Cambridge Isotope Laboratories, Inc.
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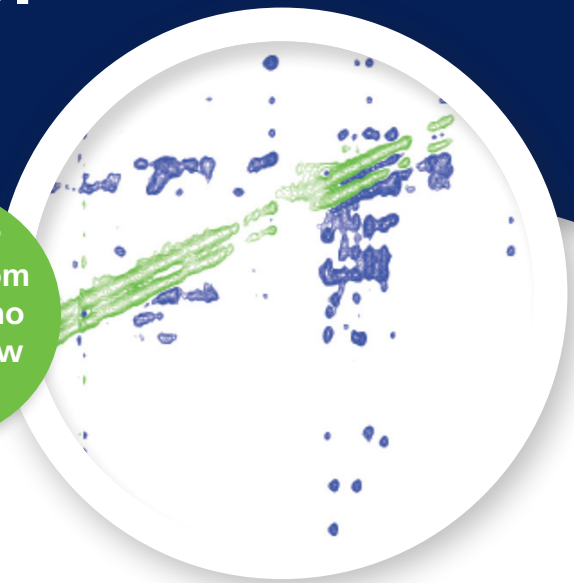
RESEARCH PRODUCTS

New Protein Standards!

Stable Isotope-Labeled Standards and XF-1 Protein Pairs for X-Filtered NOESY

Get your protein from people who really know NMR!



Cambridge Isotope Laboratories, Inc. (CIL) is pleased to offer new and exciting isotope-enriched proteins for use as standards in NMR spectroscopy. Isotope-enriched protein standards are ideal for:

- Aiding in the development of new pulse sequences
- Optimizing parameters for a given pulse sequence
- Assessing spectrometer performance
- Training purposes

Nexomics Biosciences, Inc. is a New Jersey-based contract research organization that specializes in a broad array of gene-to-structure services to the biopharmaceutical community. Gaetano Montelione, CEO of Nexomics Biosciences, Inc., is an expert in the determination of protein structures using NMR. He is a Distinguished Professor of Molecular Biology and Biochemistry at the Center for Advanced Biotechnology and Medicine, Rutgers University, and has over 300 publications.

Nexomics provides high-quality, high-purity standards that are invaluable tools for bioNMR. Each product is accompanied by the following data:

- ^{1}H-^{15}N HSQC (^{15}N-labeled proteins)
- ^{1}H-^{13}C HSQC (^{13}C-labeled proteins)
- CO-NH projection of 3D HNCO (^{15}N,^{13}C-labeled proteins)
- SDS PAGE (for all labeled proteins)
- MALDI-TOF (for all labeled proteins)
- ^{15}N-edited X-filtered 2D NOESY (NEX-XF1)

NEXOMICS BIOSCIENCES

NEW!
"ILV" and "ILVFY" labeled protein standards

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For international inquiries, please contact our International Customer Service Department at intlsales@isotope.com.

Maltose Binding Protein (NEX-MBP)

NEX-MBP is a 44.9 kDa monomeric protein for which multiple sets of resonance assignments (BMRB database) and 3D structures (PDB database) are publicly available. This product is uniformly ^{2}H,^{15}N,^{13}C-enriched with selective incorporation of protons into methyl groups of Ile-δ1, Leu-δ and Val-γ side chains. As nonuniform sampling (NUS) and other NMR techniques emerge to push the size limitations of NMR to new boundaries, large protein standards, such as NEX-MBP, will be required to test data-collection and processing strategies.

NEX-MBP sample formulations:

NEX-MBP1: Apo Conformation

0.5 mM ^{2}H,^{15}N,^{13}C and ILV methyl ^{1}H,^{13}C MBP in 10% D_2O, 0.02% NaN_3, 20 mM sodium phosphate @ pH 7.2

NEX-MBP2: Closed Conformation

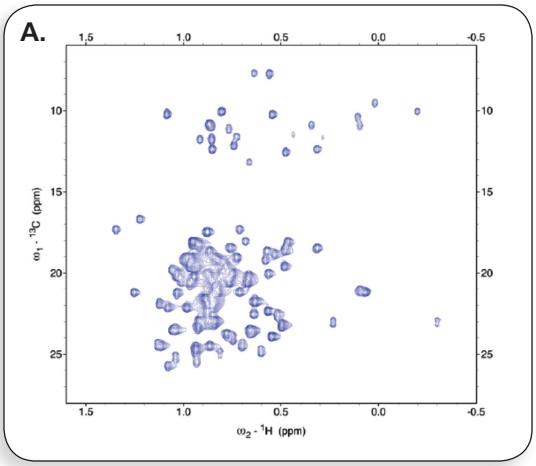
0.5 mM ^{2}H,^{15}N,^{13}C and ILV methyl ^{1}H,^{13}C MBP with 3 mM maltotriose, 10% D_2O, 0.02% NaN_3, 20 mM sodium phosphate @ pH 7.2

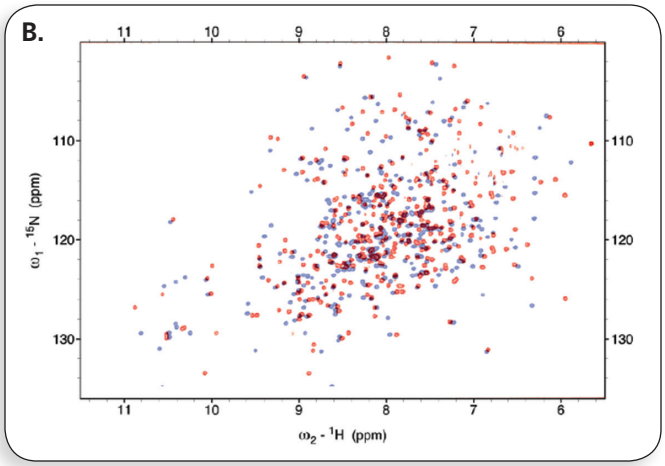
NEX-MBP3: Open Conformation

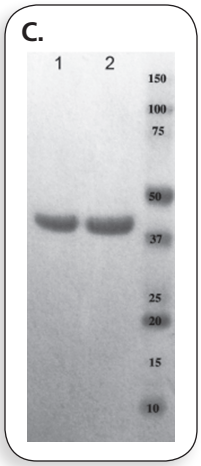
0.5 mM ^{2}H,^{15}N,^{13}C and ILV methyl ^{1}H,^{13}C MBP with 2 mM β-cyclodextrin, 10% D_2O, 0.02% NaN_3, 20 mM sodium phosphate @ pH 7.2

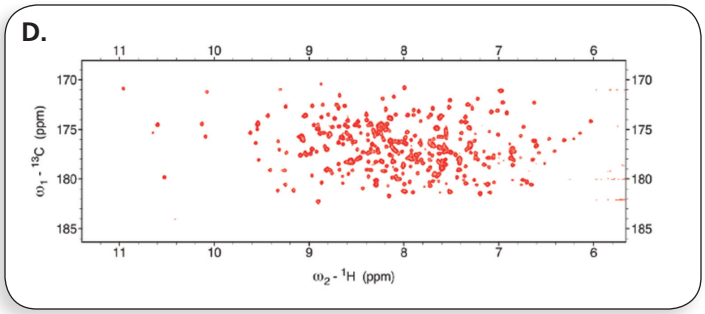
Available in a sealed NMR tube upon request

Contact CIL for different packaging configurations









E. coli Maltose Binding Protein (27-396), Apo Conformation

Catalog No.	Label
NEX-MBP1-U-0	unlabeled
NEX-MBP1-N-0	(^{15}N, 95%)
NEX-MBP1-CN-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-MBP1-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-MBP1-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-MBP1-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-MBP1-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

E. coli Maltose Binding Protein (27-396), Closed Conformation

NEX-MBP2-U-0	unlabeled
NEX-MBP2-N-0	(^{15}N, 95%)
NEX-MBP2-CN-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-MBP2-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-MBP2-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-MBP2-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-MBP2-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

E. coli Maltose Binding Protein (27-396), Open Conformation

NEX-MBP3-U-0	unlabeled
NEX-MBP3-N-0	(^{15}N, 95%)
NEX-MBP3-CN-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-MBP3-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-MBP3-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-MBP3-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-MBP3-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

A. ^{13}C,^{1}H HSQC NEX-MBP3 "open" conformation

B. "Open" (blue) and "closed" (red) superposition

C. SDS-PAGE GEL NEX-MBP

NEX-MBP3 β-cyclodextrin complexed "open" sample (lane 1)

NEX-MBP2 maltotriose complexed "closed" sample (lane 2)

D. CO-NH 2D plane of HNCO triple-resonance experiment of NEX-MBP2 "closed" sample

Protein Sequence

MKIEEGKLVIWINGDKGYNGLAEVGKKFEKDTGIKVTVEHPDKLEEKFPQVAATGDGPDIIFWAH
DRFGGYAQSGLLAEITPDKAFQDKLYPFTWDAVRYNGKLIAYPIAVEALSLIYNKDLLPNPPKTWEE
IPALDKELKAKGKSALMFNLQEPYFTWPLIAADGGYAFKYENGKYDIKDVGVDNAGAKAGLTFL
VDLIKNKHMNADTDYSIAEAAFNKGETAMTINGPWAWSNIDTSKVNYGVTVLPTFKGQPSKP
FVGVLSAGINAASPNKELAKEFLENYLLTDEGLEAVNKDKPLGAVALKSYEEELAKDPRIAATMEN
AQKGEIMPNIPQMSAFWYAVRTAVINAASGRQTVDEALKDAQTRITK

X-Filtered NOESY NMR Standard (NEX-XF1)

In an X-filtered experiment, only NOEs between $^{15}N/^{13}C$-^{1}H and $^{14}N/^{12}C$-^{1}H (e.g. interchain NOEs) protons are observed. NOEs between protons connected to $^{15}N,^{13}C$ are filtered (intrachain NOEs). When uniformly double-labeled protein sample is mixed with a natural-abundance protein sample, the interface will give rise to the only observable NOESY cross peaks. This powerful strategy enables the spectroscopist to discern intra from inter NOESY cross peaks, thereby providing essential distance constraints for defining the dimer interface (Lee, et al., 1994, 350:87; Palmer, et al., 1991, 93:151; Schleucher, et al., 1994, 4:301).

NEX-XF1 is a 16 kDa protein (*A. fulgidus* antitoxin vapB21 homodimer) for which a set of resonance assignments (bmr7362), 3D structure (2NWT) and other NMR data are available in the public domain. This is a mixture of unlabeled and uniformly $^{15}N,^{13}C$-enriched protein (25% homodimer unlabeled; 50% heterodimer unlabeled/labeled; 25% homodimer labeled) and is perfect to set up X-filtered NOESY experiments.

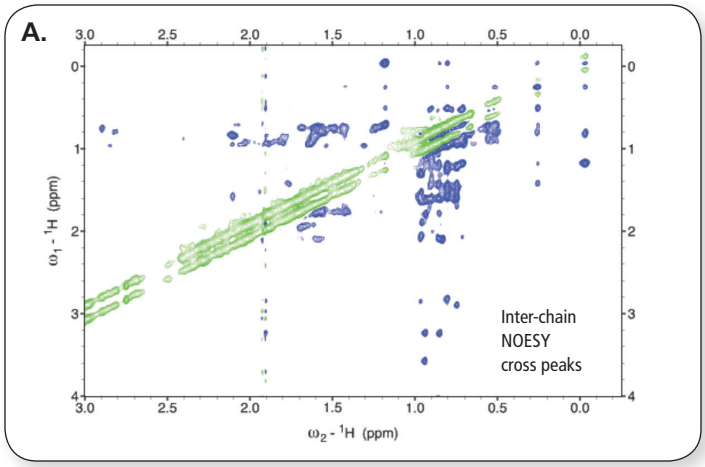
Available in a sealed NMR tube upon request

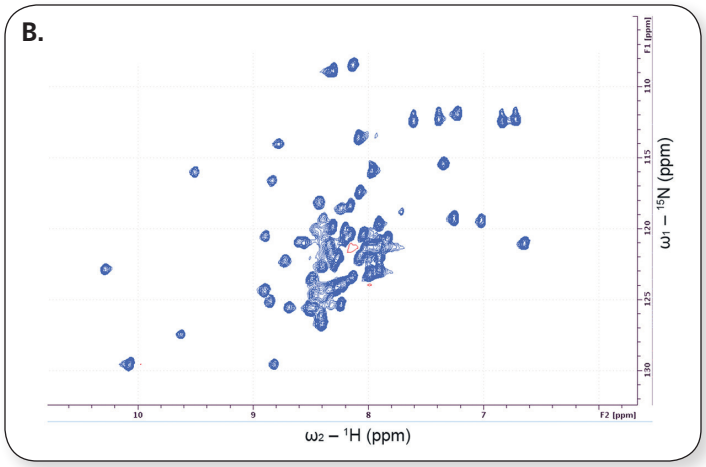
Contact CIL for different packaging configurations

NEX-XF1 homodimer sample formulation:

NEX-XF1: $^{13}C,^{15}N$-labeled and unlabeled sample conditions

1 mM protein, 20 mM NH_4OAc pH 5.5, 100 mM NaCl, 5 mM $CaCl_2$, 10% D_2O, 0.02 % NaN_3

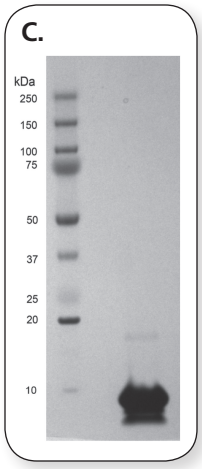




A. 2D ^{1}H-^{1}H plane of $^{1}H,^{13}C$ edited $^{1}H,^{12}C$ X-filtered NOESY

B. ^{1}H-^{15}N HSQC of NEX-XF1

C. SDS-PAGE GEL NEX-XF1



Protein Sequence

PKIIEAVYENGVFKPLQKVDLKEGERVKIKLELKVEPIDLGEPVS
VEEIKKIRDGTWMSSLEHHHHHH

X-Filtered NOESY NMR Standard

Catalog No.	Label
NEX-XF1-U-0	unlabeled
NEX-XF1-N-0	(^{15}N, 95%)
NEX-XF1-CN-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-XF1-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-XF1-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-XF1-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-XF1-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

X-Filtered NOESY NMR Standard, His-Tagged

NEX-XF1-HIS-U-0	unlabeled
NEX-XF1-HIS-N-0	(^{15}N, 95%)
NEX-XF1-HIS-CN-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-XF1-HIS-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-XF1-HIS-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-XF1-HIS-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-XF1-HIS-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

Please contact CIL for pricing and delivery or visit our website: isotope.com.

Ubiquitin (NEX-UB1)

Powder form available

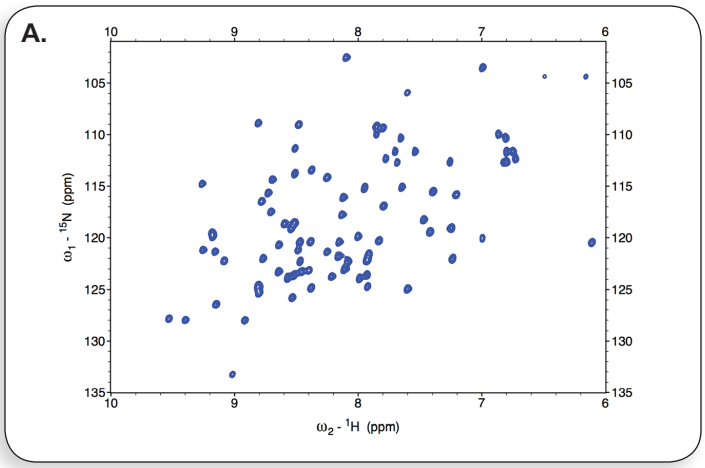
Available in a sealed NMR tube upon request

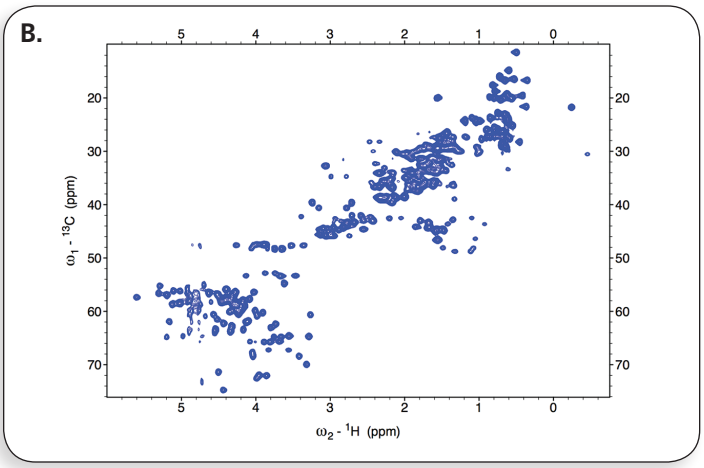
Contact CIL for different packaging configurations

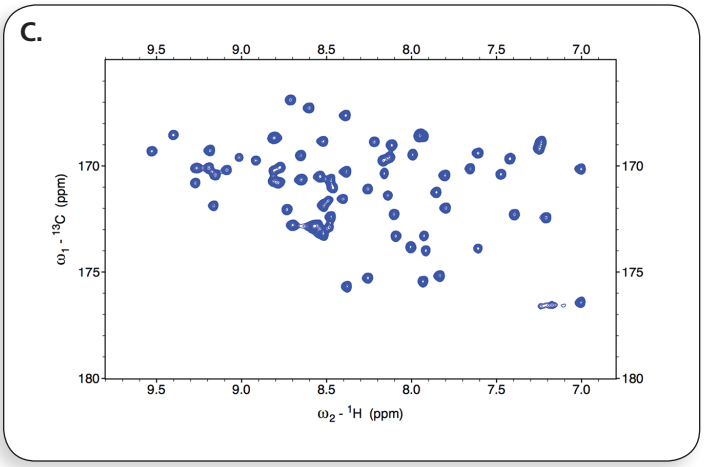
NEX-UB1 is a small 8.8 kDa monomeric protein for which multiple sets of resonance assignments (BMRB database) and 3D structures (PDB database) are publicly available. This protein standard is uniformly ^{15}N, ^{13}C-enriched. Ubiquitin has been used as an industry-wide standard in the protein NMR field for many years.

NEX-UB1 sample formulation:

NEX-UB1: Uniformly ^{15}N, ^{13}C-labeled ubiquitin in 90% H_2O; 10% D_2O
10 mM sodium phosphate buffer, pH 6.5







A. $^{1}H,^{15}N$ **HSQC of NEX-UB1**
B. ^{13}C-^{1}H **HSQC of NEX-UB1**
C. CO-NH 2D plane of HNCO triple-resonance experiment of NEX-UB1
D. SDS-PAGE GEL NEX-UB1

Ubiquitin (Human)

Catalog No.	Label
NEX-UB1-U-0	unlabeled
NEX-UB1-N-0	(^{15}N, 95%)
NEX-UB1-CN-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-UB1-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-UB1-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-UB1-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-UB1-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

His-Ubiquitin (Human)

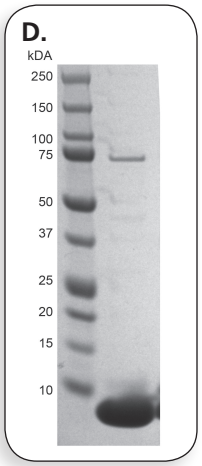
NEX-UB1-HIS-U-0	unlabeled
NEX-UB1-HIS-N-0	(^{15}N, 95%)
NEX-UB1-HIS-5-0	(^{13}C, 5%; ^{15}N, 95%)
NEX-UB1-HIS-CN-0	(^{13}C, 95%; ^{15}N, 95%)
NEX-UB1-HIS-CDN-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%)
NEX-UB1-HIS-ILV-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILV)
NEX-UB1-HIS-ILVFY-0	(^{13}C, 95%; D, 95%; ^{15}N, 95%; $^{13}CH_3$-ILVFY)

Protein Sequence after TEV Cleavage

SHMQIFVKTLTGKTITLEVEPSDTIENVKAKIQDKEGIPPDQQR LIFAGKQLEDGRTLSDYNIQKESTLHLVLRLRGG

Protein Sequence before TEV Cleavage

*MGHHHHHHENLYFQ*SHMQIFVKTLTGKTITLEVEPSDTIEN VKAKIQDKEGIPPDQQRLIFAGKQLEDGRTLSDYNIQKESTL HLVLRLRGG



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