solubility.	100 mg/ml (H_2O).

Application.

For biochemical research.

G418 disulphate salt inhibits protein synthesis in both prokaryotic and eukaryotic cells. It is an aminoglycoside antibiotic similar in structure to gentamicin, used for the selection and maintenance of prokaryotic and eukaryotic cells transfected with the neo gene.

Low toxicity to plant cells, Plant cell toxicity threshold ~200ug/ml.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Hygromycin B

Synonyms.	Hygromix, O-6-Amino-6-deoxy-L-glycero-D-galacto-heptopyranosylidene-(1-2-3)-O-β-D-talopyranosyl(1-5)-2-deoxy-N3-methyl-D-streptamine
Product Code.	ATB-HYGR01
CAS Number.	31282-04-9
Molecular formula.	$C_{20}H_{37}N_3O_{13} \cdot HCl$
Molecular weight.	527.53 g/mol
Storage.	2 ~ 8°C refrigeration
Vol.	200 mg, 500 mg, 1 g
Grade.	USP grade
Potency.	⩾900 mg/mg
Moisture.	⩽5.0%
Properties.	White or brown-white powder.
Solubility.	50 mg/ml (H_2O).

Application.

For biochemical research. Hygromycin B is an antibiotic produced by the bacterium Streptomyces hygroscopicus. It is an aminoglycoside that kills bacteria, fungi and higher eukaryotic cells by inhibiting protein synthesis.

In the laboratory, Hygromycin B is used for the selection and maintenance of prokaryotic and eukaryotic cells that contain the hygromycin resistance gene. The resistance gene is a kinase that inactivates hygromycin B through phosphorylation.[4] Since the discovery of hygromycin-resistance genes, hygromycin B has become a standard selection antibiotic in gene transfer experiments in many prokaryotic and eukaryotic cells.

Low toxicity to plant cells, Plant cell toxicity threshold ~200ug/ml.

Recommended Stock Concentration	50 mg/mL

Working concentration.

Plant histoculture	~ 100 μg/ml;
Cell selection	~ 50-800 μg/mL, specifically 50~100 μg/mL for prokaryotes, 200 μg/mL for lower eukaryotes and 150-400 μg/mL for higher eukaryotes.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Imipenem

Synonyms.	Imipenem monohydrate; (5R,6S)-6-[(1R)-1-hydroxyethyl]-3-[[2-[(iminomethyl)amino]ethyl]thio]-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid
Product Code.	ATB-IMIP01
CAS Number.	74431-23-5
Molecular formula.	$C_{10}H_{12}N_2O_3S$
Molecular weight.	317.36
Storage.	2 ~ 8°C refrigeration, sealed and dry, protected from light and moisture
Vol.	100 mg
Grade.	USP grade
Purity.	⩾ 95 %
Properties.	White powder.
Solubility.	Water 63 mg/mL; DMSO 1 mg/mL

Application.

Research reagent, widely used in Cell culture, molecular biology, pharmacology and other scientific research.

Imipenem has antimicrobial activity against Gram-positive and negative aerobic and anaerobic bacteria. The antibacterial spectrum includes Streptococcus, Staphylococcus aureus, Escherichia coli, Klebsiella, some strains of Bacillus inactivus, Haemophilus influenzae Aspergillus, Serratia marcescens, Pseudomonas aeruginosa and so on.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Kanamycin Sulphate

Product Code.	ATB-KANS01
CAS Number.	25389-94-0
Molecular formula.	$C_{18}H_{36}N_4O_{11}S \cdot H_2SO_4$
Molecular weight.	582.6
Storage.	RT
Vol.	100g, 250 g
Grade.	USP grade

Potency.	⩾ 750 mcg/mg
Purity.	⩾ 98 %
Moisture.	⩽ 2.0 %
Properties.	White to off-white powder.

Application.

Cell culture & biochemical studies.

Aminoglycoside broad-spectrum antibiotic derived from the culture fluid of Streptomyces kanamyceticus that binds to the 70S ribosomal subunit, inhibits protein translation, and causes coding errors. Antimicrobial spectrum: gram-negative and positive bacteria, mycoplasmas (mycoplasma).

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Mancozeb | Zineb + Maneb

Product Code.	ATB-MANC01
CAS Number.	Zineb. 12122-67-7 Maneb. 12427-38-2
Storage.	Ambient
Vol.	10g + 10g
Grade.	Bio reagent grade
Potency.	⩾ 920 mg/g
Moisture.	⩽ 5.0 %
Properties.	White to off-white powder.

Application.

For biochemical research. Mancozeb is a broad-spectrum and efficient antimicrobial reagent, with no plant uptake.

Working concentration.

Plant histoculture ~ 100~200 μg/ml

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Pentachloronitrobenzene

Product Code.	ATB-PCTB01
CAS Number.	82-68-8
Storage.	Ambient
Vol.	10 g
Grade.	Bio reagent grade
Potency.	⩾ 900 mg/g
Moisture.	⩽ 5.0 %
Properties.	White to off-white powder.

Application.

For biochemical research. Pentachloronitrobenzene is a broad-spectrum and efficient antimicrobial reagent.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Puromycin

Alias.	Puromycin dihydrochloride, Puromycin hydrochloride
Product Code.	ATB-PURMY01
CAS Number.	58-58-2
Molecular formula.	$C_{22}H_{29}N_7O_5 \cdot 2HCl$
Molecular weight.	544.44
Vol.	25 mg
Solubility.	Soluble in water

Description.

Inhibitor of protein synthesis. Inhibits the growth of bacteria, algal protozoa and mammalian cells.

Reference stock concentration 50mg/ml.

Application.

Research reagent, widely used in Cell culture, molecular biology, and other scientific research.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Rapamycin

Product Code.	ATB-RAPMY01
CAS Number.	53123-88-9
Molecular formula.	$C_{51}H_{79}NO_{19}$
Molecular weight.	914.18
Vol.	250 mg
Purity.	⩾ 98% (HPLC)
Solubility.	30 mg/ml 0.1M HCl
Storage condition.	RT, valid for 2 years.
Properties.	Light yellow powder.

Application.

Research reagent, widely used in Cell culture, molecular biology, and other scientific research.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Rifampicin solution (50mg/ml)

Product Code.	ATB-RIFA01
CAS Number.	13292-46-1
Molecular weight.	822.94
Potency.	50 mg/ml
Vol.	10 ml
Storage condition.	4°C, sealed and dry, protected from light
Form.	Liquid

Description.

Rifampicin is a broad-spectrum antibiotic with a strong antibacterial effect against Mycobacterium tuberculosis and different degrees of antibacterial activity against Gram-positive or Gram-negative bacteria. Its bacteriostatic effect lies in the inhibition of RNA polymerase in prokaryotic organisms and mammals, thus preventing DNA and protein synthesis. It is commonly used in biology to remove plasmids from bacteria.

Application.

Research reagent, widely used in Cell culture, molecular biology, and other scientific research.

Spectinomycin dihydrochloride

Other name.	Spectinomycin
Product Code.	ATB-SPEC01
CAS Number.	22189-32-8
Molecular formula.	$C_{14}H_{24}N_2O_7 \cdot 2\ HCl \cdot 5\ H_2O$
Molar mass.	495.35 g·mol−1
Vol.	1g, 5g, 25g
Storage.	Ambient
Grade.	USP grade
Potency.	⩾ 779 mg/g
Moisture.	⩽ 15.0 ~ 20.0 %
Properties.	White to off-white powder.

Application.

For biochemical research. Spectinomycin binds to the 30S subunit of the bacterial ribosome and interrupts protein synthesis.

It is a broad-spectrum and efficient antimicrobial reagent.

Recommended Stock Concentration	50 mg/mL
Recommended Working Concentration	50 μg/mL

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution. After the antibiotic has been configured into the solution, it can be stored at 2-8°C for several weeks or at -20°C for more extended periods.

Streptomycin sulphate

Product Code.	CH-PP-SS01
CAS Number.	3810-74-0
Molecular formula.	$C_{21}H_{39}N_7O_{12} \cdot 1.5\ H_2SO_4$
Molecular Weight.	728.69
Vol.	100g, 250 g
Storage.	2 ~ 8 °C
Grade.	High purity grade
Potency.	750 ~ 850 mcg/mg
Moisture.	⩽ 2.0 %
Properties.	White to off-white powder.

Application.

- Cell culture.

Streptomycin is used to study mechanisms of streptomycin resistance and is often used together with penicillin and other agents to inhibit bacterial contamination in cell culture applications. It is recommended for use in molecular biology applications at 25-50μg/mL, in cell culture applications at 100 mg/L and in embryo culture at 50 mg/L.

- Mode of Action:

Streptomycin acts by inhibiting prokaryotic protein synthesis by binding to the S12 protein of the 30S ribosomal subunit, thus preventing the transition from the imitation complex to the chain-elongating ribosome. This causes miscoding or inhibits initiation.

- Protein purification

When purifying protein from a biological extract, streptomycin sulphate can be added to remove nucleic acids and ribonuclear proteins. It can bind to ribosomes and precipitate out of solution; it serves as a method for removing rRNA, mRNA, and even DNA if the extract is from a prokaryote.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Streptomycin

Product Code.	ATB-STREP01
CAS Number.	57-92-1
Molecular formula.	$C_{21}H_{39}N_7O_{12}$
Molar mass.	581.580 g·mol−1
Vol.	500mg, 1g
Storage.	Ambient
Grade.	Bio reagent grade
Potency.	⩾ 900 mg/g
Moisture.	⩽ 5.0 %
Properties.	White to off-white powder.

Application.

For biochemical research. Streptomycin is a broad-spectrum and efficient antibiotic.

- Cell culture

Streptomycin, in combination with penicillin/Carbenicillin, is used in a standard antibiotic cocktail to prevent bacterial infection in cell culture.

- Protein purification

When purifying protein from a biological extract, streptomycin (sulphate) can be added to remove nucleic acids and ribonuclear proteins. It can bind to ribosomes and precipitate out of solution; it serves as a method for removing rRNA, mRNA, and even DNA if the extract is from a prokaryote.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Tetracycline

Product Code.	ATB-TETRA01
CAS Number.	60-54-8
Molecular formula.	$C_{22}H_{24}N_2O_8$
Molecular Weight.	444.44
Vol.	25 g
Storage.	Ambient
Grade.	Bio reagent grade
Potency.	⩾ 900 mg/g
Moisture.	⩽ 5.0 %
Properties.	White to off-white powder.

Application.

For biochemical research. Tetracycline is a broad-spectrum and efficient antimicrobial reagent.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Thiabendazole

Product Code.	ATB-THIA01
CAS Number.	148-79-8
Molecular Weight.	629.71
Vol.	10 g
Storage.	Ambient
Grade.	Agriculture grade
Potency.	⩾ 750 mg/g

Moisture. ⩽ 5.0 %

Properties. White to off-white powder.

Application.

For biochemical research. Thiabendazole is a broad-spectrum antimicrobial reagent.

Working concentration.

Plant histoculture ~ 100~200 μg/ml; plant cells can uptake Thiabendazole into the cell.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Tilmicosin

Product Code.	ATB-TIMC01
CAS Number.	108050-54-0
Molecular formula.	$C_{46}H_{80}N_2O_{13}$
Molecular Weight.	869.13
Vol.	5 g
Storage.	2 ~ 8 °C, valid for 3 years.
Purity.	⩾ 98 %
Properties.	White to off-white powder.

Application.

Tilmicosin is a semisynthetic macrolide antibiotic with broad-spectrum activity towards Mycoplasma spp., Pasteurella spp., and various gram-positive organisms in animals.

Caution.

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Tylosin

Synonyms.	Fradizine; Tylocine; Tylosine; N,N-Tylozine
Product Code.	ATB-TYLS01
CAS Number.	1401-69-0
Molecular formula.	$C_{46}H_{77}NO_{17}$
Molecular Weight.	916.1
Vol.	5 g
Storage.	2 ~ 8 °C, valid for 2 years.
Purity.	⩾ 98 %
Properties.	Light yellow powder.

Application.

Research reagent, widely used in Cell culture, molecular biology, and other scientific research.

Part IV. Chemicals

IV.I. Chemical set

Amino Acids Set

Information.	The 20 Amino Acids Set contains 20 amino acids.
Product Code.	CH-AAS01
Vol.	20 X 100g / 250 g
Purity.	⩾ 99.5 %
Form.	Powder.
Application.	For preparing the culture medium and stock solution of the CFPS reaction system
Components.	Alanine Arginine Asparagine Aspartate Cysteine Glutamate Glutamine Glycine Histidine Isoleucine Leucine Lysine Methionine Phenylalanine Proline Serine Threonine Tryptophan Tyrosine Valine

Buffer Compounds Set

Information.	The set contains 11 types of commonly used buffer salts.
Product Code.	CH-BFCS1101
Vol.	11 X 250 g / 500 g
Purity.	⩾ 99 %
Form.	Powder.
Application.	For the preparation of buffer solutions of different pH ranges.
Components.	

Code	Synonyms	pKa,25 °C	Mol. weight
TAPS	([tris(hydroxymethyl)methylamino]propanesulfonic acid)	243.3	8.43
Bicine	(2-(bis(2-hydroxyethyl)amino)acetic acid)	8.35	163.2
Tris	(tris(hydroxymethyl)aminomethane, or2-amino-2-(hydroxymethyl)propane-1,3-diol)	8.07	121.14
Tricine	(N-[tris(hydroxymethyl)methyl]glycine)	8.05	179.2
TAPSO	(3-[N-tris(hydroxymethyl)methylamino]-2- hydroxypropanesulfonic acid)	7.635	259.3
HEPES	(4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid)	7.48	238.3

TES	(2-[[1,3-dihydroxy-2-(hydroxymethyl)propan-2-yl]amino]ethanesulfonic acid)	7.40	229.20
MOPS	(3-(N-morpholino)propanesulfonic acid)	7.20	209.3
PIPES	(piperazine-N,N'-bis(2-ethanesulfonic acid))	6.76	302.4
Cacodylate	(dimethylarsenic acid)	6.27	138.0
MES	(2-(N-morpholino)ethanesulfonic acid)	6.15	195.2

Tris Salt Set

Information. The set contains 4 types of commonly used Tris buffer salt.
Product Code. CH-BFT401
Vol. 4 X 250 g / 500 g
Purity. ⩾ 99 %
Form. Powder.
Application. For the preparation of buffer solutions of different pH ranges.

Components.

Item	Purity
Tris Base	99.9 %
Tris HCl	99 %
Tris Acetate	99 %
Tricine	99 %

Vitamin B Set

Information. The set contains 8 types of Vitamin B.
Product Code. CH-VBS01
Vol. 4 X 100g / 250 g
Purity. ⩾ 99.5 %
Form. Powder.
Application. For the preparation of culture medium and stock solution.

Components.

Item	Name
Vitamin B1	Thiamine
Vitamin B2	Riboflavin
Vitamin B3	Niacin
Vitamin B5	Pantothenic acid
Vitamin B6	Pyridoxine, pyridoxal, pyridoxamine
Vitamin B7	Biotin
Vitamin B9	Folate
Vitamin B12	Cobalamin

IV.II. Chelating Agent

EDTA - 99%, 99.5%

Synonyms.	Ethylenediaminetetraacetic acid (Ethylenedinitrilo) tetraacetic acid, EDTA, Edathamil, Ethylenedinitrilotetraacetic acid
Product Code.	CH-EDTA01
CAS Number.	60-00-4
Molecular Weight.	292.24
Vol.	250 g, 500 g
Purity.	⩾ 99 %, ⩾ 99.5 %
Form.	Powder.

EDTA 2K, EDTA Dipotassium, 98%

Product Code.	CH-EDTA-K01
CAS Number.	2001-94-7
Molecular formula.	$C_{10}H_{14}K_2N_2O_8$
Molecular Weight.	368.42
Vol.	25g, 100g, 250 g
Store.	RT
Purity.	⩾ 99 %
Form.	Powder.

EDTA 2Na, EDTA disodium salt dihydrate, 99.5%

Product Code.	CH-EDTA-NA01
CAS Number.	6381-92-6
Molecular formula.	$C_{10}H_{14}N_2O_8Na_2 \cdot 2H_2O$
Molecular Weight.	372.2
Vol.	250 g
Store.	RT
Purity.	⩾ 99.5 %
Form.	Powder.

EDTA 4Na - EDTA tetrasodium salt dihydrate, 99%, 99.5%

Product Code.	CH-EDTA-NA03
CAS Number.	10378-23-1
Molecular formula.	$C_{10}H_{12}N_2O_8Na_4 \cdot 2H_2O$
Molecular Weight.	416.20
Vol.	250 g
Store.	RT
Purity.	⩾ 99 %, ⩾ 99.5 %
Form.	Powder.

EDTA 4Na, 99%

Product Code.	CH-EDTANA02
CAS Number.	64-02-8
Molecular formula.	$C_{10}H_{12}N_2O_8Na_4$
Molecular Weight.	380.17
Vol.	25g, 50 g, 100g

Store.	RT
Purity.	⩾ 99 %
Form.	Powder.

EDTA CaNa2, EDTA calcium disodium salt dihydrate, 98%

Product Code.	CH-EDTA-CANA01
CAS Number.	23411-34-9
Molecular formula.	$C_{10}H_{12}N_2CaNa_2O_8 \cdot xH_2O$
Molecular Weight.	374.27 (anhydrous basis)
Vol.	100g, 250 g
Store.	RT
Purity.	⩾ 98 %
Form.	Powder.

EDTA FeNa, 98%

Product Code.	CH-EDTA-FENA01
CAS Number.	15708-41-5
Molecular formula.	$C_{10}H_{12}N_2O_8FeNa$
Molecular Weight.	367.05
Vol.	100g, 250 g, 500 g
Store.	RT
Purity.	⩾ 98 %
Form.	Powder.

EDTA MnNa2, 95%

Product Code.	CH-EDTA-MnNa01
CAS Number.	15375-84-5
Molecular formula.	$C_{10}H_{12}N_2O_8MnNa_2$
Molecular Weight.	372.2
Vol.	100g, 250 g
Store.	RT
Purity.	⩾ 95 %
Form.	Powder.

EGTA - 99.5%

Synonyms.	Ethylene glycol-bis (2-aminoethylether)-N,N,N’, N’-tetraacetic acid
Product Code.	CH-EGTA01
CAS Number.	67-42-5
Molecular formula.	$C_{14}H_{24}N_2O_{10}$
Molecular Weight.	380.35
Vol.	25g, 100g
Store.	RT
MP.	241 °C
Purity.	⩾ 99.5 %
Form.	Powder.

Imidazole, $C_3H_4N_2$, 99%

Synonyms.	1,3-Diazacyclopenta-2,4-diene,1,3-Diazole, Glyoxaline (archaic)
Product Code.	CH-IMDZ01
CAS Number.	288-32-4
Molecular formula.	$C_3H_4N_2$
Molecular Weight.	68.08
Vol.	500 g, 1kg
Purity.	⩾ 99 %
Form.	Powder.

IV.III. Protein Denature Reagents

Guanidine hydrochloride

Synonyms.	Aminomethanamidine hydrochloride; carbamamidine hydrochloride; carbamidine hydrochloride; aminoformamidine hydrochloride; iminourea hydrochloride
Other names.	Iminourea hydrochloride; Guanidine hydrochloride; Carbamidine hydrochloride; Guanidine monohydrochloride
Product Code.	CH-PDR-GC01
CAS Number.	50-01-1
Molecular formula.	CH_5N_3 - HCL
Molecular Weight.	95.53
Vol.	250 g, 500 g, 1kg
Storage.	RT
Purity.	⩾ 99 %, ⩾ 99.5 %
Ammonium salt.	⩽0.5%.
Water solubility.	Freely soluble in water and ethanol, the aqueous solution is neutral.
Moisture.	⩽0.3%.
Properties.	White crystalline powder.
Relative density.	1.354 (d204)
Melting point.	182~188°C
Combustion residue.	⩽0.1%.

Application.

Biochemical research. Assay gold, iridium, osmium, platinum and ruthenium. Organic synthesis. Molecular biology protein denaturation.

Guanidine thiocyanate, 99%, 99.5%

Other name.	Guanidine isothiocyanate
Product Code.	CH-PDR-GSCN01
CAS Number.	593-84-0
EINECS No.	209-812-1
Molecular formula.	CH_5N_3 - CHNS
Molecular Weight.	118.16
Vol.	250 g, 500 g, 1kg
Storage.	RT
Purity.	⩾ 99 %, ⩾ 99.5 %
Solubility.	Soluble in water.
Properties.	White crystalline powder.

Description.

Guanidine isothiocyanate is a powerful protein denaturant with no RNAase or DNAase activity. In nucleic acid extraction, guanidinium isothiocyanate can rapidly break cells or viruses to release nucleic acid, inhibiting the nuclease released from the cells to ensure the integrity of the primary structure of nucleic acid, commonly used in RNA extraction. Due to autologous degradation and enzyme-mediated degradation, RNA is a biomolecule that is difficult to stabilise and preserve, and as the main component of nucleic acid lysate, guanidine isothiocyanate is a powerful protein denaturant, which is capable of destroying the molecular structure of the enzyme RNA, and then inactivate the nuclease that may be present in the sample, thus stabilising the RNA sample.

Application.

Biochemical research. Molecular biology protein denaturation. RNA preparation.

IV.IV. Other Chemicals

Abamectin

Product Code.	PSS-ABAM01
CAS Number.	71751-41-2
Molecular formula.	$C_{48}H_{72}O_{14}$
Molecular Weight.	873.07
Vol.	5 g
Storage.	2 ~ 8 °C
MP.	155 ~ 157 °C
Purity.	⩾ 98 % (4 homologous derivatives in total)
Solubility.	Ethanol 20g/L, water 10μg/L.
Properties.	Light yellow to white crystalline powder, odourless.

Description.

Abamectin is a natural compound produced by the fermentation of Streptomyces avermitilis, and is often used as a powerful anthelmintic and insecticide.

Application.

Research reagent, widely used in plant tissue culturing.

Cautions

Stock requires storage at -20°C after the antibiotic has been configured into the solution.

Ammonium sulphate, $(NH_4)_2SO_4$

Other names.	Diammonium sulphate, Sulphuric acid, Diammonium salt, Mascagnite
Product Code.	CH-AMSF01
CAS Number.	7783-20-2
Molecular formula.	$(NH_4)_2SO_4$
Molecular Weight.	132.14
Vol.	500 g
Storage.	RT
Purity.	⩾ 99.5 %

Fluorescein diacetate

Alias.	Fluorescein diacetate; 3,6-Diacetoxyfluoran; Di-Oacetylfluorescein
Product Code.	CH-DAFSIN
CAS Number.	596-09-8
Molecular formula.	$C_{24}H_{16}O_7$
Molecular Weight.	416.38
Vol.	1 g

Storage. -20 °C, avoid light

Properties. Light yellow to white crystalline powder

Description.

Fluorescein diacetate (FDA) is a cell-permeable esterase substrate that can be used as a viability probe, measuring both the enzymatic activity required to activate its fluorescence and the integrity of the cell membrane required for the intracellular retention of its fluorescent product. Upon hydrolysis by intracellular esterase, this AM ester yields fluorescein.

Streptomycin sulphate

See Streptomycin sulphate.

Part V. Experimental Kits

V.I. Protein Expression Kit

Pichia pastoris Expression Kit, expression element library

Product Code. K-PPEK01

Description.

For optimisation of various protein expression applications using Pichia pastoris as host cells. Suitable for optimising the yield of protein scale expression in the laboratory or industrial pilot/scale fermentation.

Please contact us (mail to:support@GMExpression.com) for pre-sales technical consulting and acquire detailed instructions and related DNA sequence files before purchase.

Each element is packaged within a 2ml centrifuge tube, 40 μL of 0.5 μg/μL (20 μg circular DNA) in TE buffer, pH 8.0

Mini protein purification kit, for His-tag protein purification

Product Code. K-MPPNN01

Vol. 20ml, 50ml, 100ml, 250ml

QTY. 3 rxs

Product uniqueness.

- Ni-NTA microspheres with high-density polyacrylate (HDPA) cores are more robust than agarose microspheres and can withstand higher pressures and flow rates.
- Contains special zwitterions that efficiently disrupt cell membranes and are gentle on proteins.
- High binding capacity with extremely sharp elution peaks
- Low toxicity

Contains

- His-Tag Affinity Microsphere, Ultra-Flux		
- Ni-NTA microspheres with PA cores	20ml, with 25% EtOH	RT
- Lysis Buffer	20 ml	RT
- Elution buffer (Imidazole solution)		RT

His-tag Affinity Microsphere, Ultra-flux

Product Code. AMS-HIS001

Vol. 10ml, 20ml, 50ml, 100ml

Description.

Ultra-flux His-tag Affinity Microsphere (Ni-NTA Ultra-Flux Affinity Microsphere Gel)

Research use, for the purification of proteins with His-tag.

The default particle size is 50μm, and the pore size is 800 Å. The particle size of 15/30/100/200/500μm and pore size 300/500/800Å are available upon request.

V.II. Molecular Biology Kit

Bacteria total RNA extraction kit

Product Code. K-BTR50

QTY. 50 rxs

Application. For Bacteria total RNA extraction.

Plant cell total RNA extraction kit

Product Code. K-PTR50

QTY. 50 rxs

Application.	For Bacteria total RNA extraction.

Mammalian cell total RNA extraction kit

Product Code.	K-MTR50
QTY.	50 rxs
Application.	For Bacteria total RNA extraction.

DNA purification/Agarose Gel purification kit

Product Code.	K-DPR50
QTY.	50 rxs
Application.	For purification and recycling.

Plasmid mini preparation kit, with 10ml DNA booster

Product Code.	K-PMP5010
Qty.	50rxs (50 X column A*) + 5rxs (5 X column B**)
	*/** Max DNA binding capacity for single columns: A: 50μg/rx | B: 80μg/rx
	DNA recycling rate: A: 29μg/50μg (58%) | B: 38μg/50μg (76%)

Product uniqueness

Media Enhancer (DNA Booster) for high-yield harvesting plasmids.
Equipped with a purification column with high DNA binding capacity and a high DNA recovery rate.

Contains

DNA booster (Ver1.2 | 10ml each for Low/High copy number plasmid) 4 ~ 6°C

Buffer 1 (P1 suspension buffer/w RNase I)	15 ml | store at 4~6℃ after adding RNase I
Buffer 2 (P2 Denaturing fluid)	15 ml
Buffer 3 (P3/N3 neutralisation buffer)	20 ml
Washing Buffer A TA/IPA	40 ml
Washing buffer B TA/EtOH	100 ml | Add 75ml pure ethanol before the first time use
Elution Fluid (TE PH~8)	10 ml
DNA Binding columns A	50 pieces
DNA Binding columns B	5 pieces
2ml Centrifugal shell	50 pieces
RNase I stock	30μL | store at -20°C

RNA mini preparation kit, Gram-negative bacteria cell (including E.coli)

Product Code.	K-RMP5001
Qty.	50rxs (100 X column)
	*/** Max RNA binding capacity for single columns: 30μg/rx

Product uniqueness

Unique efficient lysis buffer for Gram-negative bacteria cells.
Equipped with a purification column with high RNA-binding capacity.

RNA mini preparation kit, Gram-positive bacteria cell

Product Code.	K-RMP5002
Qty.	50rxs (100 X column)
	*/** Max RNA binding capacity for single columns: 30μg/rx

Product uniqueness

Unique efficient lysis buffer for Gram-positive bacteria cells.
Equipped with a purification column with high RNA-binding capacity.

RNA mini preparation kit, Yeast & Pichia pastoris cell

Product Code.	K-RMP5003
Qty.	50rxs (100 X column)
	*/** Max RNA binding capacity for single columns: 30μg/rx

Product uniqueness

Unique efficient lysis buffer for Yeast & Pichia pastoris cells.
Equipped with a purification column with high RNA binding capacity.

RNA mini preparation kit, Plant cell

Product Code.	K-RMP5004
Qty.	50rxs (100 X column)
	*/** Max RNA binding capacity for single columns: 30μg/rx

Product uniqueness

Unique efficient lysis buffer for Plant cells.
Equipped with a purification column with high RNA binding capacity.

Part VI. Other supplies

VI.I. Liquid

DEPC Treated Water

Product Code.	GMES-DEPCW
Vol.	500 ml, 1000 ml
Form	Liquid

Description.

DEPC treated water | RNase-free water 500 ml.

0.1% DEPC (diethyl pyrocarbonate) treated million Q water.

After DEPC and Million Q water are mixed and rested for more than 72 hours, it has been autoclaved at 121°C for 20 minutes, plus a 10-minute 275/365nm UVC treatment is loaded onto the water and the package to fully inactivate any possible RNase contamination.

All protein-based enzymes, such as nucleases as well as proteases, are completely inactivated.

Water can be used directly for solubilising RNase/DNase-sensitive oligonucleotides or RNA fragments.

High efficiency cell culture and fermentation steriliser| 10X Stock

Product Code.	STER-10X
Vol.	500 ml | 10X stock, up to make 5L working solution, 1 L, 5 L, 10 L
Form	Liquid

Description.

Broad-spectrum and efficient sterilisation with short processing time. Can thoroughly sterilise bacteria and strip the lipid-protein residue from the vessel wall, and is used to pre-prepare bioreactors or culture chambers to avoid contamination of fermentation or cell culture.

Non-chlorine formula, no corrosion of metallic walls and pipelines*

The working solution has a mild oxidant ingredient and neutral pH value, and does not age plastic and rubber pipe walls.

Thoroughly sterilises bacteria within 2 to 3 hours (after adding synergists), much less than the 10 hours of traditional Glutaraldehyde sterilant.

Suitable for sterilisation preparation before use and cleaning after use of various bacterial fermenters, bioreactors, and cell culture vessels.

Suitable for the sterilisation of various metal, glass, and plastic surfaces.

For thorough sterilisation of various hard-to-kill bacilli, fungi, spores, and good inactivation of most viruses and pathogenic proteins.

Basic formula (working solution concentration)

2.5%	Glutaraldehyde (sterilising ingredient)
2%	Sodium laureth sulphate (surfactant)
0.4%	Triton X-100 (surfactant)

Steriliser synergist (sold separately)

0.25%	magnesium sulphate
1%	Polysaccharidase and protease
0.5%	Cell wall digest catalysts (GMES's confidential formula)

Effervescent powder (sold separately)

Citric acid

Sodium bicarbonate

Sodium percarbonate

Solid Phase RNase Eraser (Liquid)

Product Code.	GMES-RNASE01
Vol.	100 ml
Form	Liquid

VI.II. Autoclave bags

Autoclavable Polypropylene bags, 40X60cm, 0.025

Product Code.	APB-A01
Size.	40cm X 60cm / Thickness 0.025mm / Double layers 0.05mm
Qty.	50 sheets

Description.

The majority of traditional autoclave bags are made from polypropylene mixed with polyethene in order to increase their strength and flexibility, with the drawback of considerable shrinkage and deformation during heat treatment. If the material to be sterilised contains sharp objects such as pipette tips, pipettes, syringe needles, etc., the bag can be easily broken and contaminate the entire sterilisation chamber or other objects being sterilised simultaneously.

GMExpression unique autoclavable bag product, made from high molecular weight polypropylene from Holocyte, with no polyethene content, shrinks no more than 5% when heat treated at 130 degrees Celsius for one hour while maintaining serviceable mechanical strength.

HMWPP bags also have excellent water and air tightness, just need to tie the bag mouth with a live knot, which can prevent external steam & water into the bag. Better airtightness than traditional self-sealing PP bags (shown in the picture attached). They are particularly suitable for the autoclave or dry heat sterilisation of open-top or loose-cap reagent bottles, preventing possible contamination of liquids or objects to be sterilised during the autoclave sterilisation process.

Note:

- Do not exceed 170 degrees Celsius for dry heat sterilisation.
- The mechanical strength of the bag will be reduced after autoclave sterilisation. It is recommended to use baskets for transporting items, and not to lift the bag directly to move the weight inside.
- After sterilisation, the bag can be washed and reused, but it is not recommended to reuse the bag more than three times.

Autoclavable Polypropylene bags, 23X33cm, 0.02

Product Code.	APB-A02
Size.	23cm X 33cm / Thickness 0.02mm / Double layers 0.04mm
Qty.	50 sheets

Description.

The majority of traditional autoclave bags are made from polypropylene mixed with polyethene in order to increase their strength and flexibility, with the drawback of considerable shrinkage and deformation during heat treatment. If the material to be sterilised contains sharp objects such as pipette tips, pipettes, syringe needles, etc., the bag can be easily broken and contaminate the entire sterilisation chamber or other objects being sterilised simultaneously.

GMExpression unique autoclavable bag product, made from high molecular weight polypropylene from Holocyte, with no polyethene content, shrinks no more than 5% when heat treated at 130 degrees Celsius for one hour while maintaining serviceable mechanical strength.

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Note:

- Do not exceed 170 degrees Celsius for dry heat sterilisation.

- The mechanical strength of the bag will be reduced after autoclave sterilisation. It is recommended to use baskets for transporting items, and not to lift the bag directly to move the weight inside.
- After sterilisation, the bag can be washed and reused, but it is not recommended to reuse the bag more than three times.

VI.III. Grinding ball

Zirconia cell grinding ball, diameter from 0.12mm to 7.0mm

Product Code.	ZS001
Size.	24 different diameters, from 0.12 mm to 20 mm
Vol.	500 g
Material.	Zirconium dioxide (ZrO_2)
Application.	For breaking cells, the density (~6g/cm3) and hardness are much higher than those of glass beads, which are not easy to carry charges generated by friction. 0.1mm for Escherichia coli 0.5mm for yeast 1~3mm is suitable for animal and plant tissue

Contact

support@gmexpression.com
www.gmexpression.com
shop.gmexpression.com

General Molecular Expression Service Pty Ltd
ThincLab, Hannaford Bldg, Waite Rd, Urrbrae, SA 5064