Methyl groups are ideal probes for NMR studies of challenging proteins and complex biomolecular assemblies. Therefore, NMR-Bio proposes advanced solutions for your innovative R&D, including:

**New in 2017!**

(1) Customized Electron microscopy (EM) services & (2) cost-effective Cell-free expression of regio- & stereospecifically labeled proteins

**User-friendly kits**

The latest generation of precursors for specific \([^{13}C,^{1}H]\)-labeling of methyl groups in deuterated proteins. Our patented precursors are optimized for the NMR study of large proteins including the detection of long-range noes, their NMR spectra assignment, ssNMR applications ...etc.

For any request or additional information please visit the NMR-Bio booth!

Get 10% discount on quotes issued during the conference

NMR services:

- Production of challenging NMR samples;
- Acquisition of high field NMR data;
- NMR data interpretation & analysis.
- Etc....

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NMR-Bio precursor innovation

**NMR-Bio** SLAM kits (Single Labeled Amino-acids, Methyl): Scrambling free solutions, developed by NMR-Bio, to achieve high incorporation levels of $^{13}$CH$_3$ isotopomer only in a single type of amino acid (Ala, Ile, Met, Thr or Val) in perdeuterated protein.

SLAM kits contain specifically labeled precursors and deuterated metabolites to suppress isotopic scrambling.


**NMR-Bio** combinatorial labeling kits: user-friendly solutions for the simultaneous labeling of any combinations of Ala, Ile, Leu, Met, Thr & Val methyl groups. Labeling schemes of each precursor have been optimized for the assignment and the structural/dynamics studies of large protein complexes, using solution or solid state NMR spectroscopy. Kits are provided with precise protocols extensively tested in-vivo to ensure optimal incorporation of isotopes in targeted methyl groups without detectable scrambling in other positions.

**Investigate protein assemblies with molecular weight up to 1 MDa!**

Introduce **NMR-Bio** kits in perdeuterated minimum medium, to achieve high incorporation levels of $^{13}$CH$_3$ isotopomer only in a single type of methyl groups (i.e. Val-proS, Ala-β,...) without detectable scrambling. To obtain more $^{13}$CH$_3$ probes, reduce spectral overlaps using **NMR-Bio** combinatorial labeling kits, designed to simultaneously label different methyl probes well separated in Methyl-TROSY spectra. Recommended kits: SLAM-A$^3$/ T$^3$/ M$^3$/ TROSY: DLAM- A$^{15}$/ A$^{14}$/ M$^3$/ T$^3$/ TROSY: M$^{13}$M$^3$/ M$^3$/ TROSY, TLAM- A$^{15}$/ TROSY: A$^{14}$/ M$^3$/ TROSY.

2D Methyl-TROSY spectra of a 82 KDa protein labeled on Methyl groups using **NMR-Bio** kits SLAM-A$^3$/ DLAM-LV proS & TLAM-10KMs.

2D Methyl-TROSY spectra of a 468 KDa protein labeled on **NMR-Bio** kits TLAM-A$^3$ / TLAM-V proS. Courtesy of Dr. Boisbouvier.
Sequential and side chains assignment with stereo/regio specific identification of methyl groups!

NMR-Bio has optimized kits for the assignment of Alanine, Isoleucine, Leucine and Valine residues. Precursors are designed to connect regio or stereospecific labeled $^{13}$CH$_2$ group to the $^{15}$N/$^{13}$C backbone nuclei via a linear $^{13}$C spin system. Use combinatorial labeling kits and assign simultaneously methyl groups of different types of amino acids using a single triple resonance experiment.

Recommended kits: SLAM-P$^{13}$CH$_2$/I$^{13}$C$_2$/A$^{15}$N$^{13}$C$_3$; DLAM-LV$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/I$^{13}$C$_2$; TLAM-P$^{15}$N$^{13}$C$_2$/LV$^{13}$C$_2$/U-[13C] $\&$ QLAM-A$^{15}$N$^{13}$C$_2$/LV$^{13}$C$_2$/U-[13C]$_2$.

Optimized labeling of Ile, Leu and Val for assignment. Protein was produced in U-[H/$^{13}$C,$^{15}$N] M9 medium supplemented with TLAM-tl[LV$^{15}$N$^{13}$C$_2$]-U-[13C] kit.

Detection of long-range NOE between methyl probes distant by up to 10 Å in large proteins and complexes!

NMR-Bio scrambling free labeling solutions are optimized for the extraction of precise and long-range NOE distance restraints between methyl probes in perdeuterated proteins. Compared to standard 2-keto acids, NMR-Bio acetalactate precursors increase sensitivity by up to a factor of 4, allowing for the detection of structurally meaningful long-range and intermolecular NOE restraints.

Recommended kits: TLAM-P$^{15}$N$^{13}$C$_2$/I$^{13}$C$_2$/A$^{15}$N$^{13}$C$_3$; QLAM-A$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/I$^{13}$C$_2$/PLAM-A$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/I$^{13}$C$_2$/VLAM-A$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/LV$^{15}$N$^{13}$C$_2$/I$^{13}$C$_2$/labeling kit.

NMR-Bio kits for solid-state NMR and dynamics studies.

Optimized kits for solid-state NMR applications and dynamics studies. Kits are available for regio and/or stereospecific labeling of Isoleucine, Leucine, Valine and Alanine with $^{13}$CH$_2$ isotopomers. Incorporation of $^{13}$CH$_2$ groups in perdeuterated proteins allows the measurement of precise dynamics information and the acquisition of high resolution $^1$H,$^{13}$C-spectra by solution and solid-state NMR spectroscopy. Kits combining $^{13}$CH$_2$ isotopomer with linear $^{13}$C spin system connecting the methyl groups to the backbone nuclei of Alanine, Valine and Leucine are available!

Please contact us for supplementary information.

Increase your $[^{1}H,^{13}C]Methyl, U-[D]$ protein yield using NMR-Bio rich media!

Due to the toxicity of D$_2$O, the yield of many valuable protein targets, overexpressed in D$_2$O/M9 media, is considerably reduced compared to standard H$_2$O/LB based cultures.

Use NMR-Bio $[^{1}H,^{13}C]Methyl, U-[D]$ rich labeling media, as a cost effective solution to:

• Enhance protein yield
• Reduce D$_2$O culture volumes
• Produce protein libraries in parallel
• Simplify purification

NMR-Bio $[^{1}H,^{13}C]Methyl, U-[D]$ rich labeling media already contains perdeuterated nitrogen and carbon sources and are calibrated for direct addition into pure D$_2$O (3 sites 0.25 L, 0.5 L or 1 L). First kits are now available for the $^{13}$CH$_2$ labeling of Ala-$\beta$ and Met-$\epsilon$ methyl probes. Visit our web site to obtain more information.
NMR-Bio services

We are pleased to offer now customized NMR services ranging from the production of labeled proteins to the acquisition and analysis of high field NMR data. Our engineers are experts in the production of proteins & RNAs uniformly and specifically labeled with stable isotopes (\(^{13}\text{C}, {15}\text{N}, \text{and} {2}\text{H}\)) using in vivo and in vitro expression systems. For high molecular weight systems, we offer expert production and/or NMR analysis of methyl specific labeled proteins. To characterize your samples and collect structural or dynamics information our experts have access to state-of-the-art NMR spectrometers operating at \(^1\text{H}\) frequency ranging from 600 MHz to 950 MHz.

Examples of our services:

1. **Customized protein synthesis**
   - \([{2}\text{H}, {13}\text{C}, {15}\text{N}]-\text{uniform labeling of proteins}\)
   - Efficient \(^{15}\text{NH}\) back-protonation in \([{2}\text{H}]-\text{proteins}\)
   - \(^{13}\text{CH}_3\) specific labeling of large proteins *in vivo*
   - \(^{13}\text{CH}_3\) specific labeling of challenging proteins *in vitro* using our cell-free cost-effective technology
   - Production of mutant libraries for assignment

2. **High field NMR data acquisition & analysis**
   - High field NMR data acquisition
   - NMR spectra assignment
   - Structure and Dynamics Studies
   - NMR studies of large protein assemblies
   - Mapping of interactions on protein surface

3. **EM**

For any request or additional information please visit the NMR-Bio booth or contact us at service@nmr-bio.com!