



2017/18 PRODUCT CATALOGUE

DICTYOSTELIUM DISCOIDEUM

 **FORMEDIUM**
CREATING THE CULTURE FOR DISCOVERY™

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DICTYOSTELIUM DISCOIDEUM

Dictyostelium Discoideum is a slime mold from the phylogenetic order Ascrasiales within the phylum Myxomycophyta. What makes this mold very interesting from a scientific point of view is the fact that Dictyostelium Discoideum represents a junction between single and multi-cellular organisms. Being a meat eater Dictyostelium Discoideum grows vigorously as autonomous cells when, as a food source, bacteria are present. When the cells are depleted from the bacterial food source they join with other adjacent cells to form multi cellular structures. To survive this period of nutritional starvation Dictyostelium Discoideum may eventually form fruiting bodies containing spores to increase the rate of survival during starvation. The ability to select between uni-cellular and multi-cellular life forms makes Dictyostelium Discoideum an interesting model for cell-cell interactions and development.

The genomic content of Dictyostelium Discoideum is four times that of Saccharomyces Cerevisiae with about 50 Mb of low GC DNA (20 %) localised at six chromosomes. Functional heterologous proteins are excreted into the media correctly folded and glycosylated.

As a food source Dictyostelium Discoideum feed on bacteria. Escherichia Coli or Aerobacter Aerogenus are nutritional sources for Dictyostelium Discoideum. The bacterial cells are grown on the nutrient SM medium and Dictyostelium Discoideum feed on these bacteria. The mold cells, feeding and dividing on the bacterial layer, forms colonies of growing and dividing cells. As the colony grows, the local bacteria layer becomes depleted.

Subsequently the individual slime mold amoeba join together to form multi-cellular structures and finally forming fruiting bodies. Within 3 to 4 days on SM medium, Dictyostelium Discoideum, starting as a uni-cellular organism, becomes a multi-cellular life form capable of making spores to survive starvation conditions.

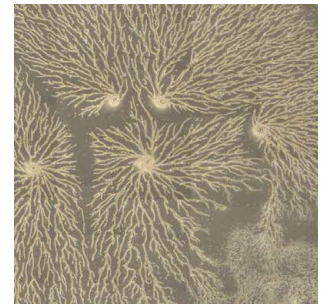
Some specific strains of Dictyostelium Discoideum are capable to grow axenically in a liquid medium without bacteria as food. Two types of media are available for culturing Dictyostelium Discoideum cells.

Non defined complex media based on mainly Peptone and Yeast extract. Proteose peptone provides high molecular weight peptides and proteins as a nitrogen source. Yeast extract is a source of vitamins, co-factors and carbohydrates. Both components are often supplemented by additional buffers, Glucose and Magnesium. HL5 is a good example of a non defined complex medium routinely used in the lab for culturing Dicty.

Synthetic defined minimal media such as FM medium and SIH medium are based on a well defined composition of mineral salts, vitamins and amino acids.

FM medium supports the growth of most strains that are capable of growing on HL5. The medium developed by Franke and Kessin is used for transformation of Dictyostelium Discoideum and genomic studies.

SIH is a newly developed modification of FM Medium. Aspartic acid is added. Tryptophane and Lysine concentrations are significantly increased, resulting in an increase of cell density up to 5×10^7 .



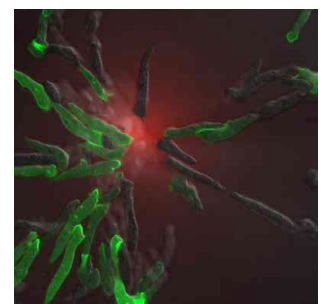
Phase contrast image of a large field of aggregating Dictyostelium cells.

Douwe Veltman, MRC Laboratory of Molecular Biology, Cambridge



The mound & fb, shows a mound of cells on the left (about half-way through the developmental cycle) and a mature fruiting body on the right.

Rob Kay, MRC Cambridge

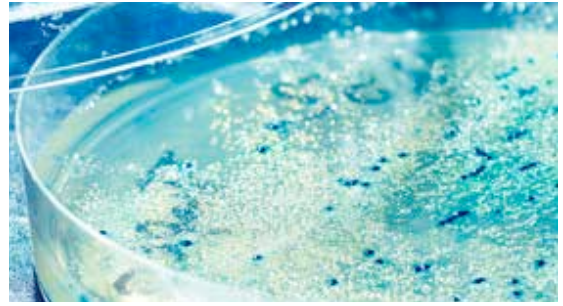


Confocal / DIC overlay image of a group of Dictyostelium cells chemotaxing towards a source of chemoattractant in the center of the field.

Douwe Veltman, MRC Laboratory of Molecular Biology, Cambridge

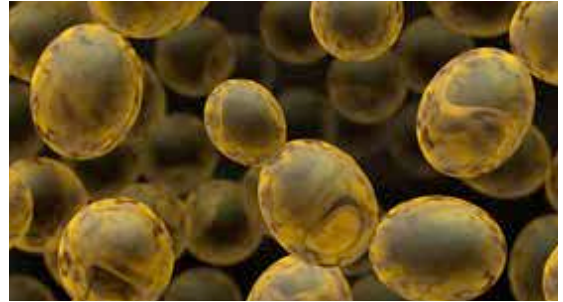
Non Defined Complex Dictyostelium Discoideum

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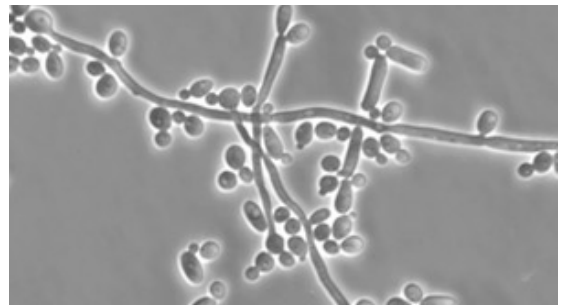
FM Defined Minimal Media

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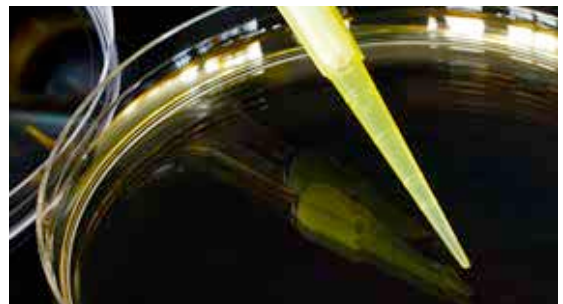
SIH Defined Minimal Media

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Yeast Media Components

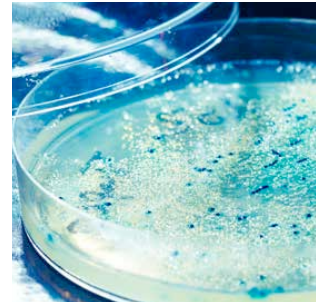
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NON DEFINED COMPLEX DICTYOSTELIUM DISCOIDEUM

Some specific strains of Dictyostelium Discoideum are capable to grow axenically in liquid media without bacteria as food. Peptone and Yeast Extract are the main components of these media within this group. Both products are present in various ratio's in different Dicty media. Peptone provides high molecular weight peptides and proteins as a nitrogen source. Yeast Extract is a source of vitamins, co-factors and carbohydrates. Often there is an additional Phosphate buffer present to inhibit acidification of the medium during cell growth.

Commonly used HL5 and HL5-C media are also available supplemented with extra vitamins and micro-elements. This supplement gives good results for cultures of Dicty cellines who require additional nutritional elements for starting up vigorous growth or protein synthesis.



This product category includes:

- 7 A Medium
- 7 AX Medium
- 8 SM Broth
- 8 SM Agar
- 9 SM Broth/5
- 9 SM Agar/5
- 10 VL6 Medium including Glucose, Animal Component Free (ACF)
- 11 VL6 Medium without Glucose, Animal Component Free (ACF)
- 12 HL5 Medium without Glucose
- 12 HL5 Medium including Glucose
- 13 HL5-C Medium including Glucose
- 13 HL5-C Medium without Glucose
- 14 HL5 Medium including Glucose supplemented with vitamins and micro-elements
- 15 HL5 Medium without Glucose supplemented with vitamins and micro-elements
- 16 HL5-C Medium including Glucose supplemented with vitamins and micro-elements
- 17 HL5-C Medium without Glucose supplemented with vitamins and micro-elements
- 18 LoFlo Medium
- 19 LoFlo Medium supplemented with Yeast extract

A MEDIUM

SKU	Size
AMD0101	250g
AMD0102	1kg
AMD0103	6 x 1kg

Formula	g/l
Peptone	5
Yeast Extract	0.5
Glucose	5
KH ₂ PO ₄	2.25
K ₂ HPO ₄	0.7
MgSO ₄ .anhydrous	0.25

Suspend 13.7 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

AX MEDIUM

SKU	Size
AXM0101	250g
AXM0102	1000g
AXM0103	6 x 1kg

Formula	g/l
Peptone	14.3
Yeast Extract	7.15
Glucose	18
KH ₂ PO ₄	0.49
Na ₂ HPO ₄ .anhydrous	0.49

Suspend 40.4 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SM BROTH

SKU	Size
SMB0101	250g
SMB0102	1000g
SMB0103	6 x 1kg

Formula	g/l
Peptone	10
Yeast Extract	1
Glucose	10
KH ₂ PO ₄	1.9
K ₂ HPO ₄ .3H ₂ O	1.3
MgO ₄ .anhydrous	0.49
Agar	17

Suspend 41.7 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SM AGAR

SKU	Size
SMA0101	250g
SMA0102	1000g
SMA0103	6 x 1kg

Formula	g/l
Peptone	10
Yeast Extract	1
Glucose	10
KH ₂ PO ₄	1.9
K ₂ HPO ₄ .3H ₂ O	1.3
MgO ₄ .anhydrous	0.49
Agar	17

Suspend 41.7 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SM BROTH/5

SKU	Size
SMB50101	250g
SMB50102	1000g
SMB50103	6 x 1kg

Formula	g/l
Peptone	2
Yeast Extract	0.2
Glucose	0.2
KH ₂ PO ₄	1.9
K ₂ HPO ₄ .3H ₂ O	1.3
MgO ₄ .anhydrous	0.49

Suspend 7.89 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SM AGAR/5

SKU	Size
SMA50101	250g
SMA50102	1000g
SMA50103	6 x 1kg

Formula	g/l
Peptone	2
Yeast Extract	0.2
Glucose	2
KH ₂ PO ₄	1.9
K ₂ HPO ₄ .3H ₂ O	1.3
MgO ₄ .anhydrous	0.49
Agar	17

Suspend 24.9 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

VL6 MEDIUM INCLUDING GLUCOSE, ANIMAL COMPONENT FREE (ACF)

SKU	Size
VL60101	250g
VL60102	1kg
VL60103	6 x 1kg

VL6 is a complex medium for cultivation of *Discoideum dyctyostelium* based on Vegetable Peptone.

Formedium Ltd have recognised the need for a range of meat-free products. This has led to the development of VL6, an animal component free alternative medium compared to traditional Dicty media such as HL5 and HL5C.

VL6 is composed of a Vegetable peptone providing high molecular weight peptides and proteins as a nitrogen source. Yeast Extract is a source of vitamins, co-factors and carbohydrates. A Phosphate buffer is present to inhibit acidification of the medium during cell growth.

As most vegetable peptones contain almost no Tryptophane VL6 is supplemented with an extra quantity of this amino acid and some other amino acids. Essential trace elements and vitamins as present in FM and SIH media are added for those Dicty cultures needing additional nutritional for starting up vigorous growth or protein synthesis.

Suspend 35.95g in 1L of Distilled or De-ionised Water.

Components		
Vegetable Peptone	10	g/L
Yeast extract	7	g/L
Potassium Dihydrogen Phosphate	1.2	g/L
Disodium Hydrogen Phosphate	0.35	g/L
Glucose	12	g/L
Trace elements	0.1	g/L
VL6 Amino acid supplement	5.3	g/L
	35.95	



GHS07 Skin & Eye Irritation

The materials used in the production are in compliance with the European Directive 75/318/EEC as amended by Directive 1999/82/EC.

Therefore Formedium takes the position that this product is free of any risk in terms of Bovine Spongiform Encephalopathy (BSE) or Transmissible Spongiform Encephalopathy (TSE).

HYGROSCOPIC Store at Room Temperature
DO NOT BREATHE DUST Keep Container Tightly Closed
WARNING GHS-07 SKIN & EYE IRRITATION

VL6 MEDIUM WITHOUT GLUCOSE, ANIMAL COMPONENT FREE (ACF)

SKU	Size
VL60201	250g
VL60202	1kg
VL60203	6 x 1kg

VL6 is a complex medium for cultivation of *Discoideum dictyostelium* based on Vegetable Peptone.

Formedium Ltd have recognised the need for a range of meat-free products. This has led to the development of VL6, an animal component free alternative medium compared to traditional Dicty media such as HL5 and HL5C.

VL6 is composed of a Vegetable peptone providing high molecular weight peptides and proteins as a nitrogen source. Yeast Extract is a source of vitamins, co-factors and carbohydrates. A Phosphate buffer is present to inhibit acidification of the medium during cell growth.

As most vegetable peptones contain almost no Tryptophan VL6 is supplemented with an extra quantity of this amino acid and some other amino acids. Essential trace elements and vitamins as present in FM and SIH media are added for those Dicty cultures needing additional nutritionals for starting up vigorous growth or protein synthesis.

Suspend 23.95g in 1L of Distilled or De-ionised Water.

Components		
Vegetable Peptone	10	g/L
Yeast extract	7	g/L
Potassium Dihydrogen Phosphate	1.2	g/L
Disodium Hydrogen Phosphate	0.35	g/L
Glucose	12	g/L
Trace elements	0.1	g/L
VL6 Amino acid supplement	5.3	g/L
	35.95	



GHS07 Skin & Eye Irritation

The materials used in the production are in compliance with the European Directive 75/318/EEC as amended by Directive 1999/82/EC.

Therefore Formedium takes the position that this product is free of any risk in terms of Bovine Spongiform Encephalopathy (BSE) or Transmissible Spongiform Encephalopathy (TSE).

HYGROSCOPIC Store at Room Temperature
DO NOT BREATHE DUST Keep Container Tightly Closed
WARNING GHS-07 SKIN & EYE IRRITATION

HL5 MEDIUM WITHOUT GLUCOSE

SKU	Size
HLB0101	250g
HLB0102	1000g
HLB0103	6 x 1kg

Formula	g/l
Peptone	14
Yeast Extract	7
KH2PO4	0.5
Na2HPO4	0.5

Suspend 22 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5 MEDIUM INCLUDING GLUCOSE

SKU	Size
HLG0101	250g
HLG0102	1000g
HLG0103	6 x 1kg

Formula	g/l
Peptone	14
Yeast Extract	7
Glucose	13.5
KH2PO4	0.5
Na2HPO4	0.5

Suspend 35.5 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5-C MEDIUM INCLUDING GLUCOSE

SKU	Size
HLC0101	250g
HLC0102	1000g
HLC0103	6 x 1kg

Formula	g/l
Peptone	5
Yeast Extract	5
Tryptone	5
KH ₂ PO ₄	1.2
Na ₂ HPO ₄	0.35
Glucose	10

Suspend 26.55 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5-C MEDIUM WITHOUT GLUCOSE

SKU	Size
HLD0101	250g
HLD0102	1000g
HLD0103	6 x 1kg

Formula	g/l
Peptone	5
Yeast Extract	5
Tryptone	5
KH ₂ PO ₄	1.2
Na ₂ HPO ₄	0.35

Suspend 16.55 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5 MEDIUM INCLUDING GLUCOSE SUPPLEMENTED WITH VITAMINS AND MICRO-ELEMENTS

SKU	Size
HLE1	250g
HLE2	1000g
HLE3	6 x 1kg

HL5 supplemented with vitamins and micro-elements as present in FM and SIH media.

The addition of extra vitamins and micro-elements gives good results for cultures of Dicty who require additional nutritional elements for starting up vigorous growth or protein synthesis.

Formula	g/l
Peptone	14
Yeast Extract	7
Glucose	13.5
KH ₂ PO ₄	0.5
Na ₂ HPO ₄	0.5
FM Vitamins and Micro-elements	0.01

Suspend 35.5 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5 MEDIUM WITHOUT GLUCOSE SUPPLEMENTED WITH VITAMINS AND MICRO-ELEMENTS

SKU	Size
HLF1	250g
HLF2	1000g
HLF3	6 x 1kg

HL5 Medium supplemented with vitamins and micro-elements as present in FM and SIH media.

The addition of extra vitamins and micro-elements gives good results for cultures of Dictyostelium Discoideum who require additional nutritional elements for starting up vigorous growth or protein synthesis.



Formula	g/l
Peptone	14
Yeast Extract	7
KH ₂ PO ₄	0.5
Na ₂ HPO ₄	0.5
FM Vitamins and Micro-elements	0.01

Suspend 22 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5-C MEDIUM INCLUDING GLUCOSE SUPPLEMENTED WITH VITAMINS AND MICRO-ELEMENTS

SKU	Size
HLH1	250g
HLH2	1kg
HLH3	6 x 1kg

HL5-C supplemented with vitamins and micro-elements as present in FM and SIH media.

The addition of extra vitamins and micro-elements gives good results for cultures of Dicty who require additional nutritional elements for starting up vigorous growth or protein synthesis.



Formula	g/l
Peptone	5
Yeast Extract	5
Tryptone	5
KH ₂ PO ₄	1.2
Na ₂ HPO ₄	0.35
Glucose	10
FM Vitamins and Micro-elements	0.01

Suspend 26.5 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

HL5-C MEDIUM WITHOUT GLUCOSE SUPPLEMENTED WITH VITAMINS AND MICRO-ELEMENTS

SKU	Size
HLI1	250g
HLI2	1kg
HLI3	6 x 1kg

HL5-C supplemented with vitamins and micro-elements as present in FM and SIH media.

The addition of extra vitamins and micro-elements gives good results for cultures of Dictyo who require additional nutritional elements for starting up vigorous growth or protein synthesis.



Formula	g/l
Peptone	5
Yeast Extract	5
Tryptone	5
KH ₂ PO ₄	1.2
Na ₂ HPO ₄	0.35
FM Vitamins and Micro-elements	0.01

Suspend 16.55 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

LOFLO MEDIUM

SKU	Size
LF0501	500g
LF1001	1kg
LF6001	6 x 1kg

Formula	g/l
Glucose	11
KH ₂ PO ₄	0.68
Casein Peptone	5
NH ₄ Cl	26.8
MgCl ₂	37.1
CaCl ₂	1.1
FeCl ₃	8.11
Na ₂ -EDTA	4.84
ZnSO ₄	2.30
H ₃ BO ₃	1.11
MnCl ₂ .4H ₂ O	0.51
CoCl ₂	0.17
CuSO ₅ .5H ₂ O	0.15
(NH ₄) ₆ Mo ₇ O ₂₄ .4H ₂ O	0.1

Suspend 16.8 gram powdered medium in 1 litre distilled water

Store dry at room temperature

Adjust to pH 6.5



GHS07 Skin & Eye Irritation

LOFLO MEDIUM SUPPLEMENTED WITH YEAST EXTRACT

SKU	Size
LFG0501	500g
LFG1001	1kg
LFG6001	6 x 1kg

Formula	g/l
Glucose	11
KH ₂ PO ₄	0.68
Casein Peptone	5
Yeast extract	0.7
NH ₄ Cl	26.8
MgCl ₂	37.1
CaCl ₂	1.1
FeCl ₃	8.11
Na ₂ -EDTA	4.84
ZnSO ₄	2.30
H ₃ BO ₃	1.11
MnCl ₂ .4H ₂ O	0.51
CoCl ₂	0.17
CuSO ₅ .5H ₂ O	0.15
(NH ₄) ₆ M ₀ 7O ₂₄ .4H ₂ O	0.1

Suspend 17.5 gram powdered medium in 1 litre distilled water

Store dry at room temperature

Adjust to pH 6.5



GHS07 Skin & Eye Irritation

FM DEFINED MINIMAL MEDIA

Synthetic Defined Minimal Media

This media is based on well defined formulations of mineral salts, vitamins and amino acids.

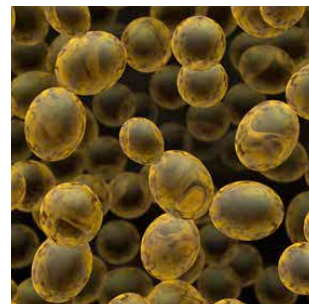
Two commonly used synthetic defined minimal Dictyostelium Discoideum media are FM and SIH.

FM medium developed by Franke and Kessin is used for transformation of Dictyostelium Discoideum and genomic studies. This formulation supports the growth of most strains that are capable of growing on HL5.

SIH medium is a newly developed modification of FM with regards to its amino acid composition. Aspartic acid is added. Tryptophane and Lysine concentrations are significantly increased, resulting in an increase of cell density up to 5×10^7 .

Both FM and SIH media are based on mineral salts in micro and macro concentrations supplemented with several vitamins. Besides these components, there is a large group of amino acids present. To facilitate genetic

studies Formedium™ offers complete formulations of FM and SIH as well as both media lacking various amino acids such as without Arginine, Glutamic Acid, Lysine and Methionine.



New to our range of synthetic media are FM and SIH without all amino acids. These two newly developed media combined with a range of amino acid drop-out mixtures gives the option to make every synthetic drop-out medium required for genetic studies.

Improvement of a synthetic medium for Dictyostelium Discoideum,
Sang-In Han, Karl Friehs and Erwin Flaschel,
Process Biochemistry, 39 (8), 925 - 930, 2004.

This product category includes:

- 21 FM Minimal Medium
- 22 FM Minimal medium w/o NH₄Cl
- 22 FM Minimal medium w/o Amino acids
- 23 FM Minimal medium w/o Amino acids and w/o Ammonium chloride
- 23 FM Minimal medium w/o Methionine
- 24 FM Minimal medium w/o Arginine and w/o Lysine
- 24 FM Minimal medium w/o Cysteine and w/o Methionine
- 25 FM Minimal medium w/o Glutamic acid and w/o Lysine
- 26 FM Amino acid drop-out mixtures
- 27 FM drop-out mixture, minus Arginine, 7600 mg/l
- 27 FM drop-out mixture, minus Cysteine, 8100 mg/l
- 27 FM drop-out mixture, minus Glutamic acid, 7800 mg/l
- 28 FM drop-out mixture, minus Lysine, 7400 mg/l
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- 28 FM drop-out mixture, minus Arginine and w/o Cysteine, 7400 mg/l
- 29 FM drop-out mixture, minus Arginine and w/o Glutamic acid, 7100 mg/l
- 29 FM drop-out mixture, minus Arginine and w/o Lysine, 6700 mg/l
- 29 FM drop-out mixture, minus Arginine and w/o Methionine, 7300 mg/l
- 30 FM drop-out mixture, minus Cysteine and w/o Glutamic acid, 7600 mg/l
- 30 FM drop-out mixture, minus Cysteine and w/o Lysine, 7200 mg/l
- 30 FM drop-out mixture, minus Cysteine and w/o Methionine, 7800 mg/l
- 31 FM drop-out mixture, minus Glutamic acid and w/o Lysine, 6900 mg/l
- 31 FM drop-out mixture, minus Glutamic acid and w/o Methionine, 7500 mg/l
- 31 FM drop-out mixture, minus Lysine and w/o Methionine, 7100 mg/l

FM MINIMAL MEDIUM

SKU	Size
FMM0101	250g
FMM0102	1kg
FMM0103	6 x 1kg

Formula	g/l
Amino Acids	
Arg	700
Asp	300
Cys	200
GluA	500
Gly	900
His	300
Ile	600
Leu	900
Lys	900
Met	300
Phe	500
Pro	800
Thr	500
Trp	200
Val	700
Vitamins	
Biotin	0.02
Cyanocobalamin	0.01
Folic Acid	0.2
Lipoic Acid	0.4
Riboflavin	0.5
Thiamine	0.6
Micro Elements	
Na ₂ EDTA.2H ₂ O	4.84
ZnSO ₄	2.3
H ₃ BO ₃	1.11
MnCl ₂ .4H ₂ O	0.51
CoCl ₂ .6H ₂ O	0.17
CuSO ₄ .5H ₂ O	0.15
(NH ₄) ₆ Mo ₇ O ₂₄ .4H ₂ O	0.1
Minerals	
NH ₄ Cl	53.5
CaCl ₂ .2H ₂ O	2.94
FeCl ₃	16.2
MgCl ₂ .6H ₂ O	81.32
KH ₂ PO ₄	870
Carbon Source	
Glucose	10000
Total	19334.87



GHS07 Skin & Eye Irritation

Suspend 19.3 gram powdered medium in 1 litre distilled water

Store dry at room temperature

FM MINIMAL MEDIUM W/O NH4CL

SKU	Size
FMM0201	250g
FMM0202	1kg
FMM0203	6 x 1kg

Suspend 19.3 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM MINIMAL MEDIUM W/O AMINO ACIDS

SKU	Size
FMM0501	250g
FMM0502	1kg
FMM0503	6 x 1kg

Suspend 11.0 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM MINIMAL MEDIUM W/O AMINO ACIDS AND W/O AMMONIUM CHLORIDE

SKU	Size
FMM0601	250g
FMM0602	1kg
FMM0603	6 x 1kg

Suspend 11.0 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM MINIMAL MEDIUM W/O METHIONINE

SKU	Size
FMM0301	250g
FMM0302	1kg
FMM0303	6 x 1kg

Suspend 19.0 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM MINIMAL MEDIUM W/O ARGININE AND W/O LYSINE

SKU	Size
FMM0401	250g
FMM0402	1kg
FMM0403	6 x 1kg

Suspend 17.7 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM MINIMAL MEDIUM W/O CYSTEINE AND W/O METHIONINE

SKU	Size
FMM0701	250g
FMM0702	1000g
FMM0703	6 x 1kg

Suspend 18.8 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM MINIMAL MEDIUM W/O GLUTAMIC ACID AND W/O LYSINE

SKU	Size
FMM0801	250g
FMM0802	1kg
FMM0803	6 x 1kg

Suspend 18.8 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

FM AMINO ACID DROP-OUT MIXTURES

SKU	Size
FMM0101	250g
FMM0102	1kg
FMM0103	6 x 1kg

FM Amino acid drop-out mixture is based on the Amino acids present in FM Minimal medium. These Amino acids form a basis for many “Drop-Out” mixtures to select for auxotrophic requirements and transformants. Each FM Drop-Out mixture contain all components except for one or two essential Amino acids, i.e. the “dropped out” supplements. FM Amino acids drop-out mixtures are used in combination with FM Minimal medium w/o Amino acids or FM Minimal medium w/o Amino acids and w/o Ammonium chloride to complete the medium.

Complete Supplement Mixture formulations are available in 25 gram and 250 gram pack sizes.

Please enquire about custom made formulations.

Formula	g/l
Amino Acids	
Arg	700
Asp	300
Cys	200
GluA	500
Gly	900
His	300
Ile	600
Leu	900
Lys	900
Met	300
Phe	500
Pro	800
Thr	500
Trp	200
Val	700
Total	8300 mg/l




GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS ARGININE, 7600 MG/L

SKU	Size
FMA47	100g
FMA48	250g




 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS CYSTEINE, 8100 MG/L

SKU	Size
FMA05	100g
FMA06	250g




 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS GLUTAMIC ACID, 7800 MG/L

SKU	Size
FMA08	100g
FMA09	250g



 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS LYSINE, 7400 MG/L

SKU	Size
FMA11	100g
FMA12	250g



GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS METHIONINE, 8000 MG/L

SKU	Size
FMA14	100g
FMA15	250g



GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS ARGININE AND W/O CYSTEINE, 7400 MG/L

SKU	Size
FMA17	100g
FMA18	250g




GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS ARGININE AND W/O GLUTAMIC ACID, 7100 MG/L

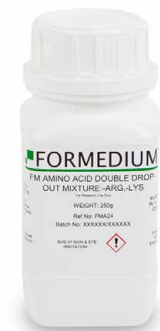
SKU	Size
FMA20	100g
FMA21	250g




 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS ARGININE AND W/O LYSINE, 6700 MG/L

SKU	Size
FMA23	100g
FMA24	250g




 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS ARGININE AND W/O METHIONINE, 7300 MG/L

SKU	Size
FMA26	100g
FMA27	250g



 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS CYSTEINE AND W/O GLUTAMIC ACID, 7600 MG/L

SKU	Size
FMA29	100g
FMA30	250g



GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS CYSTEINE AND W/O LYSINE, 7200 MG/L

SKU	Size
FMA32	100g
FMA33	250g



GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS CYSTEINE AND W/O METHIONINE, 7800 MG/L

SKU	Size
FMA35	100g
FMA36	250g




GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS GLUTAMIC ACID AND W/O LYSINE, 6900 MG/L

SKU	Size
FMA38	100g
FMA39	250g




 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS GLUTAMIC ACID AND W/O METHIONINE, 7500 MG/L

SKU	Size
FMA41	100g
FMA42	250g




 GHS07 Skin & Eye Irritation

FM DROP-OUT MIXTURE, MINUS LYSINE AND W/O METHIONINE, 7100 MG/L

SKU	Size
FMA44	100g
FMA45	250g



 GHS07 Skin & Eye Irritation

SIH DEFINED MINIMAL MEDIA

Dictyostelium Discoideum

Synthetic Defined Minimal Media

This media is based on well defined formulations of mineral salts, vitamins and amino acids.

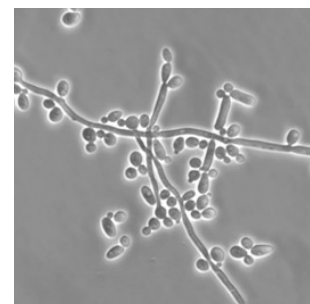
Two commonly used synthetic defined minimal Dictyostelium Discoideum media are FM Media and SIH Media.

FM medium developed by Franke and Kessin is used for transformation of Dictyostelium Discoideum and genomic studies. This formulation supports the growth of most strains that are capable of growing on HL5.

SIH medium is a newly developed modification of FM with regards to its amino acid composition. Aspartic acid is added. Tryptophane and Lysine concentrations are significantly increased, resulting in an increase of cell density up to 5×10^7 .

Both FM and SIH media are based on mineral salts in micro and macro concentrations supplemented with several vitamins. Besides these components, there is a large group of amino acids present. To facilitate genetic studies ForMedium™ offers complete formulations of FM and SIH as well as both media lacking various amino acids such as without Arginine, Glutamic Acid, Lysine and Methionine.

New to our range of synthetic media are FM and SIH without all amino acids. These two newly developed media, combined with a range of amino acid drop-out mixtures gives the option to make every synthetic drop-out medium required for genetic studies.



Improvement of a synthetic medium for Dictyostelium discoideum, Sang-In Han, Karl Friebs and Erwin Flaschel, Process Biochemistry, 39 (8), 925 - 930, 2004

This product category includes:

- 33 SIH Medium
- 34 SIH medium w/o NH₄Cl
- 34 SIH medium w/o Amino acids
- 35 SIH medium w/o Amino acids and w/o Ammonium chloride
- 35 SIH medium w/o Methionine
- 36 SIH medium w/o Arginine and w/o Lysine
- 36 SIH medium w/o Cysteine and w/o Methionine
- 37 SIH medium w/o Glutamic acid and w/o Lysine
- 38 SIH Amino acid drop-out mixture
- 39 SIH drop-out mixture, minus Arginine, 8495 mg/l
- 39 SIH drop-out mixture, minus Cysteine, 8895 mg/l
- 39 SIH drop-out mixture, minus Glutamic acid, 8650 mg/l
- 40 SIH drop-out mixture, minus Lysine, 7945 mg/l
- 40 SIH drop-out mixture, minus Methionine, 8845 mg/l
- 40 SIH drop-out mixture, minus Arginine and w/o Cysteine, 8195 mg/l
- 41 SIH drop-out mixture, minus Arginine and w/o Glutamic acid, 7950 mg/l
- 41 SIH drop-out mixture, minus Arginine and w/o Lysine, 7245 mg/l
- 41 SIH drop-out mixture, minus Arginine and w/o Methionine, 8145 mg/l
- 42 SIH drop-out mixture, minus Cysteine and w/o Glutamic acid, 8350 mg/l
- 42 SIH drop-out mixture, minus Cysteine and w/o Lysine, 7645 mg/l
- 42 SIH drop-out mixture, minus Cysteine and w/o Methionine, 8545 mg/l
- 43 SIH drop-out mixture, minus Glutamic acid and w/o Lysine, 7400 mg/l
- 43 SIH drop-out mixture, minus Glutamic acid and w/o Methionine, 8300 mg/l
- 43 SIH drop-out mixture, minus Lysine and w/o Methionine, 7595 mg/l

SIH MEDIUM

SKU	Size
SIH0101	250g
SIH0102	1kg
SIH0103	6 x 1kg

Formula	g/l
Amino Acids	
Arg	700
Asp	300
Asp A	150
Cys	300
GluA	545
Gly	900
His	300
Ile	600
Leu	900
Lys	1250
Met	350
Phe	550
Pro	800
Thr	500
Trp	350
Val	700
Vitamins	
Biotin	0.02
Cyanocobalamin	0.01
Folic Acid	0.2
Lipoic Acid	0.4
Riboflavin	0.5
Thiamine	0.6
Micro Elements	
Na ₂ EDTA.2H ₂ O	4.84
ZnSO ₄	2.3
H ₃ BO ₃	1.11
MnCl ₂ .4H ₂ O	0.51
CoCl ₂ .6H ₂ O	0.17
CuSO ₄ .5H ₂ O	0.15
(NH₄)₆Mo₇O₂₄.4H₂O	0.1
Minerals	
NH ₄ Cl	53.5
CaCl ₂ .2H ₂ O	2.94
FeCl ₃	16.2
MgCl ₂ .6H ₂ O	81.32
KH ₂ PO ₄	870
Carbon Source	
Glucose	10000
Total	20326



GHS07 Skin & Eye Irritation

SIH medium, developed by Hanh, Friehs and Flaschel (2004), is the next step in the development of synthetic media designed to grow *D. discoideum* in high cell densities.

SIH medium is an improved version of FM medium, as developed by Frank and Kessin (1977).

The main difference between SIH and FM is the novel addition of Aspartic acid (1.1 mM) and increased levels of Lysine (8.5 mM) and Tryptophane (1.7 mM). Concentrations of Cysteine, Glutamic acid, Methionine, Phenylalanine, Threonine are slightly increased as well in SIH.

The alterations in amino acid formulation of SIH medium resulted in a more even and better amino acid utilisation. Cell density of *D. discoideum* rose up to levels in excess of 5×10^7 cells compared to FM medium with cell density levels of 3×10^7 .

Improvement of a synthetic medium for *Dictyostelium discoideum*, Sang-In Han, Karl Friehs and Erwin Flaschel, *Process Biochemistry*, 39 (8), 925, 930, 2004.

Cultivation of *Dictyostelium discoideum* on an improved synthetic medium in a conventional bioreactor. Sang-In Han, Karl Friehs and Erwin Flaschel, *Process Biochemistry*, 39, 585 - 589, 2004.

Suspend 20.3 gram powdered medium in 1 litre distilled water
Store dry at room temperature

SIH MEDIUM W/O NH4CL

SKU	Size
SIH0501	250g
SIH0502	1kg
SIH0503	6 x 1kg

Suspend 20.3 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH MEDIUM W/O AMINO ACIDS

SKU	Size
SIH0601	250g
SIH0602	1kg
SIH0603	6 x 1kg

Suspend 11.1 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH MEDIUM W/O AMINO ACIDS AND W/O AMMONIUM CHLORIDE

SKU	Size
SIH0701	250g
SIH0702	1kg
SIH0703	6 x 1kg

Suspend 11.1 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH MEDIUM W/O METHIONINE

SKU	Size
SIM0101	250g
SIM0102	1kg
SIM0103	6 x 1kg

Suspend 20.0 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH MEDIUM W/O ARGININE AND W/O LYSINE

SKU	Size
SIH1001	250g
SIH1002	1kg
SIH1003	6 x 1kg

Suspend 18.4 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH MEDIUM W/O CYSTEINE AND W/O METHIONINE

SKU	Size
SIH0801	250g
SIH0802	1kg
SIH0803	6 x 1kg

Suspend 19.7 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH MEDIUM W/O GLUTAMIC ACID AND W/O LYSINE

SKU	Size
SIH0901	250g
SIH0902	1kg
SIH0903	6 x 1kg

Suspend 18.6 gram powdered medium in 1 litre distilled water

Store dry at room temperature



GHS07 Skin & Eye Irritation

SIH AMINO ACID DROP-OUT MIXTURE

SKU	Size
SHA02	100g
SHA03	250g

SIH Amino acid drop-out mixture is based on the Amino acids present in SIH Minimal medium. These Amino acids form a basis for many “Drop-Out” mixtures to select for auxotrophic requirements and transformants. Each SIH Drop-Out mixture contain all components except for one or two essential Amino acids, i.e. the “dropped out” supplements. SIH Amino acids drop-out mixtures are used in combination with SIH Minimal medium w/o Amino acids or SIH Minimal medium w/o Amino acids and w/o Ammonium chloride to complete the medium.

Complete Supplement Mixture formulations are available in 25 gram and 250 gram pack sizes.

Please enquire about custom made formulations.

Complete SIH Amino acid mixture, 9195 mg/l




GHS07 Skin & Eye Irritation

Formula	g/l
Amino Acids	
Arg	700
Asp	300
Asp A	150
Cys	300
GluA	545
Gly	900
His	300
Ile	600
Leu	900
Lys	1250
Met	350
Phe	550
Pro	800
Thr	500
Trp	350
Val	700
Total	9195 mg/l

SIH DROP-OUT MIXTURE, MINUS ARGININE, 8495 MG/L

SKU	Size
SHA05	100g
SHA06	250g



 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS CYSTEINE, 8895 MG/L

SKU	Size
SHA08	100g
SHA09	250g




 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS GLUTAMIC ACID, 8650 MG/L

SKU	Size
SHA11	100g
SHA12	250g



 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS LYSINE, 7945 MG/L

SKU	Size
SHA14	100g
SHA15	250g



GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS METHIONINE, 8845 MG/L

SKU	Size
SHA17	100g
SHA18	250g



GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS ARGININE AND W/O CYSTEINE, 8195 MG/L

SKU	Size
SHA20	100g
SHA21	250g




GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS ARGININE AND W/O GLUTAMIC ACID, 7950 MG/L

SKU	Size
SHA23	100g
SHA24	250g



 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS ARGININE AND W/O LYSINE, 7245 MG/L

SKU	Size
SHA26	100g
SHA27	250g




 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS ARGININE AND W/O METHIONINE, 8145 MG/L

SKU	Size
SHA29	100g
SHA30	250g



 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS CYSTEINE AND W/O GLUTAMIC ACID, 8350 MG/L

SKU	Size
SHA32	100g
SHA33	250g



GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS CYSTEINE AND W/O LYSINE, 7645 MG/L

SKU	Size
SHA35	100g
SHA36	250g



GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS CYSTEINE AND W/O METHIONINE, 8545 MG/L

SKU	Size
SHA38	100g
SHA39	250g




GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS GLUTAMIC ACID AND W/O LYSINE, 7400 MG/L

SKU	Size
SHA41	100g
SHA42	250g




 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS GLUTAMIC ACID AND W/O METHIONINE, 8300 MG/L

SKU	Size
SHA44	100g
SHA45	250g




 GHS07 Skin & Eye Irritation

SIH DROP-OUT MIXTURE, MINUS LYSINE AND W/O METHIONINE, 7595 MG/L

SKU	Size
SHA47	100g
SHA48	250g



 GHS07 Skin & Eye Irritation

YEAST MEDIA COMPONENTS

Formedium™ manufactures a large range of media for yeast, fungi and bacterial cell cultures. Part of these media are nutritional elements like Agar, Casamino acids, Glucose, Peptone, Tryptone and Yeast extract.

These nutrients are also offered by Formedium™ as separate media components to allow the researcher to select the optimal concentration of each component for a specific strain.

All products offered are used by Formedium™ are of high quality and purity and used to produce an extended range of cell culture media.



This product category includes:

- 45 Agar
- 45 L- Arabinose
- 46 Malt Extract
- 46 Agar Granulated, Bacteriological grade
- 47 Casamino Acids
- 47 D(+) - Galactose
- 48 D(+) - Glucose Anhydrous
- 48 D(+) - Lactose monohydrate
- 49 Peptone
- 50 Potato Extract
- 50 D(+) - Raffinose Pentahydrate
- 51 Sodium Chloride
- 51 D(+) - Sorbitol
- 52 Tryptone
- 52 Yeast Extract, Powder
- 53 Yeast Extract, Micro Granulated

AGAR

SKU	Size
AGA01	250g
AGA02	500g
AGA03	1000g
AGA04	6 x 1kg

Agar is natural product derived from seaweed. During the production process all impurities are carefully removed to obtain an agar with a high gel strength, excellent clarity and low mineral content. The result is an agar well suited for cell cultures.

Store dry at room temperature



GHS07 Skin & Eye Irritation

L- ARABINOSE

SKU	Size
ARA001	100g
ARA005	500g
ARA010	1kg

C5H10O5 = 150.13

Purity HPLC 99%

Purity TLC Single spot

Water < 0.3%

White Crystalline powder

Store dry at room temperature



GHS07 Skin & Eye Irritation

MALT EXTRACT

SKU	Size
MAL03	1kg

Malt extract is prepared from Malt by extracting the soluble products from sprouted grain.

The product contains a mix of carbohydrates (mainly maltose) and growth factors.

Solubility in water at 3 % Complete

pH (3 % solution) 4.8 - 5.8

Loss on drying ≤ 6.0 %

Reducing sugars (as maltose) ≥ 60.0 %

Residue on ignition ≤ 4.5 %

Chloride (as NaCl) ≤ 1.0 %

Store dry at room temperature



GHS07 Skin & Eye Irritation

AGAR GRANULATED, BACTERIOLOGICAL GRADE

SKU	Size
AGR02	250g
AGR05	500g
AGR10	1000g
AGR60	6 x 1kg

Agar Granulated, Bacteriological grade is a fine granulated agar with excellent characteristics for bacteriological growth.

Due to the fine granule structure of this agar dusting while handling is very low.

Store dry at room temperature



GHS07 Skin & Eye Irritation

CASAMINO ACIDS

SKU	Size
CAS01	250g
CAS02	500g
CAS03	1000g
CAS04	6 x 1kg

Casamino Acids are manufactured by a controlled acid hydrolysis of casein . Hydrolysis is not completed until all the nitrogen in the casein is converted to amino acids or other compounds of relative chemical simplicity. As a result of the acid hydrolysis process all vitamins and growth factors present in casein are destroyed.

Due to the low sodium chloride concentration ForMedium™ Casamino Acids are well suited for cultivation of yeast cells.

Store dry at room temperature



GHS07 Skin & Eye Irritation

D(+)- GALACTOSE

SKU	Size
ARA001	100g
ARA005	500g
ARA010	1kg

C6H12O6 = 180.16

Purity HPLC >99%

Water < 0.3%

White Crystalline powder

Store dry at room temperature



GHS07 Skin & Eye Irritation

D(+) - GLUCOSE ANHYDROUS

SKU	Size
GLU01	250g
GLU02	500g
GLU03	1000g
GLU04	6 x 1kg

C6H12O6 = 180

A fine white crystalline quality with excellent properties for cell culture.

Store dry at room temperature



GHS07 Skin & Eye Irritation

D(+) - LACTOSE MONOHYDRATE

SKU	Size
LAC02	1000g
LAC03	6 x 1kg

C12H22O6.2H2O = 360.2

Complies to Ph. Eur.

White Crystalline powder

Store dry at room temperature



GHS07 Skin & Eye Irritation

PEPTONE

SKU	Size
PEP01	250g
PEP02	500g
PEP03	1000g
PEP04	6 x 1kg

Peptone is a spray dried powder, manufactured by a controlled enzymatic hydrolysis of animal tissue. The most commonly used enzymes are pepsin, papain and pancreatin. The latter containing trypsin.

Pepsin will cut the peptide chain anywhere there is a phenylalanine or leucine bond.

Papain cuts in the peptide chain adjacent to arginine, lysine, phenylalanine and glycine. Pancreatin has its action at arginine, lysine, tyrosine, tryptophan, phenylalanine and leucine bonds.

The tissues are hydrolysed to produce straw coloured peptones which are highly nutritious and clearly soluble in water. Peptones contain a mix of peptides, free amino acids and growth factors.

Due to the low sodium chloride concentration ForMedium™ Pepton is well suited for cultivation of yeast cells.

Store dry at room temperature



GHS07 Skin & Eye Irritation

POTATO EXTRACT

SKU	Size
PTE01	250g
PTE02	500g
PTE03	1000g
PTE04	6 x 1kg

Potato extract is a mixture of potato proteins, manufactured by controlled enzymatic hydrolysis. The extract is an excellent nitrogen source for bacteria, yeasts and fungi. Potato extract is rich in vitamins and minerals and supports a vigorous growth of micro-organisms.

Store dry at room temperature



GHS07 Skin & Eye Irritation

D(+)- RAFFINOSE PENTAHYDRATE

SKU	Size
RAF01	100g
RAF02	250g
RAF03	500g
RAF04	1kg

$C_{18}H_{32}O_{16} \cdot 5H_2O = 594.5$

Purity HPLC >99%

White powder

Store dry at room temperature



GHS07 Skin & Eye Irritation

SODIUM CHLORIDE

SKU	Size
NAC02	1000g
NAC03	6 x 1kg

NaCl = 58.4

Complies to Ph. Eur and USP

Heavy metals < 5 ppm

Ferrocyanides

A fine white crystalline quality with excellent properties for cell culture.

Store dry at room temperature



GHS07 Skin & Eye Irritation

D(+) - SORBITOL

SKU	Size
SOR02	1kg
SOR03	5kg

C6H14O6 = 182.17

Complies to Ph. Eur.

White crystalline powder.

Store dry at room temperature



GHS07 Skin & Eye Irritation

TRYPTONE

SKU	Size
TRP01	250g
TRP02	500g
TRP03	1000g
TRP04	6 x 1kg

Enzymatic digest of casein

Tryptone is a pancreatic digest of casein. Casein is the main protein of milk and is a rich source of amino acid nitrogen. Amongst all amino acids especially Tryptophan is present in high concentrations.

Due to the rich nutritional properties, Tryptone is added to media as an accelerator to increase the yield of organisms and is recommended where a rapid and luxuriant growth of micro organisms is required.

Store dry at room temperature



GHS07 Skin & Eye Irritation

YEAST EXTRACT, POWDER

SKU	Size
YEA01	250g
YEA02	500g
YEA03	1000g
YEA04	6 x 1kg

Yeast Extract is a spray dried extract manufactured by complete autolysis, i.e. a transformation of proteins into peptides, and amino acids, implemented through the proteolytic enzymes present in yeast cells.

The cell membranes are discarded, enabling completely soluble yeast extracts to be obtained. Besides peptides and amino acids yeast extract also contains purine and pyrimidine bases, carbohydrates and water soluble vitamins of B group.

Sodium Chloride concentration of Formedium™ Yeast Extract is low and also therefore well suited for cultivation of yeast cells.

Due to its carbohydrate content, typically 10%, yeast extract is not suitable for media intended for the study of sugar fermentation.



GHS07 Skin & Eye Irritation

Store dry at room temperature

YEAST EXTRACT, MICRO GRANULATED

SKU	Size
YEM01	250g
YEM02	500g
YEM03	1000g
YEM04	6kg

The micro granulated presentation of Yeast extract considerably limits the emission of dust, gives the product its free-flowing aspect and allows it to dissolve more rapidly in water.

All other specifications see Yeast extract, Powder.

Store dry at room temperature



GHS07 Skin & Eye Irritation