

Products for Metabolic Labeling

ISOTECH® has everything you need for SILAC

ISOTECH Stable Isotopes offers a complete line of SILAC labeling materials to facilitate your quantitative proteomics experiments.

- **99% enriched amino acids**
¹³C and/or ¹⁵N Arginine and Lysine to improve overall quantification accuracy
- **DMEM or RPMI-1640 media**
 Depleted media to gain the greatest labeling flexibility and sequence coverage
- **Dialyzed Fetal Bovine Serum (FBS)**
 Maintains a 10 kDa molecular mass cutoff for a defined environment of small molecules

99% Enriched Amino Acids

Cat. No.	Description	Isotopic Purity
608033-100MG 608033-250MG 608033-500MG	L-Arginine- ¹³ C ₆ ¹⁵ N ₄ hydrochloride	99 atom % ¹³ C 99 atom % ¹⁵ N
643440-100MG	L-Arginine- ¹³ C ₆ hydrochloride	99 atom % ¹³ C
600113-100MG	L-Arginine- ¹⁵ N ₄ hydrochloride	99 atom % ¹⁵ N
608041-100MG 608041-1G	L-Lysine- ¹³ C ₆ ¹⁵ N ₂ hydrochloride	99 atom % ¹³ C 99 atom % ¹⁵ N
643459-250MG	L-Lysine- ¹³ C ₆ hydrochloride	99 atom % ¹³ C

SILAC Depleted Media and Dialyzed Serum

Cat. No.	Description
F0392-100ML F0392-500ML	Fetal Bovine Serum – Dialyzed by ultrafiltration against 0.15 M NaCl, USA origin, sterile-filtered, cell culture tested
D9443-500ML	Dulbecco's Modified Eagle's Medium – Low glucose, with 1000 mg/L of L-glucose, L-glutamine, and sodium bicarbonate. Without arginine, leucine, lysine, sodium pyruvate, and phenol red. Liquid, sterile-filtered, cell culture tested.
R1780-500ML	RPMI-1640 Medium with L-glutamine and sodium bicarbonate. Without arginine, leucine, lysine, and phenol red. Liquid, sterile-filtered, cell culture tested.

Additional Stable Isotope Labeled Amino Acids

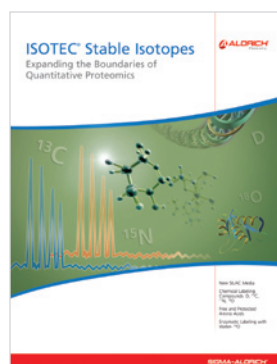
Cat. No.	Description	Isotopic Purity
608092	L-Isoleucine- ¹³ C ₆ ¹⁵ N	98 atom % ¹³ C 98 atom % ¹⁵ N
486825	L-Leucine-5,5,5-d ₃	99 atom % D
605239	L-Leucine- ¹³ C ₆	99 atom % ¹³ C
608068	L-Leucine- ¹³ C ₆ ¹⁵ N	98 atom % ¹³ C 98 atom % ¹⁵ N
616192	L-Lysine-4,4,5,5-d ₄ hydrochloride	98 atom % D
608106	L-Methionine- ¹³ C ₅ ¹⁵ N	98 atom % ¹³ C 98 atom % ¹⁵ N
299154	L-Methionine-methyl- ¹³ C ₃ d ₃	99 atom % ¹³ C 99 atom % D
300616	L-Methionine-methyl-d ₃	98 atom % D
608017	L-Phenylalanine- ¹³ C ₉ ¹⁵ N	98 atom % ¹³ C 98 atom % ¹⁵ N
489794	L-Tyrosine-phenyl- ¹³ C ₆	99 atom % ¹³ C
492868	L-Tyrosine- ¹³ C ₉	98 atom % ¹³ C
607991	L-Tyrosine- ¹³ C ₉ ¹⁵ N	98 atom % ¹³ C 98 atom % ¹⁵ N
600148	L-Valine- ¹³ C ₅ ¹⁵ N	98 atom % ¹³ C 98 atom % ¹⁵ N

Natural Abundance Amino Acids

Cat. No.	Description
A6969	L-Arginine monohydrochloride
I7403	L-Isoleucine
L8912	L-Leucine
L8662	L-Lysine monohydrochloride
M5308	L-Methionine
T8441	L-Threonine
T8566	L-Tyrosine
V0513	L-Valine

The Next Step in Metabolic Labeling — Products for SILAM

Quantitative proteomics is continuing to expand and SILAC has become the leading technique for incorporating stable isotopes into the proteome.¹ By growing cells in both “light” and “heavy” media, the relative abundance of proteins can be determined by mass spectrometry. This technique, however, is limited to cell culture and not applicable to research with larger organisms. Stable Isotope Labeling in Mammals (SILAM), has been developed to facilitate *in vivo* labeling of the entire proteome.² SILAM is able to achieve a complete, uniform labeling of the animal through the consumption of a labeled diet. One source for this labeling diet is ¹⁵N labeled *Spirulina*, a strain of blue-green algae. This diet, in which all 20 amino acids are ¹⁵N labeled, amplifies the protein labeling efficiency leading to greater data accuracy.³ In a documented study, ¹⁵N labeled *Spirulina* was fed to a rat resulting in enrichments of at least 94% throughout the proteome including tissue with slow protein turnover. It was also demonstrated that this animal did not suffer from any adverse health effects and remained phenotypically normal.² SILAM has enabled researchers to study a wide range of diseases that directly affect tissues and organs. These tissues can then be quantitatively compared by the use of mass spectrometry.⁴



For more detailed information, request our *Quantitative Proteomics* brochure at aldrich.com/biomsbrochure

Cat. No.	Description
738352	Algal Lyophilized Cells- ¹⁵ N (<i>Spirulina</i>), 98 atom % ¹⁵ N
741094	Algal Lyophilized Cells (<i>Spirulina</i>) (natural abundance)

References

- Walther TC, Mann M. Mass spectrometry-based proteomics in cell biology. *J Cell Biol* (2010) 190(4): 491-500
- McClatchy DB, Dong MQ, Wu CC, Benable JD, Yates III JR. ¹⁵N metabolic labeling of mammalian tissue with slow protein turnover. *J Proteome Res* (2007) 6: 2005-2010
- Zhang Y, Reckow S, Webhofer C, Boehme M, Gormanns P, Egge-Jacobsen WM, Turck CW. Proteome Scale Turnover Analysis in Live Animals Using Stable Isotope Metabolic Labeling. *Anal. Chem.* (2011)
- McClatchy DB, Liao L, Park SK, Xu T, Lu B, Yates III JR. Differential Proteomic Analysis of Mammalian Tissues Using SILAM. *PLoS ONE* (2011) 6(1): e16039

Literature of Interest

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- Soufi B, Kumar C, Gnad F, Mann M, Mijakovic I, Macek B. Stable Isotope Labeling by Amino Acids in Cell Culture (SILAC) Applied to Quantitative Proteomics of *Bacillus subtilis*. *J Proteome Res* (2010) 9: 3638-3646
- Graumann J, Hubner N, Kim JB, Ko K, Moser M, Kumar C, Cox J, Schöler H, Mann M. Stable Isotope Labeling by Amino Acids in Cell Culture (SILAC) and Proteome Quantification of Mouse Embryonic Stem Cells to a Depth of 5,111 Proteins *Molecular & Cellular Proteomics* (2008) 7.4:672-683
- Geiger T, Cox J, Ostasiewicz P, Wisniewski JR, Mann M. Super-SILAC mix for quantitative proteomics of human tumor tissue *Nature Methods* (2010) 7(5): 383-387

Need more Information?

Please contact us at:
 ISOTEC® Stable Isotopes Technical Service
 Phone: (937) 859-1808
 US and Canada: (800) 448-9760
 Fax: (937) 859-4878
 Email: isosales@sial.com

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World Headquarters
 3050 Spruce St.
 St. Louis, MO 63103
 (314) 771-5765
sigma-aldrich.com