Cambridge Isotope Laboratories, Inc.
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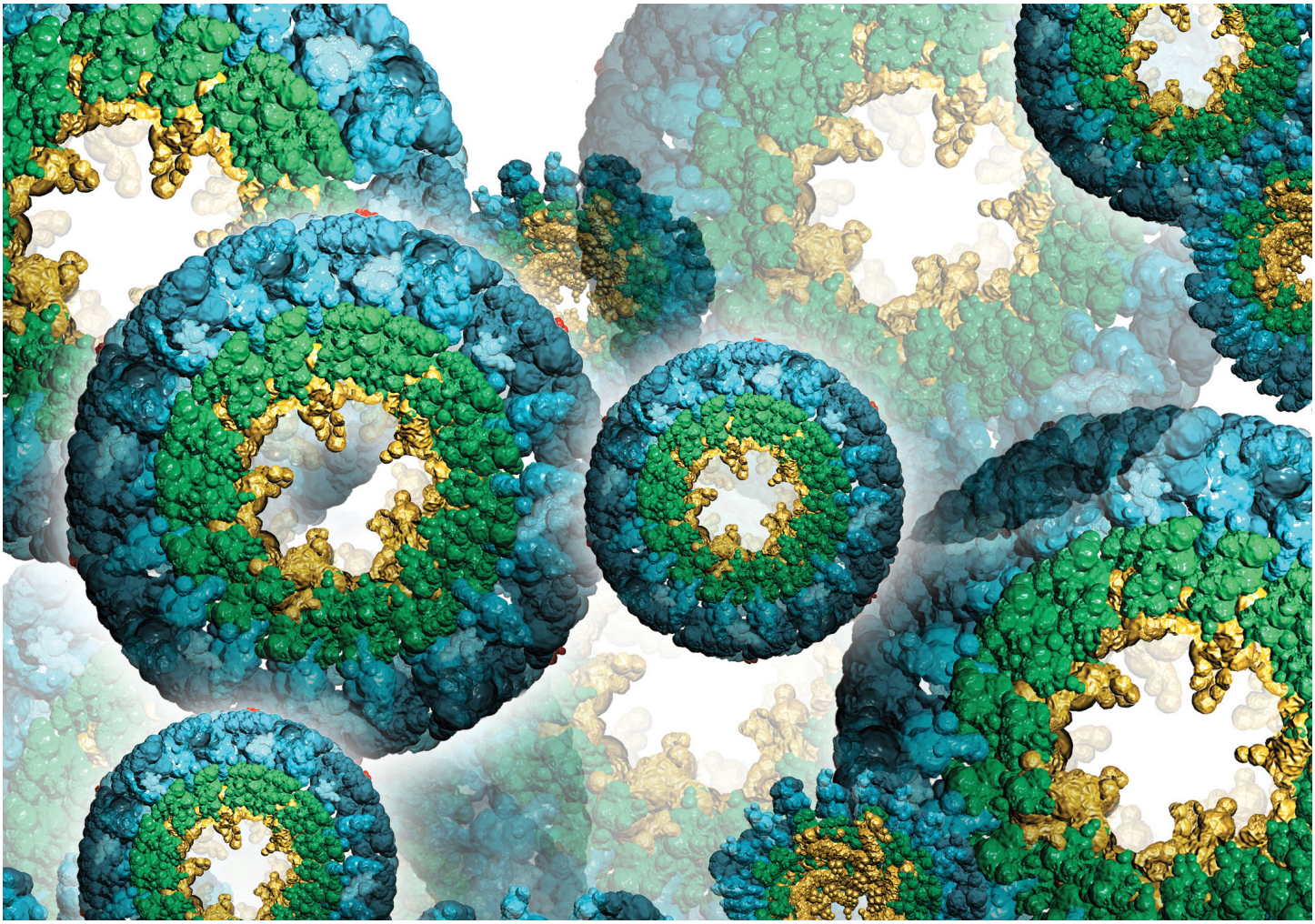
RESEARCH PRODUCTS

Stable Isotope-Labeled Peptide and Protein Reagents/Kits



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Stable Isotope-Labeled Peptide and Protein Reagents/Kits

Mass spectrometry (MS) and nuclear magnetic resonance (NMR) spectroscopy have benefitted greatly from the use of isotope-enriched peptides and proteins. Within the MS field, isotope dilution mass spectrometry (IDMS) is largely considered the gold standard for quantitative analysis of peptides and proteins. In contrast, biomolecular NMR spectroscopy typically requires isotopic enrichment of protein and nucleic acids for determination of molecular structure and dynamics. Regardless if MS or NMR is used, labeled proteins are produced *in vivo* using recombinant cells grown in isotopic cell culture media or *in situ* using cell-free synthesis. Cambridge Isotope Laboratories, Inc. (CIL) is pleased to offer stable isotope-labeled peptide and protein reagents and kits to aid researchers in the scientific community.

Overview

- Peptide synthesis
  - Protected amino acids and preloaded resins
- Protein expression starting materials
  - Cell growth media
  - Cell-free protein expression kits
- Isotope-labeled peptides and proteins
- QC and quantitation kits for peptide/protein analysis

Peptide Reagents and Kits

Protected Amino Acids

CIL offers more than 130 isotope-enriched protected amino acids for the solid-phase synthesis of stable isotope-labeled peptides. Each compound has undergone extensive quality control testing for identity, chemical purity, and isotopic enrichment. The chemical purities are ≥98%, unless otherwise specified, while the "H" in the catalog number denotes a highly enriched amino acid of ≥99%. Package sizes range from 50 mg to 1 g; however, alternate sizes may be available. Please inquire or visit **isotope.com** for pricing and delivery.

Catalog No.	Description	Mass Shift from Unlabeled (Da)
CLM-818	L-Alanine-*N*-Fmoc (1-^{13}C, 99%)	+1
CLM-3638	L-Alanine-*N*-Fmoc (2-^{13}C, 99%)	+1
CLM-1142	L-Alanine-*N*-Fmoc (3-^{13}C, 99%)	+1
NLM-614	L-Alanine-*N*-Fmoc (^{15}N, 98%)	+1
CLM-7785	L-Alanine-*N*-Fmoc ($^{13}C_3$, 97-99%)	+3
DLM-7316	L-Alanine-*N*-Fmoc (3,3,3-D_3, 98%)	+3
DLM-8168	L-Alanine-*N*-Fmoc (2,3,3,3-D_4, 98%)	+4
CNLM-4355-H	L-Alanine-*N*-Fmoc ($^{13}C_3$, 99%; ^{15}N, 99%)	+4
CDNLM-7852	L-Alanine-*N*-Fmoc ($^{13}C_3$, 97-99%; D_4, 97-99%; ^{15}N, 97-99%)	+8

Note: If equipped to perform Fmoc or Boc protection, please refer to our offering of free amino acids in our "**Stable Isotope Standards for Mass Spectrometry**" catalog.

Chemical purity (CP) is 98% or greater, unless otherwise indicated. For research use only. Not for diagnostic procedures.

Catalog No.	Description	Mass Shift from Unlabeled (Da)
CLM-2150	L-Alanine-*N*-*t*-Boc (1-^{13}C, 99%)	+1
CLM-2011	L-Alanine-*N*-*t*-Boc (2-^{13}C, 98-99%)	+1
CLM-2151	L-Alanine-*N*-*t*-Boc (3-^{13}C, 99%)	+1
DLM-649	L-Alanine-*N*-*t*-Boc (2-D, 98%)	+1
NLM-1903	L-Alanine-*N*-*t*-Boc (^{15}N, 98%)	+1
CNLM-6014	L-Alanine-*N*-*t*-Boc (2-^{13}C, 99%; ^{15}N, 96-99%)	+2
CLM-3589	L-Alanine-*N*-*t*-Boc ($^{13}C_3$, 97-99%)	+3
DLM-2793	L-Alanine-*N*-*t*-Boc (3,3,3-D_3, 99%)	+3
CNLM-2394	L-Alanine-*N*-*t*-Boc ($^{13}C_3$, 97-99%; ^{15}N, 97-99%)	+4
NLM-8841	L-Arginine-*N*-Fmoc, PBF-OH ($^{15}N_4$, 98%) contains solvent*	+4
CLM-8475-H	L-Arginine-*N*-Fmoc, PBF-OH ($^{13}C_6$, 99%) contains solvent*	+6
CNLM-8474-H	L-Arginine-*N*-Fmoc, PBF-OH ($^{13}C_6$, 99%; $^{15}N_4$, 99%) contains solvent*	+10
NLM-4204	L-Asparagine-*N*-Fmoc, *N*-β-trityl ($^{15}N_2$, 98%)	+2
CNLM-4354	L-Asparagine-*N*-Fmoc ($^{13}C_4$, 97-99%; $^{15}N_2$, 97-99%)	+6
CNLM-6193-H	L-Asparagine-*N*-Fmoc, *N*-β-trityl ($^{13}C_4$, 99%; $^{15}N_2$, 99%)	+6
CLM-4249	L-Aspartic acid-*N*-α-CBZ ($^{13}C_4$, 97-99%)	+4
CNLM-4788	L-Aspartic acid-*N*-Fmoc ($^{13}C_4$, 97-99%; ^{15}N, 97-99%)	+5
NLM-647	L-Aspartic acid-*N*-Fmoc, β-*O*-*t*-butyl ester (^{15}N, 98%)	+1
CNLM-4752-H	L-Aspartic acid-*N*-Fmoc, β-*O*-*t*-butyl ester ($^{13}C_4$, 99%; ^{15}N, 99%)	+5
NLM-3493	L-Aspartic acid-*N*-*t*-Boc (^{15}N, 98%)	+1
NLM-1908	L-Aspartic acid-*N*-*t*-Boc, β-benzyl ester (^{15}N, 98%)	+1
CNLM-2392	L-Aspartic acid-*N*-*t*-Boc, β-benzyl ester ($^{13}C_4$, 97-99%; ^{15}N, 97-99%)	+5
DLM-4721	L-Cysteine-*N*-Fmoc, *S*-trityl (3,3-D_2, 98%)	+2
CNLM-4722-H	L-Cysteine-*N*-Fmoc, *S*-trityl ($^{13}C_3$, 99%; ^{15}N, 99%)	+4
CLM-1901	L-Cysteine-*N*-*t*-Boc, *S*-benzyl (3-^{13}C, 99%)	+1
NLM-3874	L-Cysteine-*N*-*t*-Boc, *S*-*p*-Mebz (^{15}N, 98%)	+1
NLM-8960	L-Glutamic acid-*N*-Fmoc, γ-*t*-butyl ester (^{15}N, 98%)	+1
CNLM-4753-H	L-Glutamic acid-*N*-Fmoc, γ-*t*-butyl ester ($^{13}C_5$, 99%; ^{15}N, 99%) CP 96%	+6
NLM-1907	L-Glutamic acid-*N*-*t*-Boc, γ-benzyl ester (^{15}N, 98%)	+1
CLM-2008	L-Glutamic acid-*N*-*t*-Boc, γ-benzyl ester (1,2-$^{13}C_2$, 99%)	+2
CNLM-4356-H	L-Glutamine-*N*-Fmoc ($^{13}C_5$, 99%; $^{15}N_2$, 99%)	+7
CNLM-7252-H	L-Glutamine-*N*-Fmoc, *N*-γ-trityl ($^{13}C_5$, 99%; $^{15}N_2$, 99%)	+7
NLM-3419	L-Glutamine-*N*-*t*-Boc (α-^{15}N, 98%)	+1
CLM-1902	L-Glutamine-*N*-*t*-Boc (1,2-$^{13}C_2$, 99%)	+2
CLM-3639	Glycine-*N*-Fmoc (1-^{13}C, 99%)	+1
CLM-2387	Glycine-*N*-Fmoc (2-^{13}C, 99%)	+1
NLM-694	Glycine-*N*-Fmoc (^{15}N, 98%)	+1
CLM-7547	Glycine-*N*-Fmoc ($^{13}C_2$, 97-99%)	+2
DLM-7339	Glycine-*N*-Fmoc (2,2-D_2, 98%)	+2
CNLM-7697	Glycine-*N*-Fmoc (1-^{13}C, 99%; ^{15}N, 98%)	+2
CNLM-7698	Glycine-*N*-Fmoc (2-^{13}C, 99%; ^{15}N, 98%)	+2
CNLM-4357-H	Glycine-*N*-Fmoc ($^{13}C_2$, 99%; ^{15}N, 99%)	+3
CDNLM-7853	Glycine-*N*-Fmoc ($^{13}C_2$, 97-99%; 2,2-D_2, 97-99%; ^{15}N, 97-99%)	+5
CLM-2152	Glycine-*N*-*t*-Boc (1-^{13}C, 99%)	+1
CLM-1900	Glycine-*N*-*t*-Boc (2-^{13}C, 99%)	+1
NLM-2109	Glycine-*N*-*t*-Boc (^{15}N, 98%)	+1
DLM-2153	Glycine-*N*-*t*-Boc (2,2-D_2, 98%)	+2
CNLM-9686	Glycine-*N*-*t*-Boc (2-^{13}C, 99%; ^{15}N, 98%)	+2
CNLM-2412	Glycine-*N*-*t*-Boc ($^{13}C_2$, 97-99%; ^{15}N, 97-99%)	+3
NLM-8010	L-Histidine-*N*-Fmoc, *N*-IM-trityl ($^{15}N_3$, 98%)	+3
CLM-8043	L-Isoleucine-*N*-Fmoc (1-^{13}C, 99%)	+1
NLM-391	L-Isoleucine-*N*-Fmoc (^{15}N, 98%)	+1
CLM-7794	L-Isoleucine-*N*-Fmoc ($^{13}C_6$, 97-99%)	+6
CNLM-4346-H	L-Isoleucine-*N*-Fmoc ($^{13}C_6$, 99%; ^{15}N, 99%)	+7

**Solvent composition varies by lot; please inquire for details.*

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Continued ➤

Protected Amino Acids *(continued)*

Catalog No.	Description	Mass Shift from Unlabeled (Da)
NLM-2167	L-Isoleucine-*N*-*t*-Boc (^{15}N, 98%)	+1
CLM-3691	L-Leucine-*N*-Fmoc (1-^{13}C, 99%)	+1
NLM-2397	L-Leucine-*N*-Fmoc (^{15}N, 98%)	+1
CLM-7546	L-Leucine-*N*-Fmoc (1,2-$^{13}C_2$, 99%)	+2
DLM-7202	L-Leucine-*N*-Fmoc (5,5,5-D_3, 98%)	+3
CLM-3683	L-Leucine-*N*-Fmoc ($^{13}C_6$, 97-99%)	+6
CNLM-4345-H	L-Leucine-*N*-Fmoc ($^{13}C_6$, 99%; ^{15}N, 99%)	+7
DLM-7575	L-Leucine-*N*-Fmoc (D_{10}, 98%)	+10
CDNLM-7854	L-Leucine-*N*-Fmoc ($^{13}C_6$, 97-99%; D_{10}, 97-99%; ^{15}N, 97-99%)	+17
CLM-2155	L-Leucine-*N*-*t*-Boc·H_2O (1-^{13}C, 99%)	+1
CLM-2010	L-Leucine-*N*-*t*-Boc·H_2O (2-^{13}C, 99%)	+1
NLM-1904	L-Leucine-*N*-*t*-Boc·H_2O (^{15}N, 98%)	+1
DLM-2736	L-Leucine-*N*-*t*-Boc·H_2O (5,5,5-D_3, 98%)	+3
CNLM-2396	L-Leucine-*N*-*t*-Boc·H_2O ($^{13}C_6$, 97-99%; ^{15}N, 97-99%)	+7
DLM-3650	L-Leucine-*N*-*t*-Boc·H_2O (D_{10}, 98%)	+10
CLM-6194	L-Lysine-α-*N*-Fmoc, ε-*N*-*t*-Boc (1-^{13}C, 99%)	+1
NLM-4631	L-Lysine-α-*N*-Fmoc, ε-*N*-*t*-Boc ($^{15}N_2$, 96-98%)	+2
CLM-7865-H	L-Lysine-α-*N*-Fmoc, ε-*N*-*t*-Boc ($^{13}C_6$, 99%)	+6
CNLM-4754-H	L-Lysine-α-*N*-Fmoc, ε-*N*-*t*-Boc ($^{13}C_6$, 99%; $^{15}N_2$, 99%)	+8
CLM-8166	L-Methionine-*N*-Fmoc (1-^{13}C, 99%)	+1
NLM-4632	L-Methionine-*N*-Fmoc (^{15}N, 98%)	+1
CLM-1141	L-Methionine-*N*-Fmoc (methyl-^{13}C, 99%)	+1
CNLM-4358-H	L-Methionine-*N*-Fmoc ($^{13}C_5$, 99%; ^{15}N, 99%)	+6
CLM-2156	L-Methionine-*N*-*t*-Boc (methyl-^{13}C, 98%)	+1
CLM-4824	L-Phenylalanine-*N*-Fmoc (1-^{13}C, 99%)	+1
NLM-1265	L-Phenylalanine-*N*-Fmoc (^{15}N, 98%)	+1
DLM-7786	L-Phenylalanine-*N*-Fmoc (ring-D_5, 98%)	+5
CLM-3684	L-Phenylalanine-*N*-Fmoc (ring-$^{13}C_6$, 99%)	+6
DLM-8752	L-Phenylalanine-*N*-Fmoc (D_8, 98%)	+8
CNLM-4362-H	L-Phenylalanine-*N*-Fmoc ($^{13}C_9$, 99%; ^{15}N, 99%)	+10
CLM-2170	L-Phenylalanine-*N*-*t*-Boc (1-^{13}C, 99%)	+1
CLM-2009	L-Phenylalanine-*N*-*t*-Boc (2-^{13}C, 99%)	+1
NLM-1905	L-Phenylalanine-*N*-*t*-Boc (^{15}N, 98%)	+1
DLM-2157	L-Phenylalanine-*N*-*t*-Boc (ring-D_5, 98%)	+5
CLM-2061	L-Phenylalanine-*N*-*t*-Boc (ring-$^{13}C_6$, 99%)	+6
CLM-7859	L-Phenylalanine-*N*-*t*-Boc ($^{13}C_9$, 97-99%)	+9
CNLM-2393	L-Phenylalanine-*N*-*t*-Boc ($^{13}C_9$, 97-99%; ^{15}N, 97-99%)	+10
CLM-8044	L-Proline-*N*-Fmoc (1-^{13}C, 99%)	+1
NLM-3906	L-Proline-*N*-Fmoc (^{15}N, 98%)	+1
NLM-2329	L-Proline-*N*-*t*-Boc (^{15}N, 96%)	+1
CNLM-4347-H	L-Proline-*N*-Fmoc ($^{13}C_5$, 99%; ^{15}N, 99%)	+6
CNLM-8403-H	L-Serine-*N*-Fmoc ($^{13}C_3$, 99%; ^{15}N, 99%)	+4
CLM-8167	L-Serine-*N*-Fmoc, *O*-*t*-butyl ether (1-^{13}C, 99%)	+1
NLM-4630	L-Serine-*N*-Fmoc, *O*-*t*-butyl ether (^{15}N, 98%)	+1
CNLM-4755-H	L-Serine-*N*-Fmoc, *O*-*t*-butyl ether ($^{13}C_3$, 99%; ^{15}N, 99%)	+4
CLM-2007	L-Serine-*N*-*t*-Boc, *O*-benzyl ether (2-^{13}C, 99%)	+1
CLM-756	L-Serine-*N*-*t*-Boc, *O*-benzyl ether (3-^{13}C, 99%)	+1
NLM-2025	L-Serine-*N*-*t*-Boc, *O*-benzyl ether (^{15}N, 98%)	+1
NLM-8170	L-Threonine-*N*-Fmoc, *O*-*t*-butyl ether (^{15}N, 98%)	+1
CNLM-7615	L-Threonine-*N*-Fmoc, *O*-*t*-butyl ether ($^{13}C_4$, 97-99%; ^{15}N, 97-99%)	+5
CNLM-7615-H	L-Threonine-*N*-Fmoc, *O*-*t*-butyl ether ($^{13}C_4$, 99%; ^{15}N, 99%)	+5
NLM-3681	L-Threonine-*N*-*t*-Boc, *O*-benzyl ether (^{15}N, 98%)	+1

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Catalog No.	Description	Mass Shift from Unlabeled (Da)
NLM-3423	L-Tryptophan-*N*-Fmoc (α-^{15}N, 98%)	+1
DLM-6113	L-Tryptophan-*N*-Fmoc (indole-D_5, 98%)	+5
CNLM-6077	L-Tryptophan-*N*-Fmoc ($^{13}C_{11}$, 97-99%; $^{15}N_2$, 97-99%)	+13
CLM-2194	L-Tryptophan-*N*-*t*-Boc (1-^{13}C, 99%)	+1
NLM-1906	L-Tyrosine-*N*-*t*-Boc, *O*-benzyl ether (^{15}N, 98%)	+1
DLM-2303	L-Tyrosine-*N*-*t*-Boc, *O*-benzyl ether (ring-D_4, 98%)	+4
NLM-8169	L-Tyrosine-*N*-Fmoc, *O*-*t*-butyl ether (^{15}N, 98%)	+1
CNLM-4349-H	L-Tyrosine-*N*-Fmoc, *O*-*t*-butyl ether ($^{13}C_9$, 99%; ^{15}N, 99%)	+10
CLM-3640	L-Valine-*N*-Fmoc (1-^{13}C, 99%)	+1
NLM-4243	L-Valine-*N*-Fmoc (^{15}N, 98%)	+1
CLM-7793	L-Valine-*N*-Fmoc ($^{13}C_5$, 97-99%)	+5
CNLM-4348-H	L-Valine-*N*-Fmoc ($^{13}C_5$, 99%; ^{15}N, 99%)	+6
DLM-7784	L-Valine-*N*-Fmoc (D_8, 98%)	+8
CLM-2158	L-Valine-*N*-*t*-Boc (1-^{13}C, 99%)	+1
NLM-2060	L-Valine-*N*-*t*-Boc (^{15}N, 98%)	+1
CNLM-2395	L-Valine-*N*-*t*-Boc ($^{13}C_5$, 97-99%; ^{15}N, 97-99%)	+6
DLM-3651	L-Valine-*N*-*t*-Boc (D_8, 98%)	+8

"H" denotes an enrichment of ≥99%, as measured by GC-MS.

➤ **Please inquire if you desire an alternate labeling pattern or protecting group. For complete listing and additional information, please visit the "Amino Acids" section of isotope.com/products.**

Example References

Lu, B.L.; Loomes, K.M.; Hay, D.L.; et al. **2020**. Synthesis of isotopically labelled αCGRP$_{8-37}$ and its lipidated analogue. *J Labelled Comp Radiopharm, in press.*

Lau, J.K.-C.; Lam, K.H.B.; Lai, C.-K.; et al. **2019**. Imidazolone formation from pronated tetrapeptides: effects of replacing a glycine by an alanine or proline residue. *Int J Mass Spec, 435,* 69-77.

Ndao, M.; Goobes, G.; Emani, P.S.; et al. **2018**. A REDOR ssNMR investigation of the role of an *N*-terminus lysine in R5 silica recognition. *Langmuir, 34(29),* 8678-8884.

LeBlanc, A.; Michaud, S.A.; Percy, A.J.; et al. **2017**. Multiplexed MRM-based protein quantitation using two different stable isotope-labeled peptide isotopologues for calibration. *J Proteome Res, 16(7),* 2527-2536.

Percy, A.J.; Hardie, D.B.; Jardim, A.; et al. **2017**. Multiplexed panel of precisely quantified salivary proteins for biomarker assessment. *Proteomics, 17(6).*

Fernández-Fernández, M.; Rodríguez-González, P.; García Alonso, J.I. **2016**. A simplified calculation procedure for mass isotopomer distribution analysis (MIDA) based on multiple linear regression. *J Mass Spectrom, 51(10),* 980-987.

Delgado, D.A.; Doherty, K.; Cheng, Q.; et al. **2016**. Distinct membrane disruption pathways are induced by 40-residue β-amyloid peptides. *J Biol Chem, 291(23),* 12233-12244.

Wang, D.; Krilich, J.; Baudys, J.; et al. **2015**. Optimization of peptide substrates for botulinum neurotoxin E improves detection sensitivity in the Endopep-MS assay. *Anal Biochem, 468,* 15-21.

Lee, M.; Hong, M. **2014**. Cryoprotection of lipid membranes for high-resolution solid-state NMR studies of membrane peptides and proteins at low temperature. *J Biomol NMR, 59,* 263-277.

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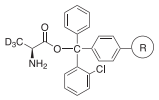
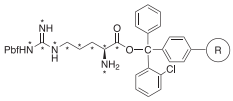
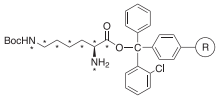
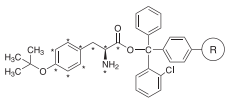
Continued ➤

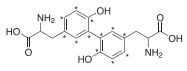
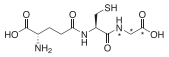
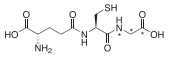
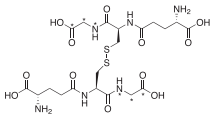
Preloaded Resins

Through collaboration with New England Peptide, Inc. (NEP), CIL is pleased to offer synthesis-ready, preloaded resins to aid the solid-phase synthesis of stable isotope-labeled tryptic peptides. The resins are prepared from isotopically labeled, protected amino acids with the highest chemical, isotopic, and chiral purity available. Please inquire for pricing and unit sizes.

Catalog No.	Description	Structure	Mass Shift from Unlabeled (Da)
SRPR-Ala-D	Preloaded L-Ala (3,3,3-D_3, 98%) 2-ClTrt resin		+3
SRPR-Arg-CN	Preloaded L-Arg, PBF-OH ($^{13}C_6$, 99%; $^{15}N_4$, 99%) 2-ClTrt resin		+10
SRPR-Lys-CN	Preloaded L-Lys, ε-*N*-*t*-Boc ($^{13}C_6$, 99%; $^{15}N_2$, 99%) 2-ClTrt resin		+8
SRPR-Tyr-CN	Preloaded L-Tyr, *O*-*t*-butyl ether ($^{13}C_9$, 99%; ^{15}N, 99%) 2-ClTrt resin		+10

➤ **Please contact us if an alternate preloaded resin would be beneficial to your research needs.**

Isotope-Labeled Peptides

Catalog No.	Description	Structure	Mass Shift from Unlabeled (Da)
CLM-7254	*O,O'*-Dityrosine (ring-$^{13}C_{12}$, 99%)		+12
CNLM-6245	Glutathione (GSH) (glycine-$^{13}C_2$, 98%; ^{15}N, 96-99%) 65-70% net peptide/peptide purity 85-90%		+3
CNLM-6245-HP	Glutathione (GSH) (glycine-$^{13}C_2$, 98%; ^{15}N, 96-99%) 90% net peptide/peptide purity 95%		+3
CNLM-8782	Glutathione disulfide (GSSG) (glycines-$^{13}C_2$, 98%; ^{15}N, 96-99%) 65-70% net peptide/peptide purity 90%		+6

Example References

Li, F.; Cui, L.; Yu, D.; et al. **2019**. Exogenous glutathione improves intracellular glutathione synthesis via the γ-glutamyl cycle in bovine zygotes and cleavage embryos. *J Cell Physiol, 234(5),* 7384-7394.

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Chemical purity (CP) is 98% or greater, unless otherwise indicated. For research use only. Not for diagnostic procedures.

PeptiQuant™ Assay Kits

CIL offers PeptiQuant™ Assay Kits from MRM Proteomics Inc. for QC and biomarker assessment using bottom-up LC-MS/MS methodologies. The QC kits are designed to evaluate the performance of an LC-MS platform, either alone or in combination with a human or mouse plasma proteomic workflow. The biomarker assessment kits (BAKs) are intended to help researchers screen target panels of candidate protein disease biomarkers in human or mouse plasma samples.

Regarding the methodology, PeptiQuant Plus kits employ mixtures of synthetic SIS and natural (NAT) peptides in the post-digestion spike of sample or surrogate matrices. Quantitation is performed via forward curves (approaches described in PubMed IDs: **27341553** and **28516774**). These kits have been rigorously characterized according to the complete set of CPTAC (Clinical Proteomic Tumor Analysis Consortium) guidelines and are available for viewing on the CPTAC Assay Portal.

Quality Control (QC) Kits

Catalog No.	Description	Unit Size
LCMSP-QC-6490-INJ	PeptiQuant Plus Human Plasma Daily QC Kit for Agilent 6490 QqQ and 1290 UPLC	10, 20, or 50 injections
LCMSP-QC-6495-INJ	PeptiQuant Plus Human Plasma Daily QC Kit for Agilent 6495 QqQ and 1290 UPLC	10, 20, or 50 injections
LCMSP-QC-6500-INJ	PeptiQuant Plus Human Plasma Daily QC Kit for SCIEX QTRAP® 6500 and 1290 UPLC	10, 20, or 50 injections
LCMSP-QC-QE-INJ	PeptiQuant Plus Human Plasma Daily QC Kit for Thermo Scientific™ Q Exactive™ Plus and 1290 UPLC	10, 20, or 50 injections
WFPK-A6490-P	PeptiQuant Plus Human Plasma Workflow QC Kit for Agilent 6490 QqQ and 1290 UPLC	1 or 2 runs
WFPK-A6495-P	PeptiQuant Plus Human Plasma Workflow QC Kit for Agilent 6495 QqQ and 1290 UPLC	1 or 2 runs
WFPK-SC6500-P	PeptiQuant Plus Human Plasma Workflow QC Kit for SCIEX QTRAP 6500 and 1290 UPLC	1 or 2 runs
WFPK-QE-P	PeptiQuant Plus Human Plasma Workflow QC Kit for Thermo Scientific Q Exactive Plus and 1290 UPLC	1 or 2 runs

Biomarker Assessment Kits (BAKs)

	BAK-A6490-125	PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6490 QqQ and 1290 UPLC	20, 50, or 100 samples
NEW!	BAK-A6490-270	PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6490 QqQ and 1290 UPLC	100 samples
	BAK-A6495-125	PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6495 QqQ and 1290 UPLC	20, 50, or 100 samples
NEW!	BAK-A6495-270	PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6495 QqQ and 1290 UPLC	100 samples
	BAK-SC6500-125	PeptiQuant Plus Human Plasma Proteomics Kit for SCIEX QTRAP 6500 and 1290 UPLC	20, 50, or 100 samples
NEW!	BAK-SC6500-270	PeptiQuant Plus Human Plasma Proteomics Kit for SCIEX QTRAP 6500 and 1290 UPLC	100 samples
	BAK-QE-125	PeptiQuant Plus Human Plasma Proteomics Kit for Thermo Scientific Q Exactive Plus and 1290 UPLC	20, 50, or 100 samples
NEW!	BAK-QE-270	PeptiQuant Plus Human Plasma Proteomics Kit for Thermo Scientific Q Exactive Plus and 1290 UPLC	100 samples
NEW!	BAK-TQXS-125	PeptiQuant Plus Human Plasma Proteomics Kit for Waters Xevo TQ-XS and Acquity UPLC I	20, 50, or 100 samples
	M-BAK-A6490-125*	PeptiQuant Plus Mouse Plasma Proteomics Kit for Agilent 6490 QqQ and 1290 UPLC	20, 50, or 100 samples
	M-BAK-A6495-125*	PeptiQuant Plus Mouse Plasma Proteomics Kit for Agilent 6495 QqQ and 1290 UPLC	20, 50, or 100 samples
	M-BAK-6545-125-2	PeptiQuant Plus Mouse Plasma Proteomics Kit for Agilent 6545 Q-TOF and 1290 UPLC	20, 50, or 100 samples
	M-BA K-SC6500-125	PeptiQuant Plus Mouse Plasma Proteomics Kit for SCIEX QTRAP 6500 and 1290 UPLC	20, 50, or 100 samples
	M-BAK-QE-125*	PeptiQuant Plus Mouse Plasma Proteomics Kit for Thermo Scientific Q Exactive Plus and 1290 UPLC	20, 50, or 100 samples

*Alternate sets of 125 target proteins are available (see **product flyer** for details).

➤ **Please inquire if an alternate LC-MS/MS platform is desired from the current panel offerings. Visit the "MRM PeptiQuant Assay Kits" section of isotope.com/products for complete product listings.**

PeptiQuant is a trademark of MRM Proteomics Inc.

Example References

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Protein Expression Reagents and Kits

Cell Growth Media

A diverse array of isotope-labeled prokaryotic and eukaryotic cell growth media for the production of isotope-enriched recombinant protein is available from CIL.

Bacterial Cell Growth Media

Celtone®, BioExpress®, E. coli-OD2, and Spectra 9

Catalog No.	Description
CGM-1030P-C	Celtone Base Powder (^{13}C, 98%)
CGM-1030P-D	Celtone Base Powder (D, 97%)
CGM-1030P-N	Celtone Base Powder (^{15}N, 98%)
CGM-1030P-CN	Celtone Base Powder (^{13}C, 98%; ^{15}N, 98%)
CGM-1030P-DN	Celtone Base Powder (D, 97%; ^{15}N, 98%)
CGM-1030P-CDN	Celtone Base Powder (^{13}C, 98%; D, 97%; ^{15}N, 98%)
CGM-1030P-U	Celtone Base Powder (unlabeled)
CGM-1050P-C	Celtone Plus Base Powder (^{13}C, 97-99%)
CGM-1050P-D	Celtone Plus Base Powder (D, 97%)
CGM-1050P-N	Celtone Plus Base Powder (^{15}N, 97-99%)
CGM-1050P-DN	Celtone Plus Base Powder (D, 97-99%; ^{15}N, 97-99%)
CGM-1050P-CDN	Celtone Plus Base Powder (^{13}C, 97-99%; D, 97-99%; ^{15}N, 97-99%)
CGM-1050P-U	Celtone Plus Base Powder (unlabeled)
CGM-1040-C	Celtone Complete Medium (^{13}C, 98%)
CGM-1040-D	Celtone Complete Medium (D, 97%)
CGM-1040-N	Celtone Complete Medium (^{15}N, 98%)
CGM-1040-CN	Celtone Complete Medium (^{13}C, 98%; ^{15}N, 98%)
CGM-1040-DN	Celtone Complete Medium (D, 97%; ^{15}N, 98%)
CGM-1040-CDN	Celtone Complete Medium (^{13}C, 98%; D, 97%; ^{15}N, 98%)
CGM-1040-U	Celtone Complete Medium (unlabeled)
CGM-1000-C	BioExpress Cell Growth Media (^{13}C, 98%) 10x concentrate
CGM-1000-D	BioExpress Cell Growth Media (D, 98%) 10x concentrate
CGM-1000-N	BioExpress Cell Growth Media (^{15}N, 98%) 10x concentrate
CGM-1000-CD	BioExpress Cell Growth Media (^{13}C, 98%; D, 98%) 10x concentrate
CGM-1000-CN	BioExpress Cell Growth Media (^{13}C, 98%; ^{15}N, 98%) 10x concentrate
CGM-1000-DN	BioExpress Cell Growth Media (D, 98%; ^{15}N, 98%) 10x concentrate
CGM-1000-CDN	BioExpress Cell Growth Media (^{13}C, 98%; ^{15}N, 98%; D 98%) 10x concentrate
CGM-1000-U	BioExpress Cell Growth Media (unlabeled) 10x concentrate
CGM-1020-SL-C	*E. coli*-OD2 (^{13}C, 98%)
CGM-1020-SL-D	*E. coli*-OD2 (D, 98%)
CGM-1020-SL-N	*E. coli*-OD2 (^{15}N, 98%)
CGM-1020-SL-CN	*E. coli*-OD2 (^{13}C, 98%; ^{15}N, 98%)
CGM-1020-SL-CDN	*E. coli*-OD2 (^{13}C, 98%; D, 98%; ^{15}N, 98%)
CGM-1020-SL-U-S	*E. coli*-OD2 (unlabeled)
CGM-3030-C	Spectra 9 (^{13}C, 98%)
CGM-3030-D	Spectra 9 (D, 97%)
CGM-3030-N	Spectra 9 (^{15}N, 98%)
CGM-3030-CN	Spectra 9 (^{13}C, 98%; ^{15}N, 98%)
CGM-3030-DN	Spectra 9 (D, 97%; ^{15}N, 98%)
CGM-3030-CDN	Spectra 9 (^{13}C, 98%; D, 97%; ^{15}N, 98%)
CGM-3030-U	Spectra 9 (unlabeled)

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Minimal Media Reagents

For E. coli Growths

Catalog No.	Description
NLM-467	Ammonium chloride (^{15}N, 99%)
NLM-713	Ammonium sulfate ($^{15}N_2$, 99%)
DLM-4-99	Deuterium oxide (D, 99%)
DLM-4-99.8	Deuterium oxide (D, 99.8%)
DLM-4	Deuterium oxide (D, 99.9%)
CLM-1396	D-Glucose ($^{13}C_6$, 99%)
DLM-2062	D-Glucose (1,2,3,4,5,6,6-D_7, 97-98%)
CDLM-3813	D-Glucose ($^{13}C_6$, 99%; 1,2,3,4,5,6,6-D_7, 97-98%)
CLM-1510	Glycerol ($^{13}C_3$, 99%)
DLM-558	Glycerol (D_8, 99%)

Insect Cell Growth Media

BioExpress® 2000

Catalog No.	Description
CGM-2000-N	BioExpress 2000 (^{15}N, 98%)
CGM-2000-CN	BioExpress 2000 (^{13}C, 98%; ^{15}N, 98%)
CGM-2000-U	BioExpress 2000 (unlabeled)
CGM-2000-CUSTOM	BioExpress 2000 (custom)*

*The labeled amino acids must be specified at the time of request for a custom media quote or order.

Yeast Cell Growth Media

OD2 Media

Catalog No.	Description
CGM-4020-SL-C	Yeast-OD2 (^{13}C, 98%)
CGM-4020-SL-N	Yeast-OD2 (^{15}N, 98%)
CGM-4020-SL-CN	Yeast-OD2 (^{13}C, 98%; ^{15}N, 98%)
CGM-4020-SL-U	Yeast-OD2 (unlabeled)

Mammalian Cell Growth Media

BioExpress® 6000

Catalog No.	Description
CGM-6000-N	BioExpress 6000 (^{15}N, 98%)
CGM-6000-CN	BioExpress 6000 (^{13}C, 98%; ^{15}N, 98%)
CGM-6000-U	BioExpress 6000 (unlabeled)
CGM-6000-CUSTOM	BioExpress 6000 (custom)*

**The labeled amino acids must be specified at the time of request for a custom media quote or order.*

➤ **Please visit the "Cell Growth Media" section of isotope.com/products for complete product listings and additional information.**

Example References

Minikel, E.V.; Kuhn, E.; Cocco, A.R.; et al. **2019**. Domain-specific quantification of prion protein in cerebrospinal fluid by targeted mass spectrometry. *Mol Cell Proteomics, 18(12),* 2388-2400.

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Zhang, C.; Gao, S.; Molascon, AJ.; et al. **2014**. Quantitative proteomics reveals histone modifications in crosstalk with H3 lysine 27 methylation. *Mol Cell Proteomics, 13(3),* 749-759.

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CIL Application Notes

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Strauss, A.; Fendrich, G.; Jahnke, W. **2007**. Efficient uniform labeling of proteins expressed in baculovirus-infected insect cells using BioExpress® 2000 (insect cell) medium. (Application Note 14)

Rhima, M.; Neil, L.C.; Gardner, K.H. **2003**. Optimization of BioExpress® supplementation of M9 cultures. (Application Note 12)

Chemical purity (CP) is 98% or greater, unless otherwise indicated. For research use only. Not for diagnostic procedures.

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Kits for Cell-Free Protein Expression

Wheat Germ Cell-Free Expression Kits (CellFree Sciences, CFS)

Wheat germ cell-free protein expression systems have been used over the years to address many different needs in basic research and applied sciences. CFS is the leading commercial manufacturer of kits and reagents used in wheat germ-based, cell-free protein expression. CFS' proprietary wheat germ embryo extract, WEPRO®, is the critical ingredient that allows reproducible production of protein in high yield.

CFS offers several starter kits to characterize yield and protein quality. These kits enable multiple large-scale reactions that typically yield microgram amounts of protein. Each kit contains a positive control that yields about 30 µg of DHFR. The Premium Plus Expression Kit for MS is perfectly suited to produce isotope-enriched protein for bottom-up LC-MS studies.

Catalog No.	Description	Contents	Specification
CFS-PRK-G24	Protein Research Kit (G)	Premixed transcription and translation reagents for GST-fusion protein expression. Reaction scale is 226 µL.	24 reactions
CFS-PRK-H24	Protein Research Kit (H)	Premixed transcription and translation reagents for His-fusion protein expression. Reaction scale is 226 µL.	24 reactions
CFS-PRK-S24	Protein Research Kit (S)	Premixed transcription and translation reagents for protein expression. Reaction scale is 226 µL.	24 reactions
CFS-TRI-PLE-BD	Proteoliposome BD Expression Kit	WEPRO 7240, transcription buffer LM, NTP mix, SP6 RNA polymerase, RNase inhibitor, creatine kinase, pEU-E01-T1R1 plasmid, SUB-AMIX SGC S1-S4, and asolectin liposome. Reaction scale is 2.5 mL.	6 reactions
CFS-TRI-PLE	Proteoliposome Expression Kit	WEPRO 7240, transcription buffer LM, NTP mix, SP6 RNA polymerase, RNase inhibitor, creatine kinase, pEU-E01-T1R1 plasmid, SUB-AMIX SGC S1-S4, and asolectin liposome. Reaction scale is 4 mL.	6 reactions
CFS-EDX-PLUS	Premium PLUS Expression Kit	Expression vector (pEU-E01-MCS), PCR primer for transcription and translation, positive control, and reaction cups. Reaction scale is 227 µL.	8 reactions
CFS-EDX-PLUS-MS	Premium PLUS Expression Kit for MS	Expression vector (pEU-E01-MCS), PCR primer set (SPU, deSP6E01), transcription premix LM, WEPRO 9240 and SUB-AMIX SGC for MS, positive control, and reaction cups. Reaction scale is 227 µL.	16 reactions
CFS-EDX-PLE-PLUS	Proteoliposome Premium PLUS Expression Kit	Expression vector, primers for DNA preparation by PCR, prepared apolection-liposomes, positive control, and reaction cups. Reaction scale is 226 µL.	8 reactions

➤ **Please visit the "CellFree Protein Expression" section of isotope.com/products and cfscience.com for additional information on these and other products.**

Example References

Lacabanne, D.; Fogeron, M.L.; Wiegand, T.; et al. **2019**. Protein sample preparation for solid-state NMR investigations. *Prog Nucl Magn Reson Spectrosc, 110,* 20-33.

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Isotope-Labeled Proteins

CIL offers a number of isotope-labeled recombinant proteins for MS and NMR research. In MS studies, these can be added to samples at the beginning of experimental workflows to help control or correct for analytical variability. This is toward improving the accuracy of protein quantification. For NMR spectroscopy, these proteins are used to assess NMR spectrometer performance, aid the development of new pulse sequences, and for training purposes. Please inquire or visit **isotope.com** for quantity, pricing, and availability.

	Catalog No.	Description	Concentration and Composition
NEW!	NEX-CRP-N-d	Human C-reactive protein (CRP) (^{15}N, 98%) denatured	100 µg/mL in 50 mM sodium acetate (pH 4.0) with 500 mM NaCl and 8 M urea
NEW!	NEX-CRP-N	Human C-reactive protein (CRP) (^{15}N, 98%)	100 µg/mL in 20 mM Tris-HCl (pH 8.0) with 100 mM NaCl
	NEX-UB1-CN	Human ubiquitin (^{13}C, 95%; ^{15}N, 95%)*	0.25, 0.5, or 1 mM in 90% H_2O/10% D_2O with 0.02% NaN_3 and 20 mM sodium phosphate (pH 7.2)
	NEX-UB1-N	Human ubiquitin (^{15}N, 95%)*	0.25, 0.5, or 1 mM in 90% H_2O/10% D_2O with 0.02% NaN_3 and 20 mM sodium phosphate (pH 7.2)
	NEX-MBP1-CN	*E. coli* maltose binding protein (^{13}C, 95%; ^{15}N, 95%)*	0.25, 0.5, or 1 mM in 90% H_2O/10% D_2O with 0.02% NaN_3 and 20 mM sodium phosphate (pH 7.2)
	NEX-XF1-CN	X-filtered NOESY NMR standard (^{13}C, 95%; ^{15}N, 95%)*	Mixture of labeled and unlabeled 16 kDa protein (*A. fulgidus* antitoxin vapB21 homodimer). 1 mM protein in 90% H_2O/10% D_2O with 20 mM NH4OAc (pH 5.5), 100 mM NaCl, 5 mM $CaCl_2$, and 0.02% NaN_3
	NEX-GB1-CN	GB1 (^{13}C, 95%; ^{15}N, 95%)*	0.25, 0.5, or 1 mM in 50 mM sodium phosphate (pH 5.5), 10% D_2O, 0.02% NaN_3
	NEX-CAL-CN	Calbindin-D9k (^{13}C, 95%; ^{15}N, 95%)*	0.25, 0.5, or 1 mM in 50 mM ammonium acetate (pH 6.0), 10% D_2O, 0.02% NaN_3
	NEX-SH3-CN	SH3 domain (^{13}C, 95%; ^{15}N, 95%)*	0.25, 0.5, or 1 mM in 50 mM sodium citrate (pH 3.5), 10% D_2O, 0.02% NaN_3

**Alternate labels are available; please inquire.*

➤ **Please visit the "Protein Standards" section of isotope.com/products for additional information.**

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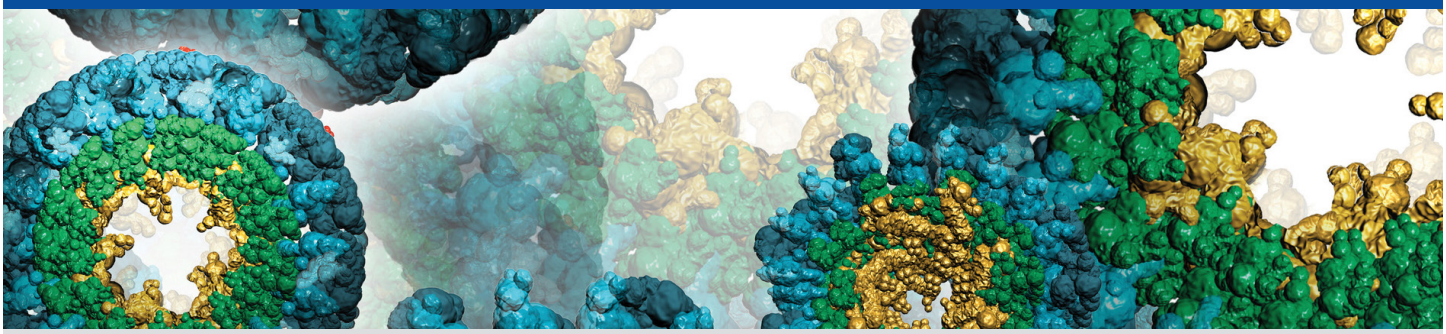
Please visit isotope.com for a complete list of isotope-labeled compounds.



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