Product Information

Dulbecco's Modified Eagle's Medium/F-12 Nutrient Mixture Ham (DMEM/F-12) 3:1 Mixture, Liquid

With 3825.5 mg/L D-glucose With 949 mg/L L-glutamine Without HEPES

Catalog Number **LM 030-01** Storage Temperature 2~8°C

제품설명

F-12 Nutrient Mixture (Ham's F-12, LM 010-02) 는 무혈청 배지로 세포를 배양할 수 있도록 개발된 것으로 여러 연구자들은 insulin, transferrin, epidermal growth factor (EGF), leutinizing hormone (또는 follicle stimulating hormone), somatomedin, 그리고 성장호르몬 등이 포함된 무혈청 배지에서 Leydig 세포와 Sertoli 세포를 성공적으로 배양할 수 있다고 보고하였다. 특히 F-12 Nutrient Mixture와 Dulbecco's Modified Eagle's Medium (DMEM)을 1:1로 혼합한 배지가 세포를 혈청 없이 배양하는데 매우 효율적이라고 알려져 있다. **LM 030-01** 은 DMEM (High glucose, **LM 001-05**) 과 Ham's F-12 (LM 010-02)를 3:1의 비율로 혼합한 조성으로 혈청 대신에 각종 영양분, 성장 인자 및 호르몬 들을 포함하고 있으며 3825.5 mg/L의 D-glucose 와 949 mg/L의 L-glutamine을 포함하고 있다. 그러나 HEPES는 포함되어 있지 않으므로, 원하는 경우, 배지 1 L 당 15 ml의 1 M HEPES 용액 (BB 001-01)을 첨가하여 최종 15 mM (3574.5 mg/L)의 농도로 사용할 수 있다. 적절한 배양액을 선택하기 위해서는 (1) 배양할 세포 종류, (2) 배양방법 (monolayer, suspension, or clonal), 그리고 (3) 필수 성분 포함 여부 등을 고려해야 한다. 또한 참고문헌을 기초로 하여 배양액에 혈청, 첨가물, 그리고 기타 물리적 조건 등을 최적화함으로써 배양 하고자 하는 세포의 성장 및 목적 산물의 생산을 최적화할 수 있다.

보관 및 안정성

액상 배지는 차광하여 2~8°C에서 보관하여야 한다. 액상배지의 변성은 (1) 침전물 또는 부유물, (2) 용액의 탁해짐, (3) 색의 변화, 그리고 (4) pH의 변화 등으로 나타날 수 있다. 추가로 첨가하는 첨가제의 성질에 의해 보관조건 및 배지의 유효기간이 바뀔 수 있다. 유효기간은 제품 라벨에 표시되어 있다.

생물학적 특성

DMEM/F-12 배지의 세포 증식 능력은 액상 배지에 적합한 세포주를 배양하면서 시험한다. 성장 속도는 세 번의 계대 배양을 통하여 측정하고 표준품에서 배양한 것과 비교한다. 시간에 따른 세포수의 변화를 측정하고 seeding efficiency, doubling time, 그리고 최종 세포농도를 결정한다. 시험을 하면서 현미경으로 세포의 형태 변화와 cytotoxicity의 현상이나타나는지 관찰한다.

수의 For *In Vitro* Use Only

	mg/L
Components	LM 030-01
CaCl ₂ (anhydrous)	158.30
Fe(NO ₃) ₃ ·9H ₂ O	0.075
CuSO ₄ ·5H ₂ O	0.000625
FeSO ₄ ·7H ₂ O	0.2075

MgSO ₄ (anhydrous) 73.2525 MgCl ₂ (anhydrous) 14.305 NaCl 6699.75 NaHCO ₃ 3069.00 NaH ₂ PO ₄ (anhydrous) 35.50 ZnSO ₄ *7H ₂ O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine:Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Phenol Red 11.55 Putrescine:HCl 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine:HCl 115.75 L-Aspartic Acid 3.25 L-Cysteine:HClH ₂ O 3.75 L-Cysteine:HClH ₂ O 3.75 L-Glutamine 949.00 Glycine 24.375 L-Histidine:HClH ₂ O 36.75 L-Leucine 82.00 L-Lycine: 82.00 L-Proline 8.625 L-Proline 8.625 <tr< th=""><th>KCI</th><th>355.90</th></tr<>	KCI	355.90
NaCl 6699.75 NaHCO₃ 3069.00 NaH₂PO₄ H₂O 93.75 Xn₂HPO₄ (anhydrous) 35.50 ZnSO₄'TH₂O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine: HCI 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCI 115.75 L-Aspartic Acid 3.25 L-Cysteine HCI+I₂O 8.75 L-Cysteine HCI+I₂O 8.75 L-Cysteine HCI+I₂O 8.75 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCI+I₂O 36.75 L-Leucine 82.00 L-Lysin-HCI 118.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L	MgSO ₄ (anhydrous)	73.2525
NaHcO₃ 3069.00 NaH₂PO₄ (H₂O) 93.75 Na₂HPO₄ (anhydrous) 35.50 ZnSO₄⁻H₂O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine HCl 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCl 115.75 L-Asparatic Acid 3.25 L-Cysteine HCl·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine HCl·H₂O 8.75 L-Cysteine HCl·H₂O 8.75 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl·H₂O 36.75 L-Isioleucine 79.75 L-Leucine 82.00 L-Lysin-HCl 118.625 L-Methionine 23.625 L-Prolline 8.625	MgCl ₂ (anhydrous)	14.305
NaH₂PO₄ (anhydrous) 93.75 Na₂HPO₄ (anhydrous) 35.50 ZnSO₄⁻H₂O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Phutrescine HCl 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCl 115.75 L-Asparagine HCl 115.75 L-Asparagine HCl 3.75 L-Cysteine HCl H₂O 8.75 L-Gutamine Acid 3.675 L-Gutamine Acid 3.675 L-Glutamine Acid 3.675 L-Histidine HCl H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Usin HCl 118.625 L-Phenylalanine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Tryptophan 12.50	NaCl	6699.75
Na₂HPO₄ (anhydrous) 35.50 ZnSO₄·7H₂O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine·Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine·HCI 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine·HCI 115.75 L-Asparagine·H₂O 3.75 L-Cysteine·HCl·H₂O 8.75 L-Cysteine·HCl·H₂O 8.75 L-Gutamine Acid 3.675 L-Glutamine Acid 3.675 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 24.375 L-Isoleucine 24.375 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Penylalanine 50.75 L-Penylalanine 50.75 L-Proline 8.625 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 <	NaHCO ₃	3069.00
ZnSO₄⁺7H₂O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine HCI 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCI 115.75 L-Asparagine H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine HCl'H₂O 8.75 L-Cysteine HCl'H₂O 8.75 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl'H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin-HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Serine 34.125 L-Trytophan 12.50 L-Tyrosine 2Na 2H₂O 79.95	NaH ₂ PO ₄ ·H ₂ O	93.75
ZnSO₄⁺7H₂O 0.215 D-Glucose 3825.50 HEPES - Hypoxanthine Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine HCI 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCI 115.75 L-Asparagine H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine HCl'H₂O 8.75 L-Cysteine HCl'H₂O 8.75 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl'H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin-HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Serine 34.125 L-Trytophan 12.50 L-Tyrosine 2Na 2H₂O 79.95	Na ₂ HPO ₄ (anhydrous)	35.50
HEPES - Hypoxanthine Na 1.1925 Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine HCI 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCI 115.75 L-Asparagine H₂O 3.75 L-Asparatic Acid 3.25 L-Cysteine HCl H₂O 8.75 L-Cysteine '2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl·H₂O 36.75 L-Istoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tryrosine '2Na '2H₂O 79.95 L-Valine 73.425 Biotin 0.00175	ZnSO ₄ ·7H ₂ O	
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Linoleic Acid 0.02 Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine·HCl 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine·HCl 115.75 L-Asparagine·H₂O 3.75 L-Asparatic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cysteine·HCl·H₂O 8.75 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325	HEPES	-
Lipoic Acid 0.0525 Phenol Red 11.55 Putrescine·HCl 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine·HCl 115.75 L-Asparagine·H2O 3.75 L-Asparagine·H2O 3.75 L-Asparagine·HCl·H2O 8.75 L-Cysteine·HCl·H2O 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H2O 36.75 L-Isoleucine 79.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tryrosine·2Na·2H2O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50	Hypoxanthine Na	1.1925
Phenol Red 11.55 Putrescine HCl 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCl 115.75 L-Asparagine H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine HCl H₂O 8.75 L-Gutamic Acid 3.675 L-Glutamine Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tryptophan 12.50 L-Tyrosine 2Na 2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325	Linoleic Acid	0.02
Putrescine HCI 0.04025 Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine HCI 115.75 L-Asparagine H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine HCl H₂O 8.75 L-Cystine 2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin-HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Proline 8.625 L-Tyrosine 2Na·22H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 <t< td=""><td>Lipoic Acid</td><td>0.0525</td></t<>	Lipoic Acid	0.0525
Sodium Pyruvate 110.00 Thymidine 0.175 L-Alanine 2.225 L-Arginine·HCl 115.75 L-Asparagine·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cystine·2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Proline 8.625 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 Pyrodoxine·HCl 0.015	Phenol Red	11.55
Thymidine 0.175 L-Alanine 2.225 L-Arginine·HCl 115.75 L-Asparagine·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cystine·2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Proline 8.625 L-Tyrosine· 34.125 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 Pyrodoxine·HCl 0.015	Putrescine·HCl	0.04025
L-Alanine 2.225 L-Arginine·HCl 115.75 L-Asparagine·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Penylalanine 50.75 L-Proline 8.625 L-Tryptoine 34.125 L-Tryptophan 12.50 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.00	Sodium Pyruvate	110.00
L-Arginine·HCl 115.75 L-Asparagine·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cystine·2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tryrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	Thymidine	0.175
L-Asparagine·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cystine·2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Alanine	2.225
L-Asparagine·H₂O 3.75 L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cystine·2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Arginine·HCl	115.75
L-Aspartic Acid 3.25 L-Cysteine·HCl·H₂O 8.75 L-Cystine·2HCl 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00		
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L-Cystine 2HCI 47.25 L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine HCl H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00		8.75
L-Glutamic Acid 3.675 L-Glutamine 949.00 Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00		
Glycine 24.375 L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00		
L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Glutamine	949.00
L-Histidine·HCl·H₂O 36.75 L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	Glycine	24.375
L-Isoleucine 79.75 L-Leucine 82.00 L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Valine '2Na·2H₂O 79.95 L-Valine Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Histidine·HCl·H₂O	
L-Lysin·HCl 118.625 L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Tyrosine·2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00		79.75
L-Methionine 23.625 L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Tyrosine 2Na 2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	L-Leucine	82.00
L-Phenylalanine 50.75 L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Tyrosine '2Na '2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	L-Lysin·HCI	118.625
L-Proline 8.625 L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Tyrosine 2Na 2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	L-Methionine	23.625
L-Serine 34.125 L-Threonine 74.25 L-Tryptophan 12.50 L-Tyrosine 2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Phenylalanine	50.75
L-Threonine 74.25 L-Tryptophan 12.50 L-Tyrosine 2Na 2H ₂ O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	L-Proline	8.625
L-Tryptophan 12.50 L-Tyrosine 2Na·2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Serine	34.125
L-Tyrosine 2Na 2H₂O 79.95 L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	L-Threonine	74.25
L-Valine 73.425 Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Tryptophan	12.50
Biotin 0.00175 D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Tyrosine·2Na·2H ₂ O	79.95
D-Ca Pantothenate 3.125 Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	L-Valine	73.425
Choline Chloride 6.50 Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	Biotin	0.00175
Folic Acid 3.325 i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	D-Ca Pantothenate	3.125
i-Inositol 9.90 Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	Choline Chloride	6.50
Niacinamide 3.01 PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	Folic Acid	3.325
PyrodoxineHCl 0.015 Riboflavin 0.31 Thiamine HCl 3.075 Pyridoxine HCl 3.00	i-Inositol	9.90
Riboflavin 0.31 Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	Niacinamide	3.01
Thiamine·HCl 3.075 Pyridoxine·HCl 3.00	PyrodoxineHCl	0.015
Pyridoxine·HCl 3.00		0.31
	Thiamine HCl	3.075
Vitamin B ₁₂ 0.35	Pyridoxine HCI	3.00
0.00	Vitamin B ₁₂	0.35

Product Profile	
Appearance	Red transparent solution
pH at RT	7.0 ~ 7.6
Osmolality	305 ~ 338 mOsm/kg H₂O
Endotoxin	≤ 1.0 EU/ml
Sterility	Sterilized by 0.2 µm filtration system. Sterility tests are performed in accordance with protocols described in USP.

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