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RESEARCH PRODUCTS

# Stable Isotope Standards For Mass Spectrometry



**Cambridge Isotope Laboratories, Inc.**

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Cambridge Isotope Laboratories, Inc. (CIL) is the world leader in the separation and manufacture of stable isotopes and stable isotope-labeled compounds. Isotope separation is performed at CIL Isotope Separations (CIS) in Xenia, Ohio – home of the world's largest <sup>13</sup>C isotope separation facility, one of the world's largest <sup>18</sup>O isotope-separation facilities, and the world's only commercial large-capacity D<sub>2</sub>O enrichment columns. For over 40 years, CIL has remained the premier supplier of stable isotope standards for MS, NMR, and MRS/MRI research applications. The products include bile acids, carbohydrates, drugs and their metabolites, fatty acids and lipids, free and protected amino acids, metabolomics mixes, organic acids and their derivatives, steroids and hormones, and vitamins and their metabolites. Our products have been specifically designed and tested with the most discerning mass spectrometrists in mind. CIL actively supports the MS community through meeting sponsorships and customer collaborations.

## Ordering and Contact Information

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- Please include the name of your customs broker.
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## Product Information

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## Importance of Stable Isotope Standards and Their Implementation in Mass Spectrometry

Technical  
Note



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The implementation of mass spectrometry (MS) in the preclinical/clinical laboratory has been garnering more attention over the past couple of decades.<sup>1</sup> Among the reasons for this are the performance benefits that MS-based methods can afford. This pertains to the high specificity, reproducibility, and sensitivity achieved through tandem MS operations (e.g., selected or multiple reaction monitoring). As with any technology, there are a few limitations worth noting. These include the upfront instrument investment and its complexity, as well as the result turnaround time. Nonetheless, as the breadth of instruments and data analysis tools continue to advance, the limitations appear to be diminishing, while the overall merits, relative to historical clinical techniques, are amplifying. Example applications that have capitalized on the analytical power of mass spectrometry include endocrinology,<sup>2</sup> therapeutic drug monitoring,<sup>3</sup> and newborn screening (for inborn errors of metabolism).<sup>4</sup> The aim of these, and other clinical MS screens, is to help improve the path to diagnosis. From this, specific treatments can be effectively implemented at the earliest time leading to enhanced patient care and longevity.

To facilitate accurate MS-based measurements, stable isotope-labeled standards must be incorporated. The preferred approach here is to add the labeled standard in a precise and constant

amount to both the experimental samples, as an internal standard (IS), as well as the standard curve and QC samples. For utmost accuracy, the curve samples should be generated in an equivalent sample type such that the matrix effects and extraction efficiency are identical. Only by adding the labeled standard as an IS can recovery differences be effectively resolved. With IS use, the type and its point of insertion are two critical factors that a researcher faces in designing a clinically relevant, MS-based method. This is critical to qualitatively evaluate the assay's effectiveness and to help guide corrective measures, as necessary.

The nature of IS can take many forms but is conventionally a compound, or mixture of compounds, that has been labeled with one or more stable isotopes (e.g., <sup>13</sup>C, <sup>15</sup>N, and/or D). The position and number of stable isotopes in a given compound is predicated on the sample preparation and method of analysis. If, for instance, D-labeling is preferred for a certain metabolite, the labels must be inserted at nonexchangeable positions to mitigate the effects of hydrogen-deuterium exchange. Regardless of the type of isotope incorporated, the labeled standards should ideally bear a total mass shift of 3 Da minimum from its unlabeled counterpart (to enable swift metabolite MS analysis) and be well characterized (e.g., for chemical and/or chiral purity, isotopic enrichment). In terms of the number of labeled standards required for a given experiment, it is recommended that this number equate to the number of target analytes. While this is generally practical for small panel analyses (as would be typical in a clinical experiment), it is common with large panels (as utilized in preclinical experiments) to select certain labeled standards as surrogates for compounds that lack a labeled analogue. This practice is considered acceptable in quantification exercises provided that the surrogates exhibit similar elution times, and thus bear similar physicochemical properties as their native targets.

Given the complexity of human biological samples, in terms of depth and breadth of analytes, it is recommended that the labeled IS be added as early as possible in the analytical workflow. In so doing, losses or modifications that occur during the sample preparation and processing steps can be adequately accounted for. Since the standard is designed to match its native analogue and behave similarly (in terms of its separation, ionization, and fragmentation), any changes that occur on one will, in theory, be reflective on the other. Therefore, in analysis, the analyte can be



quantified using relative ratios (i.e., unlabeled/labeled) of peak areas as opposed to their absolute values. In addition to the experimental samples, this approach is applied to other sample types, such as standard curve and curve QCs (at low, medium, and high concentrations). While the response of the labeled and unlabeled analyte will differ in curve and QC samples, the point of elution will not (valid particularly with  $^{13}\text{C}$  and/or  $^{15}\text{N}$  standards), enabling their relative ratios for quantitation or performance assessment to be effectively determined.

The importance of stable isotope-labeled standards in the rapidly evolving clinical MS field is becoming increasingly more recognized. This pertains to both small and large molecule analysis,<sup>5</sup> with

applications covering diagnostic testing and drug therapy monitoring, among others. Regardless of the application type, a well-executed clinical MS method should be automated and well controlled. In the assays deemed fit for purpose, the highly characterized standards should be inserted for not only accurate quantitation, but also for system suitability reliance to enable complete accounting of all possible losses or errors.<sup>6</sup> This relates to human errors (e.g., improper pipetting), chemical errors (e.g., analyte extraction, hydrolysis), and instrument errors (e.g., ion suppression, matrix effects). The labeled standards that CIL provides can be, and have been, utilized in this realm. The product listing, perspectives, and applications herein provide such examples.

## References

1. Jannetto, P.J.; Fitzgerald, R.L. **2016**. Effective use of mass spectrometry in the clinical laboratory. *Clin Chem*, 62(1), 92-98.
2. van den Ouweland, J.M.; Vogeser, M.; Bächer, S. **2013**. Vitamin D and metabolites measurement by tandem mass spectrometry. *Rev Endocr Metab Disord*, 14(2), 159-184.
3. Maurer, H.H. **2018**. Mass spectrometry for research and application in therapeutic drug monitoring or clinical and forensic toxicology. *Ther Drug Monit*, 40(4), 389-393.
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## Benefits of $^{13}\text{C}$ vs. D Standards in Clinical Mass Spectrometry Measurements

**Technical  
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The capabilities of mass spectrometry (MS) have made this analytical technique an invaluable tool in clinical-based developments and applications. As with any clinical test, accurate and precise results are paramount toward correct diagnosis and treatments. In MS testing, reliable results are best achieved by the inclusion of stable isotope-labeled standards. The utility of such standards has been demonstrated in clinical and translational research (see [page 6](#) of this catalog for a background article), with their benefits including the ability to help compensate for matrix effects and ion suppression.<sup>1</sup> For optimum results, the standards should be added as early in the analytical workflow as possible, such that they can effectively normalize the variations that may arise throughout the experimental stages. The nature of labeled standards is a critical element of a method and is predicated on its availability/cost, as well as the study design and research aims. Important to recognize in the standard selection process is the isotope differences (e.g., between  $^{13}\text{C}$  and D) and the potential impact this may have in the pre-analytical (e.g., storage and handling) and analytical (e.g., sample preparation and processing) phases. As standard selection is not always a straightforward procedure, this article compares the commonly used  $^{13}\text{C}$  and D isotopes from production to analysis in an effort to edify the challenges and guide future selections.

Standards labeled with  $^{13}\text{C}$  (and/or  $^{15}\text{N}$ ) have demonstrated broad research utility over the past couple of decades. This stems partly from the chemical stability of its isotope. Its stability ensures that the isotope remains intact irrespective of the experimental methodology employed (e.g., multidimensional LC or derivatization-based GC prior to MS/MS). In other words, the  $^{13}\text{C}$  (and  $^{15}\text{N}$ ) isotope remains positioned at its point of synthesis throughout all stages of an analytical workflow (includes extraction, derivatization, separation, and analysis in metabolomics). This provides flexibility to the end user as there is no limitation on the choice of sample/solution preparation nor the mode of MS/MS analysis. Since  $^{13}\text{C}$  (and/or  $^{15}\text{N}$ ) standards have exceptional isotope stability, as compared to their deuterated counterparts, these can be inserted at an early stage of sample preparation. Of additional benefit is that this type of labeled compound co-elutes with its corresponding unlabeled (i.e., native or endogenous) analyte during chromatographic separation. This co-eluting result is optimal in correcting for both ion suppression and matrix effects. Further to the benefits,  $^{13}\text{C}$  (and/or  $^{15}\text{N}$ ) standards are absent from isotope scrambling or loss during ionization and collisional activation in the mass

spectrometer. Owing to these collective merits,  $^{13}\text{C}$  (and/or  $^{15}\text{N}$ ) standards have incurred great value in preclinical and clinical MS applications (from qualification to absolute quantification).

Despite the benefits of  $^{13}\text{C}$  (and  $^{15}\text{N}$ ) labeling, the production of such standards could entail complex and laborious synthesis. While carefully selected structural analogues (with  $^{13}\text{C}$  and/or  $^{15}\text{N}$ ) may instead be used in cases where it is cost or time prohibitive to obtain or synthesize the required standard, deuterated standards are an alternate option to consider. These are comparatively straightforward to prepare, but invoke a number of potential issues at the pre-analytical and analytical phases. The first pertains to the isotope stability. If the D-label is placed at an exchangeable position (i.e., at acidic and polar groups), it could be susceptible to an isotope effect during storage and later in analysis. In this effect, the location of deuterium may scramble or undergo an exchange reaction with protium in solution or in the gas phase. Another situation to consider is deuterium loss on specific compounds from enzymatic reactions (e.g., deuterium abstraction from fatty acids due to fatty acid desaturation).<sup>2</sup> The impact of these collective effects could be significant and is best illustrated by a hypothetical example. In a complete exchange scenario, for instance, the labeled signal at the mass spectrometer would be unmeasurable, while the unlabeled signal (i.e., M+0) would be elevated. This would provide an invalid view of a patient's biochemistry and a false impression of the assay's fitness, a result that would clearly contribute to "imprecision medicine" in laboratory diagnostics. While this deleterious impact could be overcome by selecting alternate MRM transitions (i.e., at sites verified to have label due to consistent scrambling), a preferred approach would be to incorporate deuterium at chemically inert, nonexchangeable positions. Doing so would aid its stability, but the integrity of the deuterated standards would still need to be validated at all phases of the analytical workflow (from reconstitution through extraction to MS analysis). Complicating these assessments is the difference in physicochemical properties between deuterium and hydrogen. The difference causes deuterated standards to typically exhibit an altered chromatographic retention from its native analogues.<sup>3</sup> This elution impact is most pronounced in LC separations, but may also occur in GC separations. The shift could complicate the accuracy/reproducibility of identification and quantification in complex biosample analysis, such as human plasma or urine. Only if the stability and effectiveness of deuterated standards are



first demonstrated can its subsequent use in large-scale analysis be considered acceptable for critical decision-making studies (e.g., newborn screening, therapeutic drug monitoring, vitamin D deficiency).

To summarize, there are an array of factors to consider in designing experiments and implementing methods. Important amongst them is the type of labeled standard. As described above,  $^{13}\text{C}$  (and  $^{15}\text{N}$ ) standards provide excellent isotope stability and analytical reliability. This means that the position of label is not impacted by the pre-analytical and analytical processes. Since this type of standard has equivalent physicochemical properties as its unlabeled counterpart, we consider these to be ideal toward the accurate and reproducible quantitation of small or large molecules. Deuterated standards, in contrast, may exhibit isotope instability

and an exchange or scrambling effect during storage and the experimental phases. These effects are magnified if the D-label is incorporated at exchangeable positions. Even if deuterium is placed at nonexchangeable positions, development time must be allotted for stability testing (e.g., at storage, in autosampler) and method evaluation (e.g., for mobile phase impact, preferable MRM transitions).<sup>4</sup> That said, if validations have been performed and other options (e.g.,  $^{13}\text{C}$  standards or surrogates) are absent, then this route could be suitable long-term. Overall, although Cambridge Isotope Laboratories (CIL) offer a multitude of variably labeled standards (encompasses vitamins, steroids, and fatty acids/lipids, amongst others), our recommendation is toward a  $^{13}\text{C}$  (and/or  $^{15}\text{N}$ ) variant, when possible, for accurate/reproducible quantification in clinical MS-based analyses.

#### References

1. George, R.; Haywood, A.; Khan, S.; et al. **2018**. Enhancement and suppression of ionization in drug analysis using HPLC-MS/MS in support of therapeutic drug monitoring: a review of current knowledge of its minimization and assessment. *Ther Drug Monit*, 40(1), 1-8.
2. Triebel, A.; Wenk, M.R. **2018**. Analytical considerations of stable isotope labelling in lipidomics. *Biomolecules*, 8(4), 151.
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4. Honour, J.W. **2011**. Development and validation of a quantitative assay based on tandem mass spectrometry. *Ann Clin Biochem*, 48(Pt 2), 97-111.

## Free Amino Acids and Their Derivatives

Amino acids play critical roles in biological functions as building blocks of peptides and proteins, as well as intermediates of various metabolic pathways (e.g., citric acid cycle, urea cycle). These compounds are also reported to influence the pathogenesis and propagation of metabolic disorders/disease, with clinically designed biomarker research aimed to detect disease at the earliest stage.

To aid qualitative and quantitative research, CIL offers an array of unlabeled and stable isotope-labeled free amino acids. These can be used as internal standards or NMR probes in MS- and NMR-based research studies. The amino acids are canonical (e.g., arginine, lysine, phenylalanine) and non-canonical (e.g., beta-alanine, citrulline, ornithine). These are available in their uniform or specifically labeled (with  $^{13}\text{C}$ ,  $^{15}\text{N}$ , D, and/or  $^{18}\text{O}$ ) forms, in research or MPT grade.

| Catalog No. | Description   | Unit Size            |
|-------------|---|----------------------|
| CLM-8906    | S-Adenosyl-L-homocysteine (SAH) (adenosine- $^{13}\text{C}_{10}$ , 98%) CP 95%  | 0.1 mg               |
| CLM-11193   | S-Adenosyl-L-methionine (SAM), sulfate salt (ribose- $^{13}\text{C}_5$ , 98%) CP 95%                                  | Please inquire       |
| DLM-7476    | Asymmetric dimethylarginine (ADMA)·HCl·xH <sub>2</sub> O (2,3,3,4,4,5,5-D <sub>7</sub> , 98%) CP 98% (may be hydrate) | 5 mg                 |
| CLM-8755    | β-Alanine (3- $^{13}\text{C}$ , 99%)  | Please inquire       |
| CLM-8756    | β-Alanine ( $^{13}\text{C}_3$ , 99%)  | Please inquire       |
| NLM-1656    | β-Alanine ( $^{15}\text{N}$ , 98%)  | 0.25 g               |
| CNLM-3440   | β-Alanine (3- $^{13}\text{C}$ , 99%; $^{15}\text{N}$ , 98%)   | Please inquire       |
| CNLM-8457   | β-Alanine (1,2- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 98%)   | Please inquire       |
| CNLM-3946   | β-Alanine ( $^{13}\text{C}_3$ , 98%; $^{15}\text{N}$ , 96%)   | 0.25 g               |
| CLM-1655    | D-Alanine (1- $^{13}\text{C}$ , 99%)  | Please inquire       |
| CLM-2495    | D-Alanine (3- $^{13}\text{C}$ , 99%)  | Please inquire       |
| CLM-10963   | D-Alanine ( $^{13}\text{C}_3$ , 99%)  | Please inquire       |
| DLM-7326    | D-Alanine (D <sub>7</sub> , 98%) <5% L  | Please inquire       |
| NLM-6762    | D-Alanine ( $^{15}\text{N}$ , 98%)  | Please inquire       |
| NLM-3289    | D-Alanine, N-acetyl ( $^{15}\text{N}$ , 98%)  | Please inquire       |
| CLM-705     | DL-Alanine (1- $^{13}\text{C}$ , 99%)   | 1 g                  |
| CLM-115     | DL-Alanine (2- $^{13}\text{C}$ , 99%)   | 0.25 g, 0.5 g        |
| CLM-707     | DL-Alanine (3- $^{13}\text{C}$ , 99%)   | 0.5 g, 1 g           |
| CLM-4514    | DL-Alanine ( $^{13}\text{C}_3$ , 98%)   | Please inquire       |
| DLM-2760    | DL-Alanine (2-D, 98%)   | Please inquire       |
| DLM-176     | DL-Alanine (3,3,3-D <sub>3</sub> , 98%)   | 1 g                  |
| DLM-1276    | DL-Alanine (2,3,3,3-D <sub>4</sub> , 97%)   | 1 g                  |
| NLM-706     | DL-Alanine ( $^{15}\text{N}$ , 98%)   | 1 g                  |
| CDLM-8650   | DL-Alanine (3- $^{13}\text{C}$ , 99%; 2-D, 96%)   | Please inquire       |
| CLM-116     | L-Alanine (1- $^{13}\text{C}$ , 99%)  | 0.5 g, 1 g           |
| CLM-2016    | L-Alanine (2- $^{13}\text{C}$ , 99%)  | 0.1 g, 0.25 g, 0.5 g |
| CLM-117     | L-Alanine (3- $^{13}\text{C}$ , 99%)  | 0.5 g, 1 g           |
| CLM-2734    | L-Alanine (2,3- $^{13}\text{C}_2$ , 99%)  | 0.25 g, 0.5 g        |
| CLM-2184-H  | L-Alanine ( $^{13}\text{C}_3$ , 99%)  | 0.1 g, 0.25 g, 0.5 g |
| DLM-3101    | L-Alanine (2-D, 96%)  | Please inquire       |
| DLM-248     | L-Alanine (3,3,3-D <sub>3</sub> , 99%)  | 1 g                  |
| DLM-250     | L-Alanine (2,3,3,3-D <sub>4</sub> , 98%)  | 0.1 g, 1 g           |
| DLM-251     | L-Alanine (D <sub>7</sub> , 98%)  | 1 g                  |
| NLM-454     | L-Alanine ( $^{15}\text{N}$ , 98%)  | 0.5 g, 1 g           |
| OLM-7460    | L-Alanine ( $^{18}\text{O}_2$ , 90%)  | Please inquire       |
| CDLM-8649   | L-Alanine (3- $^{13}\text{C}$ , 99%; 2-D, 96%)  | 1 g                  |
| CDLM-11504  | L-Alanine (3- $^{13}\text{C}$ , 99%; 2,3,3-D <sub>3</sub> , 96%)  | Please inquire       |
| CDLM-3439   | L-Alanine (3- $^{13}\text{C}$ , 99%; 3,3,3-D <sub>3</sub> , 98%)  | Please inquire       |
| CNLM-6993   | L-Alanine (1- $^{13}\text{C}$ , 99%; $^{15}\text{N}$ , 98%)   | 0.25 g               |
| CNLM-3594   | L-Alanine (2- $^{13}\text{C}$ , 99%; $^{15}\text{N}$ , 98%)   | 0.25 g               |
| CNLM-534-H  | L-Alanine ( $^{13}\text{C}_3$ , 99%; $^{15}\text{N}$ , 99%)   | 0.1 g, 0.25 g, 0.5 g |
| DNLM-7178   | L-Alanine (2,3,3,3-D <sub>4</sub> , 98%; $^{15}\text{N}$ , 98%)   | 0.25 g, 0.5 g        |
| CDNLM-6800  | L-Alanine ( $^{13}\text{C}_3$ , 97%; D <sub>4</sub> , 97%; $^{15}\text{N}$ , 97%)                                     | 0.25 g               |

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| Catalog No.  | Description  | Unit Size                         |
|--------------|--|-----------------------------------|
| DLM-9799     | DL-2-Aminoadipic acid (2,5,5-D <sub>3</sub> , 98%)   | 0.1 g, 0.25 g                     |
| CLM-1541     | 4-Aminobenzoic acid (PABA) (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | Please inquire                    |
| DLM-9802     | DL-2-Aminobutyric acid (D <sub>6</sub> , 98%)  | Please inquire                    |
| CLM-8666     | γ-Aminobutyric acid (GABA) ( <sup>13</sup> C <sub>4</sub> , 97%)   | 0.05 g, 0.1 g                     |
| DLM-7760     | γ-Aminobutyric acid (GABA) (2,2,3,3,4,4-D <sub>6</sub> , 98%)  | Please inquire                    |
| CLM-535      | 5-Aminolevulinic acid·HCl (4- <sup>13</sup> C, 99%)  | 0.05 g                            |
| CLM-1371     | 5-Aminolevulinic acid·HCl (5- <sup>13</sup> C, 99%) CP 96%   | 0.05 g, 0.1 g                     |
| CLM-701      | Anthranilic acid (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 0.1 g, 0.25 g                     |
| NLM-3294     | Anthranilic acid ( <sup>15</sup> N, 98%)   | 0.5 g                             |
| CLM-2070     | L-Arginine·HCl (guanido- <sup>13</sup> C, 99%)   | 0.5 g                             |
| CLM-1268     | L-Arginine·HCl (1- <sup>13</sup> C, 99%)   | 0.1 g                             |
| CLM-2051     | L-Arginine·HCl (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.1 g                             |
| CLM-2265-H   | L-Arginine·HCl ( <sup>13</sup> C <sub>6</sub> , 99%)   | 0.05 g, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DLM-6038     | L-Arginine·HCl (4,4,5,5-D <sub>4</sub> , 94%) <5% D  | Please inquire                    |
| DLM-541      | L-Arginine·HCl (D <sub>7</sub> , 98%)  | 0.1 g                             |
| NLM-1267     | L-Arginine·HCl (α- <sup>15</sup> N, 98%)   | Please inquire                    |
| NLM-395      | L-Arginine·HCl (guanido- <sup>15</sup> N <sub>2</sub> , 98%)   | 0.5 g, 1 g                        |
| NLM-396      | L-Arginine·HCl ( <sup>15</sup> N <sub>4</sub> , 98%)   | 0.1 g                             |
| CNLM-7819    | L-Arginine·HCl (1- <sup>13</sup> C, 99%; α- <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-11110   | L-Arginine·HCl (1,2,3,4,5- <sup>13</sup> C <sub>5</sub> , 99%; α,ε- <sup>15</sup> N <sub>2</sub> , 98%)  | Please inquire                    |
| CNLM-539-H   | L-Arginine·HCl ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%)   | 0.05 g, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DNLM-7543    | L-Arginine·HCl (D <sub>7</sub> , 98%; <sup>15</sup> N <sub>4</sub> , 98%)  | 0.25 g                            |
| CDNLM-6801   | L-Arginine·HCl ( <sup>13</sup> C <sub>6</sub> , 97%; D <sub>7</sub> , 97%; <sup>15</sup> N <sub>4</sub> , 97%)   | 0.25 g                            |
| ULM-8347     | L-Arginine·HCl (unlabeled)   | 0.05 g, 0.1 g                     |
| CNLM-9007-CA | L-Argininosuccinic acid (ASA), barium salt·xH <sub>2</sub> O (arginine- <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%) CP 90% | 0.1 mg, 0.5 mg                    |
| ULM-9008-CA  | L-Argininosuccinic acid (ASA), barium salt·xH <sub>2</sub> O (unlabeled) CP 90%  | 0.1 mg                            |
| CLM-8699-H   | L-Asparagine·H <sub>2</sub> O ( <sup>13</sup> C <sub>4</sub> , 99%)  | 0.05 g                            |
| DLM-6844     | L-Asparagine·H <sub>2</sub> O (2,3,3-D <sub>3</sub> , 94%)   | 0.1 g                             |
| NLM-120      | L-Asparagine·H <sub>2</sub> O (amide- <sup>15</sup> N, 98%)  | 0.25 g, 0.5 g                     |
| NLM-3286     | L-Asparagine·H <sub>2</sub> O ( <sup>15</sup> N <sub>2</sub> , 98%)  | 0.25 g, 0.5 g                     |
| CNLM-7818    | L-Asparagine·H <sub>2</sub> O (1,4- <sup>13</sup> C <sub>2</sub> , 99%; α- <sup>15</sup> N, 98%)   | 0.25 g                            |
| CNLM-3819-H  | L-Asparagine·H <sub>2</sub> O ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)  | 0.1 g, 0.25 g, 0.5 g              |
| DNLM-6932    | L-Asparagine·H <sub>2</sub> O (2,3,3-D <sub>3</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 98%)   | 0.25 g                            |
| CDNLM-6802   | L-Asparagine·H <sub>2</sub> O ( <sup>13</sup> C <sub>4</sub> , 97%; D <sub>3</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%)                          | 0.25 g                            |
| CLM-865      | DL-Aspartic acid (3- <sup>13</sup> C, 99%)   | Please inquire                    |
| CLM-518      | DL-Aspartic acid (4- <sup>13</sup> C, 99%)   | 0.25 g, 0.5 g, 1 g                |
| DLM-832      | DL-Aspartic acid (2,3,3-D <sub>3</sub> , 98%)  | 1 g                               |
| DLM-8599     | DL-Aspartic acid, N-acetyl (aspartate-2,3,3-D <sub>3</sub> , 97%)  | Please inquire                    |
| CLM-3616     | L-Aspartic acid (1- <sup>13</sup> C, 99%)  | Please inquire                    |
| CLM-3617     | L-Aspartic acid (2- <sup>13</sup> C, 99%)  | Please inquire                    |
| CLM-627      | L-Aspartic acid (3- <sup>13</sup> C, 98%)  | 0.05 g, 0.1 g, 0.25 g             |
| CLM-519      | L-Aspartic acid (4- <sup>13</sup> C, 99%)  | Please inquire                    |
| CLM-4455     | L-Aspartic acid (1,4- <sup>13</sup> C <sub>2</sub> , 99%)  | 0.5 g                             |
| CLM-1801-H   | L-Aspartic acid ( <sup>13</sup> C <sub>4</sub> , 99%)  | 0.1 mg, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DLM-546      | L-Aspartic acid (2,3,3-D <sub>3</sub> , 98%)   | 0.1 g, 0.25 g                     |
| NLM-718      | L-Aspartic acid ( <sup>15</sup> N, 98%)  | 0.5 g, 1 g                        |
| CNLM-7817    | L-Aspartic acid (1,4- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)  | 0.25 g                            |
| CNLM-544-H   | L-Aspartic acid ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N, 99%)  | 0.25 g, 0.5 g, 1 g                |
| DNLM-6931    | L-Aspartic acid (2,3,3-D <sub>3</sub> , 98%; <sup>15</sup> N, 98%)   | 0.25 g, 0.5 g                     |
| CDNLM-6803   | L-Aspartic acid ( <sup>13</sup> C <sub>4</sub> , 97%; D <sub>3</sub> , 97%; <sup>15</sup> N, 97%)  | 0.25 g                            |

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## Free Amino Acids and Their Derivatives (continued)

| Catalog No. | Description  | Unit Size      |
|-------------|--|----------------|
| ULM-8676    | L-Aspartic acid (unlabeled)  | 0.1 mg, 0.1 g  |
| CNLM-9461   | L-Azidohomoalanine-HCl (1,2,3,4- <sup>13</sup> C <sub>4</sub> ; 2,4- <sup>15</sup> N <sub>2</sub> , 98%)         | 0.05 g, 0.1 g  |
| ULM-9460    | L-Azidohomoalanine-HCl (unlabeled)   | 0.05 g, 0.1 g  |
| CLM-9097    | 3-Bromo-L-tyrosine (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 0.01 g         |
| CLM-6574    | 1,4-Butanediamine (putrescine) ( <sup>13</sup> C <sub>4</sub> , 98%)   | 0.1 g          |
| DLM-6573    | 1,4-Butanediamine (putrescine) (1,1,2,2,3,3,4,4-D <sub>8</sub> , 98%)  | 0.1 g          |
| CLM-7103    | 3-Chloro-L-tyrosine (ring- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%  | 0.01 g         |
| CNLM-10625  | 3-Chlorotyrosine-HCl ( <sup>13</sup> C <sub>9</sub> , 98%; <sup>15</sup> N, 98%) CP 95%                          | 1 mg           |
| CLM-4899    | L-Citrulline (ureido- <sup>13</sup> C, 99%)  | 0.1 g          |
| CLM-8653    | L-Citrulline (1,2,3,4,5- <sup>13</sup> C <sub>5</sub> , 98%)   | Please inquire |
| DLM-3860    | L-Citrulline (5,5-D <sub>2</sub> , 98%)  | Please inquire |
| DLM-6039    | L-Citrulline (4,4,5,5-D <sub>4</sub> , 95%)  | 0.01 g, 5 mg   |
| DLM-10776   | L-Citrulline (2,3,3,4,4,5,5-D <sub>7</sub> , 98%)  | Please inquire |
| NLM-6850    | L-Citrulline (ureido- <sup>15</sup> N, 98%)  | Please inquire |
| CDLM-7879   | L-Citrulline (ureido- <sup>13</sup> C, 99%; 5,5-D <sub>2</sub> , 98%)  | Please inquire |
| CDLM-8808   | L-Citrulline (ureido- <sup>13</sup> C, 99%; 3,3,4-D <sub>3</sub> , 98%)  | Please inquire |
| CDLM-7139   | L-Citrulline (5- <sup>13</sup> C, 99%; 4,4,5,5-D <sub>4</sub> , 95%)   | Please inquire |
| DLM-3653    | Creatinine (N-methyl-D <sub>3</sub> , 98%)   | 0.1 mg, 0.1 g  |
| ULM-10966   | Creatinine (unlabeled)   | 0.1 mg         |
| CDLM-4211   | Cycloleucine (carboxyl- <sup>13</sup> C, 99%; 2,2,5,5-D <sub>4</sub> , 96%)                                      | 0.25 g         |
| DLM-6108    | DL-Cystathionine (3,3,4,4-D <sub>4</sub> , 98%)  | 0.01 g, 0.05 g |
| CLM-3790    | DL-Cysteine (1- <sup>13</sup> C, 99%)  | Please inquire |
| DLM-899     | DL-Cysteine (3,3-D <sub>2</sub> , 98%)   | 0.5 g          |
| CLM-404     | DL-Cysteine, S-benzyl (1- <sup>13</sup> C, 99%)  | 0.25 g         |
| CLM-3852    | L-Cysteine (1- <sup>13</sup> C, 99%)   | 0.5 g          |
| CLM-1868    | L-Cysteine (3- <sup>13</sup> C, 99%)   | 0.25 g         |
| CLM-4320-H  | L-Cysteine ( <sup>13</sup> C <sub>3</sub> , 99%)   | 0.1 g          |
| DLM-769     | L-Cysteine (3,3-D <sub>2</sub> , 98%)  | 0.1 g          |
| DLM-6901    | L-Cysteine (2,3,3-D <sub>3</sub> , 98%)  | 0.1 g          |
| NLM-2295    | L-Cysteine ( <sup>15</sup> N, 98%)   | 0.25 g         |
| CNLM-7815   | L-Cysteine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | Please inquire |
| CNLM-3871-H | L-Cysteine ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 99%)   | 0.1 g, 0.25 g  |
| CSLM-11349  | L-Cystine ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>34</sup> S <sub>2</sub> , 99%)                              | Please inquire |
| DNLM-6902   | L-Cysteine (2,3,3-D <sub>3</sub> , 98%; <sup>15</sup> N, 98%)  | 0.25 g         |
| CDNLM-6809  | L-Cysteine ( <sup>13</sup> C <sub>3</sub> , 97%; D <sub>3</sub> , 97%; <sup>15</sup> N, 97%)                     | 0.25 g         |
| CNLM-7579   | L-Cysteine, N-acetyl (cysteine- <sup>13</sup> C <sub>3</sub> , 97%; <sup>15</sup> N, 97%) CP 95%                 | Please inquire |
| CLM-2182    | L-Cysteine, S-benzyl (3- <sup>13</sup> C, 99%)   | 0.1 g          |
| DLM-2942    | L-Cysteine, S-methyl (S-methyl-D <sub>3</sub> , 98%) CP 97%  | 0.25 g         |
| NLM-3914    | L-Cysteine, S-P-mebz ( <sup>15</sup> N, 98%)   | 0.1 g          |
| DLM-1000    | DL-Cystine (3,3,3',3'-D <sub>4</sub> , 98%)  | 1 g            |
| NLM-1668    | DL-Cystine ( <sup>15</sup> N <sub>2</sub> , 95%) CP 97%  | Please inquire |
| CLM-520     | L-Cystine (3,3'- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.25 g         |
| DLM-9812    | L-Cystine (3,3,3',3'-D <sub>4</sub> , 98%)   | 0.5 g          |
| NLM-3818    | L-Cystine ( <sup>15</sup> N <sub>2</sub> , 98%)  | 0.25 g         |
| CNLM-4244-H | L-Cystine ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)                              | Please inquire |
| CDNLM-8659  | L-Cystine ( <sup>13</sup> C <sub>6</sub> , 98%; D <sub>6</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 98%) CP 95% | Please inquire |
| CLM-7401    | L-Dihydroxyphenylalanine (DOPA) (1- <sup>13</sup> C, 99%)  | 0.1 g          |
| CLM-1007    | L-Dihydroxyphenylalanine (DOPA) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                                       | 0.1 g          |
| CLM-7824    | L-Dihydroxyphenylalanine (DOPA) (1- <sup>13</sup> C, ring- <sup>13</sup> C <sub>6</sub> , 99%)                   | 0.05 g         |
| DLM-2084    | L-Dihydroxyphenylalanine (DOPA) (ring-D <sub>3</sub> , 98%)  | 0.25 g, 1 g    |
| DLM-8516    | N,N-Dimethylglycine-HCl (D <sub>6</sub> , 99%)   | Please inquire |
| CLM-7254    | O,O'-Dityrosine (ring- <sup>13</sup> C <sub>12</sub> , 99%)  | 0.1 mg         |

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| Catalog No. | Description   | Unit Size                                 |
|-------------|---|---|
| CDLM-11657  | 4-Fluoro-L-phenylalanine-HCl (ring-4- <sup>13</sup> C, 98%; 3,5-D <sub>2</sub> , 98%) CP 95%                | 50 mg                                     |
| CNLM-10516  | D-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 98%)                                 | Please inquire                            |
| CLM-3632    | DL-Glutamic acid (3- <sup>13</sup> C, 99%)  | Please inquire                            |
| DLM-335     | DL-Glutamic acid (2,4,4-D <sub>3</sub> , 98%)   | 1 g                                       |
| DLM-357     | DL-Glutamic acid (2,3,3,4,4-D <sub>5</sub> , 97%)   | 0.25 g                                    |
| CLM-3721    | DL-Glutamic acid·H <sub>2</sub> O (1- <sup>13</sup> C, 99%)   | 1 g                                       |
| CLM-674     | L-Glutamic acid (1- <sup>13</sup> C, 99%)   | 1 g                                       |
| CLM-2474    | L-Glutamic acid (2- <sup>13</sup> C, 99%)   | Please inquire                            |
| CLM-4742    | L-Glutamic acid (3- <sup>13</sup> C, 99%)   | Please inquire                            |
| CLM-2431    | L-Glutamic acid (4- <sup>13</sup> C, 98%)   | Please inquire                            |
| CLM-613     | L-Glutamic acid (5- <sup>13</sup> C, 99%)   | 0.1 g                                     |
| CLM-2024    | L-Glutamic acid (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.25 g                                    |
| CLM-3646    | L-Glutamic acid (3,4- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.25 g                                    |
| CLM-1800-H  | L-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 99%)   | 0.1 mg, 0.25 g, 0.5 g, 1 g                |
| DLM-3725    | L-Glutamic acid (2,4,4-D <sub>3</sub> , 97%)  | 0.5 g                                     |
| DLM-556     | L-Glutamic acid (2,3,3,4,4-D <sub>5</sub> , 97%)  | 0.05 g, 0.1 g                             |
| NLM-135     | L-Glutamic acid ( <sup>15</sup> N, 98%)   | 0.5 g, 1 g                                |
| CNLM-7812   | L-Glutamic acid (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.25 g                                    |
| CNLM-554-H  | L-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 99%)                                 | 0.25 g, 0.5 g, 1 g                        |
| DNLM-6996   | L-Glutamic acid (2,3,3,4,4-D <sub>5</sub> , 98%; <sup>15</sup> N, 98%)                                      | 0.25 g, 0.5 g                             |
| CDNLM-6804  | L-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 97%; D <sub>5</sub> , 97%; <sup>15</sup> N, 97%)           | 0.25 g                                    |
| ULM-8675    | L-Glutamic acid (unlabeled)   | 0.1 mg                                    |
| CLM-6664    | L-Glutamic acid, N-acetyl (glutamate- <sup>13</sup> C <sub>5</sub> , 97%)                                   | Please inquire                            |
| OLM-8028    | L-Glutamic acid-HCl ( <sup>17</sup> O <sub>4</sub> , ~30%)  | Please inquire                            |
| CLM-3612    | L-Glutamine (1- <sup>13</sup> C, 99%)   | 1 g                                       |
| CLM-3613    | L-Glutamine (2- <sup>13</sup> C, 99%)   | Please inquire                            |
| CLM-770     | L-Glutamine (4- <sup>13</sup> C, 99%)   | Please inquire                            |
| CLM-1166    | L-Glutamine (5- <sup>13</sup> C, 99%)   | 0.25 g                                    |
| CLM-2001    | L-Glutamine (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.1 g                                     |
| CLM-3641    | L-Glutamine (3,4- <sup>13</sup> C <sub>2</sub> , 99%)   | Please inquire                            |
| CLM-1822-H  | L-Glutamine ( <sup>13</sup> C <sub>5</sub> , 99%)   | 0.1 mg, 0.01 g, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DLM-1826    | L-Glutamine (2,3,3,4,4-D <sub>5</sub> , 97%)  | 0.1 g                                     |
| NLM-1016    | L-Glutamine (α- <sup>15</sup> N, 98%)   | 0.1 g, 1 g                                |
| NLM-557     | L-Glutamine (amide- <sup>15</sup> N, 98%)   | 0.5 g, 1 g                                |
| NLM-1328    | L-Glutamine ( <sup>15</sup> N <sub>2</sub> , 98%)   | 0.25 g                                    |
| CNLM-7813   | L-Glutamine (1- <sup>13</sup> C, 99%; α- <sup>15</sup> N, 98%)  | Please inquire                            |
| CNLM-1275-H | L-Glutamine ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)                       | 0.1 g, 0.25 g, 0.5 g                      |
| DNLM-6997   | L-Glutamine (2,3,3,4,4-D <sub>5</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%)                            | 0.25 g                                    |
| CDNLM-6805  | L-Glutamine ( <sup>13</sup> C <sub>5</sub> , 97%; D <sub>5</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%) | 0.25 g                                    |
| CLM-422     | Glycine (1- <sup>13</sup> C, 99%)   | 1 g, 5 g                                  |
| CLM-136     | Glycine (2- <sup>13</sup> C, 99%)   | 0.5 g, 1 g, 5 g                           |
| CLM-1017    | Glycine ( <sup>13</sup> C <sub>2</sub> , 97%)   | 0.5 g, 1 g, 5 g                           |
| DLM-1674    | Glycine (2,2-D <sub>2</sub> , 98%)  | 5 g                                       |
| DLM-280     | Glycine (D <sub>5</sub> , 98%)  | 5 g                                       |
| DLM-280-80  | Glycine (D <sub>5</sub> , 80%)  | 5 g                                       |
| NLM-202     | Glycine ( <sup>15</sup> N, 98%)   | 1 g, 5 g                                  |
| CNLM-507    | Glycine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 1 g                                       |
| CNLM-508    | Glycine (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.5 g, 1 g                                |
| CNLM-1673-H | Glycine ( <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 99%)   | 0.25 g, 0.5 g, 1 g                        |
| DNLM-6862   | Glycine (2,2-D <sub>2</sub> , 98%; <sup>15</sup> N, 98%)  | 0.25 g, 0.5 g                             |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Free Amino Acids and Their Derivatives (continued)

| Catalog No. | Description   | Unit Size             |
|-------------|---|-----------------------|
| CDNLM-6799  | Glycine ( $^{13}\text{C}_2$ , 97%; 2,2- $\text{D}_2$ , 97%; $^{15}\text{N}$ , 97%)                              | 0.25 g                |
| CLM-3777    | Glycine, <i>N</i> -acetyl (2- $^{13}\text{C}$ , 99%)  | 1 g                   |
| CLM-10468   | Glycine, <i>N</i> -benzoyl (hippuric acid) (ring- $^{13}\text{C}_6$ , 99%)                                      | 0.01 g                |
| DLM-7703    | Glycine, <i>N</i> -benzoyl (hippuric acid) (benzoyl- $\text{D}_5$ , 98%)  | 0.1 g, 0.25 g         |
| NLM-2377    | Glycine, <i>N</i> -benzoyl (hippuric acid) ( $^{15}\text{N}$ , 98%)   | 0.1 g                 |
| DLM-7248    | Glycine, <i>N</i> -hexanoyl (2,2- $\text{D}_2$ , 98%)   | Please inquire        |
| CNLM-844    | Glycine, <i>N</i> -hexanoyl ( $^{13}\text{C}_2$ , 97%; $^{15}\text{N}$ , 97%) CP 95%                            | Please inquire        |
| DLM-10483   | Glycine, <i>N</i> -isovaleryl (isovaleryl- $\text{D}_9$ , 98%)  | Please inquire        |
| CNLM-9291   | Glycine, <i>N</i> -isovaleryl (glycine- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 99%)                         | Please inquire        |
| DLM-10822   | Glycine, <i>N</i> -octanoyl (2,2- $\text{D}_2$ , 98%)   | Please inquire        |
| DLM-9677    | Glycine, <i>N</i> -propionyl (2,2- $\text{D}_2$ , 98%)  | Please inquire        |
| CNLM-9292   | Glycine, <i>N</i> -propionyl (glycine- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 99%)                          | Please inquire        |
| CNLM-7175   | Glycine-HCl, ethyl ester ( $^{13}\text{C}_2$ , 98%; $^{15}\text{N}$ , 98%)                                      | Please inquire        |
| DLM-9998    | Guanidinoacetic acid (2,2- $\text{D}_2$ , 97%)  | Please inquire        |
| CNLM-8300   | Guanidinoacetic acid (1,2- $^{13}\text{C}_2$ , 97%; 3- $^{15}\text{N}$ , 97%) CP 97%                            | 0.1 mg                |
| CLM-2636    | DL-Histidine (ring-2- $^{13}\text{C}$ , 99%)  | Please inquire        |
| NLM-10595   | DL-Histidine ( $\alpha$ - $^{15}\text{N}$ , 98%)  | Please inquire        |
| NLM-4649    | L-Histidine (ring- $\epsilon$ - $^{15}\text{N}$ , 98%) <5% D  | Please inquire        |
| NLM-4457    | L-Histidine (ring- $\pi$ - $^{15}\text{N}$ , 98%) <5% D   | Please inquire        |
| NLM-9585    | L-Histidine (ring- $^{15}\text{N}_2$ , 98%)   | Please inquire        |
| CLM-1512    | L-Histidine-HCl-H <sub>2</sub> O (ring-2- $^{13}\text{C}$ , 99%)  | 0.1 g                 |
| CLM-2264    | L-Histidine-HCl-H <sub>2</sub> O ( $^{13}\text{C}_6$ , 97%) <5% D   | 0.05 g, 0.1 g, 0.25 g |
| DLM-7855    | L-Histidine-HCl-H <sub>2</sub> O (ring-2,4- $\text{D}_2$ ; $\alpha$ , $\beta$ , $\text{D}_3$ , 98%)             | 0.25 g                |
| NLM-2245    | L-Histidine-HCl-H <sub>2</sub> O ( $\alpha$ - $^{15}\text{N}$ , 98%)  | 0.25 g                |
| NLM-846     | L-Histidine-HCl-H <sub>2</sub> O (ring- $\pi$ - $^{15}\text{N}$ , 98%) <5% D                                    | Please inquire        |
| NLM-1513    | L-Histidine-HCl-H <sub>2</sub> O ( $^{15}\text{N}_3$ , 98%) <5% D   | 0.25 g                |
| CNLM-758    | L-Histidine-HCl-H <sub>2</sub> O ( $^{13}\text{C}_6$ , 97%; $^{15}\text{N}_3$ , 97%) <5% D                      | 0.05 g, 0.1 g, 0.25 g |
| DNLM-7366   | L-Histidine-HCl-H <sub>2</sub> O ( $\text{D}_5$ , 98%; $^{15}\text{N}_3$ , 98%)                                 | 0.25 g                |
| CDNLM-6806  | L-Histidine-HCl-H <sub>2</sub> O ( $^{13}\text{C}_6$ , 97%; $\text{D}_5$ , 97%; $^{15}\text{N}_3$ , 97%) CP 95% | 0.25 g                |
| CNLM-4645   | L-Homoarginine-HCl ( $^{13}\text{C}_7$ , 98%; $^{15}\text{N}_4$ , 98%)  | 10 mg                 |
| DLM-11621   | Homocitrulline (2,6,6- $\text{D}_3$ , 98%)  | 1 mg                  |
| DLM-8259    | DL-Homocysteine (3,3,4,4- $\text{D}_4$ , 98%)   | 0.1 g                 |
| DLM-3619    | DL-Homocystine (3,3,3',3',4,4,4',4'- $\text{D}_8$ , 98%)  | 0.1 g, 0.5 g, 1 g     |
| NLM-2466    | L-Homoserine ( $^{15}\text{N}$ , 95%) CP 97%  | 0.5 g                 |
| DLM-9778    | <i>trans</i> -4-Hydroxy-L-proline (4-Hyp) (2,5,5- $\text{D}_3$ , 98%) CP 97%                                    | Please inquire        |
| DLM-10579   | <i>trans</i> -4-Hydroxy-L-proline (4-Hyp) (3,3,4,5,6- $\text{D}_5$ , 96%) contains up to 5% <i>cis</i>          | Please inquire        |
| CLM-10524   | 3-Iodo-L-tyrosine ( $^{13}\text{C}_6$ , 99%)  | 0.01 g                |
| CLM-1026    | L-Isoleucine (1- $^{13}\text{C}$ , 99%)   | 0.5 g, 1 g            |
| CLM-2248-H  | L-Isoleucine ( $^{13}\text{C}_6$ , 99%)   | 0.05 g, 0.1 g, 0.25 g |
| DLM-141     | L-Isoleucine ( $\text{D}_{10}$ , 98%)   | 0.1 g, 0.25 g         |
| NLM-292     | L-Isoleucine ( $^{15}\text{N}$ , 98%)   | 0.25 g, 1 g           |
| CNLM-7810   | L-Isoleucine (1- $^{13}\text{C}$ , 99%; $^{15}\text{N}$ , 98%)  | Please inquire        |
| CNLM-561-H  | L-Isoleucine ( $^{13}\text{C}_6$ , 99%; $^{15}\text{N}$ , 99%)  | 0.05 g, 0.1 g, 0.25 g |
| DNLM-7325   | L-Isoleucine ( $\text{D}_{10}$ , 98%; $^{15}\text{N}$ , 98%)  | 0.25 g                |
| CDNLM-6807  | L-Isoleucine ( $^{13}\text{C}_6$ , 97%; $\text{D}_{10}$ , 97%; $^{15}\text{N}$ , 97%)                           | 0.25 g                |
| CLM-8742    | L-allo-Isoleucine ( $^{13}\text{C}_6$ , 97%)  | Please inquire        |
| DLM-1505    | L-allo-Isoleucine ( $\text{D}_{10}$ , 98%)  | 0.1 g                 |
| CNLM-8670   | L-allo-Isoleucine ( $^{13}\text{C}_6$ , 97%; $^{15}\text{N}$ , 97%)   | Please inquire        |
| CDNLM-8911  | L-allo-Isoleucine ( $^{13}\text{C}_6$ , 97%; $\text{D}_{10}$ , 97%; $^{15}\text{N}$ , 97%)                      | Please inquire        |
| DLM-7374    | Kynurenic acid (ring- $\text{D}_5$ , 98%)   | Please inquire        |
| DLM-7842    | L-Kynurenine sulfate (ring- $\text{D}_4$ , 3,3- $\text{D}_2$ , 97%) CP 95%                                      | 5 mg, 10 mg           |
| CLM-9884    | L-Kynurenine sulfate- $\frac{1}{2}\text{H}_2\text{O}$ ( $^{13}\text{C}_{10}$ , 99%)                             | 0.1 mg                |
| CLM-204     | DL-Leucine (1- $^{13}\text{C}$ , 99%)   | 1 g                   |

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| Catalog No. | Description   | Unit Size                         |
|-------------|---|-----------------------------------|
| CLM-207     | DL-Leucine (2- <sup>13</sup> C, 99%)  | Please inquire                    |
| DLM-9423    | DL-Leucine (D <sub>10</sub> , 98%)  | 0.25 g                            |
| NLM-355     | DL-Leucine ( <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-8679   | DL-Leucine (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)  | Please inquire                    |
| CLM-468     | L-Leucine (1- <sup>13</sup> C, 99%)   | 1 g, 5 g                          |
| CLM-2014    | L-Leucine (2- <sup>13</sup> C, 99%)   | 0.5 g, 1 g                        |
| CLM-3524    | L-Leucine (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.25 g                            |
| CLM-2262-H  | L-Leucine ( <sup>13</sup> C <sub>6</sub> , 99%)   | 0.05 g, 0.1 g, 0.25 g             |
| DLM-1259    | L-Leucine (5,5,5-D <sub>3</sub> , 99%)  | 1 g, 5 g                          |
| DLM-4212    | L-Leucine (isopropyl-D <sub>7</sub> , 98%)  | 1 g                               |
| DLM-567     | L-Leucine (D <sub>10</sub> , 98%)   | 0.25 g                            |
| NLM-142     | L-Leucine ( <sup>15</sup> N, 98%)   | 0.5 g, 1 g                        |
| OLM-2041    | L-Leucine ( <sup>18</sup> O <sub>2</sub> , 94%)   | 0.25 g                            |
| CNLM-615    | L-Leucine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 1 g                               |
| CNLM-615-95 | L-Leucine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 93%)   | 1 g                               |
| CNLM-3450   | L-Leucine (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.5 g                             |
| CNLM-281-H  | L-Leucine ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N, 99%)   | 0.05 g, 0.1 g, 0.25 g             |
| DNLM-4642   | L-Leucine (D <sub>10</sub> , 98%; <sup>15</sup> N, 97%)   | 0.25 g, 0.5 g                     |
| CDNLM-6808  | L-Leucine ( <sup>13</sup> C <sub>6</sub> , 97%; D <sub>10</sub> , 97%; <sup>15</sup> N, 97%)                  | 0.25 g                            |
| ULM-8203    | L-Leucine (unlabeled)   | Please inquire                    |
| DLM-476     | L-Leucine, N-acetyl (D <sub>10</sub> , 98%)   | Please inquire                    |
| CLM-10684   | L-Leucine-HCl (1- <sup>13</sup> C, 99%)   | Please inquire                    |
| CLM-749     | DL-Lysine·2HCl (1- <sup>13</sup> C, 99%)  | Please inquire                    |
| DLM-8941    | DL-Lysine·2HCl (4,4,5,5-D <sub>4</sub> , 96%)   | Please inquire                    |
| NLM-1031    | DL-Lysine·2HCl (ε- <sup>15</sup> N, 98%)  | 0.1 g                             |
| CNLM-3452   | DL-Lysine·2HCl (1- <sup>13</sup> C, 99%; ε- <sup>15</sup> N, 99%)   | Please inquire                    |
| CNLM-3453   | DL-Lysine·2HCl (2- <sup>13</sup> C, 99%; ε- <sup>15</sup> N, 99%) CP 95%                                      | 0.1 g                             |
| NLM-1683    | DL-Lysine·HCl·H <sub>2</sub> O (α- <sup>15</sup> N, 99%)  | Please inquire                    |
| CLM-653     | L-Lysine·2HCl (1- <sup>13</sup> C, 99%)   | 0.25 g, 0.5 g                     |
| CLM-632     | L-Lysine·2HCl (6- <sup>13</sup> C, 99%)   | 0.25 g                            |
| CLM-2247-H  | L-Lysine·2HCl ( <sup>13</sup> C <sub>6</sub> , 99%)   | 0.05 g, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DLM-2640    | L-Lysine·2HCl (4,4,5,5-D <sub>4</sub> , 96%)  | 0.1 g, 0.25 g, 0.5 g, 1 g         |
| DLM-2641    | L-Lysine·2HCl (3,3,4,4,5,5,6,6-D <sub>8</sub> , 98%)  | 0.25 g                            |
| DLM-570     | L-Lysine·2HCl (D <sub>9</sub> , 98%)  | 0.1 g                             |
| NLM-143     | L-Lysine·2HCl (α- <sup>15</sup> N, 98%)   | 0.25 g, 1 g                       |
| NLM-631     | L-Lysine·2HCl (ε- <sup>15</sup> N, 98%)   | 0.5 g                             |
| NLM-1554    | L-Lysine·2HCl ( <sup>15</sup> N <sub>2</sub> , 98%)   | 0.1 g                             |
| CNLM-7821   | L-Lysine·2HCl (1- <sup>13</sup> C, 99%; ε- <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-3454   | L-Lysine·2HCl (6- <sup>13</sup> C, 99%; ε- <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-291-H  | L-Lysine·2HCl ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)                       | 0.05 g, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DNLM-7545   | L-Lysine·2HCl (D <sub>9</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 98%)                                      | 0.25 g                            |
| CDNLM-6810  | L-Lysine·2HCl ( <sup>13</sup> C <sub>6</sub> , 97%; D <sub>9</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%) | 0.25 g                            |
| ULM-8766    | L-Lysine·2HCl (unlabeled)   | 0.1 mg, 0.05 g, 0.1 g             |
| DLM-4731    | L-Lysine, N-ε-carboxymethyl (4,4,5,5-D <sub>4</sub> , 96%)  | Please inquire                    |
| CLM-7356    | D-Methionine (1- <sup>13</sup> C, 99%) CP 96%   | Please inquire                    |
| CLM-6191    | DL-Methionine (1- <sup>13</sup> C, 99%)   | Please inquire                    |
| DLM-10774   | DL-Methionine (S-methyl-D <sub>3</sub> , 98%)   | Please inquire                    |
| DLM-2933    | DL-Methionine (3,3,4,4-D <sub>4</sub> , 98%)  | Please inquire                    |
| CDNLM-8026  | DL-Methionine ( <sup>13</sup> C <sub>5</sub> , 97%; D <sub>8</sub> , 97%; <sup>15</sup> N, 97%)               | Please inquire                    |
| CLM-206     | L-Methionine (methyl- <sup>13</sup> C, 99%)   | 1 g, 5 g, 10 g                    |
| CLM-3267    | L-Methionine (1- <sup>13</sup> C, 99%)  | 0.25 g, 1 g                       |

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## Free Amino Acids and Their Derivatives (continued)

| Catalog No. | Description  | Unit Size             |
|-------------|--|-----------------------|
| CLM-893-H   | L-Methionine ( $^{13}\text{C}_5$ , 99%)  | 0.05 g, 0.1 g, 0.25 g |
| DLM-431     | L-Methionine (methyl- $\text{D}_3$ , 98%)  | 1 g, 5 g              |
| DLM-6797    | L-Methionine (2,3,3,4,4- $\text{D}_5$ ; methyl- $\text{D}_3$ , 98%)  | 0.1 g                 |
| NLM-752     | L-Methionine ( $^{15}\text{N}$ , 96%)  | 0.5 g, 1 g            |
| CDLM-9289   | L-Methionine (methyl- $^{13}\text{C}$ , 99%; methyl- $\text{D}_3$ , 98%)   | 0.25 g, 1 g           |
| CDLM-760    | L-Methionine (1- $^{13}\text{C}$ , 99%; methyl- $\text{D}_3$ , 98%)  | Please inquire        |
| CDLM-8885   | L-Methionine (methyl- $^{13}\text{CH}_3$ , 99%; 2,3,3,4,4- $\text{D}_5$ , 98%)   | 0.5 g, 1 g            |
| CNLM-7807   | L-Methionine (1- $^{13}\text{C}$ , 99%; $^{15}\text{N}$ , 98%)   | 0.25 g                |
| CNLM-9774   | L-Methionine (1,2,3,4- $^{13}\text{C}_4$ , 99%; $^{15}\text{N}$ , 98%)   | Please inquire        |
| CNLM-759-H  | L-Methionine ( $^{13}\text{C}_5$ , 99%; $^{15}\text{N}$ , 99%)   | 0.05 g, 0.1 g, 0.25 g |
| DNLM-7179   | L-Methionine ( $\text{D}_8$ , 98%; $^{15}\text{N}$ , 98%)  | 0.25 g                |
| CDNLM-6798  | L-Methionine ( $^{13}\text{C}_5$ , 97%; $\text{D}_8$ , 97%; $^{15}\text{N}$ , 97%)   | Please inquire        |
| CLM-8002    | L-Methionine sulfone (1- $^{13}\text{C}$ , 99%)  | Please inquire        |
| CNLM-10424  | $\beta$ -N-Methylamino-L-alanine (BMAA) ( $^{13}\text{C}_3$ , 99%; $^{15}\text{N}_2$ , 98%) Patent No.: US 11,370,812 B2             | 0.01 g, 1.2 mL        |
| ULM-10493   | $\beta$ -N-Methylamino-L-alanine (BMAA)-HCl (unlabeled) CP 97%   | Please inquire        |
| DLM-10673   | 3-Methylcrotonylglycine (glycine-2,2- $\text{D}_2$ , 98%)  | Please inquire        |
| CNLM-8111   | 3-Methylcrotonylglycine (glycine- $^{13}\text{C}_2$ , 98%; $^{15}\text{N}$ , 98%)  | Please inquire        |
| DLM-11341   | L-3-O-Methyl-dopa- $\text{H}_2\text{O}$ (3-OMD) (methoxy- $\text{D}_3$ , 98%)  | Please inquire        |
| DLM-8691    | $\pi$ -Methyl-L-histidine (methyl- $\text{D}_3$ , 98%)   | 0.05 g                |
| DLM-2949    | $\tau$ -Methyl-L-histidine (methyl- $\text{D}_3$ , 98%)  | 0.25 g                |
| CLM-11828   | 3-(3-Methyl-1H-pyrazol-5-yl)propanoic acid (MPP) ( $^{13}\text{C}_3$ , 98%) CP 95%   | 1 mg                  |
| CLM-7944    | 3-(3-Methyl-1H-pyrazol-5-yl)propanoic acid (MPP) (methyl- $^{13}\text{C}$ , pyrazolyl- $^{13}\text{C}_3$ , 3- $^{13}\text{C}$ , 99%) | 0.1 mg                |
| CLM-7104    | 3-Nitro-L-tyrosine (ring- $^{13}\text{C}_6$ , 99%) CP 94%  | 0.01 g                |
| CLM-9607    | DL-Ornithine-HCl (1- $^{13}\text{C}$ , 99%)  | Please inquire        |
| CLM-1036    | L-Ornithine-HCl (1,2- $^{13}\text{C}_2$ , 99%)   | 0.1 g                 |
| CLM-4724-H  | L-Ornithine-HCl ( $^{13}\text{C}_5$ , 99%)   | 0.1 g                 |
| DLM-4261    | L-Ornithine-HCl (5,5- $\text{D}_2$ , 98%)  | 0.25 g                |
| DLM-6046    | L-Ornithine-HCl (4,4,5,5- $\text{D}_4$ , 95%)  | Please inquire        |
| DLM-2969    | L-Ornithine-HCl (3,3,4,4,5,5- $\text{D}_6$ , 98%)  | 0.1 g, 0.25 g         |
| DLM-6669    | L-Ornithine-HCl ( $\text{D}_7$ , 98%)  | 0.25 g                |
| NLM-2212    | L-Ornithine-HCl ( $\alpha$ - $^{15}\text{N}$ , 98%)  | Please inquire        |
| NLM-2174    | L-Ornithine-HCl (5- $^{15}\text{N}$ , 98%)   | Please inquire        |
| NLM-3610    | L-Ornithine-HCl ( $^{15}\text{N}_2$ , 98%)   | 0.25 g                |
| CDLM-3873   | L-Ornithine-HCl (5- $^{13}\text{C}$ , 99%; 4,4,5,5- $\text{D}_4$ , 95%)  | Please inquire        |
| CNLM-7578-H | L-Ornithine-HCl ( $^{13}\text{C}_5$ , 99%; $^{15}\text{N}_2$ , 99%)  | Please inquire        |
| DNLM-7369   | L-Ornithine-HCl ( $\text{D}_7$ , 98%; $^{15}\text{N}_2$ , 98%)   | Please inquire        |
| DLM-4526    | D-Phenylalanine (ring- $\text{D}_5$ , 97%)   | Please inquire        |
| CLM-761     | DL-Phenylalanine (1- $^{13}\text{C}$ , 99%)  | Please inquire        |
| CLM-7486    | DL-Phenylalanine (ring- $^{13}\text{C}_6$ , 99%)   | Please inquire        |
| DLM-2983    | DL-Phenylalanine (2- $\text{D}$ , 98%)   | 1 g                   |
| DLM-2986    | DL-Phenylalanine (ring- $\text{D}_5$ , 98%)  | 1 g                   |
| NLM-3434    | DL-Phenylalanine ( $^{15}\text{N}$ , 98%)  | Please inquire        |
| CLM-762     | L-Phenylalanine (1- $^{13}\text{C}$ , 99%)   | 1 g                   |
| CLM-1631    | L-Phenylalanine (2- $^{13}\text{C}$ , 99%) CP 97%  | 0.05 g, 0.25 g        |
| CLM-1053    | L-Phenylalanine (3- $^{13}\text{C}$ , 99%)   | 0.1 g, 0.25 g         |
| CLM-1055    | L-Phenylalanine (ring- $^{13}\text{C}_6$ , 99%)  | 0.25 g, 1 g           |
| CLM-2250-H  | L-Phenylalanine ( $^{13}\text{C}_9$ , 99%)   | 0.25 g, 0.5 g, 1 g    |
| DLM-2984    | L-Phenylalanine (2- $\text{D}$ , 95%)  | 0.5 g                 |
| DLM-2985    | L-Phenylalanine (3,3- $\text{D}_2$ , 98%)  | 0.1 g, 0.5 g, 1 g     |
| DLM-1258    | L-Phenylalanine (ring- $\text{D}_5$ , 98%)   | 1 g, 5 g              |
| DLM-372     | L-Phenylalanine ( $\text{D}_8$ , 98%)  | 1 g                   |
| NLM-108     | L-Phenylalanine ( $^{15}\text{N}$ , 98%)   | 0.5 g, 1 g            |

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|-------------|--|-----------------------------------|
| CNLM-7611   | L-Phenylalanine (2,3- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-575-H  | L-Phenylalanine ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N, 99%)  | 0.1 mg, 0.1 g, 0.25 g, 0.5 g, 1 g |
| DNLM-7180   | L-Phenylalanine (D <sub>8</sub> , 98%; <sup>15</sup> N, 98%)   | 0.25 g, 0.5 g                     |
| CDNLM-11149 | L-Phenylalanine (4'- <sup>13</sup> C, 99%; 2,3,3,2',3',5',6'-D <sub>7</sub> , 98%; <sup>15</sup> N, 98%)               | 0.1 g                             |
| CDNLM-12287 | L-Phenylalanine (3',5'- <sup>13</sup> C <sub>2</sub> , 99%; 2,3,3,2',4',6'-D <sub>6</sub> , 98%; <sup>15</sup> N, 98%) | Please inquire                    |
| CDNLM-6811  | L-Phenylalanine ( <sup>13</sup> C <sub>9</sub> , 97%; D <sub>8</sub> , 97%; <sup>15</sup> N, 97%)                      | 0.25 g                            |
| ULM-8205    | L-Phenylalanine (unlabeled)  | 0.1 mg                            |
| DLM-9715    | 3-Phenylpropionylglycine (2,2-D <sub>2</sub> , 98%)  | Please inquire                    |
| CNLM-9983   | O-Phospho-L-serine ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 98%) CP 95%                                  | Please inquire                    |
| CNLM-9169   | Pipecolic acid (peperidine 2-carboxylic acid) ( <sup>13</sup> C <sub>6</sub> , 98%; <sup>15</sup> N, 98%)              | Please inquire                    |
| CLM-2479    | DL-Proline (1- <sup>13</sup> C, 99%)   | Please inquire                    |
| DLM-2657    | DL-Proline (2,3,3,4,4,5,5-D <sub>7</sub> , 97%)  | 0.25 g                            |
| CLM-510     | L-Proline (1- <sup>13</sup> C, 99%)  | 0.25 g                            |
| CLM-2260-H  | L-Proline ( <sup>13</sup> C <sub>5</sub> , 99%)  | 0.1 g, 0.25 g, 0.5 g              |
| DLM-10775   | L-Proline (2,5,5-D <sub>3</sub> , 98%)   | Please inquire                    |
| DLM-487     | L-Proline (D <sub>7</sub> , 97%)   | 0.1 g, 0.25 g                     |
| NLM-835     | L-Proline ( <sup>15</sup> N, 98%)  | 0.25 g, 0.5 g                     |
| CNLM-7822   | L-Proline (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-436-H  | L-Proline ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 99%)  | 0.1 g, 0.25 g, 0.5 g              |
| DNLM-7562   | L-Proline (D <sub>7</sub> , 98%; <sup>15</sup> N, 98%)   | 0.25 g                            |
| CDNLM-6812  | L-Proline ( <sup>13</sup> C <sub>5</sub> , 97%; D <sub>7</sub> , 97%; <sup>15</sup> N, 97%)                            | 0.25 g                            |
| ULM-8333    | L-Proline (unlabeled)  | 0.05 g, 0.1 g                     |
| DLM-11082   | DL-Pyroglutamic acid (3,3,4,4,5-D <sub>5</sub> , 98%)  | Please inquire                    |
| DLM-6874    | Sarcosine-HCl (N-methylglycine-HCl) (methyl-D <sub>3</sub> , 98%)  | 0.1 g, 0.25 g                     |
| CNLM-9699   | Sarcosine-HCl (N-methylglycine-HCl) ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 98%)                        | Please inquire                    |
| CLM-1075    | DL-Serine (1- <sup>13</sup> C, 99%)  | Please inquire                    |
| CLM-496     | DL-Serine (2- <sup>13</sup> C, 99%)  | Please inquire                    |
| CLM-497     | DL-Serine (3- <sup>13</sup> C, 99%)  | Please inquire                    |
| DLM-1073    | DL-Serine (2,3,3-D <sub>3</sub> , 98%)   | 1 g                               |
| NLM-1531    | DL-Serine ( <sup>15</sup> N, 98%)  | Please inquire                    |
| CNLM-4207   | DL-Serine ( <sup>13</sup> C <sub>3</sub> , 98%; <sup>15</sup> N, 98%)  | Please inquire                    |
| CLM-1573    | L-Serine (1- <sup>13</sup> C, 99%)   | 0.25 g                            |
| CLM-2013    | L-Serine (2- <sup>13</sup> C, 99%)   | 0.1 g                             |
| CLM-1572    | L-Serine (3- <sup>13</sup> C, 99%)   | 0.1 g, 0.25 g                     |
| CLM-1574-H  | L-Serine ( <sup>13</sup> C <sub>3</sub> , 99%)   | 0.1 g, 0.25 g, 0.5 g              |
| DLM-161     | L-Serine (3,3-D <sub>2</sub> , 98%)  | 0.1 g                             |
| DLM-582     | L-Serine (2,3,3-D <sub>3</sub> , 98%)  | 0.1 g, 0.5 g                      |
| NLM-2036    | L-Serine ( <sup>15</sup> N, 98%)   | 0.5 g, 1 g                        |
| OLM-9960    | L-Serine (carboxyl- <sup>18</sup> O <sub>2</sub> , 95%)  | Please inquire                    |
| CDLM-12299  | L-Serine (2- <sup>13</sup> C, 99%; 2,3,3-D <sub>3</sub> , 97%) <3% D   | Please inquire                    |
| CNLM-7814   | L-Serine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.25 g                            |
| CNLM-474-H  | L-Serine ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 99%)   | 0.1 g, 0.25 g, 0.5 g              |
| DNLM-6863   | L-Serine (2,3,3-D <sub>3</sub> , 98%; <sup>15</sup> N, 98%)  | 0.25 g                            |
| CDNLM-6813  | L-Serine ( <sup>13</sup> C <sub>3</sub> , 97%; D <sub>3</sub> , 97%; <sup>15</sup> N, 97%)                             | 0.25 g                            |
| DLM-10873   | L-Serine, N-acetyl (2,3,3,-D <sub>3</sub> , 98%)   | Please inquire                    |
| CLM-3949    | Sodium glutamate·xH <sub>2</sub> O ( <sup>13</sup> C <sub>5</sub> , 97%) may be hydrate                                | 0.25 g                            |
| DLM-9713    | N-Suberylglycine (2,2-D <sub>2</sub> , 98%) CP 97%   | Please inquire                    |
| CNLM-8183   | Suberylglycine (glycine- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N, 98%)                                     | Please inquire                    |
| DLM-8738    | S-Sulfo-DL-cysteine (2,3,3-D <sub>3</sub> , 99%)   | Please inquire                    |
| DLM-8057    | Taurine (D <sub>4</sub> , 98%) CP 95%  | 0.1 g, 0.25 g                     |
| CLM-6622    | Taurine (1,2- <sup>13</sup> C <sub>2</sub> , 98%)  | 0.25 g, 0.5 g                     |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Free Amino Acids and Their Derivatives (continued)

| Catalog No. | Description   | Unit Size            |
|-------------|---|----------------------|
| DLM-8057    | Taurine (D <sub>4</sub> , 98%) CP 95%   | 0.1 g, 0.25 g        |
| NLM-4472    | Taurine ( <sup>15</sup> N, 98%)   | Please inquire       |
| CNLM-10253  | Taurine ( <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)   | 0.01 g               |
| CLM-447     | L-Threonine (1- <sup>13</sup> C, 99%)   | 0.5 g                |
| CLM-2261    | L-Threonine ( <sup>13</sup> C <sub>4</sub> , 97%)   | 0.1 g, 0.25 g, 0.5 g |
| DLM-1693    | L-Threonine (D <sub>5</sub> , 98%)  | 0.1 g                |
| NLM-742     | L-Threonine ( <sup>15</sup> N, 98%)   | 0.25 g, 0.5 g        |
| CDLM-9307   | L-Threonine (4- <sup>13</sup> C, 97%; 2,3-D <sub>2</sub> , 96%)   | 0.1 g, 0.5 g         |
| CNLM-587    | L-Threonine ( <sup>13</sup> C <sub>4</sub> , 97%; <sup>15</sup> N, 97%)                                       | 0.1 g, 0.25 g, 0.5 g |
| DNLM-7367   | L-Threonine (D <sub>5</sub> , 97%; <sup>15</sup> N, 98%)  | 0.25 g, 0.5 g        |
| CDNLM-6814  | L-Threonine ( <sup>13</sup> C <sub>4</sub> , 97%; D <sub>5</sub> , 97%; <sup>15</sup> N, 97%)                 | 0.25 g               |
| ULM-8800    | L-Threonine (unlabeled)   | Please inquire       |
| CLM-6725    | L-Thyroxine (T4) (tyrosine-ring- <sup>13</sup> C <sub>6</sub> , 99%) CP 90%                                   | 0.1 mg               |
| CLM-8931    | L-Thyroxine (T4) (ring- <sup>13</sup> C <sub>12</sub> , 99%) CP 97%   | 0.1 mg               |
| ULM-8184    | L-Thyroxine (T4) (unlabeled)  | 0.2 mg               |
| CNLM-8110   | Tiglylglycine (glycine- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N, 98%)                             | Please inquire       |
| DLM-10522   | D-Tryptophan (indole-D <sub>5</sub> , 98%)  | Please inquire       |
| CLM-778     | L-Tryptophan (1- <sup>13</sup> C, 99%)  | 0.25 g               |
| CLM-1543    | L-Tryptophan (indole-2- <sup>13</sup> C, 98%)   | 0.25 g               |
| CLM-716     | L-Tryptophan (indole-3- <sup>13</sup> C, 95%)   | 0.25 g               |
| CLM-717     | L-Tryptophan (indole-4- <sup>13</sup> C, 99%) CP 95%  | Please inquire       |
| CLM-4290-H  | L-Tryptophan ( <sup>13</sup> C <sub>11</sub> , 99%)   | 0.1 g                |
| DLM-1092    | L-Tryptophan (indole-D <sub>5</sub> , 98%)  | 0.5 g                |
| DLM-6903    | L-Tryptophan (D <sub>8</sub> , 97%)   | 0.25 g               |
| NLM-1695    | L-Tryptophan (α- <sup>15</sup> N, 95%)  | 0.1 g                |
| NLM-1208    | L-Tryptophan (indole- <sup>15</sup> N, 98%)   | 0.25 g, 0.5 g        |
| NLM-800     | L-Tryptophan ( <sup>15</sup> N <sub>2</sub> , 98%)  | 0.25 g, 0.5 g        |
| CNLM-2475-H | L-Tryptophan ( <sup>13</sup> C <sub>11</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)                       | 0.1 g                |
| DNLM-6904   | L-Tryptophan (D <sub>8</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 98%)                                       | 0.25 g               |
| CDNLM-6816  | L-Tryptophan ( <sup>13</sup> C <sub>11</sub> , 97%; D <sub>8</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%) | 0.25 g               |
| CLM-448     | DL-Tyrosine (1- <sup>13</sup> C, 99%)   | Please inquire       |
| DLM-137     | DL-Tyrosine (3,3-D <sub>2</sub> , 98%)  | Please inquire       |
| DLM-2914    | DL-Tyrosine (ring-3,5-D <sub>2</sub> , 98%)   | Please inquire       |
| CLM-776     | L-Tyrosine (1- <sup>13</sup> C, 99%)  | 1 g                  |
| CLM-437     | L-Tyrosine (2- <sup>13</sup> C, 99%)  | Please inquire       |
| CLM-3378    | L-Tyrosine (3- <sup>13</sup> C, 99%)  | 0.1 g, 0.25 g        |
| CLM-622     | L-Tyrosine (phenol-4- <sup>13</sup> C, 95%)   | 0.25 g               |
| CLM-623     | L-Tyrosine (phenol-3,5- <sup>13</sup> C <sub>2</sub> , 95%)   | 0.25 g               |
| CLM-1542    | L-Tyrosine (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 0.25 g               |
| CLM-2263-H  | L-Tyrosine ( <sup>13</sup> C <sub>9</sub> , 99%)  | 0.1 g, 0.25 g, 0.5 g |
| DLM-2317    | L-Tyrosine (3,3-D <sub>2</sub> , 98%)   | 0.5 g, 1 g           |
| DLM-449     | L-Tyrosine (ring-3,5-D <sub>2</sub> , 98%)  | 1 g, 5 g             |
| DLM-2917    | L-Tyrosine (ring-2,6-D <sub>2</sub> , 2-D, 98%)   | Please inquire       |
| DLM-451     | L-Tyrosine (ring-D <sub>4</sub> , 98%)  | 0.5 g, 1 g           |
| DLM-589     | L-Tyrosine (D <sub>7</sub> , 98%)   | 0.05 g, 0.1 g        |
| NLM-590     | L-Tyrosine ( <sup>15</sup> N, 98%)  | 0.5 g                |
| OLM-621     | L-Tyrosine (phenol- <sup>17</sup> O, 35-40%)  | 0.25 g, 0.5 g        |
| OLM-8696    | L-Tyrosine (phenol- <sup>18</sup> O, 85%)   | Please inquire       |
| CDLM-2369   | L-Tyrosine (ring- <sup>13</sup> C <sub>6</sub> , 99%; 3,3-D <sub>2</sub> , 30%)                               | 0.1 g                |
| CNLM-7809   | L-Tyrosine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)  | 0.25 g               |
| CNLM-7610   | L-Tyrosine (2,3- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)                                    | Please inquire       |
| CNLM-439-H  | L-Tyrosine ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N, 99%)  | 0.1 g, 0.25 g, 0.5 g |

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| Catalog No. | Description  | Unit Size                  |
|-------------|--|----------------------------|
| DNLM-7373   | L-Tyrosine (D <sub>7</sub> , 97%; <sup>15</sup> N, 98%)  | 0.25 g                     |
| CDNLM-11148 | L-Tyrosine (3',5'- <sup>13</sup> C <sub>2</sub> , 99%; 2,3,3,2',6'-D <sub>5</sub> , 98%; <sup>15</sup> N, 98%) | 0.1 g                      |
| CDNLM-6815  | L-Tyrosine ( <sup>13</sup> C <sub>9</sub> , 97%; D <sub>7</sub> , 97%; <sup>15</sup> N, 97%)                   | 0.25 g                     |
| DLM-10940   | L-Tyrosine, N-acetyl (acetyl-D <sub>3</sub> , 98%)   | Please inquire             |
| CLM-10543   | cis-Urocanic acid (1,2,3- <sup>13</sup> C <sub>3</sub> , 99%)  | 1 mg, 2 mg, 5 mg           |
| CLM-166     | DL-Valine (1- <sup>13</sup> C, 99%)  | Please inquire             |
| CLM-3277    | DL-Valine (2- <sup>13</sup> C, 99%)  | Please inquire             |
| DLM-311     | DL-Valine (D <sub>8</sub> , 98%)   | 1 g                        |
| NLM-236     | DL-Valine ( <sup>15</sup> N, 98%)  | Please inquire             |
| CLM-470     | L-Valine (1- <sup>13</sup> C, 99%)   | 1 g                        |
| CLM-3050    | L-Valine (2- <sup>13</sup> C, 99%)   | 0.25 g                     |
| CLM-9217    | L-Valine (dimethyl- <sup>13</sup> C <sub>2</sub> , 99%)  | 0.25 g, 1 g                |
| CLM-2249-H  | L-Valine ( <sup>13</sup> C <sub>5</sub> , 99%)   | 0.1 mg, 0.25 g, 0.5 g, 1 g |
| DLM-7732    | L-Valine (3-D, 98%)  | 1 g                        |
| DLM-4364    | L-Valine (2,3-D <sub>2</sub> , 98%)  | 0.1 g, 0.25 g              |
| DLM-488     | L-Valine (D <sub>8</sub> , 98%)  | 0.25 g, 0.5 g              |
| NLM-316     | L-Valine ( <sup>15</sup> N, 98%)   | 0.5 g, 1 g                 |
| CNLM-3466   | L-Valine (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.25 g                     |
| CNLM-8678   | L-Valine (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | Please inquire             |
| CNLM-442-H  | L-Valine ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 99%)   | 0.25 g, 0.5 g, 1 g         |
| DNLM-4643   | L-Valine (D <sub>8</sub> , 96%; <sup>15</sup> N, 96%)  | 0.25 g, 0.5 g              |
| CDNLM-4281  | L-Valine ( <sup>13</sup> C <sub>5</sub> , 95%; 2,3-D <sub>2</sub> , 97%; <sup>15</sup> N, 96%)                 | 0.1 g, 0.25 g              |
| CDNLM-6817  | L-Valine ( <sup>13</sup> C <sub>5</sub> , 97%; D <sub>8</sub> , 97%; <sup>15</sup> N, 97%)                     | 0.25 g                     |
| ULM-8202    | L-Valine (unlabeled)   | 0.1 mg                     |
| NLM-7888    | L-Valine, N-acetyl ( <sup>15</sup> N, 98%)   | 0.5 g                      |

## Amino Acid Bundling Sets

| Catalog No.      | Description  | Unit Size   |
|------------------|--|-------------|
| SILAC-2PLEX      | 2-Plex SILAC Amino Acid Standards  | 1 vial each |
| <i>Contents:</i> |  |             |
| CNLM-539-H       | L-Arginine·HCl ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%) | 0.1 g       |
| ULM-8347         | L-Arginine·HCl (unlabeled)   | 0.1 g       |
| CNLM-291-H       | L-Lysine·2HCl ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)  | 0.1 g       |
| ULM-8766         | L-Lysine·2HCl (unlabeled)  | 0.1 g       |

| Catalog No.      | Description  | Unit Size   |
|------------------|--|-------------|
| SILAC-3PLEX      | 3-Plex SILAC Amino Acid Standards  | 1 vial each |
| <i>Contents:</i> |  |             |
| CLM-2265-H       | L-Arginine·HCl ( <sup>13</sup> C <sub>6</sub> , 99%)                                     | 0.1 g       |
| CNLM-539-H       | L-Arginine·HCl ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%) | 0.1 g       |
| ULM-8437         | L-Arginine·HCl (unlabeled)   | 0.1 g       |
| DLM-2640         | L-Lysine·2HCl (4,4,5,5-D <sub>4</sub> , 96%)   | 0.1 g       |
| CNLM-291-H       | L-Lysine·2HCl ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)  | 0.1 g       |
| ULM-8766         | L-Lysine·2HCl (unlabeled)  | 0.1 g       |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Protected Amino Acids

Stable isotope-labeled peptides have demonstrated to be an effective means to quantify endogenous proteins in basic and translational bottom-up proteomics. In these experiments, the labeled peptides are employed as internal standards, where they serve as molecular surrogates of the target proteins enabling relative or absolute protein quantitation.

From a development standpoint, the peptides are produced in a step-wise manner by solid phase peptide synthesis using amino acid building blocks with *N*-terminal, 9-fluorenylmethoxycarbonyl (Fmoc) or *tert*-butoxycarbonyl (*t*-Boc) protecting groups. To help facilitate the synthesis of isotopically labeled peptides, CIL offers an assortment of uniformly or partially labeled Fmoc and *t*-Boc amino acids.

| Catalog No. | Description   | Unit Size                 |
|-------------|---|---------------------------|
| CLM-818     | L-Alanine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-3638    | L-Alanine- <i>N</i> -Fmoc (2- <sup>13</sup> C, 99%)   | 0.25 g                    |
| CLM-1142    | L-Alanine- <i>N</i> -Fmoc (3- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-7785    | L-Alanine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>3</sub> , 97%)   | 0.25 g                    |
| DLM-7316    | L-Alanine- <i>N</i> -Fmoc (3,3,3-D <sub>3</sub> , 98%)  | 1 g                       |
| DLM-8168    | L-Alanine- <i>N</i> -Fmoc (2,3,3,3-D <sub>4</sub> , 98%)  | 0.5 g                     |
| NLM-614     | L-Alanine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)   | 1 g                       |
| CNLM-4355-H | L-Alanine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 99%)   | 0.1 g, 0.25 g, 1 g        |
| CDNLM-7852  | L-Alanine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>3</sub> , 97%; D <sub>4</sub> , 97%; <sup>15</sup> N, 97%)                         | Please inquire            |
| CLM-2150    | L-Alanine- <i>N</i> - <i>t</i> -Boc (1- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-2011    | L-Alanine- <i>N</i> - <i>t</i> -Boc (2- <sup>13</sup> C, 98%)   | 0.25 g                    |
| CLM-2151    | L-Alanine- <i>N</i> - <i>t</i> -Boc (3- <sup>13</sup> C, 99%)   | 0.5 g, 1 g                |
| CLM-3589    | L-Alanine- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>3</sub> , 97%)   | 0.25 g                    |
| DLM-649     | L-Alanine- <i>N</i> - <i>t</i> -Boc (2-D, 98%)  | Please inquire            |
| DLM-2793    | L-Alanine- <i>N</i> - <i>t</i> -Boc (3,3,3-D <sub>3</sub> , 99%)  | 1 g                       |
| NLM-1903    | L-Alanine- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 98%)   | 0.25 g, 0.5 g, 1 g        |
| CNLM-6014   | L-Alanine- <i>N</i> - <i>t</i> -Boc (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 96%)   | Please inquire            |
| CNLM-2394   | L-Alanine- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>3</sub> , 97%; <sup>15</sup> N, 97%)                                     | 0.05 g, 0.1 g             |
| CLM-8475-H  | L-Arginine- <i>N</i> -Fmoc, Pbf-OH ( <sup>13</sup> C <sub>6</sub> , 99%) contains solvent   | 1 g                       |
| NLM-8841    | L-Arginine- <i>N</i> -Fmoc, Pbf-OH ( <sup>15</sup> N <sub>4</sub> , 98%) contains solvent   | 0.1 g/compound            |
| CNLM-8474-H | L-Arginine- <i>N</i> -Fmoc, Pbf-OH ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%) contains solvent       | 0.1 g, 0.25 g, 0.5 g, 1 g |
| CNLM-4354   | L-Asparagine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>4</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%)                              | Please inquire            |
| CNLM-6193-H | L-Asparagine- <i>N</i> -Fmoc, <i>N</i> -β-trityl ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)          | 0.1 g                     |
| NLM-4204    | L-Asparagine- <i>N</i> -Fmoc, <i>N</i> -β-trityl ( <sup>15</sup> N <sub>2</sub> , 98%)  | 0.1 g                     |
| CLM-4249    | L-Aspartic acid- <i>N</i> -α-Cbz ( <sup>13</sup> C <sub>4</sub> , 97%)  | 0.1 g                     |
| CNLM-4788   | L-Aspartic acid- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>4</sub> , 97%; <sup>15</sup> N, 97%)   | 0.05 g                    |
| NLM-647     | L-Aspartic acid- <i>N</i> -Fmoc, β- <i>O</i> - <i>tert</i> -butyl ester ( <sup>15</sup> N, 98%)                                     | 0.1 g, 0.5 g, 1 g         |
| CNLM-4752-H | L-Aspartic acid- <i>N</i> -Fmoc, β- <i>O</i> - <i>tert</i> -butyl ester ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N, 99%) | 0.1 g                     |
| NLM-3493    | L-Aspartic acid- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 98%)   | 1 g                       |
| NLM-1908    | L-Aspartic acid- <i>N</i> - <i>t</i> -Boc, β-Bz ester ( <sup>15</sup> N, 98%)   | 0.25 g                    |
| CNLM-2392   | L-Aspartic acid- <i>N</i> - <i>t</i> -Boc, β-Bz ester ( <sup>13</sup> C <sub>4</sub> , 97%; <sup>15</sup> N, 97%)                   | 0.05 g                    |
| CLM-2403    | L-Cysteine- <i>N</i> -Fmoc, <i>S</i> -benzyl (3- <sup>13</sup> C, 98%)  | Please inquire            |
| DLM-4721    | L-Cysteine- <i>N</i> -Fmoc, <i>S</i> -trityl (3,3-D <sub>2</sub> , 98%)   | 0.1 g, 0.25 g, 0.5 g      |
| CNLM-4722-H | L-Cysteine- <i>N</i> -Fmoc, <i>S</i> -trityl ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 99%)                            | 0.1 g, 0.25 g             |
| CLM-1901    | L-Cysteine- <i>N</i> - <i>t</i> -Boc, <i>S</i> -benzyl (3- <sup>13</sup> C, 99%)  | 0.25 g                    |
| NLM-3874    | L-Cysteine- <i>N</i> - <i>t</i> -Boc, <i>S</i> - <i>P</i> -mebz ( <sup>15</sup> N, 98%)   | 0.25 g                    |
| NLM-8960    | L-Glutamic acid- <i>N</i> -Fmoc, γ- <i>tert</i> -butyl ester ( <sup>15</sup> N, 98%)  | 0.1 g                     |
| CNLM-4753-H | L-Glutamic acid- <i>N</i> -Fmoc, γ- <i>tert</i> -butyl ester ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 99%) CP 96%     | 0.1 g                     |
| CLM-2008    | L-Glutamic acid- <i>N</i> - <i>t</i> -Boc, γ-benzyl ester (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                                 | 0.1 g                     |
| NLM-1907    | L-Glutamic acid- <i>N</i> - <i>t</i> -Boc, γ-benzyl ester ( <sup>15</sup> N, 98%)   | Please inquire            |
| CNLM-4356-H | L-Glutamine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)                               | Please inquire            |
| CNLM-7252-H | L-Glutamine- <i>N</i> -Fmoc, <i>N</i> -γ-trityl ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)           | Please inquire            |
| CLM-1902    | L-Glutamine- <i>N</i> - <i>t</i> -Boc (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.1 g                     |
| NLM-3419    | L-Glutamine- <i>N</i> - <i>t</i> -Boc (α- <sup>15</sup> N, 98%)   | 0.5 g                     |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.



| Catalog No. | Description   | Unit Size                 |
|-------------|---|---------------------------|
| CLM-3639    | Glycine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-2387    | Glycine- <i>N</i> -Fmoc (2- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-7547    | Glycine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>2</sub> , 97%)   | 1 g                       |
| DLM-7339    | Glycine- <i>N</i> -Fmoc (2,2-D <sub>2</sub> , 98%)  | 1 g                       |
| NLM-694     | Glycine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)   | 1 g                       |
| CNLM-7697   | Glycine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.25 g                    |
| CNLM-7698   | Glycine- <i>N</i> -Fmoc (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | 0.1 g                     |
| CNLM-4357-H | Glycine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 99%)   | 0.1 g, 0.25 g             |
| CDNLM-7853  | Glycine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>2</sub> , 97%; 2,2-D <sub>2</sub> , 97%; <sup>15</sup> N, 97%)                     | Please inquire            |
| CLM-2152    | Glycine- <i>N</i> - <i>t</i> -Boc (1- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-1900    | Glycine- <i>N</i> - <i>t</i> -Boc (2- <sup>13</sup> C, 99%)   | 1 g                       |
| DLM-2153    | Glycine- <i>N</i> - <i>t</i> -Boc (2,2-D <sub>2</sub> , 98%)  | 1 g                       |
| NLM-2109    | Glycine- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 98%)   | 1 g                       |
| CNLM-9686   | Glycine- <i>N</i> - <i>t</i> -Boc (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | Please inquire            |
| CNLM-2412   | Glycine- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>2</sub> , 97%; <sup>15</sup> N, 97%)                                     | 0.1 g                     |
| NLM-8010    | L-Histidine- <i>N</i> -Fmoc, <i>N</i> -Im-trityl ( <sup>15</sup> N <sub>3</sub> , 98%)  | 0.1 g                     |
| CLM-8043    | L-Isoleucine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)  | 0.25 g                    |
| CLM-7794    | L-Isoleucine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 97%)  | Please inquire            |
| NLM-391     | L-Isoleucine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)  | 0.25 g                    |
| CNLM-4346-H | L-Isoleucine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N, 99%)  | 0.1 g, 0.25 g             |
| NLM-2167    | L-Isoleucine- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 98%)  | 0.25 g                    |
| CLM-10959   | D-Leucine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 97%)   | Please inquire            |
| CLM-3691    | L-Leucine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)   | 1 g                       |
| CLM-7546    | L-Leucine- <i>N</i> -Fmoc (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.1 g                     |
| CLM-3683    | L-Leucine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 97%)   | 0.1 g                     |
| DLM-7202    | L-Leucine- <i>N</i> -Fmoc (5,5,5-D <sub>3</sub> , 98%)  | 1 g                       |
| DLM-7575    | L-Leucine- <i>N</i> -Fmoc (D <sub>10</sub> , 98%)   | 0.25 g                    |
| NLM-2397    | L-Leucine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)   | 1 g                       |
| CNLM-4345-H | L-Leucine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N, 99%)   | 0.1 g, 0.25 g, 1 g        |
| CDNLM-7854  | L-Leucine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 97%; D <sub>10</sub> , 97%; <sup>15</sup> N, 97%)                      | Please inquire            |
| CLM-2155    | L-Leucine- <i>N</i> - <i>t</i> -Boc·H <sub>2</sub> O (1- <sup>13</sup> C, 99%)  | 1 g                       |
| CLM-2010    | L-Leucine- <i>N</i> - <i>t</i> -Boc·H <sub>2</sub> O (2- <sup>13</sup> C, 99%)  | 0.25 g                    |
| DLM-2736    | L-Leucine- <i>N</i> - <i>t</i> -Boc·H <sub>2</sub> O (5,5,5-D <sub>3</sub> , 98%)   | 1 g                       |
| DLM-3650    | L-Leucine- <i>N</i> - <i>t</i> -Boc·H <sub>2</sub> O (D <sub>10</sub> , 98%)  | 0.5 g                     |
| NLM-1904    | L-Leucine- <i>N</i> - <i>t</i> -Boc·H <sub>2</sub> O ( <sup>15</sup> N, 98%)  | 1 g                       |
| CNLM-2396   | L-Leucine- <i>N</i> - <i>t</i> -Boc·H <sub>2</sub> O ( <sup>13</sup> C <sub>6</sub> , 97%; <sup>15</sup> N, 97%)                  | 0.05 g                    |
| CNLM-11083  | L-Lysine-α- <i>N</i> -Fmoc, ε- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)           | Please inquire            |
| CLM-6194    | L-Lysine-α- <i>N</i> -Fmoc, ε- <i>N</i> - <i>t</i> -Boc (1- <sup>13</sup> C, 99%)   | 0.1 g                     |
| CLM-7865-H  | L-Lysine-α- <i>N</i> -Fmoc, ε- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>6</sub> , 99%)                                     | Please inquire            |
| NLM-4631    | L-Lysine-α- <i>N</i> -Fmoc, ε- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N <sub>2</sub> , 96%)                                     | 0.1 g                     |
| CNLM-4754-H | L-Lysine-α- <i>N</i> -Fmoc, ε- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%) | 0.1 g, 0.25 g, 0.5 g, 1 g |
| CLM-1141    | L-Methionine- <i>N</i> -Fmoc (methyl- <sup>13</sup> C, 99%)   | Please inquire            |
| CLM-8166    | L-Methionine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)  | Please inquire            |
| NLM-4632    | L-Methionine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)  | Please inquire            |
| CNLM-4358-H | L-Methionine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>5</sub> , 97%; <sup>15</sup> N, 97%)  | 0.1 g                     |
| CLM-2156    | L-Methionine- <i>N</i> - <i>t</i> -Boc (methyl- <sup>13</sup> C, 98%)   | Please inquire            |
| DLM-10668   | D-Phenylalanine- <i>N</i> -Fmoc (D <sub>8</sub> , 98%)  | Please inquire            |
| CLM-4824    | L-Phenylalanine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)   | 0.5 g                     |
| CLM-3684    | L-Phenylalanine- <i>N</i> -Fmoc (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 0.1 g                     |
| DLM-7786    | L-Phenylalanine- <i>N</i> -Fmoc (ring-D <sub>5</sub> , 98%)   | 0.25 g                    |
| DLM-8752    | L-Phenylalanine- <i>N</i> -Fmoc (D <sub>8</sub> , 98%)  | 0.1 g, 0.25 g             |
| NLM-1265    | L-Phenylalanine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)   | 1 g                       |
| CNLM-4362-H | L-Phenylalanine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N, 99%)                                       | 0.1 g, 0.25 g, 1 g        |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

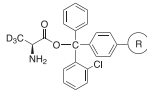
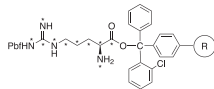
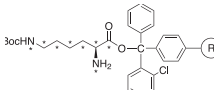
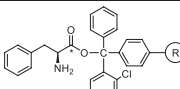
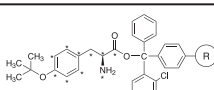
## Protected Amino Acids (continued)

| Catalog No. | Description  | Unit Size      |
|-------------|--|----------------|
| CLM-2170    | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc (1- <sup>13</sup> C, 99%)  | 0.5 g          |
| CLM-2009    | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc (2- <sup>13</sup> C, 99%)  | 0.25 g         |
| CLM-2061    | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 0.1 g          |
| CLM-7859    | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>9</sub> , 97%)  | 0.05 g         |
| DLM-2157    | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc (ring-D <sub>5</sub> , 98%)  | 1 g            |
| NLM-1905    | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 98%)  | 1 g            |
| CNLM-2393   | L-Phenylalanine- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>9</sub> , 97%; <sup>15</sup> N, 97%)  | 0.05 g         |
| CLM-8044    | L-Proline- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)  | 0.25 g         |
| NLM-3906    | L-Proline- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)  | 0.25 g         |
| CNLM-4347-H | L-Proline- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 97%)  | 0.1 g, 0.25 g  |
| NLM-2329    | L-Proline- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 96%)  | 0.25 g         |
| CNLM-8403-H | L-Serine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 99%)   | 1 g            |
| CLM-8167    | L-Serine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether (1- <sup>13</sup> C, 99%)  | 0.25 g         |
| NLM-4630    | L-Serine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>15</sup> N, 98%)  | 0.25 g         |
| CNLM-4755-H | L-Serine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 99%)                      | 0.1 g          |
| CLM-2007    | L-Serine- <i>N</i> - <i>t</i> -Boc, <i>O</i> -Bz ether (2- <sup>13</sup> C, 99%)   | Please inquire |
| CLM-756     | L-Serine- <i>N</i> - <i>t</i> -Boc, <i>O</i> -Bz ether (3- <sup>13</sup> C, 99%)   | Please inquire |
| NLM-2025    | L-Serine- <i>N</i> - <i>t</i> -Boc, <i>O</i> -Bz ether ( <sup>15</sup> N, 98%)   | 0.1 g          |
| NLM-8170    | L-Threonine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>15</sup> N, 98%)   | 0.1 g          |
| CNLM-7615-H | L-Threonine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N, 99%)                   | 0.1 g          |
| NLM-3681    | L-Threonine- <i>N</i> - <i>t</i> -Boc, <i>O</i> -benzyl ether ( <sup>15</sup> N, 98%)  | Please inquire |
| DLM-6113    | L-Tryptophan- <i>N</i> -Fmoc (indole-D <sub>5</sub> , 98%)   | 0.25 g         |
| NLM-3423    | L-Tryptophan- <i>N</i> -Fmoc (α- <sup>15</sup> N, 98%)   | Please inquire |
| CNLM-6077   | L-Tryptophan- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>11</sub> , 97%; <sup>15</sup> N <sub>2</sub> , 97%)  | 0.1 g          |
| CNLM-9200   | L-Tryptophan- <i>N</i> -Fmoc, indole- <i>N</i> - <i>t</i> -Boc (U- <sup>13</sup> C <sub>11</sub> , 97%; U- <sup>15</sup> N <sub>2</sub> , 97%) | Please inquire |
| CLM-2194    | L-Tryptophan- <i>N</i> - <i>t</i> -Boc (1- <sup>13</sup> C, 99%)   | Please inquire |
| CLM-11320   | L-Tyrosine, <i>N</i> -acetyl (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | Please inquire |
| CLM-11065   | L-Tyrosine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>13</sup> C <sub>9</sub> , 99%) CP 94%                                   | Please inquire |
| NLM-8169    | L-Tyrosine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>15</sup> N, 98%)  | 0.1 g          |
| CNLM-4349-H | L-Tyrosine- <i>N</i> -Fmoc, <i>O</i> - <i>tert</i> -butyl ether ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N, 99%)                    | 0.1 g, 0.25 g  |
| DLM-2303    | L-Tyrosine- <i>N</i> - <i>t</i> -Boc, <i>O</i> -Bz ether (ring-D <sub>4</sub> , 98%)   | 0.25 g         |
| NLM-1906    | L-Tyrosine- <i>N</i> - <i>t</i> -Boc, <i>O</i> -Bz ether ( <sup>15</sup> N, 98%)   | 0.25 g         |
| CLM-3640    | L-Valine- <i>N</i> -Fmoc (1- <sup>13</sup> C, 99%)   | 1 g            |
| CLM-7793    | L-Valine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>5</sub> , 97%)   | 0.1 g          |
| DLM-7784    | L-Valine- <i>N</i> -Fmoc (D <sub>8</sub> , 98%)  | 0.5 g          |
| NLM-4243    | L-Valine- <i>N</i> -Fmoc ( <sup>15</sup> N, 98%)   | 1 g            |
| CNLM-4348-H | L-Valine- <i>N</i> -Fmoc ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 99%)   | 0.1 g, 0.25 g  |
| CLM-2158    | L-Valine- <i>N</i> - <i>t</i> -Boc (1- <sup>13</sup> C, 99%)   | Please inquire |
| DLM-3651    | L-Valine- <i>N</i> - <i>t</i> -Boc (D <sub>8</sub> , 98%)  | 0.5 g          |
| NLM-2060    | L-Valine- <i>N</i> - <i>t</i> -Boc ( <sup>15</sup> N, 98%)   | 0.5 g, 1 g     |
| CNLM-2395   | L-Valine- <i>N</i> - <i>t</i> -Boc ( <sup>13</sup> C <sub>5</sub> , 97%; <sup>15</sup> N, 97%)   | 0.05 g         |

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## 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 <sub>3</sub> , 98%) 2-ClTrt resin   |  | +3                             |
| SRPR-Arg-CN | Preloaded L-Arg, Pbf-OH ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%) 2-ClTrt resin    |  | +10                            |
| SRPR-Lys-CN | Preloaded L-Lys, ε-N-t-Boc ( <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%) 2-ClTrt resin |  | +8                             |
| SRPR-Phe-C  | Preloaded L-Phe (1- <sup>13</sup> C, 98%) Wang resin   |  | +1                             |
| SRPR-Tyr-CN | Preloaded L-Tyr, O-tert-butyl ether ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N, 99%) 2-ClTrt resin      |  | +10                            |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Bile Acids

The analysis of bile acids (BAs) in biofluids is a developing and growing MS 'omics field. These steroid-like compounds act as detergent that assist in the breakdown of fats. The primary BAs are synthesized from cholesterol in the liver, while secondary BAs are converted from primary BAs in the colon. The bile acids can also be conjugated with glycine or taurine in the liver, which increase their solubility in water. Bile acids have gained clinical attention by their linkage to colon cancer, liver disease, chronic diarrhea, cholestasis, hyperlipidemia, and gallstones. CIL is pleased to offer an extensive panel of primary and secondary BAs, in their free acid and conjugated salt forms. These research-grade products are available as isotopically labeled and/or unlabeled standards in solution (at 100 µg/mL in methanol) and/or neat form.

### Primary Bile Acids and Their Conjugated Salts

| Catalog No. | Description   | Abbreviation | Concentration         | Unit Size      |
|-------------|---|--------------|-----------------------|----------------|
| DLM-11570-C | Allochenodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | allo-CDCA    | 100 µg/mL in methanol | 1 mL           |
| DLM-11641   | Allocholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 95%   | allo-CA      | neat                  | 1 mg           |
| CLM-2709    | Chenodeoxycholic acid (24- <sup>13</sup> C, 99%)  | CDCA         | neat                  | 0.1 g, 0.5 g   |
| CLM-11579-C | Chenodeoxycholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%)                              | CDCA         | 100 µg/mL in methanol | 1 mL           |
| DLM-6780-C  | Chenodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | CDCA         | 100 µg/mL in methanol | 1 mL           |
| DLM-6780    | Chenodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | CDCA         | neat                  | 50 mg          |
| DLM-9327    | Chenodeoxycholic acid (2,2,3,4,4-D <sub>5</sub> , 98%)  | CDCA         | neat                  | 0.05 g, 0.1 g  |
| DLM-9541-C  | Chenodeoxycholic acid (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%)                                    | CDCA         | 100 µg/mL in methanol | 1 mL           |
| DLM-9541    | Chenodeoxycholic acid (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%)                                    | CDCA         | neat                  | 10 mg          |
| DLM-11784   | Chenodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                     | CDCA-3S      | neat                  | 1 mg           |
| CLM-2710    | Cholic acid (24- <sup>13</sup> C, 99%)  | CA           | neat                  | 0.1 g, 0.5 g   |
| DLM-2611-C  | Cholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | CA           | 100 µg/mL in methanol | 1 mL           |
| DLM-2611    | Cholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | CA           | neat                  | 50 mg          |
| DLM-9549    | Cholic acid (2,2,3,4,4-D <sub>5</sub> , 98%)  | CA           | neat                  | 50 mg          |
| DLM-10997   | Cholic acid (3,6,6,7,8,11,11,12-D <sub>8</sub> , 98%) CP 95%                                      | CA           | neat                  | Please inquire |
| DLM-11785   | Cholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                               | CA-3S        | neat                  | 1 mg           |
| DLM-9550    | Glycochenodeoxycholic acid (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%) CP 97%                        | GCDCA        | neat                  | 10 mg          |
| DLM-9550-C  | Glycochenodeoxycholic acid (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%) CP 97%                        | GCDCA        | 100 µg/mL in methanol | 1 mL           |
| DLM-7804    | Glycochenodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                                  | GCDCA        | neat                  | 10 mg          |
| DLM-7804-C  | Glycochenodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                                  | GCDCA        | 100 µg/mL in methanol | 1 mL           |
| DLM-11645   | Glycochenodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                | GCDCA-3S     | neat                  | 1 mg           |
| DLM-2742-C  | Glycocholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | GCA          | 100 µg/mL in methanol | 1 mL           |
| DLM-2742    | Glycocholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 96% (contains ~4% water)                       | GCA          | neat                  | 10 mg          |
| CLM-191     | Glycocholic acid (glycine-1- <sup>13</sup> C, 99%)  | GCA          | neat                  | Please inquire |
| DLM-11640   | Glycocholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                          | GCA-3S       | neat                  | 1 mg           |
| DLM-11644   | Isochenodeoxycholic acid (2,2,4,4-D <sub>4</sub> ) CP 95%   | iso-CDCA     | neat                  | 1 mg           |
| DLM-10627   | α-Muricholic acid (2,2,3,4,4-D <sub>5</sub> , 99%)  | MCA (α)      | neat                  | 1 mg           |
| DLM-10626   | β-Muricholic acid (2,2,3,4,4-D <sub>5</sub> , 99%)  | MCA (β)      | neat                  | 1 mg           |
| DLM-10628   | γ-Muricholic acid (2,2,3,4,4-D <sub>5</sub> , 99%)  | MCA (γ)      | neat                  | 1 mg           |
| DLM-10629   | ω-Muricholic acid (2,2,3,4,4-D <sub>5</sub> , 99%)  | MCA (ω)      | neat                  | 1 mg           |
| DLM-11788   | β-Muricholic acid 3-sulfate, disodium salt (2,2,3,4,4-D <sub>5</sub> , 99%)                       | β-MCA-3S     | neat                  | 1 mg           |
| DLM-11647   | 24-Norcholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 95%   | NCA          | neat                  | 1 mg           |
| CLM-11577   | 3-Oxochenodeoxycholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                  | oxo-CDCA     | neat                  | 1 mg           |
| DLM-9563    | Taurochenodeoxycholic acid, sodium salt (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%)                  | TCDCA        | neat                  | 5 mg           |
| DLM-9563-C  | Taurochenodeoxycholic acid, sodium salt (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%)                  | TCDCA        | 100 µg/mL in methanol | 1 mL           |
| DLM-9562    | Taurochenodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                     | TCDCA        | neat                  | 10 mg          |
| DLM-9562-C  | Taurochenodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                     | TCDCA        | 100 µg/mL in methanol | 1 mL           |
| DLM-11801   | Taurochenodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                | TCDCA-3S     | neat                  | 1 mg           |
| DLM-9572    | Taurocholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                      | TCA          | neat                  | 10 mg          |
| DLM-9572-C  | Taurocholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                      | TCA          | 100 µg/mL in methanol | 1 mL           |
| CNLM-10251  | Taurocholic acid, sodium salt (taurine- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%) | TCA          | neat                  | 10 mg          |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

| Catalog No. | Description  | Abbreviation      | Concentration | Unit Size |
|-------------|--|-------------------|---------------|-----------|
| DLM-11802   | Taurocholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)       | TCA-3S            | neat          | 1 mg      |
| DLM-11627   | Tauro- $\alpha$ -muricholic acid, sodium salt (2,2,3,4,4-D <sub>5</sub> , 99%) | T-MCA( $\alpha$ ) | neat          | 1 mg      |
| DLM-11628   | Tauro- $\beta$ -muricholic acid, sodium salt (2,2,3,4,4-D <sub>5</sub> , 99%)  | T-MCA( $\beta$ )  | neat          | 1 mg      |

Unlabeled may be available. Please inquire.

## Secondary Bile Acids and Their Conjugated Salts

| Catalog No. | Description  | Abbreviation              | Concentration         | Unit Size    |
|-------------|--|---------------------------|-----------------------|--------------|
| CLM-11571   | Alloisolithocholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                        | allo-iso-LCA              | neat                  | 1 mg         |
| CLM-11574   | Allolithocholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                           | allo-LCA                  | neat                  | 1 mg         |
| CLM-3364    | Deoxycholic acid (24- <sup>13</sup> C, 98%) CP 97%   | DCA                       | neat                  | 0.1 g, 0.5 g |
| DLM-2824-C  | Deoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | DCA                       | 100 µg/mL in methanol | 1 mL         |
| DLM-2824    | Deoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | DCA                       | neat                  | 10 mg        |
| DLM-9546-C  | Deoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)  | DCA                       | 100 µg/mL in methanol | 1 mL         |
| DLM-9546    | Deoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)  | DCA                       | neat                  | 10 mg        |
| DLM-11786   | Deoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                             | DCA-3S                    | neat                  | 1 mg         |
| DLM-11642   | 3-Epideoxycholic acid (2,2,4,4-D <sub>4</sub> )  | 3-epiDCA                  | neat                  | 1 mg         |
| DLM-9554-C  | Glycodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | GDCA                      | 100 µg/mL in methanol | 1 mL         |
| DLM-9554    | Glycodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | GDCA                      | neat                  | 10 mg        |
| DLM-9553-C  | Glycodeoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)   | GDCA                      | 100 µg/mL in methanol | 1 mL         |
| DLM-9553    | Glycodeoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)   | GDCA                      | neat                  | 10 mg        |
| DLM-11798   | Glycodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                        | GDCA-3S                   | neat                  | 1 mg         |
| DLM-11625   | Glycohyodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | GHDCA                     | neat                  | 1 mg         |
| DLM-9556-C  | Glycolithocholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | GLCA                      | 100 µg/mL in methanol | 1 mL         |
| DLM-9556    | Glycolithocholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | GLCA                      | neat                  | 10 mg        |
| DLM-11799   | Glycolithocholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                        | GLCA-3S                   | neat                  | 1 mg         |
| DLM-9558-C  | Glycoursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                                      | GUDCA                     | 100 µg/mL in methanol | 1 mL         |
| CNLM-10252  | Glycoursodeoxycholic acid (glycine- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)        | GUDCA                     | neat                  | 10 mg        |
| DLM-9558    | Glycoursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                                      | GUDCA                     | neat                  | 10 mg        |
| DLM-11800   | Glycoursodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                    | GUDCA-3S                  | neat                  | 1 mg         |
| CLM-11567   | 3 $\beta$ -Hydroxy-5-cholenoic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%            | 3 $\beta$ -OH- $\Delta$ 5 | neat                  | 1 mg         |
| CLM-11587   | 7 $\alpha$ -Hydroxy-3-oxochol-4-en-24-oic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 95% | 7-HOCA                    | neat                  | 1 mg         |
| DLM-11626   | Hyodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | HDCA                      | neat                  | 1 mg         |
| CLM-11575   | Isolithocholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                            | iso-LCA                   | neat                  | 1 mg         |
| DLM-11646   | Isolithocholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 95%  | iso-LCA                   | neat                  | 1 mg         |
| CLM-11581-C | Lithocholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%)                                      | LCA                       | 100 µg/mL in methanol | 1 mL         |
| CLM-11580-C | Lithocholic acid (3,4,23,24- <sup>13</sup> C <sub>4</sub> , 98%)                                     | LCA                       | 100 µg/mL in methanol | 1 mL         |
| DLM-9560-C  | Lithocholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | LCA                       | 100 µg/mL in methanol | 1 mL         |
| DLM-9560    | Lithocholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | LCA                       | neat                  | 50 mg        |
| DLM-11787   | Lithocholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                             | LCA-3S                    | neat                  | 1 mg         |
| CLM-11565   | 3-Oxo-4-cholenoic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                         | LCA- $\Delta$ 4 -3-one    | neat                  | 1 mg         |
| CLM-11566   | 3-Oxochol-4,6-dien-24-oic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                 | —                         | neat                  | 1 mg         |
| CLM-11573   | 3-Oxoallolithocholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                      | 3-oxo-allo-LCA            | neat                  | 1 mg         |
| CLM-11572   | 3-Oxolithocholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                          | 3-oxo-LCA                 | neat                  | 1 mg         |
| DLM-9568-C  | Taurodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                    | TDCA                      | 100 µg/mL in methanol | 1 mL         |
| DLM-9568    | Taurodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                    | TDCA                      | neat                  | 10 mg        |
| DLM-9567-C  | Taurodeoxycholic acid, sodium salt (2,2,4,4,11,11-D <sub>6</sub> , 98%)                              | TDCA                      | 100 µg/mL in methanol | 1 mL         |
| DLM-9567    | Taurodeoxycholic acid, sodium salt (2,2,4,4,11,11-D <sub>6</sub> , 98%)                              | TDCA                      | neat                  | 5 mg         |
| DLM-11803   | Taurodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                        | TDCA-3S                   | neat                  | 1 mg         |
| DLM-11681   | Taurohyodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                 | THDCA                     | neat                  | 1 mg         |
| DLM-9570-C  | Taurolithocholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                    | TLCA                      | 100 µg/mL in methanol | 1 mL         |
| DLM-9570    | Taurolithocholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                    | TLCA                      | neat                  | 10 mg        |
| DLM-11804   | Taurolithocholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                        | TLCA-3S                   | neat                  | 1 mg         |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

**Bile Acids** *(continued)*

| Catalog No. | Description  | Abbreviation | Concentration         | Unit Size |
|-------------|--|--------------|-----------------------|-----------|
| DLM-9882-C  | Tauroursodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                      | TUDCA        | 100 µg/mL in methanol | 1 mL      |
| DLM-9882    | Tauroursodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                                      | TUDCA        | neat                  | 10 mg     |
| CNLM-10250  | Tauroursodeoxycholic acid, sodium salt (taurine- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%) | TUDCA        | neat                  | 10 mg     |
| DLM-11805   | Tauroursodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                          | TUDCA-3S     | neat                  | 1 mg      |
| CLM-11568   | 3β,5α,6β-Trihydroxycholanolic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%)                          | —            | neat                  | 1 mg      |
| CLM-11578-C | Ursodeoxycholic acid (22,23,24- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%                                 | UDCA         | 100 µg/mL in methanol | 1 mL      |
| DLM-9574-C  | Ursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | UDCA         | 100 µg/mL in methanol | 1 mL      |
| DLM-9574    | Ursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 95%   | UDCA         | neat                  | 50 mg     |
| DLM-11789   | Ursodeoxycholic acid 3-sulfate, disodium salt (2,2,4,4-D <sub>4</sub> , 98%)                               | UDCA-3S      | neat                  | 1 mg      |

Unlabeled may be available. Please inquire.



## Caffeine and Its Metabolites

Caffeine is a psychoactive stimulant of the central nervous system that is extensively consumed worldwide. MS-based research into the kinetics/metabolism of this compound and its metabolites (e.g., paraxanthine, theobromine, theophylline) has revealed insight into its health impact and abuse in humans. Studies further suggest an influence on pharmacological activity and neurodegeneration (e.g., Parkinson's disease); thus, strengthening a need for its robust clinical analyses.

CIL offers stable isotope-labeled caffeine and a collection of isotopically labeled metabolites for basic and translational quantitative research. These standards are available in various labeling patterns, with alternate compounds or labels evaluated upon request.

| Catalog No. | Description   | Unit Size      |
|-------------|---|----------------|
| CLM-728     | Caffeine (3-methyl- <sup>13</sup> C, 99%)                                       | 0.5 g          |
| CLM-514     | Caffeine (trimethyl- <sup>13</sup> C <sub>3</sub> , 99%)                        | 1 g            |
| NLM-332     | Caffeine (1,3- <sup>15</sup> N <sub>2</sub> , 99%)                              | Please inquire |
| CNLM-333    | Caffeine (2- <sup>13</sup> C, 99%; 1,3- <sup>15</sup> N <sub>2</sub> , 98%)     | 0.1 g          |
| CLM-522     | Ethyl acetoacetate (1,3- <sup>13</sup> C <sub>2</sub> , 99%)                    | 0.5 g, 1 g     |
| CLM-523     | Ethyl acetoacetate (2,4- <sup>13</sup> C <sub>2</sub> , 99%)                    | 0.5 g, 1 g     |
| DLM-10436   | Theobromine (3,7-dimethylxanthine) (7-methyl-D <sub>3</sub> , 98%)              | Please inquire |
| DLM-8565    | Theobromine (3,7-dimethylxanthine) (dimethyl-D <sub>6</sub> , 98%)              | 5 mg           |
| CLM-6154    | Theophylline (dimethyl- <sup>13</sup> C <sub>2</sub> , 99%)                     | 0.1 g          |
| CNLM-444    | Theophylline (2- <sup>13</sup> C, 99%; 1,3- <sup>15</sup> N <sub>2</sub> , 98%) | 0.05 g, 0.1 g  |
| NLM-1697    | Uric acid (1,3- <sup>15</sup> N <sub>2</sub> , 98%)                             | 0.1 g, 0.5 g   |

## Carbohydrates

Carbohydrates are integral biomolecules to the function and process of living systems (e.g., in cell-to-cell signaling, immune responses, protein folding). Although this family of compounds is structurally diverse and complex, analysis by LC- and GC-MS techniques has been well adopted in the metabolomics field. Clinically, the quantitative analysis of sugars in human biosamples is of increasing importance for such disease screenings as cardiovascular and nonalcoholic fatty liver disease (NAFLD).

In addition to the classic monosaccharides (e.g., glucose, fructose, ribose) and sugar alcohols (e.g., erythritol, sorbitol, xylitol), CIL offers a number of other stable isotope-labeled carbohydrates. The list includes monosaccharides, under the pentose (e.g., arabinose, erythrose) and hexose (e.g., galactose, mannose) classes, disaccharides (e.g., lactose, maltose, sucrose), and polysaccharides (e.g., starch). These compounds are supplied with various labeling patterns as neat standards, in research or MPT grade.

| Catalog No. | Description   | Unit Size                  |
|-------------|---|----------------------------|
| CLM-10786   | <i>N</i> -Acetyl-D-galactosamine (galactose- $^{13}\text{C}_6$ , 99%)     | Please inquire             |
| CLM-1220    | <i>N</i> -Acetylglucosamine ( <i>N</i> -acetyl-1- $^{13}\text{C}$ , 99%)  | Please inquire             |
| CLM-1827    | <i>N</i> -Acetylglucosamine ( $^{13}\text{C}_6$ , 99%)                    | Please inquire             |
| NLM-8810    | <i>N</i> -Acetylglucosamine ( $^{15}\text{N}$ , 98%)                      | 0.1 g                      |
| CLM-8597    | <i>N</i> -Acetyl-D-neuraminic acid (4,5,6,7,8,9- $^{13}\text{C}_6$ , 98%) | Please inquire             |
| CLM-1699    | Algal starch (U- $^{13}\text{C}$ , 98%) CP 90%                            | 0.1 g, 0.5 g, 1 g          |
| ULM-7806    | Algal starch (unlabeled)  | 1 g                        |
| CLM-7642    | D-Arabinitol (U- $^{13}\text{C}_5$ , 98%)                                 | Please inquire             |
| CLM-9657    | 1,5-Anhydro-D-glucitol (U- $^{13}\text{C}_6$ , 98%)                       | Please inquire             |
| CLM-715     | D-Arabinose (1- $^{13}\text{C}$ , 99%)                                    | 0.25 g, 0.5 g, 1 g         |
| CLM-1288    | D-Arabinose (2- $^{13}\text{C}$ , 98%)                                    | Please inquire             |
| CLM-8477    | D-Arabinose (U- $^{13}\text{C}_5$ , 99%)                                  | 0.1 g, 0.25 g              |
| DLM-1379    | D-Arabinose (2-D, 97%)  | Please inquire             |
| CLM-1824    | 2-Deoxy-D-glucose (1- $^{13}\text{C}$ , 99%)                              | 0.1 g, 0.25 g              |
| CLM-2122    | 2-Deoxy-D-glucose (6- $^{13}\text{C}$ , 99%)                              | 0.25 g, 0.5 g, 1 g         |
| CLM-10466   | 2-Deoxy-D-glucose (U- $^{13}\text{C}_6$ , 99%)                            | Please inquire             |
| DLM-6732    | 2-Deoxy-D-glucose (1-D, 98%)  | Please inquire             |
| DLM-6940    | 2-Deoxy-D-glucose (D $_8$ , 98%)  | Please inquire             |
| CLM-9601    | 2-Deoxy-D-glucose-6-phosphate, disodium salt (6- $^{13}\text{C}$ , 99%)   | Please inquire             |
| CLM-7266    | 2-Deoxyribose (1- $^{13}\text{C}$ , 99%)                                  | Please inquire             |
| DLM-4750    | 2-Deoxy-D-ribose (5,5-D $_2$ , 98%)                                       | Please inquire             |
| CLM-9207    | Erythritol (U- $^{13}\text{C}_4$ , 99%)                                   | Please inquire             |
| CLM-1118    | D-Erythrose (1- $^{13}\text{C}$ , 99%) 1.2% in H $_2$ O                   | Please inquire             |
| CLM-1387    | D-Erythrose (2- $^{13}\text{C}$ , 99%) 1.2% in H $_2$ O                   | Please inquire             |
| CLM-8944    | D-Erythrose (4- $^{13}\text{C}$ , 99%) 1.2% in H $_2$ O                   | Please inquire             |
| CLM-7863    | D-Erythrose (U- $^{13}\text{C}_4$ , 98%) 1.2% in H $_2$ O                 | Please inquire             |
| CLM-1201    | D-Fructose (1- $^{13}\text{C}$ , 99%)                                     | 0.25 g, 0.5 g, 1 g         |
| CLM-1527    | D-Fructose (2- $^{13}\text{C}$ , 99%)                                     | 0.25 g, 0.5 g, 1 g         |
| CLM-7660    | D-Fructose (3- $^{13}\text{C}$ , 99%)                                     | Please inquire             |
| CLM-7661    | D-Fructose (4- $^{13}\text{C}$ , 99%)                                     | Please inquire             |
| CLM-7662    | D-Fructose (5- $^{13}\text{C}$ , 99%)                                     | Please inquire             |
| CLM-1388    | D-Fructose (6- $^{13}\text{C}$ , 99%)                                     | Please inquire             |
| CLM-2462    | D-Fructose (1- $^{13}\text{C}$ , 99%; 6- $^{13}\text{C}$ , 97%)           | Please inquire             |
| CLM-528     | D-Fructose (1,2- $^{13}\text{C}_2$ , 99%)                                 | 0.1 g, 0.25 g, 0.5 g       |
| CLM-10546   | D-Fructose (4,5- $^{13}\text{C}_2$ , 99%)                                 | Please inquire             |
| CLM-8415    | D-Fructose (1,2,3- $^{13}\text{C}_3$ , 99%)                               | Please inquire             |
| CLM-10223   | D-Fructose (4,5,6- $^{13}\text{C}_3$ , 98%)                               | Please inquire             |
| CLM-1553    | D-Fructose (U- $^{13}\text{C}_6$ , 99%)                                   | 0.1 mg, 0.25 g, 0.5 g, 1 g |
| DLM-6050    | D-Fructose (1-D, 97%)   | Please inquire             |
| DLM-1389    | D-Fructose (6,6-D $_2$ , 98%)   | Please inquire             |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

| Catalog No. | Description  | Unit Size  |
|-------------|--|--|
| CLM-6678    | D-Fructose-1,6-bisphosphate, sodium salt, hydrate ( $1\text{-}^{13}\text{C}$ , 99%)  | Please inquire   |
| CLM-8962    | D-Fructose-1,6-bisphosphate, sodium salt, hydrate ( $\text{U-}^{13}\text{C}_6$ , 98%)  | 0.05 g   |
| CLM-8616    | D-Fructose-6-phosphate- $2\text{Na}^+\cdot\text{xH}_2\text{O}$ ( $^{13}\text{C}_6$ , 99%) may contain up to ~10% $^{13}\text{C}_6$ glucose-6-phosphate | 0.01 g, 25 mg, 0.05 g                                  |
| CLM-3705    | L-Fucose ( $1\text{-}^{13}\text{C}$ , 99%)   | Please inquire   |
| CLM-219     | L-Fucose ( $6\text{-}^{13}\text{C}$ , 99%)   | Please inquire   |
| CLM-9605    | L-Fucose ( $\text{U-}^{13}\text{C}_6$ , 99%)   | Please inquire   |
| CLM-529     | D-Galactitol ( $1\text{-}^{13}\text{C}$ , 99%)   | Please inquire   |
| CLM-2199    | D-Galactitol ( $\text{U-}^{13}\text{C}_6$ , 99%)   | Please inquire   |
| CLM-11003   | D-Galactonate, sodium salt ( $\text{U-}^{13}\text{C}_6$ , 99%) CP 97%  | Please inquire   |
| CLM-744     | D-Galactose ( $1\text{-}^{13}\text{C}$ , 99%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-745     | D-Galactose ( $2\text{-}^{13}\text{C}$ , 99%)  | Please inquire   |
| CLM-4217    | D-Galactose ( $1,2\text{-}^{13}\text{C}_2$ , 99%)  | Please inquire   |
| CLM-1570    | D-Galactose ( $\text{U-}^{13}\text{C}_6$ , 99%)  | 0.1 g  |
| DLM-1390    | D-Galactose (1-D, 98%)   | 0.5 g, 1 g   |
| DLM-1391    | D-Galactose (2-D, 98%)   | Please inquire   |
| CLM-8998    | D-Galactose-1-phosphate, dipotassium salt ( $1\text{-}^{13}\text{C}$ , 99%)  | 0.01 g, 0.05 g, 0.1 g                                  |
| CLM-9873    | D-Galactose-1-phosphate, dipotassium salt ( $1,2\text{-}^{13}\text{C}_2$ , 99%)  | Please inquire   |
| CLM-9874    | D-Galactose-1-phosphate, dipotassium salt (galactose- $^{13}\text{C}_6$ , 99%)   | Please inquire   |
| CLM-9452    | $\alpha\text{-D-Glucopyranosyl-1-phosphate}$ , dipotassium salt, monohydrate ( $^{13}\text{C}_6$ , 99%)  | Please inquire   |
| CLM-9938    | D-Glucuronic acid, sodium salt, monohydrate ( $\text{U-}^{13}\text{C}_6$ , 98%)  | Please inquire   |
| CLM-9883    | D-Glucosamine-HCl ( $^{13}\text{C}_6$ , 99%)   | Please inquire   |
| NLM-11018   | D-Glucosamine-HCl ( $^{15}\text{N}$ , 98%)   | Please inquire   |
| CLM-4819    | D-Glucose ( $\text{U-}^{12}\text{C}_6$ , 99.9%)  | 1 g  |
| CLM-420     | D-Glucose ( $1\text{-}^{13}\text{C}$ , 98%)  | 0.25 g, 0.5 g, 1 g, 5 g, 10 g                          |
| CLM-746     | D-Glucose ( $2\text{-}^{13}\text{C}$ , 99%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-1393    | D-Glucose ( $3\text{-}^{13}\text{C}$ , 99%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-1394    | D-Glucose ( $4\text{-}^{13}\text{C}$ , 99%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-1395    | D-Glucose ( $5\text{-}^{13}\text{C}$ , 98%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-481     | D-Glucose ( $6\text{-}^{13}\text{C}$ , 99%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-2717    | D-Glucose ( $1\text{-}^{13}\text{C}$ , 99%; $6\text{-}^{13}\text{C}$ , 97%)  | 0.1 g, 0.25 g, 1 g                                     |
| CLM-504     | D-Glucose ( $1,2\text{-}^{13}\text{C}_2$ , 99%)  | 0.25 g, 0.5 g, 1 g                                     |
| CLM-8942    | D-Glucose ( $2,3\text{-}^{13}\text{C}_2$ , 99%)  | Please inquire   |
| CLM-6750    | D-Glucose ( $3,4\text{-}^{13}\text{C}_2$ , 99%)  | Please inquire   |
| CLM-8787    | D-Glucose ( $4,5\text{-}^{13}\text{C}_2$ , 99%)  | Please inquire   |
| CLM-4673    | D-Glucose ( $1,2,3\text{-}^{13}\text{C}_3$ , 99%)  | 0.05 g, 0.1 g, 0.25 g                                  |
| CLM-8770    | D-Glucose ( $4,5,6\text{-}^{13}\text{C}_3$ , 98%)  | 0.1 g  |
| CLM-8946    | D-Glucose ( $2,3,4,5,6\text{-}^{13}\text{C}_5$ , 99%)  | Please inquire   |
| CLM-1396    | D-Glucose ( $\text{U-}^{13}\text{C}_6$ , 99%)  | 0.1 mg, 0.25 g, 0.5 g, 1 g, 2 g, 5 g, 10 g, 25 g, 50 g |
| CLM-1396-25 | D-Glucose ( $^{13}\text{C}_6$ , 24%)   | 1 g  |
| DLM-1150    | D-Glucose (1-D, 98%)   | 0.25 g, 0.5 g, 1 g                                     |
| DLM-1271    | D-Glucose (2-D, 98%)   | 0.25 g, 0.5 g, 1 g                                     |
| DLM-3557    | D-Glucose (3-D, 97%)   | 0.1 g, 0.5 g   |
| DLM-9294    | D-Glucose (4-D, 98%)   | Please inquire   |
| DLM-6754    | D-Glucose (5-D, 98%)   | 0.1 g, 0.25 g, 0.5 g                                   |
| DLM-349     | D-Glucose ( $6,6\text{-D}_2$ , 99%)  | 1 g, 5 g, 10 g   |
| DLM-2062    | D-Glucose ( $1,2,3,4,5,6,6\text{-D}_7$ , 97%)  | 0.5 g, 1 g, 5 g, 10 g, 20 g                            |
| DLM-9047    | D-Glucose ( $\text{U-D}_{12}$ , 98%)   | 1 g  |
| CDLM-6064   | D-Glucose ( $1\text{-}^{13}\text{C}$ , 99%; 1-D, 98%)  | Please inquire   |
| CDLM-999    | D-Glucose ( $1\text{-}^{13}\text{C}$ , 98%; 2-D, 98%)  | Please inquire   |
| CDLM-4895   | D-Glucose ( $1\text{-}^{13}\text{C}$ , 99%; $6\text{-}^{13}\text{C}$ , 97%; $6,6\text{-D}_2$ , 98%)  | Please inquire   |
| CDLM-3813   | D-Glucose ( $\text{U-}^{13}\text{C}_6$ , 99%; $1,2,3,4,5,6,6\text{-D}_7$ , 97%)  | 1 g, 2 g, 10 g   |
| CLM-8813    | D-Glucose-1-phosphate, dicyclohexylammonium salt, monohydrate ( $\text{U-}^{13}\text{C}_6$ , 99%) CP 95%   | Please inquire   |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Carbohydrates (continued)

| Catalog No. | Description  | Unit Size                     |
|-------------|--|-------------------------------|
| CLM-8367    | D-Glucose-6-phosphate, disodium salt, hydrate (U- <sup>13</sup> C <sub>6</sub> , 99%)  | 0.1 mg, 0.01 g, 0.05 g, 0.1 g |
| CLM-1966    | L-Glucose (1- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-1399    | L-Glucose (2- <sup>13</sup> C, 99%)  | Please inquire                |
| DLM-7826    | <i>myo</i> -Inositol (2-D, 91%)  | Please inquire                |
| DLM-2725    | <i>myo</i> -Inositol (1,2,3,4,5,6-D <sub>6</sub> , 98%)                                | Please inquire                |
| CLM-4518    | Lactose ureide·xH <sub>2</sub> O (ureide- <sup>13</sup> C, 99%)                        | 1 g, 10 g                     |
| ULM-4519    | Lactose ureide·2H <sub>2</sub> O (unlabeled)   | 10 g                          |
| CLM-4423    | Lactose·H <sub>2</sub> O (glucose- <sup>13</sup> C <sub>6</sub> , 98%)                 | Please inquire                |
| CLM-1127    | D-Lyxose (1- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-1525    | D-Lyxose (2- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-1128    | D-Lyxose (5- <sup>13</sup> C, 99%)   | Please inquire                |
| DLM-1187    | D-Lyxose (1-D, 98%)  | Please inquire                |
| DLM-1188    | D-Lyxose (2-D, 98%)  | Please inquire                |
| CLM-2470    | L-Lyxose (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                                     | Please inquire                |
| CLM-2642    | D-Maltose·H <sub>2</sub> O (U- <sup>13</sup> C <sub>12</sub> , 99%)                    | Please inquire                |
| CLM-10759   | Maltotetraose (U- <sup>13</sup> C <sub>24</sub> , 99%) CP 90%                          | Please inquire                |
| CLM-1189    | D-Mannitol (1- <sup>13</sup> C, 98%)   | 0.25 g, 0.5 g, 1 g            |
| CLM-4416    | D-Mannitol (2- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-10764   | D-Mannitol (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                                   | Please inquire                |
| CLM-6733    | D-Mannitol (U- <sup>13</sup> C <sub>6</sub> , 99%)                                     | 0.1 g                         |
| CLM-9393    | L-Mannitol (1- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-358     | D-Mannose (1- <sup>13</sup> C, 99%)  | 0.25 g, 0.5 g, 1 g            |
| CLM-1523    | D-Mannose (2- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-9064    | D-Mannose (3- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-9394    | D-Mannose (4- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-9063    | D-Mannose (5- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-1192    | D-Mannose (6- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-6567    | D-Mannose (U- <sup>13</sup> C <sub>6</sub> , 99%)                                      | 0.1 g, 0.25 g, 0.5 g          |
| DLM-1193    | D-Mannose (1-D, 98%)   | Please inquire                |
| DLM-1194    | D-Mannose (2-D, 98%)   | Please inquire                |
| DLM-1195    | D-Mannose (6,6-D <sub>2</sub> , 98%)   | Please inquire                |
| CLM-1218    | L-Mannose (1- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-10491   | 3-O-Methyl-D-glucose ( <sup>12</sup> C <sub>6</sub> , 99.99%) <sup>13</sup> C depleted | Please inquire                |
| CLM-10492   | 3-O-Methyl-D-glucose ( <sup>13</sup> C <sub>6</sub> , 99%)                             | Please inquire                |
| CLM-10568   | L-Rhamnose·H <sub>2</sub> O (U- <sup>13</sup> C <sub>6</sub> , 99%)                    | Please inquire                |
| CLM-1196    | D-Ribitol (1- <sup>13</sup> C, 99%)  | Please inquire                |
| CLM-768     | D-Ribose (1- <sup>13</sup> C, 99%)   | 0.25 g, 0.5 g, 1 g            |
| CLM-1069    | D-Ribose (2- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-1066    | D-Ribose (5- <sup>13</sup> C, 99%)   | 0.25 g, 0.5 g, 1 g            |
| CLM-4602    | D-Ribose (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                                     | Please inquire                |
| CLM-4830    | D-Ribose (2,3,4,5- <sup>13</sup> C <sub>4</sub> , 99%)                                 | Please inquire                |
| CLM-3652    | D-Ribose (U- <sup>13</sup> C <sub>5</sub> , 98%)                                       | 0.1 mg, 0.1 g                 |
| DLM-1070    | D-Ribose (1-D, 98%)  | 0.25 g, 0.5 g, 1 g            |
| DLM-1197    | D-Ribose (2-D, 98%)  | Please inquire                |
| DLM-6559    | D-Ribose (3-D, 98%)  | Please inquire                |
| DLM-7778    | D-Ribose (5,5-D <sub>2</sub> , 98%)  | Please inquire                |
| CLM-8780    | Sodium D-gluconate (1- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-8781    | Sodium D-gluconate (U- <sup>13</sup> C <sub>6</sub> , 99%)                             | Please inquire                |
| CLM-1565    | D-Sorbitol (1- <sup>13</sup> C, 99%)   | Please inquire                |
| CLM-8529    | D-Sorbitol (U- <sup>13</sup> C <sub>6</sub> , 98%)                                     | 0.1 g, 0.25 g                 |
| DLM-3320    | Sorbitol (1,1'-D <sub>2</sub> , 98%)   | Please inquire                |

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| Catalog No. | Description  | Unit Size          |
|-------------|--|--------------------|
| CLM-10823   | D-Sucrose (glucose-1,2- <sup>13</sup> C <sub>2</sub> , 99%)  | Please inquire     |
| CLM-9811    | D-Sucrose (fructose- <sup>13</sup> C <sub>6</sub> , 98%)     | Please inquire     |
| CLM-8091    | D-Sucrose (glucose- <sup>13</sup> C <sub>6</sub> , 98%)      | 0.1 mg             |
| CLM-7757    | D-Sucrose ( <sup>13</sup> C <sub>12</sub> , 98%)             | Please inquire     |
| DLM-10939   | D-Sucrose (U-D <sub>22</sub> , 98%)                          | Please inquire     |
| CLM-1203    | D-Talitol (1- <sup>13</sup> C, 99%)                          | Please inquire     |
| CLM-1204    | D-Talose (2- <sup>13</sup> C, 99%)                           | Please inquire     |
| CLM-1139    | D-Threose (1- <sup>13</sup> C, 99%) 1.8% in H <sub>2</sub> O | Please inquire     |
| CLM-1207    | D-Threose (2- <sup>13</sup> C, 99%) 1.8% in H <sub>2</sub> O | Please inquire     |
| CLM-1295    | D-Xylitol (1- <sup>13</sup> C, 99%)                          | Please inquire     |
| CLM-1214    | D-Xylitol (5- <sup>13</sup> C, 99%)                          | Please inquire     |
| CLM-7608    | D-Xylitol (U- <sup>13</sup> C <sub>5</sub> , 99%)            | Please inquire     |
| DLM-9656    | D-Xylitol (1,1',2,3,4,5,5'-D <sub>7</sub> , 98%)             | Please inquire     |
| CLM-1140    | D-Xylose (1- <sup>13</sup> C, 99%)                           | 0.25 g, 0.5 g, 1 g |
| CLM-1524    | D-Xylose (2- <sup>13</sup> C, 99%)                           | 0.25 g, 0.5 g, 1 g |
| CLM-8593    | D-Xylose (3- <sup>13</sup> C, 99%)                           | Please inquire     |
| CLM-9083    | D-Xylose (4- <sup>13</sup> C, 99%)                           | Please inquire     |
| CLM-1219    | D-Xylose (5- <sup>13</sup> C, 99%)                           | 0.25 g, 0.5 g, 1 g |
| CLM-2456    | D-Xylose (1,2- <sup>13</sup> C <sub>2</sub> , 99%)           | 0.25 g, 0.5 g, 1 g |
| CLM-6140    | D-Xylose (U- <sup>13</sup> C <sub>5</sub> , 99%)             | 0.25 g, 0.5 g, 1 g |
| DLM-1215    | D-Xylose (1-D, 99%)  | Please inquire     |
| DLM-1216    | D-Xylose (2-D, 98%)  | Please inquire     |
| DLM-7121    | D-Xylose (D <sub>6</sub> , 98%)                              | Please inquire     |
| CLM-11008   | D-Xylulose (U- <sup>13</sup> C <sub>5</sub> , 98%)           | Please inquire     |
| CLM-11008   | D-Xylulose (U- <sup>13</sup> C <sub>5</sub> , 98%)           | Please inquire     |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Carnitine and Acylcarnitines

Carnitine and acylcarnitines play an essential role in fatty acid metabolism. Metabolism disorders of fatty acid oxidation and several organic acidurias impose major clinical manifestations (e.g., hypoketotic hypoglycemia, skeletal myopathy, liver disease, and/or failure). These are largely attributed to enzymatic deficiencies and can be monitored through carnitine/acylcarnitine measurement.

To help facilitate metabolic screening exercises, CIL is pleased to offer a variety of stable isotope-labeled and unlabeled carnitine/acylcarnitine standards. Please refer to [page 44](#) for a list of mix offerings; individual standards are noted below.

| Catalog No. | Description  | Abbreviation | Unit Size      |
|-------------|--|--------------|----------------|
| ULM-7801    | L-Carnitine (unlabeled)  | C0           | Please inquire |
| DLM-1871    | L-Carnitine·HCl (methyl-D <sub>3</sub> , 98%)  | C0           | 0.1 g          |
| DLM-3820    | L-Carnitine·HCl (dimethyl-D <sub>6</sub> , 98%)  | C0           | Please inquire |
| DLM-10962   | L-Carnitine·HCl (trimethyl-D <sub>9</sub> , 98%)   | C0           | 5 mg           |
| DLM-3555    | L-Carnitine (trimethyl-D <sub>9</sub> , 98%)   | C0           | Please inquire |
| DNLM-10613  | L-Carnitine (N,N,N-trimethyl-D <sub>9</sub> , 98%; <sup>15</sup> N, 98%)                                 | C0           | Please inquire |
| ULM-9173    | L-Carnitine·HCl (unlabeled)  | C0           | Please inquire |
| ULM-10431   | DL-Carnitine·HCl, O-acetyl (unlabeled)   | C2           | Please inquire |
| DLM-754     | L-Carnitine·HCl, O-acetyl (N-methyl-D <sub>3</sub> , 98%)  | C2           | 0.05 g         |
| DLM-3821    | L-Carnitine·HCl, O-acetyl (N,N-dimethyl-D <sub>6</sub> , 98%) CP 97%                                     | C2           | Please inquire |
| ULM-7802    | L-Carnitine·HCl, O-acetyl (unlabeled)  | C2           | Please inquire |
| ULM-10702   | DL-Carnitine·HCl, O-propionyl (unlabeled)  | C3           | Please inquire |
| DLM-3973    | L-Carnitine·HCl, O-propionyl (N-methyl-D <sub>3</sub> , 98%)   | C3           | 10 mg          |
| ULM-7705    | L-Carnitine·HCl, O-propionyl (unlabeled)   | C3           | Please inquire |
| DLM-11049   | L-Carnitine·ClO <sub>4</sub> , O-malonyl (D <sub>3</sub> , 98%) CP 95%                                   | C3-DC        | Please inquire |
| ULM-8743    | L-Carnitine·ClO <sub>4</sub> , O-malonyl (unlabeled) CP 97%  | C3-DC        | 0.1 mg         |
| ULM-10703   | DL-Carnitine·HCl, O-butyryl (unlabeled)  | C4           | Please inquire |
| DLM-3861    | L-Carnitine·HCl, O-butyryl (N-methyl-D <sub>3</sub> , 98%)   | C4           | 10 mg          |
| ULM-7704    | L-Carnitine·HCl, O-butyryl (unlabeled)   | C4           | Please inquire |
| DLM-11877   | L-Carnitine·HCl, O-methylmalonyl (N-methyl-D <sub>3</sub> , 98%) CP 90%                                  | C4-DC        | 0.1 mg         |
| ULM-12274   | L-Carnitine, O-methylmalonyl, lithium salt (unlabeled) in solution                                       | C4-DC        | Please inquire |
| DLM-11769   | L-Carnitine·HCl, O-3-hydroxybutyryl (N-methyl-D <sub>3</sub> , 98%) CP 95%                               | C4-OH        | Please inquire |
| ULM-8621    | L-Carnitine·ClO <sub>4</sub> , O-3-DL-hydroxybutyryl (unlabeled)   | C4-OH        | 0.1 mg         |
| ULM-10704   | DL-Carnitine·HCl, O-isovaleryl (unlabeled)   | C5           | Please inquire |
| DLM-3974    | L-Carnitine·HCl, O-isovaleryl (N,N,N-trimethyl-D <sub>9</sub> , 98%)                                     | C5           | 5 mg           |
| ULM-4697    | L-Carnitine·HCl, O-isovaleryl (unlabeled)  | C5           | Please inquire |
| DLM-12325   | L-Carnitine·ClO <sub>4</sub> , O-tiglyl (N,N,N-trimethyl-D <sub>9</sub> , 98%) CP 90%                    | C5:1         | Please inquire |
| ULM-11154   | L-Carnitine, O-tiglyl (unlabeled) CP 94%   | C5:1         | Please inquire |
| DLM-3975    | L-Carnitine·ClO <sub>4</sub> , O-glutaryl (N-methyl-D <sub>3</sub> , 98%) CP 97%                         | C5-DC        | 0.1 mg         |
| ULM-7594    | L-Carnitine·ClO <sub>4</sub> , O-glutaryl (unlabeled)  | C5-DC        | 0.1 mg         |
| DLM-8272    | L-Carnitine·ClO <sub>4</sub> , 3-hydroxyisovaleryl (N-methyl-D <sub>3</sub> , 98%)                       | C5-OH        | 1 mg           |
| ULM-8237    | L-Carnitine·ClO <sub>4</sub> , 3-hydroxyisovaleryl (unlabeled)   | C5-OH        | 0.1 mg         |
| DLM-9276    | L-Carnitine·HCl, O-hexanoyl (N-methyl-D <sub>3</sub> , 98%)  | C6           | 0.1 mg         |
| ULM-7198    | L-Carnitine·HCl, O-hexanoyl (unlabeled)  | C6           | Please inquire |
| ULM-10432   | DL-Carnitine·HCl, O-octanoyl (unlabeled)   | C8           | Please inquire |
| DLM-755     | L-Carnitine·HCl, O-octanoyl (N-methyl-D <sub>3</sub> , 98%)  | C8           | 10 mg          |
| ULM-7770    | L-Carnitine·HCl, O-octanoyl (unlabeled)  | C8           | Please inquire |
| DLM-9067    | L-Carnitine·HCl, O-decanoyl (N-methyl-D <sub>3</sub> , 98%)  | C10          | 0.1 mg         |
| CNLM-11665  | L-Carnitine·HCl, O-decanoyl (trimethyl- <sup>13</sup> C <sub>3</sub> , 98%; <sup>15</sup> N, 98%) CP 95% | C10          | 1 mg           |
| ULM-7195    | L-Carnitine·HCl, O-decanoyl (unlabeled)  | C10          | Please inquire |
| DLM-8746    | L-Carnitine·HCl, O-2-decenoyl (N,N,N-trimethyl-D <sub>9</sub> , 98%) 95% E                               | C10:1        | Please inquire |
| ULM-8198    | L-Carnitine·HCl, O-2-decenoyl (unlabeled)  | C10:1        | 0.1 mg         |
| DLM-8162    | L-Carnitine·HCl, O-dodecanoyl (N-methyl-D <sub>3</sub> , 98%)  | C12          | 0.1 mg         |
| DLM-8215    | L-Carnitine·HCl, O-dodecanoyl (N,N,N-trimethyl-D <sub>9</sub> , 98%)                                     | C12          | 0.1 mg         |
| ULM-7199    | L-Carnitine·HCl, O-dodecanoyl (unlabeled)  | C12          | 0.1 mg         |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.



| Catalog No. | Description  | Abbreviation | Unit Size      |
|-------------|--|--------------|----------------|
| ULM-10705   | DL-Carnitine·HCl, <i>O</i> -myristoyl (unlabeled)  | C14          | Please inquire |
| DLM-4425    | L-Carnitine·HCl, <i>O</i> -myristoyl ( <i>N,N,N</i> -trimethyl-D <sub>9</sub> , 98%)                                 | C14          | 5 mg           |
| ULM-7737    | L-Carnitine·HCl, <i>O</i> -myristoyl (unlabeled)   | C14          | Please inquire |
| DLM-12326   | L-Carnitine·ClO <sub>4</sub> , tetradec-5- <i>cis</i> -enoyl ( <i>N,N,N</i> -trimethyl-D <sub>9</sub> , 98%) CP 90%  | C14:1        | Please inquire |
| ULM-11318   | L-Carnitine·ClO <sub>4</sub> , tetradec-5- <i>cis</i> -enoyl (unlabeled) CP 90%                                      | C14:1        | Please inquire |
| ULM-10433   | DL-Carnitine·HCl, <i>O</i> -palmitoyl (unlabeled) CP 97%   | C16          | Please inquire |
| DLM-1263    | L-Carnitine·HCl, <i>O</i> -palmitoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)  | C16          | 10 mg          |
| ULM-7738    | L-Carnitine·HCl, <i>O</i> -palmitoyl (unlabeled)   | C16          | Please inquire |
| DLM-9189    | L-Carnitine·ClO <sub>4</sub> , <i>O</i> -3-DL-hydroxypalmitoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)              | C16-OH       | 0.1 mg         |
| ULM-8620    | L-Carnitine·ClO <sub>4</sub> , <i>O</i> -3-DL-hydroxypalmitoyl (unlabeled) CP 97%                                    | C16-OH       | 0.1 mg         |
| DLM-8271    | L-Carnitine·HCl, <i>O</i> -octadecanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)                                     | C18          | 0.1 mg         |
| CNLM-11666  | L-Carnitine·HCl, <i>O</i> -octadecanoyl (trimethyl- <sup>13</sup> C <sub>3</sub> , 98%; <sup>15</sup> N, 98%) CP 95% | C18          | 1 mg           |
| ULM-7196    | L-Carnitine·HCl, <i>O</i> -octadecanoyl (unlabeled) CP 97%   | C18          | 0.1 mg         |
| DLM-11715   | L-Carnitine·HCl, <i>O</i> -hydroxyoctadecanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 95%) CP 95%                       | C18-OH       | 0.1 mg         |
| DLM-6718    | L-Carnitine·HCl, <i>O</i> -hexacosanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%) CP 95%                              | C26          | Please inquire |
| DLM-11174   | L-Carnitine·HCl, <i>O</i> -hexacosanoyl ( <i>N,N,N</i> -trimethyl-D <sub>9</sub> , 98%) CP 95% (may contain solvent) | C26          | Please inquire |
| ULM-6719    | L-Carnitine·HCl, <i>O</i> -hexacosanoyl (unlabeled) CP 95%   | C26          | Please inquire |
| DLM-11594   | L-Carnitine, <i>O</i> -hexacosanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%) CP 95%                                  | C26          | 1 mg           |
| DLM-11741   | L-carnitine, <i>O</i> -hexacosanoyl perchlorate ( <i>N</i> -methyl-D <sub>3</sub> , 98%) CP 95%                      | C26          | Please inquire |

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## Drugs and Their Metabolites

The field and scope of drug screening/analysis continues to expand worldwide. Example areas of focus include therapeutic drug monitoring, drugs of abuse, prescription monitoring, and clinical toxicology. The nature of those monitored or identified in the MS-based analysis include psychoactive drugs (e.g., benzodiazepines, cannabinoids, hallucinogens), pain-management drugs (e.g., analgesics, opiates, skeletal muscle relaxants), disorder-related treatment drugs (e.g., anticonvulsants/antiepileptics, antipsychotics, erectile dysfunction), and infectious disease or disease-related treatment drugs (e.g., antibiotics, antiarrhythmics).

CIL is pleased to offer a broad collection of unlabeled and stable isotope-labeled standards to aid the qualitative/quantitative analysis of drugs and their metabolites. These encompass a multitude of classes (e.g., analgesics, benzodiazepines, cannabinoids and its agonists, opiate and opioid analgesics, stimulants). The offerings are individual standards and/or class-specific mixtures in predominantly their concentrated solution form.

### Amphetamines

| Catalog No. | Description   | Concentration        | Unit Size |
|-------------|---|----------------------|-----------|
| CLM-10393-B | DL-MDEA-HCl (ring- $^{13}\text{C}_6$ , 98%) CP 95%            | 50 µg/mL in methanol | 1 mL      |
| CLM-10390-B | DL-Methamphetamine-HCl (ring- $^{13}\text{C}_6$ , 98%) CP 95% | 50 µg/mL in methanol | 1 mL      |

### Analgesics

| Catalog No.   | Description  | Concentration             | Unit Size      |
|---------------|--|---------------------------|----------------|
| CLM-2436      | Acetaminophen (carbonyl- $^{13}\text{C}$ , 99%)                        | neat                      | Please inquire |
| CLM-10619     | Acetaminophen (ring- $^{13}\text{C}_6$ , 98%)                          | neat                      | 1 mg           |
| CNLM-3726-1.2 | Acetaminophen (acetyl- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 98%) | 100 µg/mL in acetonitrile | 1.2 mL         |
| CNLM-3726     | Acetaminophen (acetyl- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 98%) | neat                      | 1 g            |
| ULM-7629-1.2  | Acetaminophen (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL         |
| CLM-630       | Aminopyrine ( <i>N,N</i> -dimethyl- $^{13}\text{C}_2$ , 99%)           | neat                      | 1 g            |
| CLM-1296      | Phenacetin (ethoxy- $^{13}\text{C}$ , 99%)                             | neat                      | 0.5 g, 1 g     |

### Antibiotics

| Catalog No.       | Description  | Concentration                                       | Unit Size      |
|-------------------|--|---|----------------|
| CLM-123           | Erythromycin ( <i>N</i> -methyl- $^{13}\text{C}$ , 99%)                            | neat  | 1 g            |
| CDLM-10030-MT-1.2 | Erythromycin ( <i>N</i> -methyl- $^{13}\text{C}$ , 99%; $\text{D}_3$ , 98%) CP 97% | 100 µg/mL in methyl- <i>tert</i> butyl ester (MTBE) | 1.2 mL         |
| CLM-165           | Erythromycin, lactobionate salt ( <i>N</i> -methyl- $^{13}\text{C}$ , 99%)         | neat  | 1 g            |
| CLM-3758          | Erythromycin, lactobionate salt ( <i>N,N</i> -dimethyl- $^{13}\text{C}_2$ , ~90%)  | neat  | Please inquire |
| CLM-3045-1.2      | Sulfamethazine (phenyl- $^{13}\text{C}_6$ , 99%)                                   | 100 µg/mL in acetonitrile                           | 1.2 mL         |
| CLM-3045          | Sulfamethazine (phenyl- $^{13}\text{C}_6$ , 99%)                                   | neat  | 10 mg          |
| ULM-7220-1.2      | Sulfamethazine (unlabeled)   | 100 µg/mL in acetonitrile                           | 1.2 mL         |
| CLM-7988-A-1.2    | Trimethoprim (pyrimidine-4,5,6- $^{13}\text{C}_3$ , 99%)                           | 50 µg/mL in methanol                                | 1.2 mL         |
| ULM-7989-A-1.2    | Trimethoprim (unlabeled)   | 50 µg/mL in methanol                                | 1.2 mL         |

### Anticonvulsants/Antiepileptics

| Catalog No.  | Description  | Concentration         | Unit Size      |
|--------------|--|-----------------------|----------------|
| DLM-3025     | 5,5-Diphenylhydantoin (phenyl- $\text{D}_5$ , 98%)                             | neat                  | 10 mg          |
| DLM-324      | 5,5-Diphenylhydantoin (diphenyl- $\text{D}_{10}$ , 98%)                        | neat                  | 0.01 g, 0.1 g  |
| CNLM-411-1.2 | 5,5-Diphenylhydantoin (2- $^{13}\text{C}$ , 99%; 1,3- $^{15}\text{N}_2$ , 98%) | 100 µg/mL in methanol | 1.2 mL         |
| CNLM-411     | 5,5-Diphenylhydantoin (2- $^{13}\text{C}$ , 99%; 1,3- $^{15}\text{N}_2$ , 98%) | neat                  | 0.01 g, 0.05 g |
| ULM-8533-1.2 | 5,5-Diphenylhydantoin (unlabeled)  | 100 µg/mL in methanol | 1.2 mL         |
| CNLM-7633    | Lamotrigine (5,6- $^{13}\text{C}_2$ , 99%; 5-amino- $^{15}\text{N}$ , 98%)     | neat                  | 10 mg          |

### Antidepressants

| Catalog No. | Description   | Concentration | Unit Size      |
|-------------|---|---------------|----------------|
| DLM-2762    | Amitriptyline-HCl ( <i>N</i> -methyl- $\text{D}_3$ , 98%) | neat          | Please inquire |
| DLM-2790    | Buspirone-HCl (butyl- $\text{D}_8$ , 98%)                 | neat          | Please inquire |
| DLM-3020    | Desipramine-HCl (2,4,6,8- $\text{D}_4$ , 98%)             | neat          | 5 mg           |
| DLM-3035    | Imipramine-HCl (2,4,6,8- $\text{D}_4$ , 98%) CP 97%       | neat          | 2 mg           |
| DLM-3038    | Nortriptyline-HCl (methyl- $\text{D}_3$ , 98%)            | neat          | 5 mg, 0.1 g    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Antipsychotics

| Catalog No. | Description  | Concentration | Unit Size   |
|-------------|--|---------------|-------------|
| DLM-2816    | Clozapine (4-methylpiperazinyl-D <sub>4</sub> , 97%) | neat          | 5 mg, 10 mg |

## Barbituates

| Catalog No. | Description  | Concentration | Unit Size      |
|-------------|--|---------------|----------------|
| DLM-433     | Phenobarbital (ethyl-D <sub>5</sub> , 98%)                                 | neat          | 0.1 g          |
| DLM-2659    | DL-Secobarbital (1-methyl-D <sub>3</sub> , butyl-2,2-D <sub>2</sub> , 98%) | neat          | Please inquire |

## Benzodiazepines

| Catalog No. | Description   | Concentration        | Unit Size      |
|-------------|---|----------------------|----------------|
| CLM-10630-B | Clobazam (ring-[ $\chi$ ]- <sup>13</sup> C <sub>6</sub> , 98%) CP 95%     | 50 µg/mL in methanol | 1 mL           |
| CLM-10631-B | Clonazepam (ring-[ $\alpha$ ]- <sup>13</sup> C <sub>6</sub> , 98%) CP 95% | 50 µg/mL in methanol | 1 mL           |
| CLM-10632-B | Diazepam (ring-[ $\alpha$ ]- <sup>13</sup> C <sub>6</sub> , 98%) CP 95%   | 50 µg/mL in methanol | 1 mL           |
| DLM-1886    | Diazepam (phenyl-D <sub>5</sub> , 98%)                                    | neat                 | Please inquire |
| DLM-1885    | Nordiazepam (phenyl-D <sub>5</sub> , 98%)                                 | neat                 | Please inquire |
| DLM-1888    | Oxazepam (phenyl-D <sub>5</sub> , 98%)                                    | neat                 | Please inquire |
| CLM-10640-B | Triazolam (ring-[ $\alpha$ ]- <sup>13</sup> C <sub>6</sub> , 98%) CP 95%  | 50 µg/mL in methanol | 1 mL           |

## Cannabinoids and Its Agonists

| Catalog No.   | Description  | Concentration          | Unit Size      |
|---------------|--|------------------------|----------------|
| DLM-10854-1.2 | Cannabichromene (CBC) (methyl-D <sub>3</sub> , 98%)                      | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10854     | Cannabichromene (CBC) (methyl-D <sub>3</sub> , 98%)                      | neat                   | Please inquire |
| ULM-10878-1.2 | Cannabichromene (CBC) (unlabeled)  | 1000 µg/mL in methanol | 1.2 mL         |
| DLM-10855-1.2 | Cannabidiol (CBD) (D <sub>3</sub> , 98%)                                 | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10855     | Cannabidiol (CBD) (D <sub>3</sub> , 98%)                                 | neat                   | Please inquire |
| ULM-10876-1.2 | Cannabidiol (CBD) (unlabeled)  | 1000 µg/mL in methanol | 1.2 mL         |
| DLM-11140-1.2 | Cannabidivarin (CBDV) (methyl-D <sub>3</sub> , 98%)                      | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-11140     | Cannabidivarin (CBDV) (methyl-D <sub>3</sub> , 98%)                      | neat                   | Please inquire |
| DLM-10853-1.2 | Cannabigerol (CBG) (methyl-D <sub>3</sub> , 98%)                         | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10853     | Cannabigerol (CBG) (methyl-D <sub>3</sub> , 98%)                         | neat                   | Please inquire |
| ULM-10877-1.2 | Cannabigerol (CBG) (unlabeled)   | 1000 µg/mL in methanol | 1.2 mL         |
| DLM-10847-1.2 | Cannabinol (CBN) (methyl-D <sub>3</sub> , 98%)                           | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10847     | Cannabinol (CBN) (methyl-D <sub>3</sub> , 98%)                           | neat                   | Please inquire |
| ULM-10875-1.2 | Cannabinol (CBN) (unlabeled)   | 1000 µg/mL in methanol | 1.2 mL         |
| DLM-10915-1.2 | Cannabivarin (CBV) (methyl D <sub>3</sub> , 98%) CP 97%                  | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10915     | Cannabivarin (CBV) (methyl-D <sub>3</sub> , 98%) CP 97%                  | neat                   | Please inquire |
| ULM-10916-1.2 | Cannabivarin (CBV) (unlabeled) CP 97%                                    | 1000 µg/mL in methanol | 1.2 mL         |
| DLM-10846-1.2 | (-)- $\Delta^9$ -(THC) (methyl-D <sub>3</sub> , 98%)                     | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10707-1.2 | Tetrahydrocannabivarin (THCV) (propyl-3,3,3-D <sub>3</sub> , 98%) CP 97% | 100 µg/mL in methanol  | 1.2 mL         |
| DLM-10707     | Tetrahydrocannabivarin (THCV) (propyl-3,3,3-D <sub>3</sub> , 98%) CP 97% | neat                   | Please inquire |

## Cardiac Drugs

| Catalog No.  | Description  | Concentration         | Unit Size      |
|--------------|--|-----------------------|----------------|
| DLM-1287-1.2 | Clonidine·HCl (4,4,5,5-imidazoline-D <sub>4</sub> , 98%)                                 | 100 µg/mL in methanol | 1.2 mL         |
| DLM-1287     | Clonidine·HCl (4,4,5,5-imidazoline-D <sub>4</sub> , 98%) CP 95%                          | neat                  | 5 mg, 10 mg    |
| DLM-2745     | Enalapril maleate (phenyl-D <sub>5</sub> , 98%)  | neat                  | Please inquire |
| CNLM-10539   | Mecamylamine·HCl (tetramethyl- <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N, 98%) | neat                  | 1 mg, 10 mg    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Drugs and Their Metabolites (continued)

## Hallucinogens

| Catalog No. | Description  | Concentration | Unit Size     |
|-------------|--|---------------|---------------|
| DLM-2646    | 5-Methoxytryptamine-HCl ( $\alpha,\alpha,\beta,\beta$ -D <sub>4</sub> , 98%) | neat          | 0.01 g, 0.1 g |

## Immunosuppressants

| Catalog No. | Description                                      | Concentration         | Unit Size         |
|-------------|--|-----------------------|-------------------|
| DLM-9855    | Everolimus (2-hydroxyethyl-D <sub>4</sub> , 98%) | neat                  | 1 mg              |
| ULM-9856-C  | Everolimus (unlabeled)                           | 100 µg/mL in methanol | 1 mL              |
| ULM-9856    | Everolimus (unlabeled)                           | neat                  | 10 mg             |
| DLM-9220    | Rapamycin (D <sub>3</sub> , 98%)                 | neat                  | 1 mg, 5 mg, 10 mg |

## Opiate and Opiod Analgesics

| Catalog No.  | Description   | Concentration         | Unit Size      |
|--------------|---|-----------------------|----------------|
| CNLM-10389-B | Codeine (9,10,15,16- <sup>13</sup> C <sub>4</sub> , 98%; <sup>15</sup> N, 98%) CP 95% | 50 µg/mL in methanol  | 1 mL           |
| DLM-1881SA   | Morphine-H <sub>2</sub> O (N-methyl-D <sub>3</sub> , 98%)                             | 0.1 mg/mL in methanol | Please inquire |
| CLM-7491     | cis-(±)-Tramadol-HCl (methoxy- <sup>13</sup> C, 99%)                                  | neat                  | Please inquire |

## Other Compounds

| Catalog No. | Description   | Concentration         | Unit Size      |
|-------------|---|-----------------------|----------------|
| DLM-10575   | Aldox (D <sub>6</sub> , 98%) CP 96%   | neat                  | Please inquire |
| DLM-10574   | Alexidine-2HCl (D <sub>10</sub> , 98%) CP 97%   | neat                  | Please inquire |
| CLM-6585    | Aspirin (acetyl-1- <sup>13</sup> C, 99%)  | neat                  | Please inquire |
| CLM-3655    | Azidothymidine (AZT) (methyl- <sup>13</sup> C, 99%) CP 96%  | neat                  | 10 mg          |
| CLM-10608   | 1,2-Benzisothiazol-3(2H)-one (ring- <sup>13</sup> C <sub>6</sub> , 95%) CP 95%                      | neat                  | Please inquire |
| DLM-1566    | Benzotropine mesylate (N-methyl-D <sub>3</sub> , 98%) CP 95%  | neat                  | 10 mg          |
| CLM-1608    | Chloral hydrate (trichloromethyl- <sup>13</sup> C, 97%)   | neat                  | 10 mg          |
| DLM-10609   | 5-Chloro-2-methyl-4-isothiazolin-3-one (N-methyl-D <sub>3</sub> , 98%)                              | neat                  | Please inquire |
| CLM-10642   | p-Coumaric acid (propyl- <sup>13</sup> C <sub>3</sub> , 99%)  | neat                  | 1 mg, 5 mg     |
| DLM-7504    | Dexamethasone (4,6 $\alpha$ ,21,21-D <sub>4</sub> , 96%) may contain D at C-2                       | neat                  | Please inquire |
| CLM-3369    | Dopamine-HCl (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | neat                  | Please inquire |
| DLM-2181    | Dopamine-HCl (ring-D <sub>3</sub> , 98%)  | neat                  | 0.1 g          |
| DLM-2498    | Dopamine-HCl (1,1,2,2-D <sub>4</sub> , 97%)   | neat                  | 0.01 g, 0.1 g  |
| DLM-2744    | Enalaprilat-H <sub>2</sub> O (phenyl-D <sub>5</sub> , 98%)  | neat                  | Please inquire |
| CLM-10404   | Estradiol undecanoate (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                            | neat                  | 1 mg           |
| CLM-10405   | Fenoprofen, sodium salt, hydrate (ring- <sup>13</sup> C <sub>6</sub> , 99%)                         | neat                  | 1 mg           |
| DLM-3996    | Glybenclamide (cyclohexylamine-D <sub>11</sub> , 98%)   | neat                  | Please inquire |
| CLM-373     | Homovanillic acid (1,2- <sup>13</sup> C <sub>2</sub> , 98%)   | neat                  | 0.1 g          |
| DLM-2738    | Homovanillic acid (phenyl-D <sub>3</sub> , 2,2-D <sub>2</sub> , 96%)                                | neat                  | 0.1 g          |
| COLM-376    | Homovanillic acid (ring- <sup>13</sup> C <sub>6</sub> , 99%; 4-hydroxy- <sup>18</sup> O, 90%)       | neat                  | 10 mg          |
| DLM-10541   | Iopromide (N-methyl-D <sub>3</sub> , 98%)   | neat                  | 1 mg           |
| CLM-7118    | Ketoconazole (carbonyl- <sup>13</sup> C, 99%)   | neat                  | Please inquire |
| CNLM-10406  | Kevetrin-HCl ( <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N <sub>3</sub> , 98%) CP 95%       | neat                  | 1 mg           |
| DLM-7861    | Metformin-HCl (dimethyl-D <sub>6</sub> , 99%)   | neat                  | Please inquire |
| CLM-1280    | Methacetin (methoxy- <sup>13</sup> C, 99%)  | neat                  | 1 g, 10 g      |
| CLM-7522    | Naproxen, sodium salt (O-methyl- <sup>13</sup> C, 98%)  | neat                  | Please inquire |
| DLM-8609    | DL-Normetanephine-HCl ( $\alpha,\beta,\beta$ -D <sub>3</sub> , 98%)                                 | neat                  | 5 mg, 10 mg    |
| DLM-10618   | Obeticholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | neat                  | 1 mg           |
| ULM-10473-C | Stanozolol (unlabeled)  | 100 µg/mL in methanol | 1 mL           |
| CLM-7119    | Temozolomide (methyl- <sup>13</sup> C, 99%)   | neat                  | Please inquire |
| CNLM-9258   | 1,2,4-Triazole (3,5- <sup>13</sup> C <sub>2</sub> , 99%; 1,2,4- <sup>15</sup> N <sub>3</sub> , 98%) | neat                  | 1 mg, 5 mg     |

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## Stimulants

| Catalog No.  | Description   | Concentration             | Unit Size            |
|--------------|---|---------------------------|----------------------|
| CLM-10387-B  | DL-Amphetamine-HCl (ring- <sup>13</sup> C <sub>6</sub> , 98%) CP 95%        | 50 µg/mL in methanol      | 1 mL                 |
| CLM-728      | Caffeine (3-methyl- <sup>13</sup> C, 99%)                                   | neat                      | 0.5 g                |
| CLM-514-1.2  | Caffeine (trimethyl- <sup>13</sup> C <sub>3</sub> , 99%)                    | 100 µg/mL in methanol     | 1.2 mL               |
| CLM-514      | Caffeine (trimethyl- <sup>13</sup> C <sub>3</sub> , 99%)                    | neat                      | 1 g                  |
| NLM-332      | Caffeine (1,3- <sup>15</sup> N <sub>2</sub> , 99%)                          | neat                      | Please inquire       |
| CNLM-333     | Caffeine (2- <sup>13</sup> C, 99%; 1,3- <sup>15</sup> N <sub>2</sub> , 98%) | neat                      | 0.1 g                |
| ULM-7653-1.2 | Caffeine (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL               |
| DLM-1819-1.2 | DL-Cotinine (methyl-D <sub>3</sub> , 98%)                                   | 100 µg/mL in acetonitrile | 1.2 mL               |
| DLM-1819     | DL-Cotinine (methyl-D <sub>3</sub> , 98%)                                   | neat                      | 0.01 g, 0.1 g, 0.5 g |
| CLM-3914-1.2 | DL-Nicotine (3',4',5'- <sup>13</sup> C <sub>3</sub> , 99%)                  | 100 µg/mL in acetonitrile | 1.2 mL               |
| CLM-3914     | DL-Nicotine (3',4',5'- <sup>13</sup> C <sub>3</sub> , 99%)                  | neat                      | 0.1 g                |
| DLM-1818     | DL-Nicotine (methyl-D <sub>3</sub> , 98%)                                   | neat                      | 0.1 g, 0.5 g         |
| DLM-9017     | DL-Nornicotine (pyridine-D <sub>4</sub> , 98%)                              | neat                      | Please inquire       |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Fatty Acids and Lipids

Fatty acids and lipids are important biological compounds that are essential to the regulation and control of cellular functions and metabolic pathways. These biomolecules are also tied to the energetic balance of an organism. Their qualitative/quantitative analysis has emerged to better understand the underlying pathophysiology, as well as to identify new biomarkers or diagnose existing ones.

To aid such research initiatives, CIL is pleased to offer a multitude of stable isotope-labeled and unlabeled fatty acids and lipids. The fatty acids cover saturated and unsaturated classes, while the lipids include ceramides (e.g., *N*-palmitoyl-D-sphingosine, *N*-oleoyl-D-sphingosine), and phospholipids (e.g., dodecylphosphocholine, dipalmitoyl phosphatidylcholine), as well as triacylglycerides (e.g., tripalmitin, tristearin, triolein). These are available in various labeling patterns (i.e., uniform, partial), forms (i.e., free acid, salt, ester), and material grades (i.e., research, MPT).

| Catalog No. | Description  | Unit Size            |
|-------------|--|----------------------|
| DLM-10481   | Arachidic acid (2,2-D <sub>2</sub> , 98%)  | Please inquire       |
| DLM-1234    | Arachidic acid (methyl-D <sub>3</sub> , 98%) CP 97%  | 0.1 g                |
| DLM-10519   | Arachidic acid (12,12,13,13-D <sub>4</sub> , 98%)  | 0.1 g, 0.25 g        |
| DLM-1233    | Arachidic acid (D <sub>39</sub> , 98%)   | 1 g                  |
| DLM-1661-N  | Arachidonic acid (5,6,8,9,11,12,14,15-D <sub>8</sub> , 98%)  | 5 mg                 |
| DLM-11670   | Arachidonic acid (d16,16,17,17,8,18,19,19,20,20-D <sub>11</sub> , 98%) CP 95%  | 1 mg                 |
| ULM-10272   | Arachidonic acid (unlabeled)   | Please inquire       |
| CLM-9666    | Butyric acid (1- <sup>13</sup> C, 99%)   | 1 g                  |
| CLM-9215    | Butyric acid ( <sup>13</sup> C <sub>4</sub> , 99%)   | 0.1 g                |
| DLM-1110    | Butyric acid (3,3,4,4,4-D <sub>5</sub> , 97%)  | Please inquire       |
| DLM-1508    | Butyric acid (D <sub>7</sub> , 98%)  | 5 g                  |
| CLM-9768    | Butyryl coenzyme A, lithium salt (butyryl- <sup>13</sup> C <sub>4</sub> , 99%) CP 95% (in solution)  | Please inquire       |
| DLM-10279   | Coenzyme Q10 (ubiquinone) (dimethoxy-D <sub>6</sub> , methyl-D <sub>3</sub> , 98%) CP 97%  | 1 mg, 5 mg           |
| DLM-2006    | Decanoic acid (methyl-D <sub>3</sub> , 98%)  | 0.5 g, 1 g           |
| DLM-270     | Decanoic acid (D <sub>19</sub> , 98%)  | 1 g                  |
| DLM-1002    | <i>N</i> -Decanol (D <sub>21</sub> , 98%)  | 1 g                  |
| ULM-9721    | <i>N</i> -Decanoyl-D-sphingosine (ceramide d18:1/10:0) (unlabeled) CP 97%  | Please inquire       |
| DLM-677-1.2 | Dibenz[ <i>A,H</i> ]anthracene (D <sub>14</sub> , 98%) 200 µg/mL in toluene-d <sub>8</sub>   | 1.2 mL               |
| DLM-677     | Dibenz[ <i>A,H</i> ]anthracene (D <sub>14</sub> , 98%)   | 0.01 g, 0.1 g, 0.5 g |
| DLM-11092   | 1,2-Diheptanoyl- <i>sn</i> -glycero-3-phosphocholine (heptanoyl-D <sub>26</sub> , 97%; 50-60% on alpha carbons)                                  | 100 mg               |
| DLM-11085   | 1,2-Dihexanoyl- <i>sn</i> -glycero-3-phosphocholine (hexanoyl-D <sub>22</sub> , 97%; 50-60% on alpha carbons)                                    | 100 mg               |
| DLM-11093   | 1,2-Dimyrystoyl- <i>sn</i> -glycero-3-phosphocholine (dimyrystoyl-D <sub>54</sub> , 97%; 50-60% on alpha carbons)                                | 100 mg               |
| DLM-11097   | 1,2-Dimyrystoyl- <i>sn</i> -glycero-3-phosphoglycerol, ammonium salt (dimyrystoyl-D <sub>54</sub> , 99%; 50-60% on alpha carbons)                | 100 mg               |
| DLM-11094   | 1,2-Dipalmitoyl- <i>sn</i> -glycero-3-phosphocholine (dipalmitoyl-D <sub>62</sub> , 97%; 50-60% on alpha carbons)                                | 100 mg               |
| DLM-11098   | 1,2-Dipalmitoyl- <i>sn</i> -glycero-3-phosphoethanolamine (dipalmitoyl-D <sub>62</sub> , 97%; 50-60% at alpha carbon)                            | 100 mg               |
| DLM-11099   | 1,2-Dipalmitoyl- <i>sn</i> -glycero-3-phosphoserine, ammonium salt (dipalmitoyl-D <sub>62</sub> , 97%; 50-60% on alpha carbons)                  | 50 mg                |
| DLM-11093   | 1,2-Dimyrystoyl- <i>sn</i> -glycero-3-phosphocholine (DMPC) (dimyrystoyl-D <sub>54</sub> , 99%; 50-60% on alpha carbons)                         | 0.1 g                |
| DLM-11095   | 1,2-Dioleoyl- <i>sn</i> -glycero-3-phosphocholine (dioleoyl-D <sub>64</sub> , 97%; 50-60% on alpha, vinyl carbons)                               | 50 mg                |
| CLM-8388    | Docosahexaenoic acid (DHA) (U- <sup>13</sup> C <sub>22</sub> , 99%) may contain 5% docosapentaenoic acid or "DPA"                                | 1 mg, 5 mg           |
| DLM-10012   | Docosahexaenoic acid (DHA) (21,21,22,22,22-D <sub>5</sub> , 98%)   | 1 mg, 5 mg           |
| ULM-10013   | Docosahexaenoic acid (DHA) (unlabeled)   | 1 mg, 5 mg           |
| DLM-10015   | Docosahexaenoic acid, ethyl ester (DHA ethyl ester) (21,21,22,22,22-D <sub>5</sub> , 98%) CP 95%   | Please inquire       |
| ULM-10016   | Docosahexaenoic acid, ethyl ester (DHA ethyl ester) (unlabeled) CP 95%   | Please inquire       |
| CLM-8398    | Docosahexaenoic acid, methyl ester (DHA methyl ester) (DHA U- <sup>13</sup> C <sub>22</sub> , 99%) may contain 5% docosapentaenoic acid or "DPA" | 1 mg, 5 mg           |
| DLM-10014   | Docosahexaenoic acid, methyl ester (DHA methyl ester) (21,21,22,22,22-D <sub>5</sub> , 98%) CP 97%   | 1 mg                 |
| CLM-9909    | Docosanoic acid (1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%   | Please inquire       |
| DLM-9180    | Docosanoic acid (22,22,22-D <sub>3</sub> , 98%)  | Please inquire       |
| DLM-9951    | Docosanoic acid (3,3,5,5-D <sub>4</sub> , 98%) CP 95%  | Please inquire       |
| DLM-10503   | Docosanoic acid (12,12,13,13-D <sub>4</sub> , 98%)   | 0.1 g, 0.25 g        |
| DLM-4703    | Docosanoic acid (D <sub>43</sub> , 98%)  | Please inquire       |
| DLM-738     | <i>N</i> -Dodecanol (D <sub>25</sub> , 98%)  | 0.5 g, 1 g           |

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| Catalog No. | Description  | Unit Size                  |
|-------------|--|----------------------------|
| DLM-2274    | Dodecylphosphocholine (D <sub>38</sub> , 98%)  | 0.1 mg, 0.5 g              |
| DLM-9720    | <i>cis</i> -5,8,11,14,17-Eicosapentaenoic acid (19,19,20,20,20-D <sub>5</sub> , 98%)                             | 1 mg, 5 mg                 |
| ULM-10024   | <i>cis</i> -5,8,11,14,17-Eicosapentaenoic acid (unlabeled)   | 1 mg, 5 mg                 |
| DLM-10558   | Eicosapentaenoic acid, ethyl ester (19,19,20,20,20-D <sub>5</sub> , 98%) CP 95%                                  | Please inquire             |
| DLM-10559   | <i>cis</i> -5,8,11,14,17-Eicosapentaenoic acid, methyl ester (19,19,20,20,20-D <sub>5</sub> , 98%) CP 95%        | 1 mg                       |
| DLM-10667   | Ethyl hexacosanoate (hexacosanoyl-12,12,13,13-D <sub>4</sub> , 98%)  | Please inquire             |
| CLM-8274    | Ethyl hexanoate (hexanoate- <sup>13</sup> C <sub>6</sub> , 99%)  | Please inquire             |
| DLM-6013    | Ethylmalonic acid (methyl-D <sub>3</sub> , 98%)  | 0.1 g                      |
| CLM-11683   | <i>sn</i> -Glycerol 3-phosphate, disodium salt (glycerol- <sup>13</sup> C <sub>3</sub> , 99%) CP 95%             | 1 mg                       |
| DLM-1308    | Heptadecanoic acid (methyl-D <sub>3</sub> , 98%)   | 0.1 g                      |
| DLM-6905    | Heptadecanoic acid (D <sub>33</sub> , 98%)   | 0.25 g, 0.5 g              |
| DLM-1820    | Heptanoic acid (2,2,3,3-D <sub>4</sub> , 98%)  | Please inquire             |
| DLM-2731    | Heptanoic acid (D <sub>13</sub> , 98%)   | 0.5 g                      |
| CLM-9790    | Hexacosanoic acid (1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)  | Please inquire             |
| DLM-9953    | Hexacosanoic acid (3,3,5,5-D <sub>4</sub> , 98%) CP 95%  | Please inquire             |
| DLM-8510    | Hexacosanoic acid (12,12,13,13-D <sub>4</sub> , 98%)   | 0.1 g                      |
| CLM-3519    | Hexanoic acid (1- <sup>13</sup> C, 99%)  | 0.5 g                      |
| DLM-3030    | Hexanoic acid (2,2-D <sub>2</sub> , 98%)   | Please inquire             |
| DLM-612     | Hexanoic acid (methyl-D <sub>3</sub> , 98%)  | 0.1 g, 0.5 g, 1 g          |
| DLM-11023   | Hexanoic acid (4,4,5,5,6,6,6-D <sub>7</sub> , 98%)   | Please inquire             |
| DLM-277     | Hexanoic acid (D <sub>11</sub> , 98%)  | 0.1 g, 1 g                 |
| DLM-11424   | 2-Hexyldecanoic acid (D <sub>31</sub> , 98%) CP 97%  | Please inquire             |
| DLM-2922    | DL-3-Hydroxymyristic acid (2,2,3,4,4-D <sub>5</sub> , 96%)   | Please inquire             |
| CLM-2095    | Isovaleric acid (1- <sup>13</sup> C, 99%)  | 1 g                        |
| CLM-10348   | Isovaleric acid (2,3,4- <sup>13</sup> C <sub>3</sub> , 3-methyl- <sup>13</sup> C, 99%)                           | Please inquire             |
| DLM-2938    | Isovaleric acid (D <sub>9</sub> , 98%)   | Please inquire             |
| CLM-1586    | Lauric acid (1- <sup>13</sup> C, 99%)  | 1 g, 5 g                   |
| DLM-3062    | Lauric acid (methyl-D <sub>3</sub> , 99%)  | 0.5 g, 1 g                 |
| DLM-563     | Lauric acid (D <sub>23</sub> , 98%)  | 1 g                        |
| CLM-9688    | Linoleic acid (18:2) (1- <sup>13</sup> C, 99%)   | 1 g                        |
| CLM-6855    | Linoleic acid (18:2) (U- <sup>13</sup> C <sub>18</sub> , 98%) CP 94% (<10% <i>cis/trans</i> isomer)              | 0.1 mg, 0.1 g, 0.25 g, 1 g |
| CLM-2119    | Linoleic acid (18:2), ethyl ester (1- <sup>13</sup> C, 99%)  | Please inquire             |
| CLM-3960    | Linoleic acid (18:2), ethyl ester (U-linoleate- <sup>13</sup> C <sub>18</sub> , 98%) CP 95%                      | 0.5 g                      |
| DLM-227     | Linoleic acid (18:2), ethyl ester (17,17,18,18,18-D <sub>5</sub> , 98%)  | Please inquire             |
| DLM-766     | Linoleic acid (18:2), ethyl ester (D <sub>31</sub> , 98%) CP 95%   | Please inquire             |
| CLM-8395    | Linoleic acid (18:2), methyl ester (U-linoleate- <sup>13</sup> C <sub>18</sub> , 98%) CP 95%                     | 0.1 g, 0.25 g, 1 g         |
| DLM-9663    | Linoleic acid (18:2), methyl ester (D <sub>31</sub> , 98%) CP 95%  | Please inquire             |
| CLM-6229    | Linoleic acid (18:2), potassium salt (1- <sup>13</sup> C, 99%)   | 1 g                        |
| CLM-8835    | Linoleic acid (18:2), potassium salt (U- <sup>13</sup> C <sub>18</sub> , 98%) CP 97% (may have up to 5% isomers) | Please inquire             |
| CLM-10487   | Linoleic acid (18:2), sodium salt (U- <sup>13</sup> C <sub>18</sub> , 98%) CP 94% (may have up to 5% isomers)    | Please inquire             |
| CLM-8386    | Linolenic acid (18:3) (U- <sup>13</sup> C <sub>18</sub> , 98%) CP 95%  | 0.1 g                      |
| DLM-9348    | Linolenic acid (18:3) (17,17,18,18,18-D <sub>5</sub> , 98%) CP 90%   | 0.25 g                     |
| DLM-2351    | Linolenic acid (18:3), ethyl ester (17,17,18,18,18-D <sub>5</sub> , 98%) CP 95%                                  | 0.25 g                     |
| CLM-8396    | Linolenic acid (18:3), methyl ester (linolenate-U- <sup>13</sup> C <sub>18</sub> , 98%) CP 95%                   | 0.1 g                      |
| CLM-10919   | Lysophosphatidylcholine (Lyso-PC) 17:0 (choline- <sup>13</sup> C <sub>5</sub> , 98%)                             | 1 mg, 5 mg                 |
| DLM-10520   | Lysophosphatidylcholine (Lyso-PC) 20:0 (eicosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                             | 1 mg, 5 mg                 |
| ULM-10521   | Lysophosphatidylcholine (Lyso-PC) 20:0 (unlabeled)   | 5 mg, 10 mg                |
| CLM-10499   | Lysophosphatidylcholine (Lyso-PC) 22:0 (docosanoyl-1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)              | 1 mg, 5 mg                 |
| DLM-10500   | Lysophosphatidylcholine (Lyso-PC) 22:0 (docosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                             | 1 mg, 5 mg                 |
| ULM-10498   | Lysophosphatidylcholine (Lyso-PC) 22:0 (unlabeled)   | 5 mg, 10 mg                |
| CLM-10496   | Lysophosphatidylcholine (Lyso-PC) 24:0 (tetracosanoyl-1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)           | 1 mg, 5 mg                 |
| DLM-10497   | Lysophosphatidylcholine (Lyso-PC) 24:0 (tetracosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                          | 1 mg, 5 mg                 |
| ULM-10495   | Lysophosphatidylcholine (Lyso-PC) 24:0 (unlabeled)   | 5 mg, 10 mg                |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Fatty Acids and Lipids (continued)

| Catalog No. | Description   | Unit Size            |
|-------------|---|----------------------|
| CLM-9792    | Lysophosphatidylcholine (Lyso-PC) 26:0 (hexacosanoyl-1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)                             | 1mg, 5mg             |
| DLM-10501   | Lysophosphatidylcholine (Lyso-PC) 26:0 (hexacosanoyl-12,12,13,13-D <sub>4</sub> , 98%)  | 1 mg, 5 mg           |
| ULM-9791    | Lysophosphatidylcholine (Lyso-PC) 26:0 (unlabeled)  | 5 mg, 10 mg          |
| DLM-2960    | 2-Methylsuccinic acid (D <sub>6</sub> , 98%)  | 1 g                  |
| CLM-1844    | Myristic acid (1- <sup>13</sup> C, 99%)   | 1 g                  |
| CLM-3665    | Myristic acid (1,2,3- <sup>13</sup> C <sub>3</sub> , 99%)   | 0.5 g                |
| DLM-1039    | Myristic acid (methyl-D <sub>3</sub> , 98%)   | 0.1 g                |
| DLM-7487    | Myristic acid (13,13,14,14,14-D <sub>5</sub> , 98%)   | Please inquire       |
| DLM-11024   | Myristic acid (12,12,13,13,14,14,14-D <sub>7</sub> , 98%)   | Please inquire       |
| DLM-208     | Myristic acid (D <sub>27</sub> , 98%)   | 1 g                  |
| CLM-6228    | Myristic acid, potassium salt (1- <sup>13</sup> C, 99%)   | Please inquire       |
| CLM-8695    | Myristic acid, sodium salt (1,2,3- <sup>13</sup> C <sub>3</sub> , 99%)  | 0.5 g                |
| DLM-11100   | 1-Myristoyl-2-lyso- <i>sn</i> -glycero-3-phosphoglycerol, ammonium salt (myristoyl-D <sub>27</sub> , 97%; 50-60% at alpha carbon) | 100 mg               |
| DLM-11671   | <i>N</i> -Nervonoyl-D-sphingosine (C24:1 ceramide, d18:1/24:1) (16,16,17,17,18,18,18-D <sub>7</sub> , 98%) CP 95%                 | 1 mg                 |
| DLM-10367   | Nonadecanoic acid (D <sub>37</sub> , 98%)   | Please inquire       |
| CLM-8724    | Nonanoic acid (U- <sup>13</sup> C <sub>9</sub> , 98%)   | Please inquire       |
| DLM-7490    | Nonanoic acid (9,9,9-D <sub>3</sub> , 98%)  | Please inquire       |
| DLM-9501    | Nonanoic acid (D <sub>17</sub> , 98%)   | 0.5 g, 1 g           |
| DLM-795     | <i>N</i> -Octadecanol (D <sub>37</sub> , 98%)   | 1 g                  |
| CLM-293     | Octanoic acid (1- <sup>13</sup> C, 99%)   | 1 g, 5 g             |
| CLM-3827    | Octanoic acid (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | Please inquire       |
| CLM-2721    | Octanoic acid (1,2,3,4- <sup>13</sup> C <sub>4</sub> , 99%)   | 0.25 g               |
| CLM-3981    | Octanoic acid ( <sup>13</sup> C <sub>8</sub> , 99%)   | Please inquire       |
| DLM-619     | Octanoic acid (D <sub>15</sub> , 98%)   | 1 g                  |
| CLM-3707    | 2-Octanoyl-1,3-distearin (octanoic-1- <sup>13</sup> C, 99%)   | 1 g, 10 g            |
| CLM-4258    | 2-Octanoyl-1,3-distearin (octanoyl-1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 1 g                  |
| ULM-9722    | <i>N</i> -Octanoyl-D-sphingosine (ceramide d18:1/8:0) (unlabeled)   | Please inquire       |
| DLM-6726    | <i>n</i> -Octyl-β-glucoside (D <sub>24</sub> , 98%)   | 0.1 g                |
| CLM-9583    | <i>N</i> -Oleoyl-D-sphingosine (ceramide d18:1/18:1 (9z) (oleoyl-U- <sup>13</sup> C <sub>18</sub> , 99%) CP 95%                   | 0.1 mg, 1 mg         |
| CLM-2492    | Oleic acid (methyl- <sup>13</sup> C, 99%)   | 0.25 g               |
| CLM-149     | Oleic acid (1- <sup>13</sup> C, 99%)  | 0.5 g, 1 g           |
| CLM-460     | Oleic acid (U- <sup>13</sup> C <sub>18</sub> , 98%)   | 0.1 mg, 0.1 g        |
| DLM-689     | Oleic acid (9,10-D <sub>2</sub> , 97%)  | 0.1 g                |
| DLM-1891    | Oleic acid (D <sub>33</sub> , 98%)  | Please inquire       |
| CLM-3959    | Oleic acid, ethyl ester (oleate-U- <sup>13</sup> C <sub>18</sub> , 98%) CP 95%  | 1 g                  |
| DLM-8747    | Oleic acid, ethyl ester (D <sub>33</sub> , 98%) CP 95%  | Please inquire       |
| CLM-4337    | Oleic acid, methyl ester (oleate- <sup>13</sup> C <sub>18</sub> , 98%)  | Please inquire       |
| CLM-4477    | Oleic acid, potassium salt (1- <sup>13</sup> C, 99%)  | 1 g                  |
| CLM-8856    | Oleic acid, potassium salt (U- <sup>13</sup> C <sub>18</sub> , 98%) CP 95%  | Please inquire       |
| DLM-8837    | Oleic acid, potassium salt (15,15,16,16,17,17,18,18,18-D <sub>9</sub> , 98%)  | Please inquire       |
| CLM-6230    | Oleic acid, sodium salt (1- <sup>13</sup> C, 99%)   | Please inquire       |
| CLM-8763    | Oleic acid, sodium salt (U- <sup>13</sup> C <sub>18</sub> , 98%)  | Please inquire       |
| ULM-9581    | <i>N</i> -Oleoyl-D-sphingosine (ceramide d18:1/18:1 (9z) (unlabeled) CP 95%   | 0.1 mg               |
| NLM-10511   | Oleylamine ( <sup>15</sup> N, 98%)  | Please inquire       |
| CLM-150     | Palmitic acid (1- <sup>13</sup> C, 99%)   | 1 g, 5 g, 10 g       |
| CLM-2120    | Palmitic acid (2- <sup>13</sup> C, 99%)   | 1 g                  |
| CLM-214     | Palmitic acid (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | 0.5 g                |
| CLM-7896    | Palmitic acid (1,2,3,4- <sup>13</sup> C <sub>4</sub> , 99%)   | 0.1 mg, 1 g          |
| CLM-10926   | Palmitic acid (1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)   | Please inquire       |
| CLM-409     | Palmitic acid (U- <sup>13</sup> C <sub>16</sub> , 98%)  | 0.01 g, 0.1 g, 0.5 g |
| DLM-8673    | Palmitic acid (12-D, 98%)   | Please inquire       |
| DLM-1153    | Palmitic acid (2,2-D <sub>2</sub> , 98%)  | 1 g                  |

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| Catalog No. | Description   | Unit Size            |
|-------------|---|----------------------|
| DLM-2890    | Palmitic acid (9,9-D <sub>2</sub> , 98%)  | Please inquire       |
| DLM-2891    | Palmitic acid (13,13-D <sub>2</sub> , 98%)  | 0.5 g                |
| DLM-611     | Palmitic acid (methyl-D <sub>3</sub> , 98%)   | 0.5 g                |
| DLM-2893    | Palmitic acid (7,7,8,8-D <sub>4</sub> , 98%)  | 0.1 g, 0.5 g         |
| DLM-2894    | Palmitic acid (11,11,12,12-D <sub>4</sub> , 98%)  | Please inquire       |
| DLM-9424    | Palmitic acid (13,13,14,14,15,15,16,16,16-D <sub>9</sub> , 98%)   | Please inquire       |
| DLM-2895    | Palmitic acid (9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-D <sub>17</sub> , 98%) CP 97%                                     | 0.1 g                |
| DLM-215     | Palmitic acid (D <sub>31</sub> , 98%)   | 1 g                  |
| CLM-3957    | Palmitic acid, ethyl ester (palmitate- <sup>13</sup> C <sub>16</sub> , 98%) CP 95%  | 1 g                  |
| DLM-8793    | Palmitic acid, ethyl ester (D <sub>31</sub> , 98%)  | Please inquire       |
| CLM-11289   | Palmitic acid, methyl ester (1,2,3,4- <sup>13</sup> C <sub>4</sub> , 99%)   | Please inquire       |
| CLM-8390    | Palmitic acid, methyl ester (palmitate- <sup>13</sup> C <sub>16</sub> , 98%)  | 0.25 g, 1 g          |
| CLM-2241    | Palmitoleic acid (U- <sup>13</sup> C <sub>16</sub> , 98%) CP 97%  | 5 mg, 10 mg          |
| CLM-3958    | Palmitoleic acid, ethyl ester (palmitoleate-U- <sup>13</sup> C <sub>16</sub> , 98%) CP 97%  | Please inquire       |
| CLM-8391    | Palmitoleic acid, methyl ester (palmitoleate-U- <sup>13</sup> C <sub>16</sub> , 98%) CP 97%                                       | Please inquire       |
| DLM-11101   | 1-Palmitoyl-2-lyso- <i>sn</i> -glycero-3-phosphoglycerol, ammonium salt (palmitoyl-D <sub>31</sub> , 97%; 50-60% at alpha carbon) | 100 mg               |
| DLM-11096   | 1-Palmitoyl-2-oleoyl- <i>sn</i> -glycero-3-phosphocholine (fatty acids-D <sub>63</sub> , 97%; 50-60% on alpha, vinyl carbons)     | 50 mg                |
| CLM-9582    | <i>N</i> -Palmitoyl-D-sphingosine (C16 ceramide, d18:1/16:0) (palmitoyl-U- <sup>13</sup> C <sub>16</sub> , 99%) CP 95%            | 0.1 mg, 1 mg         |
| DLM-11674   | <i>N</i> -Palmitoyl-D-sphingosine (C16 ceramide, d18:1/16:0) (16,16,17,17,18,18-D <sub>7</sub> , 98%) CP 95%                      | 1 mg                 |
| ULM-9580    | <i>N</i> -Palmitoyl-D-sphingosine (C16 ceramide, d18:1/16:0) (unlabeled) CP 95%   | 0.1 mg               |
| DLM-1307    | Pentadecanoic acid (methyl-D <sub>3</sub> , 98%)  | 0.1 g                |
| DLM-572     | Pentanoic acid (D <sub>9</sub> , 98%)   | 1 g, 5 g             |
| CLM-10700   | Pentanoic acid, pentyl ester ( <sup>13</sup> C <sub>10</sub> , 99%) CP 95%  | Please inquire       |
| DLM-4341    | DL- $\alpha$ -Phosphatidylcholine, dihexanoyl (DHPC) (D <sub>40</sub> , 98%) CP 95%   | 0.1 g                |
| CLM-9668    | DL- $\alpha$ -Phosphatidylcholine, dipalmitoyl (DPPC) (U- <sup>13</sup> C <sub>40</sub> , 98%) CP 95%                             | 0.05 g               |
| DLM-8256    | DL- $\alpha$ -Phosphatidylcholine, dipalmitoyl (DPPC) (D <sub>80</sub> , 98%) CP 95%  | Please inquire       |
| DLM-6998    | Phytanic acid (3-methyl-D <sub>3</sub> , 98%) CP 95%  | Please inquire       |
| CLM-1889    | Potassium palmitate (1- <sup>13</sup> C, 99%)   | 1 g                  |
| CLM-6865    | Potassium palmitate (1,2,3,4- <sup>13</sup> C <sub>4</sub> , 99%)   | Please inquire       |
| CLM-10942   | Potassium palmitate (1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)   | Please inquire       |
| CLM-3943    | Potassium palmitate (U- <sup>13</sup> C <sub>16</sub> , 98%)  | 0.5 g                |
| DLM-3773    | Potassium palmitate (2,2-D <sub>2</sub> , 97%)  | 1 g                  |
| DLM-6199    | Potassium palmitate (methyl-D <sub>3</sub> , 98%)   | Please inquire       |
| DLM-6033    | Potassium palmitate (7,7,8,8-D <sub>4</sub> , 98%)  | 0.5 g                |
| DLM-8302    | Pristanic acid (2-methyl-D <sub>3</sub> , 98%) CP 95%   | Please inquire       |
| DLM-10241   | Sebacic acid (2,2,9,9-D <sub>4</sub> , 98%)   | Please inquire       |
| CLM-1256    | Sodium butyrate (1- <sup>13</sup> C, 99%)   | 1 g, 5 g             |
| CLM-4780    | Sodium butyrate (2- <sup>13</sup> C, 99%)   | Please inquire       |
| CLM-10426   | Sodium butyrate ( <sup>13</sup> C <sub>4</sub> , 99%)   | 0.1 g                |
| DLM-641     | Sodium butyrate (3,3,4,4,4-D <sub>5</sub> , 98%)  | Please inquire       |
| DLM-7616    | Sodium butyrate (D <sub>7</sub> , 98%)  | Please inquire       |
| DLM-197     | Sodium dodecyl sulfate (D <sub>25</sub> , 98%)  | 1 g                  |
| CLM-10897   | Sodium isobutyrate ( <sup>13</sup> C <sub>4</sub> , 99%)  | Please inquire       |
| CLM-1948    | Sodium octanoate (1- <sup>13</sup> C, 99%)  | 1 g, 5 g, 10 × 0.1 g |
| CLM-3876    | Sodium octanoate (1,2,3,4- <sup>13</sup> C <sub>4</sub> , 99%)  | 0.1 g, 0.25 g        |
| CLM-3980    | Sodium octanoate (2,4,6,8- <sup>13</sup> C <sub>4</sub> , 99%)  | Please inquire       |
| CLM-9617    | Sodium octanoate (U- <sup>13</sup> C <sub>8</sub> , 99%)  | Please inquire       |
| CLM-174     | Sodium palmitate (1- <sup>13</sup> C, 99%)  | 1 g                  |
| CLM-6059    | Sodium palmitate (U- <sup>13</sup> C <sub>16</sub> , 98%)   | 1 g                  |
| ULM-9579    | Sphingosine (unlabeled) CP 95%  | Please inquire       |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

**Fatty Acids and Lipids** *(continued)*

| Catalog No. | Description   | Unit Size          |
|-------------|---|--------------------|
| CLM-490     | Stearic acid (methyl- $^{13}\text{C}$ , 99%)  | 1 g                |
| CLM-676     | Stearic acid ( $1\text{-}^{13}\text{C}$ , 99%)  | 1 g, 5 g           |
| CLM-6990    | Stearic acid ( $\text{U-}^{13}\text{C}_{18}$ , 98%) CP 97%  | 0.25 g             |
| DLM-1154    | Stearic acid (methyl- $\text{D}_3$ , 98%)   | 0.1 g, 0.25 g      |
| DLM-2712    | Stearic acid (17,17,18,18,18- $\text{D}_5$ , 98%)   | 0.1 g, 0.5 g       |
| DLM-379     | Stearic acid ( $\text{D}_{35}$ , 98%)   | 1 g                |
| CLM-8731    | Stearic acid, ethyl ester (stearate- $\text{U-}^{13}\text{C}_{18}$ , 98%)                                       | Please inquire     |
| CLM-8394    | Stearic acid, methyl ester (stearate- $\text{U-}^{13}\text{C}_{18}$ , 98%) CP 95%                               | 0.25 g, 1 g        |
| CLM-6227    | Stearic acid, potassium salt ( $1\text{-}^{13}\text{C}$ , 99%)  | Please inquire     |
| CLM-10365   | Stearic acid, sodium salt ( $\text{U-}^{13}\text{C}_{18}$ , 98%) CP 97%   | Please inquire     |
| DLM-11672   | <i>N</i> -Stearoyl-D-sphingosine (C18 ceramide, d18:1/18:0) (d16,16,17,17,18,18,18- $\text{D}_7$ , 98%) CP 95%  | 1 mg               |
| DLM-6143    | Suberic acid (2,2,7,7- $\text{D}_4$ , 98%)  | 0.5 g, 1 g         |
| CLM-9932    | Tetracosanoic acid (1,2,3,4,5,6- $^{13}\text{C}_6$ , 99%) CP 96%  | Please inquire     |
| DLM-9952    | Tetracosanoic acid (3,3,5,5- $\text{D}_4$ , 98%) CP 95%   | Please inquire     |
| DLM-9179    | Tetracosanoic acid (9,9,10,10- $\text{D}_4$ , 98%)  | Please inquire     |
| DLM-10502   | Tetracosanoic acid (12,12,13,13- $\text{D}_4$ , 98%)  | 0.1 g, 0.25 g      |
| DLM-7302    | Tetracosanoic acid ( $\text{D}_{47}$ , 98%)   | Please inquire     |
| DLM-11673   | <i>N</i> -Tetracosanoylsphingosine (C24 ceramide, d18:1/24:0) (16,16,17,17,18,18,18- $\text{D}_7$ , 98%) CP 95% | 1 mg               |
| DLM-1392    | Tridecanoic acid ( $\text{D}_{25}$ , 98%)   | Please inquire     |
| DLM-11086   | Triheptanoin (tris(heptanoyl-7,7,7)- $\text{D}_9$ , 98%)  | Please inquire     |
| CLM-162     | Trioctanoin (1,1,1- $^{13}\text{C}_3$ , 99%)  | 0.25 g, 0.5 g, 1 g |
| CLM-163     | Triolein (1,1,1- $^{13}\text{C}_3$ , 99%)   | 0.1 g, 0.5 g       |
| CLM-8445    | Tripalmitin (glyceryl- $^{13}\text{C}_3$ , 99%)   | Please inquire     |
| CLM-164     | Tripalmitin (1,1,1- $^{13}\text{C}_3$ , 99%)  | 0.25 g, 0.5 g, 1 g |
| CLM-350     | Tripalmitin (2,2,2- $^{13}\text{C}_3$ , 99%)  | 0.1 g              |
| CLM-9468    | Tripalmitin (1,1,1,2,2,2,3,3,3,4,4,4- $^{13}\text{C}_{12}$ , 99%)   | Please inquire     |
| DLM-9986    | Tripalmitin (glyceryl- $\text{D}_5$ , 98%)  | Please inquire     |
| DLM-9462    | Tripalmitin (trispalmitoyl- $\text{D}_{93}$ , 98%)  | 0.5 g              |
| DLM-9044    | Tripalmitin ( $\text{D}_{98}$ , 98%)  | Please inquire     |
| DLM-7875    | Tristearin (tristearoyl- $\text{D}_{105}$ , 98%)  | Please inquire     |
| CLM-3399    | Valproic acid (1,2,3,3'- $^{13}\text{C}_4$ , 99%)   | Please inquire     |
| DLM-7876    | Valproic acid (propyl-1,1- $\text{D}_2$ , pentanoic-3,3- $\text{D}_2$ , 98%)                                    | Please inquire     |
| DLM-4291    | Valproic acid (4,4,4',4'- $\text{D}_4$ , 98%)   | 0.1 g              |
| DLM-8875    | Valproic acid ( $\text{D}_{15}$ , 98%)  | Please inquire     |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Gases

### Calibration Standards

We are pleased to offer four CO<sub>2</sub> standards for use in <sup>13</sup>C-urea breath analysis. These gas calibration standards are designed to mimic <sup>13</sup>CO<sub>2</sub> levels in normal breath (baseline calibrant) and at three enriched levels (low-, mid-, and high-level calibrants). Each is gravimetrically prepared and analyzed for <sup>13</sup>C content by isotope ratio mass spectrometry (IRMS). The <sup>13</sup>C content for the baseline standard is expressed as delta value vs. PDB (Pee Dee Belemnite), with the enriched calibrant gases additionally reported as delta value above baseline (see lot-specific CoA for details). Please visit [isotope.com](https://isotope.com) for a complete listing of high-purity gases and mixtures.

| Catalog No. | Description*                                       | Unit       | Stock Packaging |
|-------------|--|------------|-----------------|
| CLM-10584   | 5% CO <sub>2</sub> in air baseline calibrant gas   | 10 L, 50 L | CODE C or G     |
| CLM-10585   | 5% CO <sub>2</sub> in air low-level calibrant gas  | 10 L, 50 L | CODE C or G     |
| CLM-10586   | 5% CO <sub>2</sub> in air mid-level calibrant gas  | 10 L, 50 L | CODE C or G     |
| CLM-10587   | 5% CO <sub>2</sub> in air high-level calibrant gas | 10 L, 50 L | CODE C or G     |

## Glycan Standards

CIL is pleased to offer high-quality glycan standards, available in <sup>13</sup>C-labeled and unlabeled forms. These are provided as purified powders and packaged in self-standing, microcentrifuge tubes in 500 pmol quantities. Please visit [isotope.com](https://isotope.com) for a complete listing of available glycans.

### INLIGHT® Glycan Tagging Kit

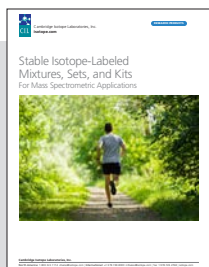
| Catalog No. | Description                 | Amount |
|-------------|-----------------------------|--------|
| GTK-1000    | INLIGHT® Glycan Tagging Kit | 1 kit  |

## Metabolomics Mixtures and Kits

Metabolomics is an increasingly important and growing area of research. The use of stable isotopes (as internal standards), in combination with analytical techniques such as mass spectrometry, allow researchers to identify and quantify metabolites in a given biological sample. This information can be used to better understand disease mechanisms, evaluate drug responses, and assess putative biomarkers, amongst other targeted applications. To help facilitate such initiatives, CIL is pleased to offer a variety of mixes and kits. These are designed to aid ease of use in untargeted and targeted metabolomics exercises (e.g., in quantification, qualification, quality control, system suitability). The mixtures are offered neat or as solutions, while the kits are additionally supplied with a user manual. The manuals outline general procedures and processing tables (i.e., platform parameters and conditions), as well as alternate method suggestions and data analysis guides for user reference. Supplemental figures and references in the user manuals provide additional user support.

| Catalog No.     | Description   | Unit Size  |
|-----------------|---|------------|
| ISO1            | Metabolite Yeast Extract (U- <sup>13</sup> C, 99%)        | 1 kit      |
| ISO1-KIT        | Metabolite Yeast Extract Kit                              | 1 kit      |
| L-ISO1          | Crude Lipid Yeast Extract (U- <sup>13</sup> C, 99%)       | 1 kit      |
| MSK-A2          | Metabolomics Amino Acid Mix                               | 1.2 mL     |
| MSK-CAA         | Canonical Amino Acid Mix                                  | 1 vial     |
| MSK-NCAA        | Non-canonical Amino Acid Mix                              | 1 vial     |
| MSK-CNCAA       | Canonical/Non-canonical Amino Acid Mix Set                | 2 × 1 vial |
| NSK-BCAA        | Branched-chain Amino Acid Standards Mix                   | 1 vial     |
| MSK-BA1         | Bile Acid Standard Mix 1 – Unconjugated                   | 1 vial     |
| MSK-BA2         | Bile Acid Standard Mix 2 – Conjugated                     | 1 vial     |
| MSK-BA-A        | Bile Acid Standards Mix Sets 1 and 2                      | 2 × 1 vial |
| MSK-BA1-25X     | Bile Acid Standard Mix 1 (25x) – Unconjugated             | 1 vial     |
| MSK_BA2-20X     | Bile Acid Standard Mix 2 (20x) – Conjugated               | 1 vial     |
| MSK-BA3         | Bile Acid Standards Mix 3 – Unconjugated Sulfates         | 1 vial     |
| MSK-BA4         | Bile Acid Standards Mix 4 – Conjugated Sulfates           | 1 vial     |
| MSK-CRED-DD-KIT | Credentialed <i>E. coli</i> Cell Extract Kit (dried down) | 1 kit      |
| MSK-CRED-KIT    | Credentialed <i>E. coli</i> Cell Extract Kit (solution)   | 1 kit      |
| MSK-MET1        | Metabolomics Standards Mix 1                              | 1 vial     |
| MSK-MSM1        | Metabolomics Screening and Monitoring Standards Mix 1     | 1 vial     |
| MSK-QC1         | Metabolomics QC Standards Mix 1                           | 1 vial     |
| MSK-QC2         | Metabolomics QC Standards Mix 2                           | 1 vial     |
| MSK-QC-KIT      | Metabolomics QC Kit                                       | 1 kit      |
| MSK-QCMSI-KIT   | Metabolomics QC Kit for MSI                               | 1 kit      |
| MSK-QReSS1      | Metabolomics QReSS™ Standards Mix 1                       | 1 vial     |
| MSK-QReSS2      | Metabolomics QReSS™ Standards Mix 2                       | 1 vial     |
| MSK-QReSS-KIT   | Metabolomics QReSS™ Kit                                   | 1 kit      |
| MSK-OA          | Organic Acid Mix  | 1 vial     |
| MSK-SBCFA       | Short-/Branched-chain Fatty Acid Mix                      | 1 vial     |
| MSK-TCA1        | TCA Cycle Standards Mix 1                                 | 1 vial     |
| MSK-TCA2-A      | TCA Cycle Standards Mix 2A                                | 1 vial     |
| MSK-TCA-A       | TCA Cycle Standards Mix Sets 1 and 2A                     | 2 × 1 vial |

Companion unlabeled standard mixes and kits are also available; please inquire.



For complete product details, click on the thumbnail to download the catalog or visit the **Metabolomics Mixtures and Kits application page** at [isotope.com](http://isotope.com).

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Mouse Feeds

The study of animal models, using a metabolic labeling technique called SILAM (stable isotope labeling of mammals), can provide useful insight into human disease. To help facilitate this branch of research, CIL offers labeled/unlabeled Mouse Express® mouse feeds in their irradiated and nonirradiated form. Consumption of an isotope-enriched chow enables metabolically labeling of an entire mouse proteome with an isotopically labeled compound. Traditionally, the feeds incorporate isotopically labeled canonical (e.g., lysine, leucine, valine) and/or non-canonical (e.g., azidohomoalanine) amino acids, with labeling on individual or multiple isotopes (e.g., NeuCode™ lysine). Diets that comprise <sup>15</sup>N and unlabeled feed prepared with spirulina are also available. For expanded research opportunities, the labeled feed can be packaged together in a kit with the unlabeled in standard units of 1 kg. Please see the **SILAM application page** for product details and [isotope.com](https://isotope.com) for product inquiries.

### Mouse Express®

| Catalog No.            | Description   | Concentration | Unit Size              |
|------------------------|---|---------------|------------------------|
| MF-AHA                 | Mouse Express® AHA Mouse Feed   | neat          | 1 kg                   |
| MF-HAHA                | Mouse Express® hAHA Mouse Feed  | neat          | 1 kg                   |
| MLK-HAHA-KIT           | Mouse Express® hAHA Mouse Feed Kit  | neat          | 1 kit                  |
| MF-LEU-D3              | Mouse Express® L-Leucine (5,5,5-D <sub>3</sub> , 99%) Mouse Feed                          | neat          | 1 kg                   |
| MF-LEU-UNLABELED       | Mouse Express® L-Leucine (unlabeled) Mouse Feed   | neat          | 1 kg                   |
| MLK-LEU-D3             | Mouse Express® L-Leucine Mouse Feed Kit   | neat          | 1 kit                  |
| MF-LEU-D3-IR           | Mouse Express® L-Leucine (5,5,5-D <sub>3</sub> , 99%) Irradiated Mouse Feed               | neat          | 1 kg                   |
| MF-LEU-D3-IR-UNLABELED | Mouse Express® L-Leucine (unlabeled) Irradiated Mouse Feed                                | neat          | 1 kg                   |
| MLK-LEU-D3-IR          | Mouse Express® L-Leucine Irradiated Mouse Feed Kit  | neat          | 1 kit                  |
| MF-LYS-C               | Mouse Express® L-Lysine ( <sup>13</sup> C <sub>6</sub> , 99%) Mouse Feed                  | neat          | 1 kg                   |
| MF-LYS-C-UNLABELED     | Mouse Express® L-Lysine (unlabeled) Mouse Feed  | neat          | 1 kg                   |
| MLK-LYS-C              | Mouse Express® L-Lysine Mouse Feed Kit  | neat          | 1 kit                  |
| MF-LYS-C-IR            | Mouse Express® L-Lysine ( <sup>13</sup> C <sub>6</sub> , 99%) Irradiated Mouse Feed       | neat          | 1 kg                   |
| MF-LYS-C-IR-UNLABELED  | Mouse Express® L-Lysine (unlabeled) Irradiated Mouse Feed                                 | neat          | 1 kg                   |
| MLK-LYS-C-IR           | Mouse Express® L-Lysine Irradiated Mouse Feed Kit   | neat          | 1 kit                  |
| MF-LYS-NEU2            | Mouse Express® L-Lysine 2-plex NeuCode Mouse Feed   | neat          | 1-week kit, 3-week kit |
| MF-UNLABELED-MET       | Mouse Express® (unlabeled) Mouse Feed   | neat          | 1 kg                   |
| MF-TYR-C-IR            | Mouse Express® L-Tyrosine ( <sup>13</sup> C <sub>9</sub> , 99%) Irradiated Mouse Feed     | neat          | 1 kg                   |
| MF-UNLABELED-TYR-IR    | Mouse Express® L-Tyrosine Irradiated Mouse Feed (unlabeled)                               | neat          | 1 kg                   |
| MLK-TYR-C-IR           | Mouse Express® L-Tyrosine ( <sup>13</sup> C <sub>9</sub> , 99%) Irradiated Mouse Feed Kit | neat          | 1 kit                  |

NeuCode is a trademark of WARF.

Mouse Express is a registered trademark of Cambridge Isotope Laboratories, Inc.

### Spirulina and Mouse Express® (prepared with Spirulina)

| Catalog No.        | Description  | Concentration | Unit Size |
|--------------------|--|---------------|-----------|
| CLM-8400           | Spirulina Whole Cells (U- <sup>13</sup> C, 97%)                  | neat          | 1 g       |
| NLM-8401           | Spirulina Whole Cells (U- <sup>15</sup> N, 98%)                  | neat          | 1 g       |
| ULM-8453           | Spirulina Whole Cells (unlabeled)                                | neat          | 1 g       |
| MF-Spirulina-N     | Mouse Express® ( <sup>15</sup> N, 98%) Mouse Feed                | neat          | 1 kg      |
| MF-Spirulina-U     | Mouse Express® (unlabeled) Mouse Feed                            | neat          | 1 kg      |
| MLK-Spirulina-N    | Mouse Express® ( <sup>15</sup> N, 98%) Mouse Feed Kit            | neat          | 1 kit     |
| MF-Spirulina-N-IR  | Mouse Express® ( <sup>15</sup> N, 98%) Irradiated Mouse Feed     | neat          | 1 kg      |
| MF-Spirulina-U-IR  | Mouse Express® (unlabeled) Irradiated Mouse Feed                 | neat          | 1 kg      |
| MLK-Spirulina-N-IR | Mouse Express® ( <sup>15</sup> N, 98%) Irradiated Mouse Feed Kit | neat          | 1 kit     |

**Custom feeds can be prepared upon request; please inquire.**

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## MS/MS Screening Mixtures and Standards

The utility of stable isotope-labeled standards for MS/MS screening is gaining traction worldwide. To support such research endeavors and enhance method adoption, CIL is pleased to offer a breadth of high-quality, stable isotope-labeled mixtures. These mixes contain a collection of stable isotope-labeled standards (e.g., 12 amino acids in NSK-A) and are class-specific (e.g., amino acids, carnitine/acylcarnitines, steroids). These are available in 10-vial sets or single vials and are suitable for metabolite quantification in isotope dilution MS (IDMS) experiments. Also listed here are example individual standards used in MS/MS screening research.

### Mixtures and Sets

| Catalog No. | Description   | Unit Size        |
|-------------|---|------------------|
| NSK-A       | Amino Acid Standards Mix A                                      | 1 vial, 10 vials |
| NSK-A1      | Amino Acid Standards Mix A1                                     | 1 vial, 10 vials |
| NSK-AA3     | 3-Plex Amino Acid Standards Mix                                 | 1 vial, 10 vials |
| NSK-AA3-10X | 3-Plex Amino Acid Standards Mix (10x)                           | 1 vial, 10 vials |
| NSK-B       | Carnitine/Acylcarnitine Standards Mix B                         | 1 vial, 10 vials |
| NSK-B-G1    | Acylcarnitine Standards Mix 1 Supplement to NSK-B               | 1 vial, 10 vials |
| NSK-BBG1    | Carnitine/Acylcarnitine Standards Mix Sets B and B-G1           | 2 × 1 vial       |
| NSK-AB      | Standards Mix Sets A and B                                      | 2 × 10 vials     |
| NSK-BCAA    | Branched-chain Amino Acid Standards Mix                         | 1 vial           |
| NSK-NI      | Acid Sphingomyelinase Substrate and Internal Standards Mix      | 1 vial           |
| NSK-KR      | Galactocerebrosidase Substrate and Internal Standards Mix       | 1 vial           |
| NSK-FA      | $\alpha$ -Galactosidase Substrate and Internal Standards Mix    | 1 vial           |
| NSK-GA      | Glucocerebrosidase Substrate and Internal Standards Mix         | 1 vial           |
| NSK-MP      | $\alpha$ -L-Iduronidase Substrate and Internal Standards Mix    | 1 vial           |
| NSK-PO      | Acid $\alpha$ -Glucosidase Substrate and Internal Standards Mix | 1 vial           |
| NSK-LPC     | Lysophosphatidylcholine Mix                                     | 1 vial           |
| NSK-S       | Steroid Standards Mix S   | 1 vial, 10 vials |
| NSK-S-40X   | Steroid Standards Mix S (40x)                                   | 1 vial           |
| NSK-S-EXP   | Expanded Steroid Standards Mix S                                | 1 vial, 10 vials |

Companion unlabeled standard mixes are also available; please inquire.

### Individual Standards (Examples)

| Catalog No.  | Description  | Unit Size      |
|--------------|--|----------------|
| CLM-3777     | <i>N</i> -Acetylglycine (2- <sup>13</sup> C, 99%)  | Please inquire |
| CLM-3678     | Adenosine (ribose- <sup>13</sup> C <sub>5</sub> , 98%) CP 97%  | 0.05 g, 0.1 g  |
| CLM-8755     | $\beta$ -Alanine (3- <sup>13</sup> C, 99%)   | Please inquire |
| CLM-8756     | $\beta$ -Alanine ( <sup>13</sup> C <sub>3</sub> , 99%)   | Please inquire |
| NLM-1656     | $\beta$ -Alanine ( <sup>15</sup> N, 98%)   | 0.25 g         |
| CNLM-3440    | $\beta$ -Alanine (3- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)   | Please inquire |
| CNLM-8457    | $\beta$ -Alanine (1,2- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)   | Please inquire |
| CNLM-3946    | $\beta$ -Alanine ( <sup>13</sup> C <sub>3</sub> , 98%; <sup>15</sup> N, 96%)   | 0.25 g         |
| CNLM-9007-CA | L-Argininosuccinic acid, barium salt·xH <sub>2</sub> O (arginine- <sup>13</sup> C <sub>6</sub> , 99%; <sup>15</sup> N <sub>4</sub> , 99%) CP 90% | 0.1 mg, 0.5 mg |
| ULM-9008-CA  | L-Argininosuccinic acid, barium salt·xH <sub>2</sub> O (unlabeled) CP 90%  | 0.1 mg         |
| ULM-10431    | DL-Carnitine·HCl, <i>O</i> -acetyl (unlabeled)   | Please inquire |
| ULM-10703    | DL-Carnitine·HCl, <i>O</i> -butyryl (unlabeled)  | Please inquire |
| ULM-10704    | DL-Carnitine·HCl, <i>O</i> -isovaleryl (unlabeled)   | Please inquire |
| ULM-10705    | DL-Carnitine·HCl, <i>O</i> -myristoyl (unlabeled)  | Please inquire |
| ULM-10432    | DL-Carnitine·HCl, <i>O</i> -octanoyl (unlabeled)   | Please inquire |
| ULM-10433    | DL-Carnitine·HCl, <i>O</i> -palmitoyl (unlabeled) CP 97%   | Please inquire |
| ULM-10702    | DL-Carnitine·HCl, <i>O</i> -propionyl (unlabeled)  | Please inquire |
| DLM-11049    | L-Carnitine·ClO <sub>4</sub> , <i>O</i> -malonyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)  | Please inquire |
| DLM-10962    | L-Carnitine·HCl (trimethyl-D <sub>9</sub> , 98%)   | 5 mg           |
| DLM-9067     | L-Carnitine·HCl, <i>O</i> -decanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)   | 0.1 mg         |
| DLM-8162     | L-Carnitine·HCl, <i>O</i> -dodecanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)   | 0.1 mg         |
| DLM-9276     | L-Carnitine·HCl, <i>O</i> -hexanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%)   | 0.1 mg         |
| ULM-7198     | L-Carnitine·HCl, <i>O</i> -hexanoyl (unlabeled)  | Please inquire |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.



| Catalog No.  | Description   | Unit Size                                    |
|--------------|---|--|
| DLM-6718     | L-Carnitine-HCl, <i>O</i> -hexacosanoyl ( <i>N</i> -methyl-D <sub>3</sub> , 98%) CP 95%                       | Please inquire                               |
| CLM-7933     | Creatine (guanidino- <sup>13</sup> C, 99%)  | 0.1 g  |
| DLM-1302     | Creatine (methyl-D <sub>3</sub> , 98%) CP 97%   | 0.25 g                                       |
| DLM-3653     | Creatinine ( <i>N</i> -methyl-D <sub>3</sub> , 98%)   | 0.1 g  |
| CLM-4579     | 2'-Deoxyadenosine-H <sub>2</sub> O (ribose- <sup>13</sup> C <sub>5</sub> , 99%)                               | Please inquire                               |
| CLM-7686     | 2'-Deoxyguanosine-H <sub>2</sub> O (ribose-1- <sup>13</sup> C, 98%)   | Please inquire                               |
| DLM-7687     | 2'-Deoxyguanosine-H <sub>2</sub> O (ribose-5,5-D <sub>2</sub> , 98%)  | 0.05 g, 0.1 g                                |
| NLM-3899-CA  | 2'-Deoxyguanosine-H <sub>2</sub> O ( <sup>15</sup> N <sub>5</sub> , 98%) CP 95%                               | 5 mg, 10 mg, 25 mg                           |
| CNLM-3900-CA | 2'-Deoxyguanosine-H <sub>2</sub> O ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%) | 5 mg, 10 mg, 25 mg                           |
| DLM-6013     | Ethylmalonic acid (methyl-D <sub>3</sub> , 98%)   | 0.1 g  |
| CLM-744      | D-Galactose (1- <sup>13</sup> C, 99%)   | 0.25 g, 0.5 g, 1 g                           |
| CLM-4217     | D-Galactose (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | Please inquire                               |
| CLM-1570     | D-Galactose (U- <sup>13</sup> C <sub>6</sub> , 99%)   | 0.1 g  |
| DLM-9308     | D-Galactose (6,6'-D <sub>2</sub> , 97%)   | Please inquire                               |
| CLM-1822-H   | L-Glutamine ( <sup>13</sup> C <sub>5</sub> , 99%)   | 0.1 mg, 0.01 g, 0.1 g,<br>0.25 g, 0.5 g, 1 g |
| DLM-1826     | L-Glutamine (2,3,3,4,4-D <sub>5</sub> , 97%)  | 0.1 g  |
| CNLM-1275    | L-Glutamine ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)                         | 0.1 g, 0.25 g, 0.5 g                         |
| CLM-1017     | Glycine (1,2- <sup>13</sup> C <sub>2</sub> , 97- 99%)   | 0.5 g, 1 g, 5g                               |
| DLM-280      | Glycine (D <sub>5</sub> , 98%)  | 5 g  |
| NLM-202      | Glycine ( <sup>15</sup> N, 98%)   | 1 g, 5 g                                     |
| CNLM-8111    | <i>N</i> -(3-Methylcrotonyl)glycine (glycine- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N, 98%)       | Please inquire                               |
| DLM-9715     | <i>N</i> -(3-Phenylpropionyl)glycine (2,2,-D <sub>2</sub> , 98%)  | Please inquire                               |
| DLM-9998     | Guanidinoacetic acid (2,2-D <sub>2</sub> , 97%)   | Please inquire                               |
| CLM-7688     | Guanosine-H <sub>2</sub> O (ribose-1- <sup>13</sup> C, 98%)   | 0.05 g, 0.1 g                                |
| DLM-7689     | Guanosine-H <sub>2</sub> O, (ribose-5,5-D <sub>2</sub> , 98%)   | 0.05 g, 0.1 g                                |
| CNLM-3808-CA | Guanosine-H <sub>2</sub> O ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%)         | 5 mg, 10 mg, 25 mg                           |
| CNLM-8448    | <i>N</i> -Hexanoylglycine ( <sup>13</sup> C <sub>2</sub> , 97%; <sup>15</sup> N, 97%) CP 95%                  | Please inquire                               |
| NLM-4649     | L-Histidine (ring-ε- <sup>15</sup> N, 98%) <5% D  | Please inquire                               |
| NLM-4457     | L-Histidine (ring-π- <sup>15</sup> N, 98%) <5% D  | Please inquire                               |
| NLM-9585     | L-Histidine (ring- <sup>15</sup> N <sub>2</sub> , 98%)  | Please inquire                               |
| DLM-3619     | DL-Homocystine (3,3,3',3',4,4,4',4'-D <sub>8</sub> , 98%)   | 0.1 g, 0.5 g, 1 g                            |
| NLM-4264     | Inosine ( <sup>15</sup> N <sub>4</sub> , 95%)   | 0.01 g, 0.05 g                               |
| CLM-8742     | L-allo-Isoleucine ( <sup>13</sup> C <sub>6</sub> , 97%)   | Please inquire                               |
| DLM-1505     | L-allo-Isoleucine (D <sub>10</sub> , 98%)   | 0.1 g  |
| CNLM-9291    | <i>N</i> -Isovalerylglycine (glycine- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 99%)               | Please inquire                               |
| CLM-2247-H   | L-Lysine-2HCl ( <sup>13</sup> C <sub>6</sub> , 99%)   | 0.05 g, 0.1 g, 0.25 g, 0.5 g, 1 g            |
| DLM-2640     | L-Lysine-2HCl (4,4,5,5-D <sub>4</sub> , 96%)  | 0.1 g, 0.25 g, 0.5 g, 1 g                    |
| NLM-143      | L-Lysine-2HCl (α- <sup>15</sup> N, 95%)   | 0.25 g, 1 g                                  |
| CLM-10919    | Lysophosphatidylcholine (Lyso-PC) 17:0 (choline- <sup>13</sup> C <sub>5</sub> , 98%)                          | 1 mg, 5 mg                                   |
| DLM-10520    | Lysophosphatidylcholine (Lyso-PC) 20:0 (eicosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                          | 1 mg, 5 mg                                   |
| ULM-10521    | Lysophosphatidylcholine (Lyso-PC) 20:0 (unlabeled)  | 5 mg, 10 mg                                  |
| CLM-10499    | Lysophosphatidylcholine (Lyso-PC) 22:0 (docosanoyl-1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)           | 1 mg, 5 mg                                   |
| DLM-10500    | Lysophosphatidylcholine (Lyso-PC) 22:0 (docosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                          | 1 mg, 5 mg                                   |
| ULM-10498    | Lysophosphatidylcholine (Lyso-PC) 22:0 (unlabeled)  | 5 mg, 10 mg                                  |
| CLM-10496    | Lysophosphatidylcholine (Lyso-PC) 24:0 (tetracosanoyl-1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)        | 1 mg, 5 mg                                   |
| DLM-10497    | Lysophosphatidylcholine (Lyso-PC) 24:0 (tetracosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                       | 1 mg, 5 mg                                   |
| ULM-10495    | Lysophosphatidylcholine (Lyso-PC) 24:0 (unlabeled)  | 5 mg, 10 mg                                  |
| CLM-9792     | Lysophosphatidylcholine (Lyso-PC) 26:0 (hexacosanoyl-1,2,3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)         | 1 mg, 5 mg                                   |
| DLM-10501    | Lysophosphatidylcholine (Lyso-PC) 26:0 (hexacosanoyl-12,12,13,13-D <sub>4</sub> , 98%)                        | 1 mg, 5 mg                                   |
| ULM-9791     | Lysophosphatidylcholine (Lyso-PC) 26:0 (unlabeled)  | 5 mg, 10 mg                                  |
| CLM-10350    | 2-Methylbutyric acid (methyl- <sup>13</sup> C, 99%)   | Please inquire                               |
| DLM-2312     | DL-2-Methylcitric acid (methyl-D <sub>3</sub> , 98%) CP 90%   | 5 mg, 10 mg                                  |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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**MS/MS Screening Mixtures and Standards** *(continued)*

| Catalog No. | Description  | Unit Size            |
|-------------|--|----------------------|
| CLM-9426    | Methylmalonic acid ( $^{13}\text{C}_4$ , 99%)  | 0.1 g                |
| DLM-387     | Methylmalonic acid (methyl- $\text{D}_3$ , 98%)  | 0.25 mg              |
| ULM-10578   | Methylmalonic acid, disodium salt (unlabeled) CP 95%   | Please inquire       |
| DLM-2960    | 2-Methylsuccinic acid ( $\text{D}_6$ , 98%)  | 1 g                  |
| NLM-1048    | Orotic acid· $\text{H}_2\text{O}$ ( $1,3\text{-}^{15}\text{N}_2$ , 98%)  | 0.25 mg              |
| CLM-10604   | Phenylpyruvic acid, sodium salt ( $^{13}\text{C}_9$ , 99%)   | Please inquire       |
| CLM-7944    | 3-(3-Methyl-1H-pyrazol-5-yl)propanoic acid (MPP) (methyl- $^{13}\text{C}$ , pyrazolyl- $^{13}\text{C}_3$ , $3\text{-}^{13}\text{C}$ , 99%) | 0.1 mg               |
| CNLM-9292   | N-Propionylglycine (glycine- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 99%)   | Please inquire       |
| CLM-510     | L-Proline ( $1\text{-}^{13}\text{C}$ , 99%)  | 0.25 g               |
| CLM-2260-H  | L-Proline ( $^{13}\text{C}_5$ , 99%)   | 0.1 g, 0.25 g, 0.5 g |
| DLM-487     | L-Proline ( $\text{D}_7$ , 97%)  | 0.1 g, 0.25 g        |
| NLM-835     | L-Proline ( $^{15}\text{N}$ , 98%)   | 0.25 g, 0.5 g        |
| CNLM-7822   | L-Proline ( $1\text{-}^{13}\text{C}$ , 99%; $^{15}\text{N}$ , 98%)   | Please inquire       |
| CNLM-436-H  | L-Proline ( $^{13}\text{C}_5$ , 99%; $^{15}\text{N}$ , 99%)  | 0.1 g, 0.25 g, 0.5 g |
| DNLM-7562   | L-Proline ( $\text{D}_7$ , 98%; $^{15}\text{N}$ , 98%)   | 0.25 g               |
| CDNLM-6812  | L-Proline ( $^{13}\text{C}_5$ , 97%; $\text{D}_7$ , 97%; $^{15}\text{N}$ , 97%)  | 0.25 g               |
| ULM-8333    | L-Proline (unlabeled)  | 0.05 g, 0.1 g        |
| CLM-646     | Propionic acid ( $1\text{-}^{13}\text{C}$ , 99%)   | 1 g                  |
| CLM-647     | Propionic acid ( $^{13}\text{C}_3$ , 99%)  | 1 g                  |
| DLM-2488    | Propionic acid ( $2,2\text{-D}_2$ , 98%)   | 1 g, 5 g             |
| DLM-1137    | Propionic acid (methyl- $\text{D}_3$ , 98%)  | 5 g                  |
| DLM-1919    | Propionic acid ( $\text{D}_5$ , 98%)   | 5 g                  |
| DLM-599     | Propionic acid ( $\text{D}_6$ , 98%)   | Please inquire       |
| CLM-1036    | L-Ornithine·HCL ( $1,2\text{-}^{13}\text{C}_2$ , 99%)  | 0.1 g                |
| CLM-4724    | L-Ornithine·HCL ( $^{13}\text{C}_5$ , 98%)   | 0.1 g                |
| DLM-2969    | L-Ornithine·HCL ( $3,3,4,4,5,5\text{-D}_6$ , 98%)  | 0.1 g, 0.25 g        |
| NLM-3610    | L-Ornithine·HCL ( $^{15}\text{N}_2$ , 98%)   | 0.25 g               |
| NLM-1072    | Sarcosine ( $^{15}\text{N}$ , 98%)   | Please inquire       |
| CNLM-8183   | Suberylglycine (glycine- $^{13}\text{C}_2$ , 98%; $^{15}\text{N}$ , 98%) CP 95%  | Please inquire       |
| NSK-T       | Succinylacetone Standards Set T  | 1 vial, 10 vials     |
| NSK-T-US    | Succinylacetone Standards Set T (unlabeled)  | 1 vial               |
| DLM-10502   | Tetracosanoic acid ( $12,12,13,13\text{-D}_4$ , 98%)   | 0.1 g, 0.25 g        |
| CLM-2261    | L-Threonine ( $^{13}\text{C}_4$ , 97%)   | 0.1 g, 0.25 g, 0.5 g |
| DLM-1693    | L-Threonine ( $\text{D}_5$ , 98%)  | 0.1 g                |
| NLM-742     | L-Threonine ( $^{15}\text{N}$ , 98%)   | 0.25 g, 0.5 g        |
| CNLM-587    | L-Threonine ( $^{13}\text{C}_4$ , 97%; $^{15}\text{N}$ , 97%)  | 0.1 g, 0.25 g, 0.5 g |
| CLM-6725    | L-Thyroxine (tyrosine-ring- $^{13}\text{C}_6$ , 99%) CP 90%  | 0.1 mg               |
| CLM-8931    | L-Thyroxine (ring- $^{13}\text{C}_{12}$ , 99%) CP 97%  | 0.1 mg               |
| ULM-8184    | L-Thyroxine (unlabeled)  | 0.2 mg               |
| DLM-10758   | Trisodium 2-methylcitrate (methyl- $\text{D}_3$ , 98%) CP 90% (racemic mixture of diastereomers)   | 5 mg, 10 mg          |
| ULM-10510   | Trisodium 2-methylcitrate (unlabeled) CP 90% (racemic mixture of diastereomers)  | Please inquire       |
| CLM-716     | L-Tryptophan (indole- $3\text{-}^{13}\text{C}$ , 95%)  | 0.25 g               |
| CLM-4290-H  | L-Tryptophan ( $^{13}\text{C}_{11}$ , 99%)   | 0.1 g                |
| DLM-6903    | L-Tryptophan ( $\text{D}_8$ , 97%)   | 0.25 g               |
| NLM-800     | L-Tryptophan ( $^{15}\text{N}_2$ , 98%)  | 0.25 g, 0.5 g        |

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## Neurotransmitters and Their Metabolites

Neurotransmitters are small chemicals in the central nervous system that modulate and regulate brain function. Signals are relayed from neuron to neuron by release, upon stimulation, from a synaptic vesicle into a space where it can bind to a receptor. These molecules can be grouped into several classes, such as catecholamines (e.g., dopamine, epinephrine) and indolamines (e.g., melatonin, serotonin). MS analysis of neurotransmitters in human biosamples, such as urine, is a clinically relevant area as they mediate homeostatic function, modulate neural activity, and have been correlated to the pathogenesis of neurodegenerative diseases (e.g., Alzheimer's).

CIL offers an array of stable isotope-labeled neurotransmitters. These research-grade materials are available in their solution and/or neat form.

### Catecholamines

| Catalog No. | Description  | Unit Size      |
|-------------|--|----------------|
| CLM-3368    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (1- <sup>13</sup> C, 99%)                                    | 0.01 g, 0.05 g |
| CLM-9926    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (2- <sup>13</sup> C, 99%)                                    | Please inquire |
| CLM-3369    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                   | Please inquire |
| DLM-2833    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (1,1-D <sub>2</sub> , 93%) CP 96%                            | Please inquire |
| DLM-2834    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (2,2-D <sub>2</sub> , 97%)                                   | 0.01 g, 0.1 g  |
| DLM-2181    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (ring-D <sub>3</sub> , 98%)                                  | 0.1 g          |
| DLM-2498    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (1,1,2,2-D <sub>4</sub> , 97%)                               | 0.01 g, 0.1 g  |
| DLM-2290    | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (ring-D <sub>3</sub> , 95%; 2,2-D <sub>2</sub> , 95%) CP 95% | 0.05 g, 0.1 g  |
| CNLM-3445   | Dopamine-HCl (2-(3,4-dihydroxyphenyl) ethylamine-HCl) (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 99%)              | Please inquire |
| DLM-9088    | DL-Epinephrine (ring-D <sub>3</sub> , 1,2,2-D <sub>3</sub> , 98%)  | Please inquire |
| CNLM-7889   | DL-Epinephrine (1,2- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)                                     | 10 mg          |
| DLM-8820    | DL-Norepinephrine (noradrenaline)-HCl (ring-D <sub>3</sub> , 1,2,2-D <sub>3</sub> , 99%)                           | 5 mg, 10 mg    |

### Indolamines

| Catalog No. | Description  | Unit Size      |
|-------------|--|----------------|
| DLM-7101    | Melatonin (acetyl-D <sub>3</sub> , 98%)                    | 5 mg, 10 mg    |
| DLM-11030   | Serotonin (5-HT)-HCl (α,α,β,β-D <sub>4</sub> , 98%) CP 96% | Please inquire |

### Other Compounds

| Catalog No. | Description   | Unit Size                  |
|-------------|---|----------------------------|
| DLM-11620   | Acetylcholine chloride (N,N,N-trimethyl-D <sub>9</sub> , 98%)                   | Please inquire             |
| DLM-11029   | N-Acetyl-5-hydroxytryptamine (N-acetylserotonin) (acetyl-D <sub>3</sub> , 98%)  | Please inquire             |
| CLM-8666    | γ-Aminobutyric acid (GABA) ( <sup>13</sup> C <sub>4</sub> , 97%)                | 0.05 g, 0.1 g              |
| DLM-7760    | γ-Aminobutyric acid (GABA) (2,2,3,3,4,4-D <sub>6</sub> , 98%)                   | Please inquire             |
| CLM-548     | Choline chloride (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                      | 0.1 g                      |
| DLM-549     | Choline chloride (trimethyl-D <sub>9</sub> , 98%)                               | 1 g                        |
| DLM-2499    | 3,4-Dihydroxyphenylacetic acid (ring-D <sub>3</sub> , 2,2-D <sub>2</sub> , 98%) | 0.01 g, 0.1 g              |
| CLM-3632    | DL-Glutamic acid (3- <sup>13</sup> C, 99%)                                      | Please inquire             |
| DLM-335     | DL-Glutamic acid (2,4,4-D <sub>3</sub> , 98%)                                   | 1 g                        |
| DLM-357     | DL-Glutamic acid (2,3,3,4,4-D <sub>5</sub> , 97%)                               | 0.25 g                     |
| CLM-674     | L-Glutamic acid (1- <sup>13</sup> C, 99%)                                       | 1 g                        |
| CLM-2474    | L-Glutamic acid (2- <sup>13</sup> C, 99%)                                       | Please inquire             |
| CLM-4742    | L-Glutamic acid (3- <sup>13</sup> C, 99%)                                       | Please inquire             |
| CLM-2431    | L-Glutamic acid (4- <sup>13</sup> C, 98%)                                       | Please inquire             |
| CLM-613     | L-Glutamic acid (5- <sup>13</sup> C, 99%)                                       | 0.1 g                      |
| CLM-2024    | L-Glutamic acid (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                       | 0.25 g                     |
| CLM-3646    | L-Glutamic acid (3,4- <sup>13</sup> C <sub>2</sub> , 99%)                       | 0.25 g                     |
| CLM-1800-H  | L-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 99%)                           | 0.1 mg, 0.25 g, 0.5 g, 1 g |
| DLM-3725    | L-Glutamic acid (2,4,4-D <sub>3</sub> , 97%)                                    | 0.5 g                      |
| DLM-556     | L-Glutamic acid (2,3,3,4,4-D <sub>5</sub> , 98%)                                | 0.05 g, 0.1 g              |
| NLM-135     | L-Glutamic acid ( <sup>15</sup> N, 98%)   | 0.5 g, 1 g                 |
| CNLM-7812   | L-Glutamic acid (1- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)                 | 0.25 g                     |
| CNLM-554-H  | L-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 99%; <sup>15</sup> N, 99%)     | 0.25 g, 0.5 g, 1 g         |

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## Neurotransmitters and Their Metabolites (continued)

| Catalog No.   | Description   | Unit Size      |
|---------------|---|----------------|
| DNLM-6996     | L-Glutamic acid (2,3,3,4,4-D <sub>5</sub> , 98%; <sup>15</sup> N, 98%)                            | 0.25 g, 0.5 g  |
| CDNLM-6804    | L-Glutamic acid ( <sup>13</sup> C <sub>5</sub> , 97%; D <sub>5</sub> , 97%; <sup>15</sup> N, 97%) | 0.25 g         |
| ULM-8675      | L-Glutamic acid (unlabeled)   | 0.1 mg         |
| CLM-6664      | L-Glutamic acid, N-acetyl (glutamate- <sup>13</sup> C <sub>5</sub> , 97%)                         | Please inquire |
| CLM-3721      | DL-Glutamic acid·H <sub>2</sub> O (1- <sup>13</sup> C, 99%)                                       | 1 g            |
| OLM-8028      | L-Glutamic acid·HCl ( <sup>17</sup> O <sub>4</sub> , ~30%)  | Please inquire |
| CLM-11041     | 4-(aminobutyl)Guanidine sulfate (butyl- <sup>13</sup> C <sub>4</sub> , 98%) CP 95%                | Please inquire |
| DLM-2911      | Histamine·2HCl (α,α,β,β-D <sub>4</sub> , 98%)   | 10 mg          |
| CLM-373       | Homovanillic acid (1,2- <sup>13</sup> C <sub>2</sub> , 98%)                                       | 0.1 g          |
| DLM-2738      | Homovanillic acid (phenyl-D <sub>3</sub> , 2,2-D <sub>2</sub> , 96%)                              | 0.1 g          |
| COLM-376      | Homovanillic acid (ring- <sup>13</sup> C <sub>6</sub> , 99%; 4-hydroxy- <sup>18</sup> O, 90%)     | 0.01 g         |
| CLM-10900     | Homovanillic acid, sodium salt (1,2- <sup>13</sup> C <sub>2</sub> , 98%)                          | Please inquire |
| ULM-10577     | Homovanillic acid, sodium salt (unlabeled)  | Please inquire |
| CLM-9936-1.2  | 5-Hydroxyindole-3-acetic acid (3α,4,5,6,7,7α- <sup>13</sup> C <sub>6</sub> , 98%)                 | 1.2 mL         |
| ULM-11111-1.2 | 5-Hydroxyindole-3-acetic acid (unlabeled)   | 1.2 mL         |
| CLM-1896      | Indole-3-acetic acid (IAA) (phenyl- <sup>13</sup> C <sub>6</sub> , 99%)                           | 0.01 g         |
| DLM-3560      | DL-Metanephrine·HCl (α,β,β-D <sub>3</sub> , 98%)  | 5 mg, 10 mg    |
| DLM-2950      | N-τ-Methylhistamine·2HCl (N-methyl-D <sub>3</sub> , 98%)  | 0.1 g          |
| DLM-8609      | DL-Normetanephrine·HCl (α,β,β-D <sub>3</sub> , 98%)   | 5 mg, 10 mg    |
| DLM-2993      | 2-Phenylethylamine (2,2-D <sub>2</sub> , 95%)   | Please inquire |
| CLM-6622      | Taurine (1,2- <sup>13</sup> C <sub>2</sub> , 98%)   | 0.25 g, 0.5 g  |
| DLM-8057      | Taurine (D <sub>4</sub> , 98%) CP 95%   | 0.1 g, 0.25 g  |
| NLM-4472      | Taurine ( <sup>15</sup> N, 98%)   | Please inquire |
| CNLM-10253    | Taurine ( <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)                               | 0.01 g         |
| DLM-8075      | Tyramine·HCl (1,1,2,2-D <sub>4</sub> , 98%)   | Please inquire |
| DLM-4794      | DL-Vanilmandelic acid (VMA) (ring-D <sub>3</sub> , 98%)   | 0.1 g          |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Nucleic Acids

Nucleic acids are necessary biomolecules of living systems, being fundamentally important to a multitude of cellular processes. Its basic building blocks are nucleobases (e.g., adenine, cytosine, xanthine), nucleosides (e.g., adenosine, guanosine, inosine), and nucleotides (e.g., ATP, CMP, dGTP). The qualification/quantification of these compounds, and their synthetic analogues (e.g., 5-fluorouracil), in biosamples is performed preclinically and clinically to address a number of purposes. This includes the screening of metabolic errors and the efficacy evaluation of drug treatments (be it anticancer, antiviral, or immunosuppressive), among other target areas.

CIL offers an array of stable isotope-labeled nucleic acid building blocks for MS- or NMR-based research. These standards are available in a variety of labeling patterns and quantities.

| Catalog No.   | Description   | Unit Size                  |
|---------------|---|----------------------------|
| CLM-1654      | Adenine (8- <sup>13</sup> C, 95%)   | 0.5 g                      |
| NLM-6924      | Adenine·HCl·½H <sub>2</sub> O ( <sup>15</sup> N <sub>5</sub> , 98%)   | 10 mg                      |
| CLM-3698      | Adenosine (ribose-2- <sup>13</sup> C, 99%)  | Please inquire             |
| CLM-3678      | Adenosine (ribose- <sup>13</sup> C <sub>5</sub> , 98%) CP 97%   | 0.05 g, 0.1 g              |
| DLM-7676      | Adenosine (ribose-1-D, 98%)   | Please inquire             |
| DLM-7677      | Adenosine (ribose-2-D, 97%)   | Please inquire             |
| DLM-7678      | Adenosine (ribose-5,5-D <sub>2</sub> , 98%)   | Please inquire             |
| NLM-9750-SL   | Adenosine (U- <sup>15</sup> N <sub>5</sub> , 96%)   | 10 mg, 50 mg               |
| CNLM-3806-CA  | Adenosine ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%)  | 10 mg, 50 mg               |
| CLM-3605      | Adenosine·H <sub>2</sub> O (ribose-1- <sup>13</sup> C, 99%) CP 95%  | 0.1 g, 0.25 g              |
| CLM-7674      | Adenosine·H <sub>2</sub> O (3'- <sup>13</sup> C, 98%)   | 0.05 g, 0.1 g              |
| CNLM-3802-SL  | Adenosine 5'-monophosphate (AMP) (U- <sup>13</sup> C <sub>10</sub> , 98%; U- <sup>15</sup> N <sub>5</sub> , 96%)  | 10 mg, 50 mg               |
| CNLM-3802-CA  | Adenosine 5'-monophosphate (AMP), ammonium salt (U- <sup>13</sup> C <sub>10</sub> , 99%; U- <sup>15</sup> N <sub>5</sub> , 98%) CP 95%<br>(100 mM in water, pH 7.5) | 10 mg, 50 mg               |
| NLM-3792-SL   | Adenosine 5'-monophosphate (AMP), lithium salt (U- <sup>15</sup> N <sub>5</sub> , 96%) in solution  | 10 mg, 50 mg               |
| CLM-11604-SL  | Adenosine phosphoramidite (U- <sup>13</sup> C <sub>10</sub> , 98%) CP 95%   | 10 mg, 50 mg               |
| NLM-11609-SL  | Adenosine phosphoramidite (U- <sup>15</sup> N <sub>5</sub> , 98%) CP 95%  | 10 mg, 50 mg               |
| CNLM-11613-SL | Adenosine phosphoramidite (U- <sup>13</sup> C <sub>10</sub> , 98%; U- <sup>15</sup> N <sub>5</sub> , 98%) CP 95%  | 10 mg, 50 mg               |
| CLM-11402-CA  | Adenosine 5'-triphosphate (ATP), ammonium salt (4'- <sup>13</sup> C, 99%) CP 95% (in solution)  | Please inquire             |
| CLM-11403-CA  | Adenosine 5'-triphosphate (ATP), ammonium salt (5'- <sup>13</sup> C, 99%) CP 95% (in solution)  | Please inquire             |
| CLM-11404-CA  | Adenosine 5'-triphosphate (ATP), ammonium salt (1',2',3',4',5'- <sup>13</sup> C <sub>5</sub> , 99%) CP 95% (in solution)  | Please inquire             |
| CLM-8426-CA   | Adenosine 5'-triphosphate (ATP), ammonium salt ( <sup>13</sup> C <sub>10</sub> , 99%) CP 95% (in solution)  | 100 µmol                   |
| DLM-7514-CA   | Adenosine 5'-triphosphate (ATP), ammonium salt (U-D, 97%) CP 90% (in solution)  | 20 µmol, 50 µmol, 100 µmol |
| DLM-8815-CA   | Adenosine 5'-triphosphate (ATP), ammonium salt (2-D, 97%) CP 90% (in solution)  | 100 µmol                   |
| DLM-11405-CA  | Adenosine 5'-triphosphate (ATP), ammonium salt (4'-D, 97%) CP 95% (in solution)   | Please inquire             |
| DLM-9268-CA   | Adenosine 5'-triphosphate (ATP), ammonium salt (2,8-D <sub>2</sub> , 98%) CP 95% (in solution)  | Please inquire             |
| DLM-11406-CA  | Adenosine 5'-triphosphate (ATP), ammonium salt (5',5"-D <sub>2</sub> , 97%) CP 95% (in solution)  | Please inquire             |
| DLM-8922-CA   | Adenosine 5'-triphosphate (ATP), ammonium salt (ribose-3',4',5',5'-D <sub>4</sub> , 98%) CP 90% (in solution)   | 20 µmol, 50 µmol, 100 µmol |
| NLM-3987-CA   | Adenosine 5'-triphosphate (ATP), ammonium salt ( <sup>15</sup> N <sub>5</sub> , 98%) CP 90% (in solution)   | 20 µmol, 100 µmol          |
| CNLM-4265-CA  | Adenosine 5'-triphosphate (ATP), ammonium salt ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 98%) CP 90% (in solution)                      | 20 µmol, 50 µmol, 100 µmol |
| DNLM-10985-CA | Adenosine 5'-triphosphate (ATP), ammonium salt (ribose-D <sub>6</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 98%) CP 95% (in solution)                               | Please inquire             |
| NLM-12312     | DL-Allantoin ( <sup>15</sup> N <sub>4</sub> , 98%) CP 97%   | Please inquire             |
| CLM-3611      | Cytidine (ribose-1- <sup>13</sup> C, 99%)   | 0.25 g                     |
| CLM-3699      | Cytidine (ribose-2- <sup>13</sup> C, 99%)   | Please inquire             |
| CLM-3679      | Cytidine (ribose- <sup>13</sup> C <sub>5</sub> , 98%)   | 0.05 g, 0.1 g              |
| DLM-7681      | Cytidine (ribose-5,5-D <sub>2</sub> , 98%)  | Please inquire             |
| NLM-3797      | Cytidine ( <sup>15</sup> N <sub>3</sub> , 96%)  | 50 mg                      |
| CNLM-3807     | Cytidine ( <sup>13</sup> C <sub>9</sub> , 98%; <sup>15</sup> N <sub>3</sub> , 96%)  | 50 mg                      |
| NLM-3793-SL   | Cytidine 5'-monophosphate (CMP), lithium salt (U- <sup>15</sup> N <sub>3</sub> , 96%) CP 90% (in solution)  | 10 mg, 50 mg               |
| CNLM-3803-SL  | Cytidine 5'-monophosphate (CMP), lithium salt (U- <sup>13</sup> C <sub>9</sub> , 98%; U- <sup>15</sup> N <sub>3</sub> , 96%) CP 90% (in solution)                   | 10 mg, 50 mg               |
| CLM-11606-SL  | Cytidine phosphoramidite (U- <sup>13</sup> C <sub>9</sub> , 98%) CP 95%   | 10 mg, 50 mg               |
| NLM-11610-SL  | Cytidine phosphoramidite (U- <sup>15</sup> N <sub>3</sub> , 98%) CP 95%   | 10 mg, 50 mg               |
| CNLM-11614-SL | Cytidine phosphoramidite (U- <sup>13</sup> C <sub>9</sub> , 98%; U- <sup>15</sup> N <sub>3</sub> , 98%) CP 95%  | 10 mg, 50 mg               |
| CLM-10987-CA  | Cytidine 5'-triphosphate (CTP), ammonium salt ( <sup>13</sup> C <sub>9</sub> , 99%) CP 95% (in solution)  | 100 µmol                   |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Nucleic Acids (continued)

| Catalog No.  | Description  | Unit Size                  |
|--------------|--|----------------------------|
| DLM-9267-CA  | Cytidine 5'-triphosphate (CTP), ammonium salt (5,6-D <sub>2</sub> , 97%) CP 90% (in solution)  | 100 µmol                   |
| DLM-8924-CA  | Cytidine 5'-triphosphate (CTP), ammonium salt (5-D, ribose-3',4',5',5'-D <sub>4</sub> , 97%) CP 90% (in solution)                                  | 20 µmol, 50 µmol, 100 µmol |
| DLM-8594-CA  | Cytidine 5'-triphosphate (CTP), ammonium salt (cytosine-5-D, 6-H; ribose-1,2,3,4,5,5-D <sub>6</sub> , 96%) in solution                             | 100 µmol                   |
| DLM-7515-CA  | Cytidine 5'-triphosphate (CTP), ammonium salt (D <sub>8</sub> , 97%) CP 90% (in solution)  | 20 µmol, 50 µmol, 100 µmol |
| NLM-4266-CA  | Cytidine 5'-triphosphate (CTP), ammonium salt ( <sup>15</sup> N <sub>3</sub> , 96%) CP 90% (in solution)   | 20 µmol, 100 µmol          |
| CNLM-4267-CA | Cytidine 5'-triphosphate (CTP), ammonium salt ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N <sub>3</sub> , 96%) CP 90% (in solution)       | 20 µmol, 50 µmol, 100 µmol |
| CLM-1001     | Cytosine (2- <sup>13</sup> C, 99%)   | Please inquire             |
| CNLM-4424    | Cytosine (2- <sup>13</sup> C, 99%; 1,3- <sup>15</sup> N <sub>2</sub> , 98%)  | 0.05 g                     |
| DLM-4750     | 2-Deoxy-D-ribose (5,5-D <sub>2</sub> , 98%)  | Please inquire             |
| CLM-3700     | 2'-Deoxyadenosine-H <sub>2</sub> O (deoxyribose-1- <sup>13</sup> C, 99%)   | Please inquire             |
| CLM-3701     | 2'-Deoxyadenosine-H <sub>2</sub> O (deoxyribose-2- <sup>13</sup> C, 99%)   | Please inquire             |
| CLM-7682     | 2'-Deoxyadenosine-H <sub>2</sub> O (ribose-5- <sup>13</sup> C, 98%)  | 0.05 g, 0.1 g              |
| CLM-4579     | 2'-Deoxyadenosine-H <sub>2</sub> O (ribose- <sup>13</sup> C <sub>5</sub> , 99%)  | Please inquire             |
| DLM-7683     | 2'-Deoxyadenosine-H <sub>2</sub> O (ribose-5,5-D <sub>2</sub> , 98%)   | 0.05 g, 0.1 g              |
| NLM-3895     | 2'-Deoxyadenosine-H <sub>2</sub> O ( <sup>15</sup> N <sub>5</sub> , 96%)   | 25 mg                      |
| CNLM-3896-CA | 2'-Deoxyadenosine monohydrate ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%)   | 5 mg, 10 mg, 25 mg         |
| NLM-3919-SL  | 2'-Deoxyadenosine 5'-monophosphate (U- <sup>15</sup> N <sub>5</sub> , 98%)   | 10 mg, 50 mg               |
| CNLM-3918-SL | 2'-Deoxyadenosine 5'-monophosphate, lithium salt (U- <sup>13</sup> C <sub>10</sub> , 98%; U- <sup>15</sup> N <sub>5</sub> , 98%) in solution       | 10 mg, 50 mg               |
| NLM-6829     | 2'-Deoxyadenosine phosphoramidite ( <sup>15</sup> N <sub>5</sub> , 98%) CP 95%   | 10 mg, 25 mg, 50 mg        |
| CNLM-6828    | 2'-Deoxyadenosine phosphoramidite ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 98%) CP 95%                                | 10 mg, 25 mg, 50 mg        |
| CNLM-6219-CA | 2'-Deoxyadenosine 5'-triphosphate, ammonium salt ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%) CP 90% (in solution)   | 20 µmol, 100 µmol          |
| DLM-7507-SL  | 2'-Deoxyadenosine 5'-triphosphate, lithium salt (U-D, 97%) CP 90% (in solution)  | 10 mg, 50 mg               |
| NLM-6215-SL  | 2'-Deoxyadenosine 5'-triphosphate, lithium salt (U- <sup>15</sup> N <sub>5</sub> , 98%) CP 90% (in solution)                                       | 10 mg, 50 mg               |
| NLM-3897     | 2'-Deoxycytidine ( <sup>15</sup> N <sub>3</sub> , 96%)   | 25 mg                      |
| CLM-7684     | 2'-Deoxycytidine-H <sub>2</sub> O (ribose-1- <sup>13</sup> C, 98%)   | Please inquire             |
| CLM-3702     | 2'-Deoxycytidine-H <sub>2</sub> O (deoxyribose-2- <sup>13</sup> C, 99%)  | Please inquire             |
| DLM-7685     | 2'-Deoxycytidine-H <sub>2</sub> O (ribose-5,5-D <sub>2</sub> , 98%)  | Please inquire             |
| NLM-3921     | 2'-Deoxycytidine 5'-monophosphate ( <sup>15</sup> N <sub>3</sub> , 96%)  | 10 mg                      |
| NLM-6827     | 2'-Deoxycytidine phosphoramidite ( <sup>15</sup> N <sub>3</sub> , 97%) CP 95%  | 10 mg, 25 mg, 50 mg        |
| CNLM-6830    | 2'-Deoxycytidine phosphoramidite ( <sup>13</sup> C <sub>9</sub> , 98%; <sup>15</sup> N <sub>3</sub> , 98%) CP 95%                                  | 10 mg, 25 mg, 50 mg        |
| DLM-7508-SL  | 2'-Deoxycytidine 5'-triphosphate, dilithium salt (U-D, 97%) CP 90% (in solution)   | 10 mg, 50 mg               |
| NLM-6216-SL  | 2'-Deoxycytidine 5'-triphosphate, lithium salt (U- <sup>15</sup> N <sub>3</sub> , 98%) CP 90% (in solution)  | 10 mg, 50 mg               |
| CNLM-6220-SL | 2'-Deoxycytidine 5'-triphosphate, lithium salt (U- <sup>13</sup> C <sub>9</sub> , 98%; U- <sup>15</sup> N <sub>3</sub> , 98%) CP 90% (in solution) | 10 mg, 50 mg               |
| CLM-7686     | 2'-Deoxyguanosine-H <sub>2</sub> O (ribose-1- <sup>13</sup> C, 98%)  | Please inquire             |
| CLM-11401-CA | 2'-Deoxyguanosine-H <sub>2</sub> O ( <sup>13</sup> C <sub>10</sub> , 99%) CP 95%   | Please inquire             |
| DLM-7687     | 2'-Deoxyguanosine-H <sub>2</sub> O (ribose-5,5-D <sub>2</sub> , 98%)   | 0.05 g, 0.1 g              |
| NLM-3899-CA  | 2'-Deoxyguanosine-H <sub>2</sub> O ( <sup>15</sup> N <sub>5</sub> , 98%) CP 95%  | 5 mg, 10 mg, 25 mg         |
| CNLM-3900-CA | 2'-Deoxyguanosine-H <sub>2</sub> O ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%)                                      | 5 mg, 10 mg, 25 mg         |
| NLM-6835-SL  | 2'-Deoxyguanosine 5'-monophosphate (U- <sup>15</sup> N <sub>5</sub> , 98%) CP 90% (in solution)  | 10 mg                      |
| CNLM-6836-SL | 2'-Deoxyguanosine 5'-monophosphate (U- <sup>13</sup> C, 98%; U- <sup>15</sup> N, 98%)  | 10 mg, 50 mg               |
| NLM-6826     | 2'-Deoxyguanosine phosphoramidite ( <sup>15</sup> N <sub>5</sub> , 98%) CP 95%   | 10 mg, 25 mg, 50 mg        |
| CNLM-6825    | 2'-Deoxyguanosine phosphoramidite ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 98%) CP 95%                                | 10 mg, 25 mg, 50 mg        |
| NLM-6217-CA  | 2'-Deoxyguanosine 5'-triphosphate, ammonium salt ( <sup>15</sup> N <sub>5</sub> , 98%) CP 90% (in solution)  | 100 µmol                   |
| CNLM-6221-CA | 2'-Deoxyguanosine 5'-triphosphate, ammonium salt ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>5</sub> , 96%) CP 90% (in solution)   | 100 µmol                   |
| DLM-7509-SL  | 2'-Deoxyguanosine 5'-triphosphate, dilithium salt (U-D, 97%) CP 90% (in solution)  | 10 mg, 50 mg               |
| CNLM-7871-SL | Set of 4 2'-deoxyribonucleoside 5'-monophosphates (U- <sup>13</sup> C, 98%; U- <sup>15</sup> N, 98%) CP 90% (in solution)                          | 4 × 10 mg                  |
| DLM-7511-SL  | Set of 4 2'-deoxyribonucleoside 5'-triphosphates, lithium salt (U-D, 98%) CP 90% (in solution)   | 4 × 10 mg, 4 × 50 mg       |
| NLM-7512-SL  | Set of 4 2'-deoxyribonucleoside 5'-triphosphates, lithium salt (U- <sup>15</sup> N, 98%) CP 90% (in solution)                                      | 4 × 10 mg, 4 × 50 mg       |
| CNLM-7513-SL | Set of 4 2'-deoxyribonucleoside 5'-triphosphates, lithium salt (U- <sup>13</sup> C, 98%; U- <sup>15</sup> N, 98%) CP 90% (in solution)             | 4 × 10 mg, 4 × 50 mg       |

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| Catalog No.   | Description  | Unit Size   |
|---------------|--|---|
| CNLM-8771-CA  | 2'-Deoxyuridine, ammonium salt ( $^{13}\text{C}_9$ , 98%; $^{15}\text{N}_2$ , 98%) CP 90% (in solution)                                      | 25 $\mu\text{mol}$ , 50 $\mu\text{mol}$ , 100 $\mu\text{mol}$ |
| DLM-4391      | 5,6-Dihydrothymine (5,6,6- $\text{D}_3$ , methyl- $\text{D}_3$ , 95%)  | 50 mg   |
| CNLM-4510     | 5,6-Dihydrouracil ( $^{13}\text{C}_4$ , 99%; $^{15}\text{N}_2$ , 98%)  | 25 mg   |
| DLM-7862      | Equimolar mix: ATP, GTP (ribose-3',4',5',5''- $\text{D}_4$ , 98%), CTP, UTP (5-D, ribose-3',4',5',5''- $\text{D}_4$ , 98%) ammonium salt     | 100 mg  |
| CNLM-3752     | Fapyadenine (formyl- $^{13}\text{C}$ , 98%; diamino- $^{15}\text{N}_2$ , 98%)  | 25 mg   |
| CNLM-3858     | Fapyguanine (formyl- $^{13}\text{C}$ , 99%; 4-amino-5-amido- $^{15}\text{N}_2$ , 98%)  | Please inquire  |
| ULM-11411-CA  | 2-Fluoro-2'-deoxyadenosine 5'-triphosphate, ammonium salt (unlabeled) CP 95% (in solution)   | Please inquire  |
| ULM-11412-CA  | 5-Fluoro-2'-deoxycytidine 5'-triphosphate, ammonium salt (unlabeled) CP 95% (in solution)  | Please inquire  |
| ULM-11413-CA  | 5-Fluoro-2'-deoxyuridine 5'-triphosphate, ammonium salt (unlabeled) CP 95% (in solution)   | Please inquire  |
| NLM-798       | 5-Fluorouracil (1,3- $^{15}\text{N}_2$ , 99%)  | Please inquire  |
| CNLM-3916     | 5-Fluorouracil ( $^{13}\text{C}_4$ , 99%; $^{15}\text{N}_2$ , 98%)   | 10 mg   |
| DLM-1846      | Guanidine·DCI ( $\text{D}_6$ , 98%)  | 1 g   |
| NLM-6723      | Guanidine·HBr ( $^{15}\text{N}_3$ , 98%)   | Please inquire  |
| CLM-1019      | Guanine (8- $^{13}\text{C}$ , 98%)   | 0.5 g   |
| NLM-6925      | Guanine ( $^{15}\text{N}_5$ , 98%)   | 10 mg   |
| CNLM-3990     | Guanine (8- $^{13}\text{C}$ , 98%; 7,9- $^{15}\text{N}_2$ , 98%)   | 25 mg   |
| CLM-7688      | Guanosine· $\text{H}_2\text{O}$ (ribose-1- $^{13}\text{C}$ , 98%)  | Please inquire  |
| DLM-7689      | Guanosine· $\text{H}_2\text{O}$ (ribose-5,5- $\text{D}_2$ , 98%)   | Please inquire  |
| CNLM-3808-CA  | Guanosine· $\text{H}_2\text{O}$ ( $^{13}\text{C}_{10}$ , 98%; $^{15}\text{N}_5$ , 96%)   | 5 mg, 10 mg, 25 mg  |
| NLM-3798      | Guanosine·2 $\text{H}_2\text{O}$ ( $^{15}\text{N}_5$ , 96%)  | 50 mg   |
| CNLM-3804-SL  | Guanosine 5'-monophosphate (GMP), lithium salt ( $\text{U-}^{13}\text{C}_{10}$ , 98%; $\text{U-}^{15}\text{N}_5$ , 98%) CP 90% (in solution) | 10 mg, 50 mg  |
| NLM-3794-SL   | Guanosine 5'-monophosphate (GMP) ( $\text{U-}^{15}\text{N}_5$ , 98%) CP 90% (lyophilized powder)   | 10 mg, 50 mg  |
| CLM-11607-SL  | Guanosine phosphoramidite ( $\text{U-}^{13}\text{C}_{10}$ , 98%) CP 95%  | 10 mg, 50 mg  |
| NLM-11611-SL  | Guanosine phosphoramidite ( $\text{U-}^{15}\text{N}_5$ , 98%) CP 95%   | 10 mg, 50 mg  |
| CNLM-11615-SL | Guanosine phosphoramidite ( $\text{U-}^{13}\text{C}_{10}$ , 98%; $\text{U-}^{15}\text{N}_5$ , 98%) CP 95%                                    | 10 mg, 50 mg  |
| CLM-10988-CA  | Guanosine 5'-triphosphate (GTP), ammonium salt ( $^{13}\text{C}_{10}$ , 99%) CP 90% (in solution)  | 100 $\mu\text{mol}$   |
| DLM-7516-CA   | Guanosine 5'-triphosphate (GTP), ammonium salt (U-D, 97%) CP 90% (in solution)   | 20 $\mu\text{mol}$ , 50 $\mu\text{mol}$ , 100 $\mu\text{mol}$ |
| DLM-11407-CA  | Guanosine 5'-triphosphate (GTP), ammonium salt (3'-D, 97%) CP 95% (in solution)  | Please inquire  |
| DLM-8923-CA   | Guanosine 5'-triphosphate (GTP), ammonium salt (ribose-3',4',5',5''- $\text{D}_4$ , 98%) CP 90% (in solution)                                | 20 $\mu\text{mol}$ , 50 $\mu\text{mol}$ , 100 $\mu\text{mol}$ |
| DNLM-10913-CA | Guanosine 5'-triphosphate (GTP), ammonium salt (ribose-1',2',3',4',5',5''- $\text{D}_6$ , 98%; $^{15}\text{N}_5$ , 98%) CP 90% (in solution) | Please inquire  |
| NLM-4268-CA   | Guanosine 5'-triphosphate (GTP), ammonium salt ( $^{15}\text{N}_5$ , 98%) CP 90% (in solution)   | 20 $\mu\text{mol}$ , 100 $\mu\text{mol}$                      |
| CNLM-4269-CA  | Guanosine 5'-triphosphate (GTP), ammonium salt ( $^{13}\text{C}_{10}$ , 99%; $^{15}\text{N}_5$ , 98%) CP 90% (in solution)                   | 20 $\mu\text{mol}$ , 50 $\mu\text{mol}$ , 100 $\mu\text{mol}$ |
| DNLM-10913-CA | Guanosine 5'-triphosphate (GTP), ammonium salt (ribose-1',2',3',4',5',5''- $\text{D}_6$ , 98%; $^{15}\text{N}_5$ , 98%) CP 90% (in solution) | 100 $\mu\text{mol}$   |
| NLM-6715      | 8-Hydroxy-2'-deoxyguanosine ( $^{15}\text{N}_5$ , 98%) CP 95%  | 0.1 mg, 1 mg  |
| CNLM-4392     | 5-Hydroxycytosine (2- $^{13}\text{C}$ , 99%; 1,3- $^{15}\text{N}_2$ , 98%)   | 25 mg, 50 mg  |
| DLM-10484     | 5-Hydroxymethyl-2'-deoxycytidine (hydroxymethyl- $\text{D}_2$ , 6-D, 98%)  | Please inquire  |
| CLM-8042      | Hypoxanthine ( $^{13}\text{C}_5$ , 99%)  | 0.1 mg, 10 mg   |
| DLM-8658      | Hypoxanthine (2,8- $\text{D}_2$ , 98%)   | 0.1 g   |
| DLM-2923      | Hypoxanthine (2,8,9- $\text{D}_3$ , OD, 98%)   | 0.1 g   |
| NLM-8500      | Hypoxanthine ( $^{15}\text{N}_4$ , 98%)  | Please inquire  |
| CNLM-7894     | Hypoxanthine ( $^{13}\text{C}_5$ , 99%; $^{15}\text{N}_4$ , 98%)   | 10 mg   |
| NLM-4264      | Inosine ( $^{15}\text{N}_4$ , 95%)   | 0.01 g, 0.05 g  |
| NLM-8712-CA   | Inosine 5'-monophosphate, ammonium salt ( $^{15}\text{N}_4$ , 98%) CP 90% (in solution)  | 100 $\mu\text{mol}$   |
| DLM-7471      | 3-Methyladenine (methyl- $\text{D}_3$ , 98%)   | 50 mg   |
| CNLM-11120    | 2'-O-Methyladenosine ( $^{13}\text{C}_{10}$ , 98%; $^{15}\text{N}_5$ , 96%)  | Please inquire  |
| DLM-7472      | 7-Methylguanine (methyl- $\text{D}_3$ , 98%)   | 10 mg   |
| DLM-7473      | 6-O-Methylguanine (methyl- $\text{D}_3$ , 98%)   | 10 mg   |
| CLM-10671     | Nicotinamide adenine dinucleotide ( $\text{NAD}^+$ ), ammonium salt (ribose- $^{13}\text{C}_5$ , 98%) CP 96% (in solution)                   | 0.5 mg, 1 mg  |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.



## Nucleic Acids (continued)

| Catalog No.   | Description   | Unit Size                                 |
|---------------|---|---|
| CLM-9427-CA   | 1-(5'-Phosphoribosyl)-5-amino-4-imidazole-carboxamide salt (2NH <sub>4</sub> <sup>+</sup> ) (ribose- <sup>13</sup> C <sub>5</sub> , 99%) CP 90% | 100 µmol                                  |
| CLM-11345-CA  | Pseudouridine ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%) in solution   | Please inquire                            |
| CLM-11344-CA  | Pseudouridine 5'-monophosphate, ammonium salt ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%) in solution             | Please inquire                            |
| DLM-7518-SL   | Set of 4 ribonucleoside 5'-triphosphates, lithium salt (U-D, 98%) CP 90% (in solution)  | 10 mg, 50 mg                              |
| NLM-7519-SL   | Set of 4 ribonucleoside 5'-triphosphates, lithium salt (U- <sup>15</sup> N, 98%) CP 90% (in solution)   | 10 mg, 50 mg                              |
| CNLM-7503-SL  | Set of 4 ribonucleoside 5'-triphosphates, lithium salt (U- <sup>13</sup> C, 98%; U- <sup>15</sup> N, 98%) CP 90% (in solution)                  | 10 mg, 50 mg                              |
| DLM-7518-CA   | Set of 4 ribonucleoside 5'-triphosphates, ammonium salt (U-D, 98%) CP 90% (in solution)   | 4 × 20 µmol, 4 × 50 µmol,<br>4 × 100 µmol |
| NLM-7519-CA   | Set of 4 ribonucleoside 5'-triphosphates, ammonium salt (U- <sup>15</sup> N, 98%) CP 90% (in solution)  | 4 × 100 µmol                              |
| CNLM-7503-CA  | Set of 4 ribonucleoside 5'-triphosphates, ammonium salt (U- <sup>13</sup> C, U- <sup>15</sup> N; 98%) CP 90% (in solution)                      | 4 × 20 µmol, 4 × 50 µmol,<br>4 × 100 µmol |
| CLM-11348-CA  | 1-Ribosyl-5-aminoimidazole-4-carboxamide (acadesine) (ribose- <sup>13</sup> C <sub>5</sub> , 99%)   | 100 µmol                                  |
| CLM-3629      | Ribothymidine (ribose-1- <sup>13</sup> C, 99%)  | Please inquire                            |
| NLM-7565-SL   | RNA standard ( <sup>15</sup> N, 98%)  | 1 mg                                      |
| DLM-10436     | Theobromine (3,7-dimethylxanthine) (7-methyl-D <sub>3</sub> , 98%)  | Please inquire                            |
| CLM-3647      | Thymidine (methyl- <sup>13</sup> C, 98%)  | 0.25 g, 0.5 g                             |
| CLM-4289      | Thymidine (deoxyribose-1- <sup>13</sup> C, 99%)   | Please inquire                            |
| CLM-3703      | Thymidine (deoxyribose-2- <sup>13</sup> C, 99%)   | Please inquire                            |
| CLM-7692      | Thymidine (deoxyribose-3- <sup>13</sup> C, 99%)   | Please inquire                            |
| DLM-7691      | Thymidine (ribose-5,5-D <sub>2</sub> , 98%)   | Please inquire                            |
| DLM-3327      | Thymidine (methyl-D <sub>3</sub> , ring-6-D, 97%) CP 95%  | Please inquire                            |
| NLM-3901      | Thymidine ( <sup>15</sup> N <sub>2</sub> , 96%)   | 25 mg                                     |
| CNLM-3902     | Thymidine ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 96%)  | 25 mg                                     |
| NLM-10691     | α-Thymidine ( <sup>15</sup> N <sub>2</sub> , 98%)   | Please inquire                            |
| NLM-3925      | Thymidine 5'-monophosphate ( <sup>15</sup> N <sub>2</sub> , 98%)  | 10 mg                                     |
| CNLM-3924-SL  | Thymidine 5'-monophosphate (U- <sup>13</sup> C <sub>10</sub> , 98%; U- <sup>15</sup> N <sub>2</sub> , 98%)                                      | 10 mg, 50 mg                              |
| NLM-6823      | Thymidine phosphoramidite ( <sup>15</sup> N <sub>2</sub> , 96%) CP 95%  | 10 mg, 25 mg, 50 mg                       |
| CNLM-6824     | Thymidine phosphoramidite ( <sup>13</sup> C <sub>10</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 98%) CP 95%                                     | 10 mg, 25 mg, 50 mg                       |
| DLM-7510-SL   | Thymidine 5'-triphosphate, lithium salt (U-D, 97%) CP 90% (in solution)   | 10 mg, 50 mg                              |
| NLM-6218-SL   | Thymidine 5'-triphosphate, lithium salt (U- <sup>15</sup> N <sub>2</sub> , 98%) CP 90% (in solution)  | 10 mg, 50 mg                              |
| CNLM-6222-SL  | Thymidine 5'-triphosphate, lithium salt (U- <sup>13</sup> C <sub>10</sub> , 98%; U- <sup>15</sup> N <sub>2</sub> , 98%) CP 90% (in solution)    | 10 mg, 50 mg                              |
| CLM-3764      | Thymine (6- <sup>13</sup> C, 99%)   | 0.25 g                                    |
| DLM-1089      | Thymine (α,α,α,6-D <sub>4</sub> , 98%)  | 1 g                                       |
| NLM-3995      | Thymine (1,3- <sup>15</sup> N <sub>2</sub> , 98%)   | 0.1 g                                     |
| CNLM-6945     | Thymine ( <sup>13</sup> C <sub>5</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 98%)   | Please inquire                            |
| CLM-10507     | Uracil ( <sup>13</sup> C <sub>4</sub> , 99%)  | Please inquire                            |
| NLM-637       | Uracil (1,3- <sup>15</sup> N <sub>2</sub> , 98%)  | 0.25 g, 0.5 g                             |
| NLM-1697      | Uric acid (1,3- <sup>15</sup> N <sub>2</sub> , 98%)   | 0.1 g, 0.5 g                              |
| CNLM-10617    | Uric acid (2- <sup>13</sup> C, 98%; 1,3,7- <sup>15</sup> N <sub>3</sub> , 98%) CP 95%   | 1 mg                                      |
| CLM-3276      | Uracil (2- <sup>13</sup> C, 99%)  | 0.1 g                                     |
| CLM-692       | Uracil (4,5- <sup>13</sup> C <sub>2</sub> , 99%)  | 0.25 g                                    |
| DLM-8633      | Uracil (5-D, 98%)   | 0.1 g, 0.25 g                             |
| DLM-8502      | Uracil (5,6-D <sub>2</sub> , 98%)   | 0.1 g, 0.25 g                             |
| CNLM-3917     | Uracil ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%)  | 0.1 g                                     |
| NLM-10910     | Uric acid, sodium salt ( <sup>15</sup> N <sub>2</sub> , 98%) CP 95%   | Please inquire                            |
| CLM-3630      | Uridine (ribose-1- <sup>13</sup> C, 99%)  | 0.05 g, 0.1 g                             |
| CLM-3680      | Uridine (ribose- <sup>13</sup> C <sub>5</sub> , 98%)  | Please inquire                            |
| DLM-11408-CA  | Uridine (5-D, 97%) CP 95% (in solution)   | Please inquire                            |
| DLM-7693      | Uridine (ribose-5,5-D <sub>2</sub> , 98%)   | Please inquire                            |
| NLM-812       | Uridine ( <sup>15</sup> N <sub>2</sub> , 98%)   | 25 mg                                     |
| CDLM-11409-CA | Uridine (1',2',3',4',5'- <sup>13</sup> C <sub>5</sub> , 99%; 5-D, 97%) CP 95% (in solution)   | Please inquire                            |
| CNLM-3809     | Uridine ( <sup>13</sup> C <sub>9</sub> , 98%; <sup>15</sup> N <sub>2</sub> , 96%)   | Please inquire                            |

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| Catalog No.    | Description   | Unit Size                                 |
|----------------|---|---|
| CDNLM-11410-CA | Uridine (2,4,5,6- <sup>13</sup> C <sub>4</sub> , 99%; 5-D, 97%; 1,3- <sup>15</sup> N <sub>2</sub> , 98%) CP 95% (in solution)               | Please inquire                            |
| CLM-10513      | Uridine diphosphate- $\alpha$ -D-glucose, disodium salt (glucose- <sup>13</sup> C <sub>6</sub> , 99%) in solution                           | Please inquire                            |
| NLM-3795       | Uridine 5'-monophosphate ( <sup>15</sup> N <sub>2</sub> , 96%)  | 10 mg                                     |
| NLM-3795-SL    | Uridine 5'-monophosphate, lithium salt (U- <sup>15</sup> N <sub>2</sub> , 96%) in solution  | 10 mg                                     |
| CNLM-3805-SL   | Uridine 5'-monophosphate, lithium salt (U- <sup>13</sup> C <sub>9</sub> , 98%; U- <sup>15</sup> N <sub>2</sub> , 96%) CP 90% (in solution)  | 10 mg, 50 mg                              |
| CLM-11608-SL   | Uridine phosphoramidite (U- <sup>13</sup> C <sub>9</sub> , 98%) CP 95%  | 10 mg, 50 mg                              |
| NLM-11612-SL   | Uridine phosphoramidite (U- <sup>15</sup> N <sub>2</sub> , 98%) CP 95%  | 10 mg, 50 mg                              |
| CNLM-11616-SL  | Uridine phosphoramidite (U- <sup>13</sup> C <sub>9</sub> , 98%; U- <sup>15</sup> N <sub>2</sub> , 98%) CP 95%                               | 10 mg, 50 mg                              |
| CLM-10914-CA   | Uridine 5'-triphosphate (UTP), ammonium salt ( <sup>13</sup> C <sub>9</sub> , 99%) CP 90% (in solution)                                     | 100 $\mu$ mol                             |
| DLM-9365-CA    | Uridine 5'-triphosphate (UTP), ammonium salt (uracil-5-D, 98%) CP 90% (in solution)   | 100 $\mu$ mol                             |
| DLM-9100-CA    | Uridine 5'-triphosphate (UTP), ammonium salt (5,6-D <sub>2</sub> , 98%) CP 90% (in solution)  | 100 $\mu$ mol                             |
| DLM-8925-CA    | Uridine 5'-triphosphate (UTP), ammonium salt (5-D, ribose-3',4',5',5'-D <sub>4</sub> , 98%) CP 90% (in solution)                            | 20 $\mu$ mol, 50 $\mu$ mol, 100 $\mu$ mol |
| DLM-8637-CA    | Uridine 5'-triphosphate (UTP), ammonium salt (uracil-5-D, 6-H; ribose-1,2,3,4,5,5-D <sub>6</sub> , 96%) CP 90% (in solution)                | 100 $\mu$ mol                             |
| DLM-7517-CA    | Uridine 5'-triphosphate (UTP), ammonium salt (D <sub>8</sub> , 97%) CP 90% (in solution)  | 20 $\mu$ mol, 50 $\mu$ mol, 100 $\mu$ mol |
| NLM-4270-CA    | Uridine 5'-triphosphate (UTP), ammonium salt ( <sup>15</sup> N <sub>2</sub> , 98%) CP 90% (in solution)                                     | 20 $\mu$ mol, 100 $\mu$ mol               |
| CNLM-4271-CA   | Uridine 5'-triphosphate (UTP), ammonium salt ( <sup>13</sup> C <sub>9</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%) CP 90% (in solution) | 20 $\mu$ mol, 50 $\mu$ mol, 100 $\mu$ mol |
| DNLM-10986-CA  | Uridine 5'-triphosphate (UTP), ammonium salt (ribose-D <sub>6</sub> , 98%; uracil- <sup>15</sup> N <sub>2</sub> , 98%) CP 95% (in solution) | Please inquire                            |
| NLM-1698       | Xanthine (1,3- <sup>15</sup> N <sub>2</sub> , 98%) CP 90%   | 0.1 g                                     |
| CLM-10530      | Xanthosine ( <sup>13</sup> C <sub>5</sub> , 98%) CP 95%   | Please inquire                            |
| CLM-8700-CA    | Xanthosine-5'-monophosphate, ammonium salt ( <sup>13</sup> C <sub>10</sub> , 98%) CP 90% (in solution)                                      | 100 $\mu$ mol                             |

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## Organic Acids and Their Conjugate Salts

Organic acids (OAs) play essential roles in energy metabolism pathways (e.g., glycolysis, tricarboxylic acid cycle), with the short-chained OAs emerging as important regulators of host immune response and transcriptional regulation.

To aid quantitative research in preclinical and clinical studies, CIL is pleased to offer a collection of stable isotope-labeled and unlabeled OAs and their conjugate salts. These encompass monocarboxylic (e.g., acetic, lactic), dicarboxylic (e.g., malic, succinic), and tricarboxylic (e.g., *cis*-aconitic, citric) acids.

| Catalog No. | Description   | Concentration | Unit Size          |
|-------------|---|---------------|--------------------|
| CLM-317     | Acetic acid ( $1\text{-}^{13}\text{C}$ , 99%)   | neat          | 1 g, 5 g           |
| CLM-318     | Acetic acid ( $2\text{-}^{13}\text{C}$ , 99%)   | neat          | 1 g                |
| CLM-113     | Acetic acid ( $1,2\text{-}^{13}\text{C}_2$ , 99%)   | neat          | 0.5 g, 1 g         |
| CLM-12323   | <i>cis</i> -Aconitic acid, trisodium salt, trihydrate ( $^{13}\text{C}_4$ , 99%) (1,2,3,6 : 3,4,5,6 AS 96:4) CP 97% | neat          | 1 g, 5 g, 10 g     |
| CLM-9878    | <i>trans</i> -Aconitic acid ( $2,4,4'\text{-}^{13}\text{C}_3$ , 99%) CP 95%   | neat          | Please inquire     |
| CLM-4723    | Adipic acid ( $^{13}\text{C}_6$ , 99%)  | neat          | 0.1 g              |
| DLM-2905    | Adipic acid ( $2,2,5,5\text{-D}_4$ , 98%)   | neat          | Please inquire     |
| DLM-2632    | Adipic acid ( $3,3,4,4\text{-D}_4$ , 98%)   | neat          | 0.5 g, 1 g         |
| DLM-2115    | Adipic acid ( $\text{D}_{10}$ , 98%)  | neat          | Please inquire     |
| CLM-10894   | Adipic acid, disodium salt ( $^{13}\text{C}_6$ , 99%)   | neat          | 0.1 mg             |
| ULM-10893   | Adipic acid, disodium salt (unlabeled) CP 95%   | neat          | 0.1 mg             |
| CLM-535     | 5-Aminolevulinic acid:HCl ( $4\text{-}^{13}\text{C}$ , 99%)   | neat          | 0.05 g             |
| CLM-1371    | 5-Aminolevulinic acid:HCl ( $5\text{-}^{13}\text{C}$ , 99%) CP 96%  | neat          | 0.05 g, 0.1 g      |
| CLM-7337    | Citric acid ( $1,5\text{-}^{13}\text{C}_2$ , 98%)   | neat          | Please inquire     |
| CLM-148     | Citric acid ( $2,4\text{-}^{13}\text{C}_2$ , 99%)   | neat          | Please inquire     |
| CLM-9876    | Citric acid ( $1,5,6\text{-carboxyl-}^{13}\text{C}_3$ , 99%)  | neat          | 0.1 mg, 0.1 g      |
| CLM-9021    | Citric acid ( $^{13}\text{C}_6$ , 99%) CP 97%   | neat          | Please inquire     |
| DLM-3487    | Citric acid ( $2,2,4,4\text{-D}_4$ , 98%)   | neat          | 0.5 g              |
| CLM-7933    | Creatine (guanidino- $^{13}\text{C}$ , 99%)   | neat          | 0.1 g              |
| DLM-1302    | Creatine (methyl- $\text{D}_3$ , 98%) CP 97%  | neat          | 0.25 g             |
| DLM-12302   | Creatine- $\text{H}_2\text{O}$ ( <i>N</i> -methyl- $\text{D}_3$ ; glycine- $2,2\text{-D}_2$ , 99%)                  | neat          | Please inquire     |
| CLM-495     | Diethyl malonate ( $2\text{-}^{13}\text{C}$ , 99%)  | neat          | 0.5 g, 1 g         |
| CLM-521     | Diethyl malonate ( $1,3\text{-}^{13}\text{C}_2$ , 99%)  | neat          | 0.25 g, 0.5 g, 1 g |
| CLM-3603    | Diethyl malonate ( $1,2,3\text{-}^{13}\text{C}_3$ , 99%)  | neat          | 0.5 g              |
| CLM-681     | Ethyl acetoacetate ( $3\text{-}^{13}\text{C}$ , 99%)  | neat          | 0.5 g, 1 g         |
| CLM-1284    | Formic acid ( $^{13}\text{C}$ , 99%) <5% $\text{H}_2\text{O}$   | neat          | 0.5 g, 1 g, 5 g    |
| DLM-743     | Formic acid (formyl- $\text{D}$ , 98%) <5% $\text{H}_2\text{O}$   | neat          | 5 g                |
| DLM-285     | Formic acid (OD, 98%) <5% $\text{D}_2\text{O}$  | neat          | 5 g                |
| DLM-286     | Formic acid ( $\text{D}_2$ , 98%) <5% $\text{D}_2\text{O}$  | neat          | 5 g                |
| CLM-1529    | Fumaric acid ( $^{13}\text{C}_4$ , 99%)   | neat          | 0.1 mg, 0.1 g      |
| DLM-1539    | Fumaric acid ( $2,3\text{-D}_2$ , 98%)  | neat          | 5 g                |
| DLM-7654    | Fumaric acid ( $\text{D}_4$ , 98%)  | neat          | 1 g                |
| CDLM-6062   | Fumaric acid ( $1\text{-}^{13}\text{C}$ , 99%; $2,3\text{-D}_2$ , 98%)  | neat          | Please inquire     |
| CDLM-8473   | Fumaric acid ( $1,4\text{-}^{13}\text{C}_2$ , 99%; $2,3\text{-D}_2$ , 98%)  | neat          | 0.1 g              |
| CLM-10890   | Fumaric acid, disodium salt ( $^{13}\text{C}_4$ , 99%)  | neat          | Please inquire     |
| DLM-3106    | Glutaric acid ( $2,2,4,4\text{-D}_4$ , 98%)   | neat          | 5 g                |
| CLM-10351   | DL-2-Hydroxyglutaric acid, disodium salt ( $^{13}\text{C}_5$ , 99%)   | neat          | 1 mg, 10 mg        |
| ULM-10479   | DL-2-Hydroxyglutaric acid, disodium salt (unlabeled)  | neat          | 0.01 g, 0.1 g      |
| DLM-9104    | ( <i>RS</i> )-2-Hydroxyglutaric acid, disodium salt ( $2,3,3\text{-D}_3$ ; OD, 98%) CP 95%                          | neat          | 0.1 g              |
| CLM-12282   | Isocitric acid, trisodium salt, hydrate ( $3,4,5,6\text{-}^{13}\text{C}_4$ , 98%) mixture of diastereomers          | neat          | 1 mg, 5 mg, 10 mg  |
| CLM-6820    | $\alpha$ -Ketobutyric acid, sodium salt (methyl- $^{13}\text{C}$ , 99%)   | neat          | 0.5 g              |
| CLM-6164    | $\alpha$ -Ketobutyric acid, sodium salt ( $^{13}\text{C}_4$ , 98%)  | neat          | 0.5 g              |
| CDLM-7318   | $\alpha$ -Ketobutyric acid, sodium salt (methyl- $^{13}\text{C}$ , 99%; $3,3\text{-D}_2$ , 98%)                     | neat          | 0.5 g, 1 g         |
| CDLM-7353   | $\alpha$ -Ketobutyric acid, sodium salt ( $4\text{-}^{13}\text{C}$ , 99%; $3,3,4,4\text{-D}_4$ , 98%)               | neat          | 0.25 g             |
| CDLM-4611   | $\alpha$ -Ketobutyric acid, sodium salt ( $^{13}\text{C}_4$ , 98%; $3,3\text{-D}_2$ , 98%)                          | neat          | 0.1 g, 0.25 g      |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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| Catalog No. | Description  | Concentration | Unit Size                           |
|-------------|--|---------------|-------------------------------------|
| CLM-2411    | $\alpha$ -Ketoglutaric acid ( $^{13}\text{C}_5$ , 99%) CP 90%  | neat          | 0.01 g, 0.1 g                       |
| DLM-9476    | $\alpha$ -Ketoglutaric acid ( $\text{D}_6$ , 98%)  | neat          | 0.01 g, 0.1 g                       |
| CLM-4442    | $\alpha$ -Ketoglutaric acid, disodium salt (1,2,3,4- $^{13}\text{C}_4$ , 99%) CP 97%   | neat          | 0.1 mg, 10 mg, 0.1 g, 0.5 g         |
| ULM-10648   | $\alpha$ -Ketoglutaric acid, disodium salt, hydrate (unlabeled) CP 90%   | neat          | 0.1 mg                              |
| CLM-2093    | $\alpha$ -Ketoisocaproic acid, sodium salt (1- $^{13}\text{C}$ , 99%)  | neat          | 1 g, 10 g                           |
| CLM-4826    | $\alpha$ -Ketoisocaproic acid, sodium salt (1,2- $^{13}\text{C}_2$ , 99%)  | neat          | 0.1 g                               |
| DLM-4214    | $\alpha$ -Ketoisocaproic acid, sodium salt (isopropyl- $\text{D}_7$ , 98%)   | neat          | 0.1 g, 0.25 g                       |
| CLM-4785    | $\alpha$ -Ketoisocaproic acid, sodium salt ( $^{13}\text{C}_6$ , 99%)  | neat          | 0.1 g                               |
| DLM-1944    | $\alpha$ -Ketoisocaproic acid, sodium salt (methyl- $\text{D}_3$ , 98%)  | neat          | 0.5 g                               |
| CLM-6821    | $\alpha$ -Ketoisovaleric acid, sodium salt (dimethyl- $^{13}\text{C}_2$ , 99%)   | neat          | 0.5 g                               |
| CLM-4418    | $\alpha$ -Ketoisovaleric acid, sodium salt ( $^{13}\text{C}_5$ , 98%)  | neat          | 0.25 g, 1 g                         |
| DLM-4646    | $\alpha$ -Ketoisovaleric acid, sodium salt ( $\text{D}_7$ , 98%)   | neat          | Please inquire                      |
| CDLM-10647  | $\alpha$ -Ketoisovaleric acid, sodium salt (dimethyl- $^{13}\text{C}_2$ , 99%; 3-D, 98%)   | neat          | 0.1 g, 0.5 g                        |
| CDLM-4418   | $\alpha$ -Ketoisovaleric acid, sodium salt ( $^{13}\text{C}_5$ , 98%; 3-D, 98%)  | neat          | 0.25 g                              |
| CDLM-7317   | $\alpha$ -Ketoisovaleric acid, sodium salt (3-methyl- $^{13}\text{C}$ , 99%; 3,4,4,4- $\text{D}_4$ , 98%)                          | neat          | 0.5 g, 1 g                          |
| CDLM-7354   | $\alpha$ -Ketoisovaleric acid, sodium salt (3-methyl- $^{13}\text{C}$ , 99%; 3-methyl- $\text{D}_2$ , 3,4,4,4- $\text{D}_4$ , 98%) | neat          | 0.25 g                              |
| CDLM-8446   | $\alpha$ -Ketoisovaleric acid, sodium salt (dimethyl- $^{13}\text{C}_2$ , 98%; 3-methyl- $\text{D}_2$ , 4,4- $\text{D}_2$ , 98%)   | neat          | 0.25 g                              |
| CDLM-8100   | $\alpha$ -Ketoisovaleric acid, sodium salt (1,2,3,4- $^{13}\text{C}_4$ , 99%; 3,4',4',4'- $\text{D}_4$ , 97%)                      | neat          | 0.25 g                              |
| DLM-1129    | Maleic acid (2,3- $\text{D}_2$ , 98%)  | neat          | 5 g                                 |
| CLM-10892   | Maleic acid, disodium salt, monohydrate ( $^{13}\text{C}_4$ , 99%)   | neat          | Please inquire                      |
| CLM-310     | Maleic anhydride (1,4- $^{13}\text{C}_2$ , 99%)  | neat          | 0.25 g                              |
| CLM-312     | Maleic anhydride (2,3- $^{13}\text{C}_2$ , 99%)  | neat          | 0.1 g                               |
| CLM-6019    | Maleic anhydride ( $^{13}\text{C}_4$ , 99%)  | neat          | Please inquire                      |
| DLM-1853    | Maleic anhydride ( $\text{D}_2$ , 98%)   | neat          | 1 g, 5 g                            |
| DLM-9045    | DL-Malic acid (2,3,3- $\text{D}_3$ , 98%)  | neat          | 0.1 g                               |
| CLM-8065    | L-Malic acid ( $^{13}\text{C}_4$ , 99%)  | neat          | 0.1 mg, 5 mg, 0.01 g, 0.05 g, 0.1 g |
| ULM-10964   | L-Malic acid (unlabeled)   | neat          | 0.1 mg                              |
| CLM-10826   | Malic acid, disodium salt, monohydrate ( $^{13}\text{C}_4$ , 99%)  | neat          | Please inquire                      |
| CLM-751     | Malonic acid (2- $^{13}\text{C}$ , 99%)  | neat          | 0.5 g, 1 g                          |
| CLM-1248    | Malonic acid (1,3- $^{13}\text{C}_2$ , 99%)  | neat          | 0.25, 0.5 g, 1 g                    |
| CLM-6123    | Malonic acid ( $^{13}\text{C}_3$ , 99%)  | neat          | 0.25 g                              |
| DLM-205     | Malonic acid ( $\text{D}_4$ , 98%)   | neat          | 50 g                                |
| CLM-10887   | Malonic acid, disodium salt ( $^{13}\text{C}_3$ , 99%)   | neat          | Please inquire                      |
| DLM-2312    | DL-2-Methylcitric acid (methyl- $\text{D}_3$ , 98%) CP 90%   | neat          | 5 mg, 10 mg                         |
| CLM-4285    | 3-Methylglutaconic acid (2,4- $^{13}\text{C}_2$ , 3-methyl- $^{13}\text{C}$ , 99%) <i>cis/trans</i> mix                            | neat          | 5 mg                                |
| CLM-10398   | 2-Methylglutaric acid (4,5- $^{13}\text{C}_2$ , 98%) CP 95%  | neat          | Please inquire                      |
| CLM-9426    | Methylmalonic acid ( $^{13}\text{C}_4$ , 99%)  | neat          | 0.1 g                               |
| DLM-387     | Methylmalonic acid (methyl- $\text{D}_3$ , 98%)  | neat          | 0.25 g                              |
| CLM-10895   | Methylmalonic acid, disodium salt ( $^{13}\text{C}_4$ , 99%)   | neat          | Please inquire                      |
| ULM-10578   | Methylmalonic acid, disodium salt (unlabeled) CP 95%   | neat          | Please inquire                      |
| NLM-10907   | Orotic acid, sodium salt ( $^{15}\text{N}_2$ , 98%)  | neat          | Please inquire                      |
| NLM-1048    | Orotic acid·H <sub>2</sub> O (1,3- $^{15}\text{N}_2$ , 98%)  | neat          | 0.25 g                              |
| CNLM-10662  | Orotic acid·H <sub>2</sub> O (2- $^{13}\text{C}$ , 99%; 1,3- $^{15}\text{N}_2$ , 98%)  | neat          | Please inquire                      |
| CLM-4449    | Oxalic acid, disodium salt (1,2- $^{13}\text{C}_2$ , 99%)  | neat          | 1 g                                 |
| CLM-10902   | Phthalic acid, disodium salt ( $^{13}\text{C}_4$ , 99%)  | neat          | Please inquire                      |
| CLM-3551    | Potassium phosphoenol pyruvate (2- $^{13}\text{C}$ , 99%)  | neat          | Please inquire                      |
| CLM-2723    | Potassium phosphoenol pyruvate (3- $^{13}\text{C}$ , 99%)  | neat          | Please inquire                      |
| CLM-3398    | Potassium phosphoenol pyruvate (2,3- $^{13}\text{C}_2$ , 99%)  | neat          | 0.05 g                              |
| CLM-646     | Propionic acid (1- $^{13}\text{C}$ , 99%)  | neat          | 1 g                                 |
| CLM-647     | Propionic acid ( $^{13}\text{C}_3$ , 99%)  | neat          | 1 g                                 |

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Organic Acids and Their Conjugate Salts *(continued)*

| Catalog No. | Description  | Concentration    | Unit Size   |
|-------------|--|------------------|---|
| DLM-2488    | Propionic acid (2,2-D <sub>2</sub> , 98%)  | neat             | 1 g, 5 g  |
| DLM-1137    | Propionic acid (methyl-D <sub>3</sub> , 98%)   | neat             | 5 g   |
| DLM-1919    | Propionic acid (D <sub>5</sub> , 98%)  | neat             | 5 g   |
| DLM-599     | Propionic acid (D <sub>6</sub> , 98%)  | neat             | Please inquire                                      |
| CLM-8077    | Pyruvic acid (1- <sup>13</sup> C, 99%)   | neat             | 1 g, 5 g  |
| CLM-8849    | Pyruvic acid (2- <sup>13</sup> C, 99%)   | neat             | 1 g, 5 g  |
| CLM-9505    | Pyruvic acid (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                               | neat             | 1 g, 5 g  |
| DLM-10675   | Pyruvic acid (D <sub>4</sub> , 98%)  | neat             | Please inquire                                      |
| CDLM-10674  | Pyruvic acid (1- <sup>13</sup> C, 99%; D <sub>4</sub> , 98%)                         | neat             | Please inquire                                      |
| CLM-2471    | Sodium acetate (1,2- <sup>12</sup> C <sub>2</sub> , 99.95%) <sup>13</sup> C depleted | neat             | 1 g   |
| CLM-156     | Sodium acetate (1- <sup>13</sup> C, 99%)   | neat             | 1 g, 5 g, 10 g                                      |
| CLM-381     | Sodium acetate (2- <sup>13</sup> C, 99%)   | neat             | 1 g, 5 g, 10 g                                      |
| CLM-440     | Sodium acetate (1,2- <sup>13</sup> C <sub>2</sub> , 99%)                             | neat             | 1 g, 5 g  |
| DLM-3126    | Sodium acetate (D <sub>3</sub> , 99%)  | neat             | 25 g  |
| OLM-1077    | Sodium acetate ( <sup>18</sup> O <sub>2</sub> , 95%)                                 | neat             | 1 g   |
| CDLM-611    | Sodium acetate (1- <sup>13</sup> C, 99%; D <sub>3</sub> , 98%)                       | neat             | 1 g   |
| CDLM-3457   | Sodium acetate (1,2- <sup>13</sup> C <sub>2</sub> , 99%; D <sub>3</sub> , 98%)       | neat             | 1 g   |
| CDLM-1240   | Sodium acetate (2- <sup>13</sup> C, 99%; D <sub>3</sub> , 98%)                       | neat             | 1 g   |
| COLM-1230   | Sodium acetate (1- <sup>13</sup> C, 99%; <sup>18</sup> O <sub>2</sub> , 96%)         | neat             | Please inquire                                      |
| CLM-1256    | Sodium butyrate (1- <sup>13</sup> C, 99%)  | neat             | 1 g, 5 g  |
| CLM-10426   | Sodium butyrate ( <sup>13</sup> C <sub>4</sub> , 99%)                                | neat             | 0.1 g   |
| DLM-641     | Sodium butyrate (3,3,4,4,4-D <sub>5</sub> , 98%)                                     | neat             | Please inquire                                      |
| DLM-7616    | Sodium butyrate (D <sub>7</sub> , 98%)   | neat             | Please inquire                                      |
| CLM-3780    | Sodium dichloroacetate ( <sup>13</sup> C <sub>2</sub> , 99%)                         | neat             | Please inquire                                      |
| CLM-583     | Sodium formate ( <sup>13</sup> C, 99%)   | neat             | 1 g, 5 g  |
| OLM-8123    | Sodium formate ( <sup>18</sup> O <sub>2</sub> , 95%)                                 | neat             | 0.5 g   |
| CLM-3706    | Sodium D-3-hydroxybutyrate (2,4- <sup>13</sup> C <sub>2</sub> , 99%)                 | neat             | 1 g   |
| CLM-3853    | Sodium D-3-hydroxybutyrate ( <sup>13</sup> C <sub>4</sub> , 99%) CP 97%              | neat             | 0.5 g   |
| DLM-10415-D | Sodium DL-3-hydroxybutyrate (3,4,4,4-D <sub>4</sub> , 98%) CP 95%                    | 1 mg/mL in water | 1 mL  |
| CLM-10768   | Sodium D-lactate ( <sup>13</sup> C <sub>3</sub> , 98%)                               | 20% w/w in water | Please inquire                                      |
| CLM-1577    | Sodium L-lactate (1- <sup>13</sup> C, 99%)   | 20% w/w in water | 1 g/compound  |
| CLM-1578    | Sodium L-lactate (3- <sup>13</sup> C, 98%)   | 20% w/w in water | 0.25 g/compound,<br>0.5 g/compound,<br>1 g/compound |
| CLM-1579    | Sodium L-lactate ( <sup>13</sup> C <sub>3</sub> , 98%)                               | 20% w/w in water | 0.1 g/compound                                      |
| CLM-1579-N  | Sodium L-lactate ( <sup>13</sup> C <sub>3</sub> , 98%)                               | neat             | 0.1 mg  |
| DLM-9071    | Sodium L-lactate (3,3,3-D <sub>3</sub> , 98%)  | 20% w/w in water | 0.1 g/compound,<br>0.25 g/compound                  |
| CLM-771     | Sodium propionate (1- <sup>13</sup> C, 99%)  | neat             | 1 g   |
| CLM-1506    | Sodium propionate (2- <sup>13</sup> C, 99%)  | neat             | 0.5 g, 1 g  |
| CLM-4573    | Sodium propionate (3- <sup>13</sup> C, 99%)  | neat             | Please inquire                                      |
| CLM-3042    | Sodium propionate (2,3- <sup>13</sup> C <sub>2</sub> , 99%)                          | neat             | Please inquire                                      |
| CLM-1865    | Sodium propionate ( <sup>13</sup> C <sub>3</sub> , 99%)                              | neat             | 0.1 g   |
| DLM-1601    | Sodium propionate (D <sub>5</sub> , 98%)   | neat             | 1 g   |
| CLM-1082    | Sodium pyruvate (1- <sup>13</sup> C, 99%)  | neat             | 0.25 g, 0.5 g, 1 g                                  |
| CLM-1580    | Sodium pyruvate (2- <sup>13</sup> C, 99%)  | neat             | 0.5 g, 1 g  |
| CLM-1575    | Sodium pyruvate (3- <sup>13</sup> C, 99%)  | neat             | 0.25 g, 0.5 g, 1 g                                  |
| CLM-3507    | Sodium pyruvate (2,3- <sup>13</sup> C <sub>2</sub> , 99%)                            | neat             | 0.5 g, 1 g  |
| CLM-2440    | Sodium pyruvate ( <sup>13</sup> C <sub>3</sub> , 99%)                                | neat             | 0.5 g, 1 g  |
| DLM-6068    | Sodium pyruvate (D <sub>3</sub> , 97%)   | neat             | 0.5 g, 1 g  |
| CLM-1084    | Succinic acid (1,4- <sup>13</sup> C <sub>2</sub> , 99%)                              | neat             | 0.25 g, 0.5 g, 1 g                                  |
| CLM-1199    | Succinic acid (2,3- <sup>13</sup> C <sub>2</sub> , 99%)                              | neat             | 1 g   |

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| Catalog No. | Description  | Concentration | Unit Size             |
|-------------|--|---------------|-----------------------|
| CLM-1571    | Succinic acid ( $^{13}\text{C}_4$ , 99%)   | neat          | 0.1 g, 0.25 g, 0.1 mg |
| DLM-584     | Succinic acid ( $\text{D}_4$ , 98%)  | neat          | 5 g, 10 g             |
| DLM-831     | Succinic acid ( $\text{D}_6$ , 98%)  | neat          | 5 g                   |
| CDLM-7754   | Succinic acid ( $^{13}\text{C}_4$ , 99%; 2,2,3,3- $\text{D}_4$ , 98%)                            | neat          | Please inquire        |
| CLM-9371    | Succinic acid, disodium salt (2,3- $^{13}\text{C}_2$ , 99%)                                      | neat          | 1 g                   |
| CLM-10364   | Succinic acid, disodium salt ( $^{13}\text{C}_4$ , 99%)  | neat          | Please inquire        |
| DLM-2307    | Succinic acid, disodium salt ( $\text{D}_4$ , 80%) CP 95%  | neat          | 10 g, 25 g            |
| CLM-6755    | Succinylacetone (3,4,5,6,7- $^{13}\text{C}_5$ , 99%)   | neat          | 10 mg                 |
| CLM-10366   | Trisodium citrate, hemihydrate (1,5,6-carboxy- $^{13}\text{C}_3$ , 99%) CP 95%                   | neat          | Please inquire        |
| DLM-10758   | Trisodium 2-methylcitrate (methyl- $\text{D}_3$ , 98%) CP 90% (racemic mixture of diastereomers) | neat          | 5 mg, 10 mg           |
| NLM-1697    | Uric acid (1,3- $^{15}\text{N}_2$ , 98%)   | neat          | 0.1 g, 0.5 g          |

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## Other Compounds

CIL offers a breadth of other compounds that could find utility in qualitative and quantitative, analytical analyses. These are available in neat or solution form in variable unit sizes. For a comprehensive listing of additional individual compounds, please visit [isotope.com](https://www.isotope.com).

| Catalog No.       | Description  | Concentration  | Unit Size                  |
|-------------------|--|--|----------------------------|
| CLM-173           | Acetaldehyde (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | neat   | 0.5 g, 1 g                 |
| DLM-112           | Acetaldehyde (D <sub>4</sub> , 99%)  | neat   | 1 g, 5 g                   |
| DLM-11675         | Albuterol (3-hydroxymethyl-D <sub>2</sub> , α-D <sub>1</sub> , 98%) CP 95%                                   | neat   | Please inquire             |
| NLM-467           | Ammonium chloride ( <sup>15</sup> N, 99%)  | neat   | 1 g, 5 g, 10 g, 25 g, 50 g |
| DLM-11473         | 4-(2-Aminoethyl)morpholine (morpholino-2,2,3,3,5,5,6,6-D <sub>8</sub> , 98%)                                 | neat   | Please inquire             |
| CLM-9435          | N-(3-Aminopropyl) butane-1,4-diamine-3HCl (spermidine-3HCl) ( <sup>13</sup> C <sub>4</sub> , 99%) CP 95%     | neat   | 5 mg, 10 mg                |
| DLM-9261          | N-(3-Aminopropyl) butane-1,4-diamine-3HCl (spermidine-3HCl) (1,1,2,2,3,3,4,4-D <sub>8</sub> , 98%) CP 95%    | neat   | 5 mg, 10 mg, 50 mg         |
| ULM-10264         | N-(3-Aminopropyl) butane-1,4-diamine (unlabeled) CP 95%  | neat   | 1 mg, 5 mg, 10 mg          |
| DLM-9262          | N,N'-bis(3-Aminopropyl)-1,4-butanediamine-4HCl (spermine-3HCl) (1,1,2,2,3,3,4,4-D <sub>8</sub> , 97%) CP 95% | neat   | 5 mg, 10 mg                |
| ULM-10265         | N,N'-bis(3-Aminopropyl)-1,4-butanediamine-4HCl (unlabeled) CP 95%  | neat   | 1 mg, 5 mg, 10 mg          |
| NLM-711           | Ammonium nitrate (ammonium- <sup>15</sup> N, 98%)  | neat   | 1 g                        |
| NLM-711-10        | Ammonium nitrate (ammonium- <sup>15</sup> N, 10%)  | neat   | Please inquire             |
| NLM-712           | Ammonium nitrate (nitrate- <sup>15</sup> N, 98%)   | neat   | 1 g                        |
| NLM-712-10        | Ammonium nitrate (nitrate- <sup>15</sup> N, 10%)   | neat   | Please inquire             |
| NLM-390           | Ammonium nitrate ( <sup>15</sup> N <sub>2</sub> , 98%)   | neat   | 1 g                        |
| NLM-390-10        | Ammonium nitrate ( <sup>15</sup> N <sub>2</sub> , 10%)   | neat   | Please inquire             |
| NLM-390-5         | Ammonium nitrate ( <sup>15</sup> N <sub>2</sub> , 5%)  | neat   | Please inquire             |
| NLM-713           | Ammonium sulfate ( <sup>15</sup> N <sub>2</sub> , 99%)   | neat   | 1 g, 5 g, 10 g, 25 g, 50 g |
| NLM-713-10        | Ammonium sulfate ( <sup>15</sup> N <sub>2</sub> , 10%)   | neat   | 50 g                       |
| NLM-713-5         | Ammonium sulfate ( <sup>15</sup> N <sub>2</sub> , 5%)  | neat   | Please inquire             |
| DLM-1100          | Ammonium sulfate (D <sub>8</sub> , 98%)  | neat   | 5 g, 10 g                  |
| CLM-8141          | Arsenobetaine bromide (carboxymethyl- <sup>13</sup> C <sub>2</sub> , 99%) CP 90%                             | neat   | Please inquire             |
| CNLM-9695         | 5-Azacytosine (4,6- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N <sub>4</sub> , 98%)                  | neat   | Please inquire             |
| DLM-1109          | tert-Butanol (anhydrous) (OD, 99%)   | neat   | 25 g, 100 g                |
| DLM-4862          | Cacodylic acid (D <sub>7</sub> , 98%)  | neat   | 0.5 g                      |
| NLM-499           | Calcium nitrate ( <sup>15</sup> N <sub>2</sub> , 98%)  | neat   | 1 g                        |
| NLM-499-10        | Calcium nitrate ( <sup>15</sup> N <sub>2</sub> , 10%)  | neat   | Please inquire             |
| CLM-9256          | (±)-Catechin (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | neat   | 1 mg                       |
| CLM-10554         | (±)-Catechin gallate (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                                      | neat   | 1 mg                       |
| DLM-2816          | Clozapine (4-methylpiperazinyl-D <sub>4</sub> , 97%)   | neat   | 5 mg, 10 mg                |
| NEX-CRP-N         | C-reactive protein (CRP) (human) ( <sup>15</sup> N, 98%) CP 95%  | 100 µg/mL in 20 mM Tris-HCl (pH 8.0) with 100 mM NaCl                    | 1 mL                       |
| NEX-CRP-N-D       | C-reactive protein (CRP) (human) ( <sup>15</sup> N, 98%) CP 95% (denatured)                                  | 100 µg/mL in 50 mM sodium acetate (pH 4.0) with 500 mM NaCl and 8 M urea | 1 mL                       |
| DLM-9786          | p-Cresol sulfate, potassium salt (D <sub>7</sub> , 98%) CP 95%   | neat   | 10 mg                      |
| CNLM-4661-10X-1.2 | Cyanuric acid ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N <sub>3</sub> , 98%) CP 90%               | 1000 µg/mL in water  | 1.2 mL                     |
| CNLM-4661-1.2     | Cyanuric acid ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N <sub>3</sub> , 98%) CP 90%               | 100 µg/mL in water   | 1.2 mL                     |
| NLM-11619         | Cyclopropylamine ( <sup>15</sup> N, 98%)   | neat   | Please inquire             |
| CLM-11588         | Dansyl chloride (Dns-Cl) (dimethyl- <sup>13</sup> C <sub>2</sub> , 99%)                                      | neat   | 5 mg                       |
| ULM-11630         | Dansyl chloride (Dns-Cl) (unlabeled) CP 97%  | neat   | 5 mg                       |
| CLM-9255          | 1,3-Diaminobenzene ( <sup>13</sup> C <sub>6</sub> , 99%) CP 95%  | neat   | Please inquire             |
| CLM-10563         | 1,4-Diaminobenzene ( <sup>13</sup> C <sub>6</sub> , 99%)   | neat   | Please inquire             |
| DLM-10544         | Desethylamodiaquine (ethyl-D <sub>5</sub> , 97%)   | neat   | 2 mg, 5 mg                 |
| DLM-2744          | Enalaprilat-H <sub>2</sub> O (phenyl-D <sub>5</sub> , 98%)   | neat   | Please inquire             |
| CLM-10553         | (±)-Epicatechin gallate (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                                   | neat   | 1 mg                       |
| CLM-344           | Ethanol (1- <sup>13</sup> C, 99%) <6% H <sub>2</sub> O   | neat   | 0.5 g, 1 g                 |

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| Catalog No.       | Description  | Concentration       | Unit Size      |
|-------------------|--|---------------------|----------------|
| CLM-130           | Ethanol (2- <sup>13</sup> C, 99%) <6% H <sub>2</sub> O   | neat                | 0.5 g, 1 g     |
| CLM-551           | Ethanol (1,2- <sup>13</sup> C <sub>2</sub> , 99%) <6% H <sub>2</sub> O   | neat                | 0.5 g, 1 g     |
| DLM-552           | Ethanolamine (1,1,2,2-D <sub>4</sub> , 98%)  | neat                | 0.1 g, 1 g     |
| NLM-8722          | Ethanolamine ( <sup>15</sup> N, 98%)   | Please inquire      | Please inquire |
| CLM-3911          | Ethanolamine-HCl (1- <sup>13</sup> C, 99%)   | neat                | 1 g            |
| CLM-274           | Ethanolamine-HCl (1,2- <sup>13</sup> C <sub>2</sub> , 99%)   | neat                | 0.1 g, 0.25 g  |
| CNLM-3446         | Ethylenediamine-2HCl ( <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 99%)   | neat                | Please inquire |
| ULM-10281         | Galangin (unlabeled)   | neat                | 1 mg           |
| CLM-10556         | (±)-Galocatechin (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%  | neat                | 1 mg           |
| CLM-10552         | (±)-Galocatechin gallate (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%  | neat                | 1 mg           |
| CLM-11768         | Glutathione (GSH) (cysteinyl- <sup>13</sup> C <sub>3</sub> , 99%) 80% net peptide (peptide purity 85%)                                 | neat                | 5 g            |
| CNLM-6245         | Glutathione (GSH) (glycine- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N, 96%) 65% net peptide (peptide purity 85%)             | neat                | 10 mg, 50 mg   |
| CNLM-6245-HP      | Glutathione (GSH) (glycine- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N, 96%) 90% net peptide (peptide purity 95%)             | neat                | 10 mg          |
| CNLM-8782         | Glutathione disulfide (GSSG) (glycines- <sup>13</sup> C <sub>2</sub> , 98%; <sup>15</sup> N, 96%) 65% net peptide (peptide purity 90%) | neat                | 5 mg           |
| DLM-558           | Glycerol (D <sub>8</sub> , 99%)  | neat                | 1 g, 5 g       |
| DLM-1326          | Glycerol [(OD) <sub>3</sub> , 98%]   | neat                | 5 g, 10 g      |
| CDLM-11589        | Glycerol (1,3- <sup>13</sup> C <sub>2</sub> , 99%; D <sub>8</sub> , 98%) CP 95%  | neat                | Please inquire |
| CLM-11669         | Glycylglycine (Gly-Gly) ( <sup>13</sup> C <sub>4</sub> , 98%) CP 95%   | neat                | 1 mg           |
| NLM-6723          | Guanidine-HBr ( <sup>15</sup> N <sub>3</sub> , 98%)  | neat                | 0.1 g          |
| CLM-10368         | Hydrocinnamic acid (1- <sup>13</sup> C, 99%)   | neat                | Please inquire |
| CLM-8877          | Hydrocinnamic acid (1,2,3- <sup>13</sup> C <sub>3</sub> , 99%)   | neat                | 0.1 g          |
| CNLM-10399        | DL-3-Hydroxykynurenine (1,2,3- <sup>13</sup> C <sub>3</sub> , 98%; α-amino- <sup>15</sup> N, 98%) CP 95%                               | neat                | 1 mg           |
| CLM-9260          | 4-Hydroxy-3-methoxycinnamic acid (1',2',3'- <sup>13</sup> C <sub>3</sub> , 99%)  | neat                | 1 mg, 5 mg     |
| DLM-3033          | Imidazole (D <sub>4</sub> , 98%)   | neat                | 1 g, 5 g       |
| CLM-10572         | Isobutanol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)   | Please inquire      | Please inquire |
| CLM-9755          | Kaempferol (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 95%  | Please inquire      | Please inquire |
| CLM-11040         | Kaempferol (U- <sup>13</sup> C, 98%)   | neat                | Please inquire |
| CLM-7613          | <i>trans</i> -Lycopene (8,8',9,9',10,10',11,11',19,19'- <sup>13</sup> C <sub>10</sub> , 99%)   | neat                | Please inquire |
| CNLM-8150-10X-1.2 | Melamine ( <sup>13</sup> C <sub>3</sub> , 99%; amino- <sup>15</sup> N <sub>3</sub> , 98%)  | 1000 µg/mL in water | 1.2 mL         |
| CNLM-8150-1.2     | Melamine ( <sup>13</sup> C <sub>3</sub> , 99%; amino- <sup>15</sup> N <sub>3</sub> , 98%)  | 100 µg/mL in water  | 1.2 mL         |
| DLM-7101          | Melatonin (acetyl-D <sub>3</sub> , 98%)  | neat                | 5 mg, 10 mg    |
| CLM-359           | Methanol ( <sup>13</sup> C, 99%)   | neat                | 1 g, 5 g       |
| DLM-1211          | Methanol (D, 98%)  | neat                | 5 g            |
| DLM-1209          | Methanol (D <sub>2</sub> , 98%)  | neat                | 5 g            |
| CDLM-1035         | Methanol ( <sup>13</sup> C, 99%; D <sub>3</sub> , 98%)   | Please inquire      | Please inquire |
| DLM-651           | Methyl formate (formyl-D, 99%)   | neat                | 5 g, 10 g      |
| CDLM-11829        | 6-Methylmercaptapurine ( <sup>13</sup> C <sub>3</sub> , 98%; D <sub>3</sub> , 98%) CP 95%  | neat                | 1 mg           |
| CLM-9754          | Myricetin (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 95%   | neat                | 1 mg           |
| CNLM-11821        | L-Norepinephrine-HCl (1,2- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)   | neat                | 0.1 g          |
| CLM-7831          | (±)-Pantoprazole, sodium salt, sesquihydrate (pyridyl-4-methoxy- <sup>13</sup> C, 98%)   | neat                | Please inquire |
| CLM-10408         | <i>N</i> -Phenyl-1-naphthylamine (phenyl- <sup>13</sup> C <sub>6</sub> , 98%)  | neat                | 1 mg           |
| CLM-10409         | <i>N</i> -Phenyl-2-naphthylamine (phenyl- <sup>13</sup> C <sub>6</sub> , 98%)  | neat                | 1 mg           |
| DLM-9842          | <i>N</i> -Phosphorylethanolamine (1,1,2,2-D <sub>4</sub> , 98%)  | Please inquire      | Please inquire |
| NLM-765           | Potassium nitrate ( <sup>15</sup> N, 99%)  | neat                | 1 g            |
| NLM-765-10        | Potassium nitrate ( <sup>15</sup> N, 10%)  | neat                | Please inquire |
| CLM-222           | Potassium thiocyanate ( <sup>13</sup> C, 95%) CP 95%   | neat                | 0.5 g, 1 g     |
| CNLM-3952         | Potassium thiocyanate ( <sup>13</sup> C, 99%; <sup>15</sup> N, 98%)  | neat                | 0.5 g          |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## Other Compounds (continued)

| Catalog No. | Description   | Concentration | Unit Size         |
|-------------|---|---------------|-------------------|
| DLM-11667   | Ractopamine-HCl (1-methyl-D <sub>3</sub> -propyl-1,2,2-D <sub>3</sub> , 98%) CP 95%       | neat          | 1 mg              |
| DLM-11668   | Ractopamine-HCl (2-hydroxyethyl-1,1,2-D <sub>3</sub> , 98%) CP 95%                        | neat          | 1 mg              |
| DLM-10542   | Resorufin (D <sub>6</sub> , 98%) CP 96%   | neat          | 10 mg, 50 mg      |
| CLM-9259    | Resveratrol (4-hydroxyphenyl- <sup>13</sup> C <sub>6</sub> , 99%)                         | neat          | 1 mg, 5 mg, 10 mg |
| DLM-3579    | Serotonin creatinine sulfate complex ( $\alpha,\alpha,\beta,\beta$ -D <sub>4</sub> , 98%) | neat          | Please inquire    |
| CLM-441     | Sodium bicarbonate ( <sup>13</sup> C, 99%)  | neat          | 1 g, 5 g          |
| CLM-3780    | Sodium dichloroacetate ( <sup>13</sup> C <sub>2</sub> , 99%)                              | neat          | Please inquire    |
| CLM-9676    | Sodium isopropyl carbonate (carbonyl- <sup>13</sup> C, 99%)                               | neat          | Please inquire    |
| CLM-1579    | Sodium L-lactate ( <sup>13</sup> C <sub>3</sub> , 98%) 20% w/w in water                   | neat          | 1 g               |
| NLM-157     | Sodium nitrate ( <sup>15</sup> N, 98%)  | neat          | 1 g, 5 g          |
| CLM-3046    | Thiourea ( <sup>13</sup> C, 99%)  | neat          | 0.5 g             |
| CNLM-4818   | Thiourea ( <sup>13</sup> C, 99%; <sup>15</sup> N <sub>2</sub> , 98%)                      | neat          | 0.5 g             |
| CLM-10417   | Toxoflavin (3,4 $\alpha$ ,5,8 $\alpha$ - <sup>13</sup> C <sub>4</sub> , 98%) CP 95%       | neat          | 1 mg              |
| DLM-4779    | Trimethylamine N-oxide (D <sub>9</sub> , 98%)   | neat          | 1 g               |
| CLM-796     | Vanillic acid (carboxyl- <sup>13</sup> C, 99%)  | neat          | 0.1 g             |
| CLM-1867    | Vanillic acid (ring- <sup>13</sup> C <sub>6</sub> , 99%)                                  | neat          | 0.1 g             |

For a complete product listing, please visit [isotope.com](https://isotope.com).

## PeptiQuant™ Plus Assay Kits

Researchers in academia and life science industries continue to adopt a targeted, bottom-up MS-based workflow for protein biomarker evaluation. Biomarker verification/validation requires absolute quantification of surrogate peptides in the sample matrix, a requirement that is best achieved using well-characterized standards. To ensure robust quantitative measurement, quality control (QC) checks should be routinely performed. CIL offers a collection of 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. Platform-specific kits are listed below.

### 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)

|                   |  |                        |
|-------------------|--|------------------------|
| <b>Human</b>      |  |                        |
| BAK-A6490-125     | PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6490 QqQ and 1290 UPLC                           | 20, 50, or 100 samples |
| BAK-A6495-125     | PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6495 QqQ and 1290 UPLC                           | 20, 50, or 100 samples |
| BAK-SC6500-125    | PeptiQuant Plus Human Plasma Proteomics Kit for SCIEX QTRAP 6500 and 1290 UPLC                           | 20, 50, or 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 |
| BAK-TQXS-125      | PeptiQuant Plus Human Plasma Proteomics Kit for Waters Xevo TQ-XS and Acquity UPLC I                     | 20, 50, or 100 samples |
| BAK-A6490-270     | Expanded PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6490 QqQ and 1290 UPLC                  | 20, 50, or 100 samples |
| BAK-A6495-270     | Expanded PeptiQuant Plus Human Plasma Proteomics Kit for Agilent 6495 QqQ and 1290 UPLC                  | 20, 50, or 100 samples |
| BAK-SC6500-270    | Expanded PeptiQuant Plus Human Plasma Proteomics Kit for SCIEX QTRAP 6500 and 1290 UPLC                  | 20, 50, or 100 samples |
| BAK-QE-270        | Expanded PeptiQuant Plus Human Plasma Proteomics Kit for Thermo Scientific Q Exactive Plus and 1290 UPLC | 20, 50, or 100 samples |
| BAK-A6490-CNCR50  | DiseaseQuant Human Tissue Cancer Pathway Proteomics Kit for Agilent 6490 QqQ                             | 50 or 100 samples      |
| BAK-A6495-CNCR50  | DiseaseQuant Human Tissue Cancer Pathway Proteomics Kit for Agilent 6495 QqQ                             | 50 or 100 samples      |
| BAK-QE-CNCR50     | DiseaseQuant Human Tissue Cancer Pathway Proteomics Kit for Thermo Scientific Q Exactive Plus            | 50 or 100 samples      |
| <b>Mouse</b>      |  |                        |
| 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-BAK-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). PeptiQuant is a trademark of MRM Proteomics Inc.

## Pharmaceutical and Personal Care Products

Concerns about environmental and human exposure to pharmaceutical and personal care products (PPCPs) has grown significantly over the years. The classification of PPCPs encompasses a broad range of chemicals, ranging from antibiotics to hormones to food and drinking water impurities. Isotope-labeled standards are necessary in the qualitative/quantitative analysis of PPCPs, especially in complex matrices such as sewage sludge and biosamples, as well as in applications where ion suppression or enhancement are of high concern. CIL, with guidance from leading laboratories around the world, works diligently to produce high-quality, native and stable isotope-labeled standards for analysis of PPCPs. Please see [isotope.com](http://isotope.com) for the listing and details of our PPCP standards.

### *n*-Alkane Standards

| Catalog No. | Description   | Concentration | Unit Size       |
|-------------|---|---------------|-----------------|
| DLM-133     | <i>n</i> -Decane (D <sub>22</sub> , 99%)  | neat          | 1 g, 5 g        |
| DLM-338     | <i>n</i> -Dodecane (D <sub>26</sub> , 98%)  | neat          | 1 g, 5 g        |
| DLM-2724    | <i>n</i> -Dotriacontane (D <sub>66</sub> , 98%)   | neat          | 1 g             |
| DLM-2208    | <i>n</i> -Eicosane (D <sub>42</sub> , 98%)  | neat          | 0.5 g, 1 g      |
| DLM-1342    | <i>n</i> -Heptadecane (D <sub>36</sub> , 98%) CP 95% (5% related perdeuterated alkanes) | neat          | 1 g, 5 g        |
| DLM-423     | <i>n</i> -Heptane (D <sub>16</sub> , 98%)   | neat          | 1 g, 5 g        |
| DLM-203     | <i>n</i> -Hexadecane (D <sub>34</sub> , 98%)  | neat          | 0.1 g, 1 g, 5 g |
| DLM-139     | <i>n</i> -Hexane (D <sub>14</sub> , 98%)  | neat          | 1 g, 5 g        |
| DLM-2634    | <i>n</i> -Hexatriacontane (D <sub>74</sub> , 98%)                                       | neat          | 1 g             |
| DLM-1346    | <i>n</i> -Nonadecane (D <sub>40</sub> , 98%)  | neat          | 0.1 g, 1 g      |
| DLM-2438    | <i>n</i> -Nonane (D <sub>20</sub> , 98%)  | neat          | 1 g, 5 g        |
| DLM-1283    | <i>n</i> -Pentadecane (D <sub>32</sub> , 98%)   | neat          | 1 g, 5 g        |
| DLM-1213    | <i>n</i> -Pentane (D <sub>12</sub> , 98%)   | neat          | 1 g, 5 g        |
| DLM-50      | <i>n</i> -Octane (D <sub>18</sub> , 99%)  | neat          | 1 g, 5 g        |
| DLM-2209    | <i>n</i> -Tetracosane (D <sub>50</sub> , 98%)   | neat          | 0.5 g           |
| DLM-670     | <i>n</i> -Tetradecane (D <sub>30</sub> , 98%)   | neat          | 1 g, 5 g        |
| DLM-2210    | <i>n</i> -Triacontane (D <sub>62</sub> , 98%) CP 97%                                    | neat          | 0.5 g           |
| DLM-3336    | <i>n</i> -Tricosane (D <sub>48</sub> , 98%)   | neat          | 1 g             |
| DLM-1354    | <i>n</i> -Tridecane (D <sub>28</sub> , 98%)   | neat          | 1 g, 5 g        |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Bisphenol Standards

| Catalog No. | Description   | Concentration             | Unit Size |
|-------------|---|---------------------------|-----------|
| CLM-4325    | Bisphenol A (ring- $^{13}\text{C}_{12}$ , 99%)                              | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-7106    | Bisphenol A (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| DLM-9193    | Bisphenol A diglycidyl ether (BADGE) (diglycidyl- $\text{D}_{10}$ , 98%)    | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9857    | Bisphenol A diglycidyl ether (BADGE) (unlabeled)                            | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9831    | Bisphenol A $\beta$ -D-glucuronide (unlabeled) CP 90%                       | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9832    | Bisphenol A bis-( $\beta$ -D-glucuronide), disodium salt (unlabeled) CP 90% | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9833    | Bisphenol A bissulfate, disodium salt (unlabeled) CP 90%                    | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-9776    | Bisphenol AF (ring- $^{13}\text{C}_{12}$ , 99%)                             | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9779    | Bisphenol AF (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9830    | Bisphenol AP (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-9851    | Bisphenol B (ring- $^{13}\text{C}_{12}$ , 99%)                              | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9852    | Bisphenol B (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9826    | Bisphenol E (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-9866    | Bisphenol F (ring- $^{13}\text{C}_{12}$ , 99%)                              | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9827    | Bisphenol F (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-9867    | Bisphenol F diglycidyl ether (BFDGE) (ring- $^{13}\text{C}_{12}$ , 99%)     | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9868    | Bisphenol F diglycidyl ether (BFDGE) (unlabeled)                            | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9829    | Bisphenol P (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-9319    | Bisphenol S ( $^{13}\text{C}_{12}$ , 98%)                                   | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9320    | Bisphenol S (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9828    | Bisphenol Z (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL    |

## Chlorinated Paraffin Standards

| Catalog No. | Description  | Concentration       | Unit Size |
|-------------|--|---------------------|-----------|
| CLM-9000    | 1,5,5,6,6,10-Hexachlorodecane ( $^{13}\text{C}_{10}$ , 99%)          | 100 µg/mL in nonane | 1.2 mL    |
| ULM-8917    | 1,5,5,6,6,10-Hexachlorodecane (unlabeled)                            | 100 µg/mL in nonane | 1.2 mL    |
| CLM-9679    | 1,1,1,3,10,12,12,12-Octachlorododecane ( $^{13}\text{C}_{12}$ , 99%) | 100 µg/mL in nonane | 1.2 mL    |
| ULM-9485    | 1,1,1,3,10,12,12,12-Octachlorododecane (unlabeled)                   | 100 µg/mL in nonane | 1.2 mL    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Endocrine-Disrupting Compounds and Xenoestrogen Standards

| Catalog No. | Description  | Concentration             | Unit Size |
|-------------|--|---------------------------|-----------|
| CLM-1643    | Acenaphthene ( $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-108     | Acenaphthene ( $\text{D}_{10}$ , 98%)  | 200 µg/mL in isooctane    | 1.2 mL    |
| ULM-7413    | Acenaphthene (unlabeled)   | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-3727    | Alachlor (ring- $^{13}\text{C}_6$ , 99%) CP 96%  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-10027   | Alachlor (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4725    | Aldrin ( $^{13}\text{C}_{12}$ , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-1333    | Anthracene ( $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-102     | Anthracene ( $\text{D}_{10}$ , 98%)  | 200 µg/mL in isooctane    | 1.2 mL    |
| ULM-7412    | Anthracene (unlabeled)   | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-3737-MT | Atrazine (ring- $^{13}\text{C}_3$ , 99%)   | 100 µg/mL in MTBE         | 1.2 mL    |
| CLM-3737    | Atrazine (ring- $^{13}\text{C}_3$ , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-3602    | Benz[a]anthracene ( $^{13}\text{C}_6$ , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-610     | Benz[a]anthracene ( $\text{D}_{12}$ , 98%)   | 200 µg/mL in isooctane    | 1.2 mL    |
| ULM-2415-I  | Benz[a]anthracene (unlabeled)  | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-2722    | Benzo[a]pyrene ( $^{13}\text{C}_4$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-258     | Benzo[a]pyrene ( $\text{D}_{12}$ , 97%)  | 200 µg/mL in isooctane    | 1.2 mL    |
| ULM-2412-I  | Benzo[a]pyrene (unlabeled)   | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-6170    | Benzo[e]pyrene ( $^{13}\text{C}_4$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-257     | Benzo[e]pyrene ( $\text{D}_{12}$ , 98%)  | 200 µg/mL in isooctane    | 1.2 mL    |
| ULM-7423    | Benzo[e]pyrene (unlabeled)   | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-3599    | Benzo[b]fluoranthene ( $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-2136    | Benzo[b]fluoranthene ( $\text{D}_{12}$ , 98%)  | 200 µg/mL in isooctane    | 1.2 mL    |
| ULM-2416-I  | Benzo[b]fluoranthene (unlabeled)   | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-9590    | Benzo[j]fluoranthene ( $^{13}\text{C}_{12}$ , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-2411    | Benzo[j]fluoranthene (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-3756    | Benzo[k]fluoranthene ( $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-1923    | Benzo[k]fluoranthene ( $\text{D}_{12}$ , 98%)  | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-9730    | Benzo[c]phenanthrene ( $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-8155    | Benzo[c]phenanthrene (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-183     | Benzophenone ( $\text{D}_{10}$ , 98%)  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-8303    | Benzophenone (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-9849    | Benzyl paraben (benzyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                    | 1 mg/mL in methanol       | 1.2 mL    |
| ULM-9850    | Benzyl paraben (benzyl 4-hydroxybenzoate) (unlabeled)  | 1 mg/mL in methanol       | 1.2 mL    |
| DLM-1369    | Benzyl butyl phthalate (ring- $\text{D}_4$ , 98%)  | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4675    | Bis(2-ethylhexyl) adipate (adipate- $^{13}\text{C}_6$ , 99%)                                 | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-1368    | Bis(2-ethylhexyl) phthalate (ring- $\text{D}_4$ , 98%)                                       | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-6241    | Bis(2-ethylhexyl) phthalate (unlabeled)  | 1000 µg/mL in nonane      | 1.2 mL    |
| CLM-4325    | Bisphenol A (ring- $^{13}\text{C}_{12}$ , 99%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-7106    | Bisphenol A (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-9319    | Bisphenol S ( $^{13}\text{C}_{12}$ , 98%)  | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9320    | Bisphenol S (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-9776    | Bisphenol AF (ring- $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-9779    | Bisphenol AF (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-4674    | <i>n</i> -Butylbenzene (ring- $^{13}\text{C}_6$ , 99%)                                       | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-8285    | <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 1 mg/mL in methanol       | 1.2 mL    |
| ULM-8287    | <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (unlabeled)                     | 1 mg/mL in methanol       | 1.2 mL    |
| CLM-4682    | Carbaryl (ring- $^{13}\text{C}_6$ , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-8096    | Carbaryl (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-1911    | Carbofuran (ring- $^{13}\text{C}_6$ , 99%)   | 100 µg/mL in 1,4-dioxane  | 1.2 mL    |
| ULM-7419    | Carbofuran (unlabeled)   | 100 µg/mL in 1,4-dioxane  | 1.2 mL    |
| CLM-4792    | <i>trans</i> -Chlordane ( $\gamma$ ) ( $^{13}\text{C}_{10}$ , 99%)                           | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4814    | Chlordecone (kepone) ( $^{13}\text{C}_{10}$ , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-2301    | Chlordecone (kepone) (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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| Catalog No. | Description  | Concentration                          | Unit Size  |
|-------------|--|--|------------|
| CLM-4758    | Chlordene ( $^{13}\text{C}_{10}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7443    | Chlordene (unlabeled)  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-4360    | Chlorpyrifos (diethyl- $\text{D}_{10}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-3757    | Chrysene ( $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-261     | Chrysene ( $\text{D}_{12}$ , 98%)  | 200 µg/mL in toluene- $\text{D}_8$     | 1.2 mL     |
| ULM-7424    | Chrysene (unlabeled)   | 200 µg/mL in toluene                   | 1.2 mL     |
| CLM-7293    | Cyfluthrin (phenoxy- $^{13}\text{C}_6$ , 99%) mix of stereoisomers                                 | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7454    | Cyfluthrin (unlabeled) mix of stereoisomers  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-7292    | Cypermethrin (phenoxy- $^{13}\text{C}_6$ , 99%) mix of stereoisomers                               | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7453    | Cypermethrin (unlabeled) mix of stereoisomers  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-4461    | Daidzein (3',5',8- $\text{D}_3$ , 97%)   | 60 µg/mL in acetonitrile- $\text{D}_3$ | 2 × 1.2 mL |
| ULM-4459    | Daidzein (unlabeled)   | 60 µg/mL in acetonitrile               | 1.2 mL     |
| CLM-6999    | 2,4'-DDD (ring- $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-3533    | 4,4'-DDD (ring- $\text{D}_8$ , 98%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4693    | 2,4'-DDE (ring- $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-6251    | 2,4'-DDE (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-1627    | 4,4'-DDE (ring- $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4692    | 2,4'-DDT (ring- $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-6134    | 2,4'-DDT (unlabeled) CP 97%  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-1281    | 4,4'-DDT (ring- $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-6135    | 4,4'-DDT (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-1148    | Diazinon (diethyl- $\text{D}_{10}$ , 98%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-1367    | Di- <i>n</i> -butyl phthalate (ring- $\text{D}_4$ , 98%)   | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7466    | Di- <i>n</i> -butyl phthalate (unlabeled)  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-2943    | 2,6-Di( <i>tert</i> -butyl)-4-methylphenol ( $\text{D}_{21}$ , 98%) stabilized with BHT            | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-126     | 1,2-Dichlorobenzene ( $^{13}\text{C}_6$ , 99%)   | 100 µg/mL in isooctane                 | 1.2 mL     |
| ULM-7415    | 1,2-Dichlorobenzene (unlabeled)  | 100 µg/mL in isooctane                 | 1.2 mL     |
| CLM-4484    | 1,3-Dichlorobenzene ( $^{13}\text{C}_6$ , 99%)   | 100 µg/mL in isooctane                 | 1.2 mL     |
| ULM-7431    | 1,3-Dichlorobenzene (unlabeled)  | 100 µg/mL in isooctane                 | 1.2 mL     |
| DLM-1669    | 2,4-Dichlorophenol (ring- $\text{D}_3$ , OD, 98%)  | neat                                   | 0.1 g      |
| CLM-1858    | 2,4-Dichlorophenoxyacetic acid (ring- $^{13}\text{C}_6$ , 99%)                                     | 100 µg/mL in acetonitrile              | 1.2 mL     |
| CLM-4726    | Dieldrin ( $^{13}\text{C}_{12}$ , 99%)   | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7230    | Dieldrin (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-1629    | Diethyl phthalate (ring- $\text{D}_4$ , 98%)   | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-6174    | Diethyl phthalate (unlabeled)  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4669    | Di- <i>n</i> -hexyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7434    | Di- <i>n</i> -hexyl phthalate (unlabeled)  | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-7151    | Dimethoate ( <i>O,O</i> -dimethyl- $\text{D}_6$ , 98%)   | 100 µg/mL in acetonitrile              | 1.2 mL     |
| ULM-7972    | Dimethoate (unlabeled)   | 100 µg/mL in acetonitrile              | 1.2 mL     |
| CLM-4668    | Di- <i>n</i> -pentyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%) | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7433    | Di- <i>n</i> -pentyl phthalate (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4671    | Di- <i>n</i> -propyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%) | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-6025    | Endosulfan I ( $^{13}\text{C}_9$ , 99%) CP 95%   | 100 µg/mL in nonane                    | 1.2 mL     |
| DLM-2862    | Endosulfan I ( $\text{D}_4$ , 97%)   | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7447    | Endosulfan I (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-6026    | Endosulfan II ( $^{13}\text{C}_9$ , 99%) CP 95%  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7448    | Endosulfan II (unlabeled)  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-7531    | Endosulfan sulfate ( $^{13}\text{C}_9$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7990    | Endosulfan sulfate (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4782    | Endrin ( $^{13}\text{C}_{12}$ , 99%)   | 100 µg/mL in nonane                    | 1.2 mL     |
| ULM-7444    | Endrin (unlabeled)   | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4815    | Endrin aldehyde ( $^{13}\text{C}_{12}$ , 99%)  | 100 µg/mL in nonane                    | 1.2 mL     |
| CLM-4815    | Endrin aldehyde ( $^{13}\text{C}_{12}$ , 99%) CP 90%   | neat                                   | 50 µg      |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Endocrine-Disrupting Compounds and Xenoestrogen Standards (continued)

| Catalog No.   | Description  | Concentration             | Unit Size     |
|---------------|--|---------------------------|---------------|
| ULM-8958      | Endrin aldehyde (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-4816      | Endrin ketone ( <sup>13</sup> C <sub>12</sub> , 99%)   | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-4816      | Endrin ketone ( <sup>13</sup> C <sub>12</sub> , 99%) CP 95%                                  | neat                      | 50 µg         |
| ULM-8956      | Endrin ketone (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-3374      | Epichlorohydrin ( <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in acetonitrile | 1.2 mL        |
| ULM-7403      | Epichlorohydrin (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL        |
| CLM-9761      | Ethyl paraben (ethyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)           | 1 mg/mL in methanol       | 1.2 mL        |
| ULM-9760      | Ethyl paraben (ethyl 4-hydroxybenzoate) (unlabeled)  | 1 mg/mL in methanol       | 1.2 mL        |
| DLM-4460      | Genistein (3',5',6,8-D <sub>4</sub> , 94%)   | 100 µg/mL in acetonitrile | 1.2 mL        |
| CNLM-4666     | Glyphosate (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%) CP 96%                            | 100 µg/mL in water        | 1.2 mL, 10 mL |
| CNLM-4666-10X | Glyphosate (2- <sup>13</sup> C, 99%; <sup>15</sup> N, 98%) CP 96%                            | 1000 µg/mL in water       | 1.2 mL        |
| CNLM-6792     | Glyphosate ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 98%) CP 95%                | 100 µg/mL in water        | 1.2 mL        |
| ULM-6876      | Glyphosate (unlabeled)   | 100 µg/mL in water        | 1.2 mL        |
| CLM-2482      | α-HCH (α-BHC) ( <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-3623      | β-HCH (β-BHC) ( <sup>13</sup> C <sub>6</sub> , 99%)  | 50 µg/mL in nonane        | 2 × 1.2 mL    |
| CLM-1282      | γ-HCH (γ-BHC) (lindane) ( <sup>13</sup> C <sub>6</sub> , 99%)                                | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-4759      | Heptachlor ( <sup>13</sup> C <sub>10</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-2424      | Heptachlor (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-4734      | cis-Heptachlor epoxide ( <sup>13</sup> C <sub>10</sub> , 99%)                                | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-2425      | cis-Heptachlor epoxide (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-10451     | n-Heptyl paraben (n-heptyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)     | 1 mg/mL in methanol       | 1.2 mL        |
| ULM-10442     | n-Heptyl paraben (n-heptyl 4-hydroxybenzoate) (unlabeled)                                    | 1 mg/mL in methanol       | 1.2 mL        |
| EB-5162       | 2,2',4,4',5,5'-HexaBB (PBB-153) ( <sup>13</sup> C <sub>12</sub> , 99%)                       | 40 ± 4 µg/mL in nonane    | 1.2 mL        |
| PBB-153-CS    | 2,2',4,4',5,5'-HexaBB (PBB 153) (unlabeled) Certified Standard                               | 100 µg/mL in isooctane    | 1.2 mL        |
| CLM-351       | Hexachlorobenzene ( <sup>13</sup> C <sub>6</sub> , 99%)                                      | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-6130      | Hexachlorobenzene (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-9000      | 1,5,5,6,6,10-Hexachlorodecane ( <sup>13</sup> C <sub>10</sub> , 99%)                         | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-8917      | 1,5,5,6,6,10-Hexachlorodecane (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-9429      | Hp-Sed (unlabeled)   | 10 µg/mL in nonane        | 1.2 mL        |
| ULM-9428      | Hx-Sed (unlabeled)   | 10 µg/mL in nonane        | 1.2 mL        |
| CLM-3600      | Indeno[1,2,3-cd]pyrene ( <sup>13</sup> C <sub>6</sub> , 99%)                                 | 100 µg/mL in nonane       | 1.2 mL        |
| DLM-2148      | Indeno[1,2,3-cd]pyrene (D <sub>12</sub> , 98%)   | 200 µg/mL in isooctane    | 1.2 mL        |
| CLM-9847      | Isobutyl paraben (isobutyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)     | 1 mg/mL in methanol       | 1.2 mL        |
| ULM-9848      | Isobutyl paraben (isobutyl 4-hydroxybenzoate) (unlabeled)                                    | 1 mg/mL in methanol       | 1.2 mL        |
| CLM-4727      | Isodrin ( <sup>13</sup> C <sub>12</sub> , 99%) CP 95%  | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-7442      | Isodrin (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-9845      | Isopropyl paraben (isopropyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 1 mg/mL in methanol       | 1.2 mL        |
| ULM-9846      | Isopropyl paraben (isopropyl 4-hydroxybenzoate) (unlabeled)                                  | 1 mg/mL in methanol       | 1.2 mL        |
| DLM-4476      | Malathion (D <sub>10</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-8122      | Malathion (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| CNLM-8150     | Melamine ( <sup>13</sup> C <sub>3</sub> , 99%; amino- <sup>15</sup> N <sub>3</sub> , 98%)    | 100 µg/mL in water        | 1.2 mL        |
| CNLM-8150-10X | Melamine ( <sup>13</sup> C <sub>3</sub> , 99%; amino- <sup>15</sup> N <sub>3</sub> , 98%)    | 1000 µg/mL in water       | 1.2 mL        |
| ULM-8156      | Melamine (unlabeled)   | 100 µg/mL in water        | 1.2 mL        |
| CNLM-7148     | Methomyl (acetohydroxamate- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%) CP 97% | 100 µg/mL in methanol     | 1.2 mL        |
| ULM-8639      | Methomyl (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL        |
| CLM-4683      | Methoxychlor (ring- <sup>13</sup> C <sub>12</sub> , 99%)                                     | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-7440      | Methoxychlor (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-8249      | Methyl paraben (methyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)         | 1 mg/mL in methanol       | 1.2 mL        |
| ULM-8250      | Methyl paraben (methyl 4-hydroxybenzoate) (unlabeled)  | 1 mg/mL in methanol       | 1.2 mL        |
| CLM-3712      | Metolachlor (ring- <sup>13</sup> C <sub>6</sub> , 99%)                                       | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-7314      | Metolachlor (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |
| CLM-4813      | Mirex ( <sup>13</sup> C <sub>10</sub> , 99%) CP 98%  | 100 µg/mL in nonane       | 1.2 mL        |
| ULM-2427      | Mirex (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL        |

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| Catalog No. | Description  | Concentration             | Unit Size |
|-------------|--|---------------------------|-----------|
| DLM-8246    | Musk ketone (butyl-D <sub>9</sub> , 98%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-8290    | Musk ketone (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL    |
| DLM-8278    | Musk xylene (butyl-D <sub>9</sub> , 98%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9957    | Musk xylene (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-1332    | Naphthalene ( <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-7425    | Naphthalene (unlabeled)  | 200 µg/mL in isooctane    | 1.2 mL    |
| CLM-3914    | DL-Nicotine (3',4',5'- <sup>13</sup> C <sub>3</sub> , 99%)                                 | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-9547    | Nicotine (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-3913-S  | 4-Nitrotoluene (ring- <sup>13</sup> C <sub>6</sub> , 99%)                                  | 1 mg/mL in acetonitrile   | 1 mL      |
| ULM-3891    | 4-Nitrotoluene (unlabeled)   | 1 mg/mL in acetonitrile   | 1.2 mL    |
| CLM-4811    | <i>cis</i> -Nonachlor ( <sup>13</sup> C <sub>10</sub> , 99%)                               | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-7445    | <i>cis</i> -Nonachlor (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4735    | <i>trans</i> -Nonachlor ( <sup>13</sup> C <sub>10</sub> , 98%)                             | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-7229    | <i>trans</i> -Nonachlor (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4306    | <i>p</i> - <i>n</i> -Nonylphenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)                | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4306-M  | <i>p</i> - <i>n</i> -Nonylphenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)                | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-4559    | <i>p</i> - <i>n</i> -Nonylphenol (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-4559-M  | <i>p</i> - <i>n</i> -Nonylphenol (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-4307    | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4307-M  | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-4521    | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (unlabeled)                                  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-4521-M  | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (unlabeled)                                  | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-7147    | Nonylphenol diethoxylate (unlabeled) branched isomers                                      | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4512    | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%) | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4512-M  | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%) | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-4520    | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (unlabeled)                                | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-4520-M  | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (unlabeled)                                | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-7146    | Nonylphenol monoethoxylate (unlabeled) branched isomers                                    | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4516    | <i>p</i> - <i>n</i> -Nonylphenol triethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-9679    | 1,1,1,3,10,12,12,12-Octachlorododecane ( <sup>13</sup> C <sub>12</sub> , 99%)              | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-9485    | 1,1,1,3,10,12,12,12-Octachlorododecane (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-4729    | Oxychlordane ( <sup>13</sup> C <sub>10</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-6139    | Oxychlordane (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL    |
| DLM-2970    | Parathion (diethyl-D <sub>10</sub> , 98%)  | 100 µg/mL in nonane       | 1.2 mL    |
| ULM-8144    | Parathion (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL    |
| CLM-7930    | Parlar 26 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-7828    | Parlar 26 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| CLM-8705    | Parlar 32 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-8665    | Parlar 32 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-9005    | Parlar 38 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| CLM-8719    | Parlar 39 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-8767    | Parlar 39 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-9431    | Parlar 41 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-9432    | Parlar 44 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| CLM-7931    | Parlar 50 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-7829    | Parlar 50 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| CLM-7932    | Parlar 62 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-7830    | Parlar 62 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| CLM-8720    | Parlar 69 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-8768    | Parlar 69 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |
| CLM-8721    | Parlar 70 ( <sup>13</sup> C <sub>10</sub> , 99%)   | 10 µg/mL in nonane        | 1.2 mL    |
| ULM-8769    | Parlar 70 (unlabeled)  | 10 µg/mL in nonane        | 1.2 mL    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## Endocrine-Disrupting Compounds and Xenoestrogen Standards (continued)

| Catalog No. | Description  | Concentration                              | Unit Size         |
|-------------|--|--|-------------------|
| EC-1404-3   | PCB-77 (3,3',4,4'-tetraCB) ( $^{13}\text{C}_{12}$ , 99%)                                       | 40 $\pm$ 2 $\mu\text{g/mL}$ in nonane      | 3 mL              |
| EC-1425-3   | PCB-126 (3,3',4,4',5-pentaCB) ( $^{13}\text{C}_{12}$ , 99%)                                    | 40 $\pm$ 2 $\mu\text{g/mL}$ in nonane      | 3 mL              |
| EC-1416-3   | PCB-169 (3,3',4,4',5,5'-hexaCB) ( $^{13}\text{C}_{12}$ , 99%)                                  | 40 $\pm$ 2 $\mu\text{g/mL}$ in nonane      | 3 mL              |
| CLM-2050    | Pentachlorobenzene ( $^{13}\text{C}_6$ , 99%)  | 100 $\mu\text{g/mL}$ in isooctane          | 1.2 mL            |
| ULM-7234    | Pentachlorobenzene (unlabeled)   | 100 $\mu\text{g/mL}$ in isooctane          | 1.2 mL            |
| CLM-1955    | Pentachloronitrobenzene ( $^{13}\text{C}_6$ , 99%)   | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| ULM-7597    | Pentachloronitrobenzene (unlabeled)  | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| CLM-661     | Pentachlorophenol ( $^{13}\text{C}_6$ , 99%)   | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| ULM-6894    | Pentachlorophenol (unlabeled)  | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| CLM-10450   | <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 1 mg/mL in methanol                        | 1.2 mL            |
| ULM-10441   | <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (unlabeled)                     | 1 mg/mL in methanol                        | 1.2 mL            |
| ULM-10655   | Perfluorooctanesulfonate (PFOS) (unlabeled) mix of isomers                                     | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| CLM-8505    | Perfluorooctanesulfonate (PFOS), sodium salt ( $^{13}\text{C}_8$ , 99%)                        | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| ULM-9001    | Perfluorooctanesulfonate (PFOS), sodium salt (unlabeled)                                       | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| CLM-8005    | Perfluorooctanoic acid (PFOA) ( $^{13}\text{C}_8$ , 99%)                                       | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| ULM-7451    | Perfluorooctanoic acid (PFOA) (unlabeled) CP 96%   | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| CLM-7322    | <i>cis</i> -Permethrin (phenoxy- $^{13}\text{C}_6$ , 99%)                                      | 50 $\mu\text{g/mL}$ in nonane              | 1.2 mL            |
| ULM-8526    | <i>cis</i> -Permethrin (unlabeled)   | 50 $\mu\text{g/mL}$ in nonane              | 1.2 mL            |
| CLM-7323    | <i>trans</i> -Permethrin (phenoxy- $^{13}\text{C}_6$ , 99%)                                    | 50 $\mu\text{g/mL}$ in nonane              | 1.2 mL            |
| ULM-8527    | <i>trans</i> -Permethrin (unlabeled)   | 50 $\mu\text{g/mL}$ in nonane              | 1.2 mL            |
| CLM-2451    | Phenanthrene ( $^{13}\text{C}_6$ , 99%)  | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| DLM-371     | Phenanthrene ( $\text{D}_{10}$ , 98%)  | 200 $\mu\text{g/mL}$ in isooctane          | 1.2 mL            |
| ULM-7427    | Phenanthrene (unlabeled)   | 200 $\mu\text{g/mL}$ in isooctane          | 1.2 mL            |
| DLM-695     | Phenol (ring- $\text{D}_5$ , 98%)  | neat                                       | 1 g, 5 g          |
| DLM-7141    | Propoxur (isopropyl- $\text{D}_7$ , 98%)   | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| ULM-9765    | Propoxur (unlabeled)   | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| CLM-9763    | <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 1 mg/mL in methanol                        | 1.2 mL            |
| ULM-9762    | <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (unlabeled)                     | 1 mg/mL in methanol                        | 1.2 mL            |
| CLM-3739    | Simazine (ring- $^{13}\text{C}_3$ , 99%)   | 100 $\mu\text{g/mL}$ in methanol           | 1.2 mL            |
| CLM-3739-A  | Simazine (ring- $^{13}\text{C}_3$ , 99%)   | 100 $\mu\text{g/mL}$ in acetonitrile       | 1.2 mL            |
| ULM-7893    | Simazine (unlabeled)   | 100 $\mu\text{g/mL}$ in methanol           | 1.2 mL            |
| ULM-7893-A  | Simazine (unlabeled)   | 100 $\mu\text{g/mL}$ in acetonitrile       | 1.2 mL            |
| CLM-4694    | Tetrabromobisphenol A (ring- $^{13}\text{C}_{12}$ , 99%)                                       | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| CLM-4694-T  | Tetrabromobisphenol A (ring- $^{13}\text{C}_{12}$ , 99%)                                       | 50 $\mu\text{g/mL}$ in toluene             | 1.2 mL            |
| ULM-8734    | Tetrabromobisphenol A (unlabeled)  | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |
| ULM-8734-T  | Tetrabromobisphenol A (unlabeled)  | 50 $\mu\text{g/mL}$ in toluene             | 1.2 mL            |
| ED-900      | 2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin ( $^{13}\text{C}_{12}$ , 99%)                     | 50 $\mu\text{g/mL}$ in nonane              | 1.2 mL            |
| ED-901      | 2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin (unlabeled)                                       | 50 $\mu\text{g/mL}$ in nonane              | 4 $\times$ 1.2 mL |
| DLM-7136    | Tributyltin chloride ( $\text{D}_{27}$ , 98%)  | 100 $\mu\text{g/mL}$ in MeCl- $\text{D}_2$ | 1.2 mL            |
| ULM-8061    | Tributyltin chloride (unlabeled) CP 97%  | 100 $\mu\text{g/mL}$ in MeCl               | 1.2 mL            |
| CLM-4551    | 2,4,5-Trichlorophenoxyacetic acid (ring- $^{13}\text{C}_6$ , 99%)                              | 100 $\mu\text{g/mL}$ in MeCl               | 1.2 mL            |
| ULM-7213    | 2,4,5-Trichlorophenoxyacetic acid (unlabeled)  | 100 $\mu\text{g/mL}$ in MeCl               | 1.2 mL            |
| CLM-9049    | 3,5,6-Trichloro-2-pyridinol (TCPY) (4,5,6- $^{13}\text{C}_3$ , 99%) CP 97%                     | 100 $\mu\text{g/mL}$ in acetonitrile       | 1.2 mL            |
| ULM-9204    | 3,5,6-Trichloro-2-pyridinol (TCPY) (unlabeled)   | 100 $\mu\text{g/mL}$ in acetonitrile       | 1.2 mL            |
| CLM-6779    | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) ( $^{13}\text{C}_{12}$ , 99%)            | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| CLM-6779-MT | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) ( $^{13}\text{C}_{12}$ , 99%)            | 100 $\mu\text{g/mL}$ in MTBE               | 1.2 mL            |
| ULM-6935    | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) (unlabeled)                              | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| ULM-6935-MT | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) (unlabeled)                              | 100 $\mu\text{g/mL}$ in MTBE               | 1.2 mL            |
| DLM-4479    | Trifluralin (di- <i>n</i> -propyl- $\text{D}_{14}$ , 98%)                                      | 100 $\mu\text{g/mL}$ in nonane             | 1.2 mL            |
| DLM-4444    | Urethane (ethyl carbamate) (ethyl- $\text{D}_5$ , 98%)   | neat                                       | 0.1 g             |
| DLM-167     | Vinyl chloride ( $\text{D}_3$ , 98%)   | 50 $\mu\text{g/mL}$ in methanol-OD         | 1.2 mL            |
| ULM-8224    | Vinyl chloride (unlabeled)   | 50 $\mu\text{g/mL}$ in methanol            | 1.2 mL            |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Explosive Standards

| Catalog No. | Description  | Concentration  | Unit Size |
|-------------|--|--|-----------|
| CLM-1519    | 1,3-Dinitrobenzene ( $^{13}\text{C}_6$ , 99%)                                    | 1 mg/mL in acetonitrile                              | 1 mL      |
| CLM-1519    | 1,3-Dinitrobenzene ( $^{13}\text{C}_6$ , 99%)                                    | neat   | 0.1 g     |
| ULM-3850    | 1,3-Dinitrobenzene (unlabeled)   | 1 mg/mL in acetonitrile                              | 1.2 mL    |
| DLM-299     | 2,4-Dinitrophenol (ring- $\text{D}_3$ , 98%) contains 0.35 mg/mL deuterium oxide | 1 mg/mL in methanol-OD                               | 10 mL     |
| ULM-8706    | 2,4-Dinitrophenol (unlabeled) contains 0.35 mg/mL water                          | 1 mg/mL in methanol                                  | 10 mL     |
| DLM-2207    | 2,4-Dinitrotoluene (ring- $\text{D}_3$ , 98%)                                    | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-3888    | 2,4-Dinitrotoluene (unlabeled)   | 1 mg/mL in acetonitrile                              | 1 mL      |
| DLM-1939    | 2,6-Dinitrotoluene (methyl- $\text{D}_3$ , 98%)                                  | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-3889    | 2,6-Dinitrotoluene (unlabeled)   | 1 mg/mL in acetonitrile                              | 1 mL      |
| CNLM-7963   | HMX ( $^{13}\text{C}_4$ , 99%; ring- $^{15}\text{N}_4$ , 98%)                    | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-7969    | HMX (unlabeled)  | 1 mg/mL in acetonitrile                              | 1 mL      |
| CLM-675     | Nitrobenzene ( $^{13}\text{C}_6$ , 99%)  | neat   | 0.1 g     |
| DLM-294     | Nitrobenzene ( $\text{D}_5$ , 99%)   | neat   | 5 g, 10 g |
| ULM-3892    | Nitrobenzene (unlabeled)   | 1 mg/mL in acetonitrile                              | 1.2 mL    |
| NLM-814     | Nitroglycerin ( $^{15}\text{N}_3$ , 98%)   | 1 mg/mL in ethanol                                   | 1.2 mL    |
| ULM-3893    | Nitroglycerin (unlabeled)  | 1 mg/mL in acetonitrile                              | 1 mL      |
| CLM-3912    | 2-Nitrotoluene (ring- $^{13}\text{C}_6$ , 99%)                                   | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-3890    | 2-Nitrotoluene (unlabeled)   | 1 mg/mL in acetonitrile                              | 1.2 mL    |
| CLM-3913    | 4-Nitrotoluene (ring- $^{13}\text{C}_6$ , 99%)                                   | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-3891    | 4-Nitrotoluene (unlabeled)   | 1 mg/mL in acetonitrile                              | 1.2 mL    |
| CLM-3846    | RDX ( $^{13}\text{C}_3$ , 99%)   | 1 mg/mL in acetonitrile                              | 1 mL      |
| CNLM-7987   | RDX ( $^{13}\text{C}_3$ , 99%; $^{15}\text{N}_3$ , 98%)                          | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-3847    | RDX (unlabeled)  | 1 mg/mL in acetonitrile                              | 1.2 mL    |
| CLM-3848    | 1,3,5-Trinitrobenzene ( $^{13}\text{C}_6$ , 99%)                                 | 1 mg/mL in acetonitrile                              | 1 mL      |
| ULM-3849    | 1,3,5-Trinitrobenzene (unlabeled)  | 1 mg/mL in acetonitrile                              | 1.2 mL    |
| CNLM-3643   | 2,4,6-Trinitrotoluene (TNT) ( $^{13}\text{C}_7$ , 99%; $^{15}\text{N}_3$ , 98%)  | 1 mg/mL in benzene (wetted with 33% water by weight) | 1 mL      |
| ULM-3845    | 2,4,6-Trinitrotoluene (TNT) (unlabeled)  | 1 mg/mL in acetonitrile                              | 1.2 mL    |

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## Food and Drinking Water Impurity Standards

| Catalog No.   | Description  | Concentration                             | Unit Size      |
|---------------|--|---|----------------|
| CLM-813       | Acrylamide (1,2,3- <sup>13</sup> C <sub>3</sub> , 99%) stabilized with 100 ppm hydroquinone  | 1 mg/mL in methanol                       | 1.2 mL         |
| ULM-6721      | Acrylamide (unlabeled) (with 100 ppm hydroquinone)   | 1 mg/mL in methanol                       | 1.2 mL         |
| DLM-10285     | Allyl alcohol (D <sub>5</sub> , 98%)   | 2 mg/mL in methanol                       | 1.2 mL         |
| ULM-10288     | Allyl alcohol (unlabeled)  | 10 mg/mL in methanol                      | 1.2 mL         |
| DLM-7170      | 1-Aminohydantoin hydrochloride (AHD) (5,5-D <sub>2</sub> , 98%)  | 100 µg/mL in acetonitrile-D <sub>3</sub>  | 1.2 mL         |
| ULM-7188      | 1-Aminohydantoin hydrochloride (AHD) (unlabeled)   | 100 µg/mL in methanol                     | 1.2 mL         |
| DLM-7171      | 3-Amino-2-oxazolidone (AOZ) (ring-D <sub>4</sub> , 98%)  | 100 µg/mL in acetonitrile-D <sub>3</sub>  | 1.2 mL         |
| ULM-7189      | 3-Amino-2-oxazolidone (AOZ) (unlabeled)  | 100 µg/mL in methanol                     | 1.2 mL         |
| CLM-8589      | Ammelide (ring- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in water:<br>diethylamine (4:1) | 1.2 mL         |
| ULM-8590      | Ammelide (unlabeled) CP 92%  | 100 µg/mL in water:<br>diethylamine (4:1) | 1.2 mL         |
| CLM-8316      | Ammeline (desethyl-desisopropylhydroxyatrazine) (ring- <sup>13</sup> C <sub>3</sub> , 99%) CP 94%  | 100 µg/mL in water:<br>diethylamine (4:1) | 1.2 mL         |
| ULM-8323      | Ammeline (desethyl-desisopropylhydroxyatrazine) (unlabeled)  | 100 µg/mL in water:<br>diethylamine (4:1) | 1.2 mL         |
| CLM-4748      | 1,6-Anhydro-β-D-glucose (levoglucosan) ( <sup>13</sup> C <sub>6</sub> , 98%)   | 100 µg/mL in DMSO                         | 1.2 mL         |
| ULM-8000      | 1,6-Anhydro-β-D-glucose (levoglucosan) (unlabeled)   | 100 µg/mL in DMSO                         | 1.2 mL         |
| DLM-1598      | <i>n</i> -Butanol (D <sub>10</sub> , 98%)  | 2 mg/mL in methanol                       | 1.2 mL         |
| ULM-10286     | <i>n</i> -Butanol (unlabeled)  | 10 mg/mL in methanol                      | 1.2 mL         |
| DLM-119       | (±)-Chloramphenicol (ring-D <sub>4</sub> , benzyl-D, 98%)  | 100 µg/mL in acetonitrile                 | 1.2 mL         |
| ULM-6687      | (±)-Chloramphenicol (unlabeled)  | 100 µg/mL in acetonitrile                 | 1.2 mL         |
| DLM-263       | Chlorobenzene (D, 99%)   | 2 mg/mL in methanol                       | 1.2 mL         |
| ULM-8138      | Chlorobenzene (unlabeled)  | 2 mg/mL in methanol                       | 1.2 mL         |
| DLM-4633      | 3-Chloro-1,2-propanediol (propane-D <sub>5</sub> , 98%)  | 1 mg/mL in methanol                       | 1.2 mL         |
| ULM-7998      | 3-Chloro-1,2-propanediol (unlabeled)   | 1 mg/mL in methanol                       | 1.2 mL         |
| CNLM-4661     | Cyanuric acid ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N <sub>3</sub> , 98%) CP 90%   | 100 µg/mL in water                        | 1.2 mL         |
| CNLM-4661-10X | Cyanuric acid ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N <sub>3</sub> , 98%) CP 90%   | 1000 µg/mL in water                       | 1.2 mL         |
| ULM-8157      | Cyanuric acid (unlabeled)  | 100 µg/mL in water                        | 1.2 mL         |
| DLM-1632      | Diethylene glycol (D <sub>8</sub> , 98%) CP 95%  | 1 mg/mL in methanol                       | 1.2 mL         |
| ULM-8235      | Diethylene glycol (unlabeled)  | 1 mg/mL in methanol                       | 1.2 mL         |
| CNLM-8150     | Melamine ( <sup>13</sup> C <sub>3</sub> , 99%; amino- <sup>15</sup> N <sub>3</sub> , 98%)  | 100 µg/mL in water                        | 1.2 mL         |
| CNLM-8150-10X | Melamine ( <sup>13</sup> C <sub>3</sub> , 99%; amino- <sup>15</sup> N <sub>3</sub> , 98%)  | 1000 µg/mL in water                       | 1.2 mL         |
| ULM-8156      | Melamine (unlabeled)   | 100 µg/mL in water                        | 1.2 mL         |
| DLM-4412      | (-)-Menthol (1,2,6,6-D <sub>4</sub> , 98%)   | neat                                      | 25 mg          |
| ULM-10287     | 2-Methoxyethanol (unlabeled)   | 10 mg/mL in methanol                      | 1.2 mL         |
| CNLM-10424    | β- <i>N</i> -Methylamino-L-alanine (BMAA) ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%)<br>Patent No. US 11,370,812 B2 | 100 µg/mL in 0.1 M HCl                    | 1.2 mL         |
| CNLM-10424    | β- <i>N</i> -Methylamino-L-alanine (BMAA) ( <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%)<br>Patent No. US 11,370,812 B2 | neat                                      | 0.01 g         |
| ULM-10493     | β- <i>N</i> -Methylamino-L-alanine (BMAA)·HCl (unlabeled) CP 97%   | 100 µg/mL in 0.1 M HCl                    | 1.2 mL         |
| ULM-10493     | β- <i>N</i> -Methylamino-L-alanine (BMAA)·HCl (unlabeled) CP 97%   | neat                                      | Please inquire |
| DLM-2943      | 2,6-Di( <i>tert</i> -butyl)-4-methylphenol (D <sub>21</sub> , 98%) (BHT)   | 100 µg/mL in nonane                       | 1.2 mL         |
| ULM-7494      | 2,6-Di( <i>tert</i> -butyl)-4-methylphenol (unlabeled) (BHT)   | 100 µg/mL in nonane                       | 1.2 mL         |
| NLM-10345     | Microcystin-LA ( <sup>15</sup> N <sub>7</sub> , 98%)   | 10 µg/mL in methanol:<br>water (1:1)      | 1.2 mL         |

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| Catalog No. | Description   | Concentration                                   | Unit Size |
|-------------|---|---|-----------|
| ULM-10346   | Microcystin-LA (unlabeled)  | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| NLM-10295   | Microcystin-LR ( <sup>15</sup> N <sub>10</sub> , 97%)   | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| ULM-10342   | Microcystin-LR (unlabeled)  | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| DLM-10260   | Microcystin-LR, ethylated (D <sub>5</sub> , 98%)  | neat  | 0.025 mg  |
| NLM-10340   | Microcystin-RR ( <sup>15</sup> N <sub>13</sub> , 98%)   | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| ULM-10341   | Microcystin-RR (unlabeled)  | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| NLM-10343   | Microcystin-YR ( <sup>15</sup> N <sub>10</sub> , 98%)   | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| ULM-10344   | Microcystin-YR (unlabeled)  | 10 µg/mL in methanol:<br>water (1:1)            | 1.2 mL    |
| DLM-7172    | 5-(4-Morpholinylmethyl)-3-amino-2-oxazolidinone (AMOZ) (4,4,5,5',5'-D <sub>5</sub> , 98%)     | 100 µg/mL in acetonitrile-D <sub>3</sub>        | 1.2 mL    |
| ULM-7190    | 5-(4-Morpholinylmethyl)-3-amino-2-oxazolidinone (AMOZ) (unlabeled)                            | 100 µg/mL in methanol                           | 1.2 mL    |
| DLM-2130    | N-Nitrosodimethylamine (D <sub>6</sub> , 98%)   | 1 mg/mL in methylene<br>chloride-D <sub>2</sub> | 1 mL      |
| CDLM-7279   | N-Nitrosodimethylamine ( <sup>13</sup> C <sub>2</sub> , 99%; D <sub>6</sub> , 98%)            | 1 mg/mL in methylene<br>chloride-D <sub>2</sub> | 1 mL      |
| ULM-9042    | N-Nitrosodimethylamine (unlabeled)  | 1 mg/mL in methylene<br>chloride-D <sub>2</sub> | 1 mL      |
| OLM-7310    | Perchloric acid, sodium salt ( <sup>18</sup> O <sub>4</sub> , >90%)                           | 100 µg/mL in water                              | 1.2 mL    |
| ULM-7312    | Perchloric acid, sodium salt (unlabeled)  | 100 µg/mL in water                              | 1.2 mL    |
| DLM-1258    | L-Phenylalanine (ring-D <sub>5</sub> , 98%)   | 1000 µg/mL in methanol:<br>water (1:1)          | 1.2 mL    |
| ULM-8205    | L-Phenylalanine (unlabeled)   | 1000 µg/mL in methanol:<br>water (1:1)          | 1.2 mL    |
| CLM-3733    | o-Phenylphenol (phenyl- <sup>13</sup> C <sub>6</sub> , 99%)                                   | 100 µg/mL in nonane                             | 1.2 mL    |
| ULM-7396    | o-Phenylphenol (unlabeled)  | 100 µg/mL in nonane                             | 1.2 mL    |
| CLM-3748    | p-Phenylphenol (phenyl- <sup>13</sup> C <sub>6</sub> , 99%) CP 96%                            | 100 µg/mL in nonane                             | 1.2 mL    |
| OLM-10485   | Potassium chlorate ( <sup>18</sup> O <sub>3</sub> , 98%) CP 90%                               | 100 µg/mL in <sup>18</sup> O water              | 1.2 mL    |
| ULM-10486   | Potassium chlorate (unlabeled)  | 100 µg/mL in <sup>18</sup> O water              | 1.2 mL    |
| DLM-1158    | Quinoline (D <sub>7</sub> , 98%) CP 97%   | 2 mg/mL in methanol                             | 1.2 mL    |
| ULM-10290   | Quinoline (unlabeled)   | 10 mg/mL in methanol                            | 1.2 mL    |
| OLM-8283    | Potassium bromate ( <sup>18</sup> O <sub>3</sub> , 98%) CP 90%                                | 100 µg/mL in <sup>18</sup> O water              | 1.2 mL    |
| ULM-8451    | Potassium bromate (unlabeled)   | 100 µg/mL in water                              | 1.2 mL    |
| CNLM-7221   | Semicarbazide hydrochloride (SEM) ( <sup>13</sup> C, 99%; <sup>15</sup> N <sub>2</sub> , 98%) | 100 µg/mL in methanol                           | 1.2 mL    |
| ULM-7187    | Semicarbazide hydrochloride (SEM) (unlabeled)   | 100 µg/mL in methanol                           | 1.2 mL    |
| DLM-3330    | o-Toluidine (D <sub>9</sub> , 98%)  | 2 mg/mL in methanol                             | 1.2 mL    |
| ULM-10289   | o-Toluidine (unlabeled)   | 10 mg/mL in methanol                            | 1.2 mL    |
| DLM-6083    | 2,4,6-Trichloroanisole (D <sub>5</sub> , 98%)   | 1 mg/mL in methanol-D                           | 1.2 mL    |
| ULM-7999    | 2,4,6-Trichloroanisole (unlabeled)  | 1 mg/mL in methanol                             | 1.2 mL    |
| DLM-2080    | 1,2,3-Trichloropropane (D <sub>5</sub> , 98%) CP 95%  | 1 mg/mL in methanol                             | 1.2 mL    |
| ULM-6911    | 1,2,3-Trichloropropane (unlabeled)  | 1 mg/mL in methanol                             | 1.2 mL    |
| DLM-10255   | Uracil (D <sub>4</sub> , 98%)   | 1000 µg/mL in methanol:<br>water (1:1)          | 1.2 mL    |
| ULM-10256   | Uracil (unlabeled)  | 1000 µg/mL in methanol:<br>water (1:1)          | 1.2 mL    |
| DLM-4444    | Urethane (ethyl carbamate) (ethyl-D <sub>5</sub> , 98%)                                       | neat  | 0.1 g     |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.



## Halogenated and Substituted Benzene, Phenol, and Anisole Standards

| Catalog No. | Description   | Concentration                     | Unit Size          |
|-------------|---|-----------------------------------|--------------------|
| CLM-871     | Bromobenzene ( $^{13}\text{C}_6$ , 99%)                         | neat                              | 0.5 g              |
| DLM-398     | Bromobenzene ( $\text{D}_5$ , 99%)                              | neat                              | 5 g, 10 g, 25 g    |
| CLM-2268    | 4-Bromophenol ( $^{13}\text{C}_6$ , 99%)                        | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-6917    | 4-Bromophenol (unlabeled)                                       | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| DLM-263     | Chlorobenzene ( $\text{D}_5$ , 99%)                             | 2 mg/mL in methanol               | 1.2 mL             |
| DLM-263     | Chlorobenzene ( $\text{D}_5$ , 99%)                             | neat                              | 1 g, 5 g           |
| DLM-1638    | 2-Chlorophenol (ring- $\text{D}_4$ , 99%)                       | neat                              | 0.1 g, 0.25 g, 1 g |
| CLM-1913    | 4-Chlorophenol ( $^{13}\text{C}_6$ , 99%)                       | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-7420    | 4-Chlorophenol (unlabeled)                                      | 100 $\mu\text{g/mL}$ in nonane    | 1.2 mL             |
| CLM-9373    | 2,4-Dibromoanisole (ring- $^{13}\text{C}_6$ , 99%)              | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-9369    | 2,4-Dibromoanisole (unlabeled)                                  | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-1340    | 1,4-Dibromobenzene ( $^{13}\text{C}_6$ , 99%)                   | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-1340    | 1,4-Dibromobenzene ( $^{13}\text{C}_6$ , 99%)                   | neat                              | 0.1 g              |
| DLM-341     | 1,4-Dibromobenzene ( $\text{D}_4$ , 98%)                        | neat                              | 5 g                |
| ULM-10506   | 1,4-Dibromobenzene (unlabeled)                                  | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-6058    | 2,4-Dibromophenol ( $^{13}\text{C}_6$ , 99%)                    | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-6918    | 2,4-Dibromophenol (unlabeled)                                   | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-8007    | 2,6-Dibromophenol ( $^{13}\text{C}_6$ , 99%)                    | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-7603    | 2,6-Dibromophenol (unlabeled)                                   | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-126     | 1,2-Dichlorobenzene ( $^{13}\text{C}_6$ , 99%)                  | 100 $\mu\text{g/mL}$ in isooctane | 1.2 mL             |
| DLM-158     | 1,2-Dichlorobenzene ( $\text{D}_4$ , 99%)                       | neat                              | 1 g, 5 g           |
| ULM-7415    | 1,2-Dichlorobenzene (unlabeled)                                 | 100 $\mu\text{g/mL}$ in isooctane | 1.2 mL             |
| CLM-4484    | 1,3-Dichlorobenzene ( $^{13}\text{C}_6$ , 99%)                  | 100 $\mu\text{g/mL}$ in isooctane | 1.2 mL             |
| DLM-2139    | 1,3-Dichlorobenzene ( $\text{D}_4$ , 98%)                       | neat                              | 0.1 g              |
| ULM-7431    | 1,3-Dichlorobenzene (unlabeled)                                 | 100 $\mu\text{g/mL}$ in isooctane | 1.2 mL             |
| CLM-1518    | 1,4-Dichlorobenzene ( $^{13}\text{C}_6$ , 99%)                  | neat                              | 1 mg               |
| DLM-268     | 1,4-Dichlorobenzene ( $\text{D}_4$ , 98%)                       | neat                              | 5 g                |
| DLM-1359    | 2,4-Dichlorophenol (ring- $\text{D}_3$ , 98%)                   | neat                              | 0.1 g, 0.5 g       |
| DLM-1669    | 2,4-Dichlorophenol (ring- $\text{D}_3$ , OD, 98%)               | neat                              | 0.1 g              |
| ULM-6822    | 2,4-Dichlorophenol (unlabeled)                                  | 100 $\mu\text{g/mL}$ in nonane    | 1.2 mL             |
| CLM-1365    | 2,5-Dichlorophenol ( $^{13}\text{C}_6$ , 99%)                   | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| ULM-9066    | 2,5-Dichlorophenol (unlabeled)                                  | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| CLM-1921    | Hexabromobenzene ( $^{13}\text{C}_6$ , 99%)                     | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-7607    | Hexabromobenzene (unlabeled)                                    | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-351     | Hexachlorobenzene ( $^{13}\text{C}_6$ , 99%)                    | 100 $\mu\text{g/mL}$ in nonane    | 1.2 mL             |
| CLM-351     | Hexachlorobenzene ( $^{13}\text{C}_6$ , 99%)                    | neat                              | 0.1 g              |
| ULM-6130    | Hexachlorobenzene (unlabeled)                                   | 100 $\mu\text{g/mL}$ in nonane    | 1.2 mL             |
| CLM-10453   | 2-Isopropyl-5-methylphenol (isopropyl- $^{13}\text{C}_3$ , 99%) | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| ULM-10444   | 2-Isopropyl-5-methylphenol (unlabeled)                          | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| CLM-10447   | 4-Isopropyl-3-methylphenol (isopropyl- $^{13}\text{C}_3$ , 99%) | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| ULM-10445   | 4-Isopropyl-3-methylphenol (unlabeled)                          | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| CLM-10448   | 5-Isopropyl-2-methylphenol (isopropyl- $^{13}\text{C}_3$ , 99%) | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| ULM-10446   | 5-Isopropyl-2-methylphenol (unlabeled)                          | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| CLM-10449   | 3-Methyl-4-nitrophenol ( $^{13}\text{C}_6$ , 99%)               | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| ULM-10440   | 3-Methyl-4-nitrophenol (unlabeled)                              | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| CLM-789     | 4-Nitrophenol ( $^{13}\text{C}_6$ , 99%)                        | 1 mg/mL in methanol               | 1.2 mL             |
| ULM-8892    | 4-Nitrophenol (unlabeled)                                       | 1 mg/mL in methanol               | 1.2 mL             |
| CLM-10452   | 4- <i>tert</i> -Octylphenol (ring- $^{13}\text{C}_6$ , 99%)     | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| ULM-10443   | 4- <i>tert</i> -Octylphenol (unlabeled)                         | 100 $\mu\text{g/mL}$ in methanol  | 1.2 mL             |
| CLM-8992    | Pentabromoanisole ( $^{13}\text{C}_6$ , 99%)                    | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-8991    | Pentabromoanisole (unlabeled)                                   | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| CLM-1959    | Pentabromophenol ( $^{13}\text{C}_6$ , 99%)                     | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |
| ULM-6922    | Pentabromophenol (unlabeled)                                    | 100 $\mu\text{g/mL}$ in toluene   | 1.2 mL             |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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| Catalog No. | Description   | Concentration          | Unit Size       |
|-------------|---|------------------------|-----------------|
| CLM-8003    | Pentachloroanisole ( $^{13}\text{C}_6$ , 99%)         | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-7605    | Pentachloroanisole (unlabeled)                        | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-2050    | Pentachlorobenzene ( $^{13}\text{C}_6$ , 99%)         | 100 µg/mL in isooctane | 1.2 mL          |
| ULM-7234    | Pentachlorobenzene (unlabeled)                        | 100 µg/mL in isooctane | 1.2 mL          |
| CLM-1955    | Pentachloronitrobenzene ( $^{13}\text{C}_6$ , 99%)    | 100 µg/mL in nonane    | 1.2 mL          |
| ULM-7597    | Pentachloronitrobenzene (unlabeled)                   | 100 µg/mL in nonane    | 1.2 mL          |
| CLM-661     | Pentachlorophenol ( $^{13}\text{C}_6$ , 99%)          | 100 µg/mL in nonane    | 1.2 mL          |
| CLM-661     | Pentachlorophenol ( $^{13}\text{C}_6$ , 99%)          | neat                   | 0.01 g          |
| ULM-6894    | Pentachlorophenol (unlabeled)                         | 100 µg/mL in nonane    | 1.2 mL          |
| CLM-1996    | 2,3,4,5-Tetrabromophenol ( $^{13}\text{C}_6$ , 99%)   | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-6778    | 2,3,4,5-Tetrabromophenol (unlabeled)                  | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-1982    | 1,2,3,4-Tetrachlorobenzene ( $^{13}\text{C}_6$ , 99%) | 100 µg/mL in isooctane | 1.2 mL          |
| ULM-6195    | 1,2,3,4-Tetrachlorobenzene (unlabeled)                | 100 µg/mL in isooctane | 1.2 mL          |
| CLM-585     | 1,2,4,5-Tetrachlorobenzene ( $^{13}\text{C}_6$ , 99%) | neat                   | 0.1 g, 5 mg     |
| DLM-1177    | 1,2,4,5-Tetrachlorobenzene ( $\text{D}_2$ , 98%)      | neat                   | 1 g, 5 g        |
| ULM-7598    | 1,2,4,5-Tetrachlorobenzene (unlabeled)                | 100 µg/mL in isooctane | 1.2 mL          |
| ULM-2428    | 2,3,4,5-Tetrachlorophenol (unlabeled)                 | neat                   | 0.1 g           |
| ULM-2429    | 2,3,4,6-Tetrachlorophenol (unlabeled)                 | neat                   | 0.1 g           |
| ULM-2430    | 2,3,5,6-Tetrachlorophenol (unlabeled)                 | neat                   | 0.1 g           |
| CLM-9372    | 2,4,5-Tribromoanisole (ring- $^{13}\text{C}_6$ , 99%) | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-9367    | 2,4,5-Tribromoanisole (unlabeled)                     | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-6744    | 2,4,6-Tribromoanisole (ring- $^{13}\text{C}_6$ , 99%) | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-9370    | 2,4,6-Tribromoanisole (unlabeled)                     | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-7488    | 2,3,4-Tribromophenol ( $^{13}\text{C}_6$ , 99%)       | neat                   | Please inquire  |
| CLM-2235    | 2,3,5-Tribromophenol ( $^{13}\text{C}_6$ , 99%)       | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-6919    | 2,3,5-Tribromophenol (unlabeled)                      | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-6151    | 2,4,5-Tribromophenol ( $^{13}\text{C}_6$ , 99%)       | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-6084    | 2,4,5-Tribromophenol (unlabeled)                      | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-6743    | 2,4,6-Tribromophenol ( $^{13}\text{C}_6$ , 99%)       | 100 µg/mL in toluene   | 1.2 mL          |
| ULM-4210    | 2,4,6-Tribromophenol (unlabeled)                      | 100 µg/mL in toluene   | 1.2 mL          |
| CLM-1836    | 3,4,5-Tribromophenol ( $^{13}\text{C}_6$ , 99%)       | 100 µg/mL in toluene   | 1.2 mL          |
| DLM-9198    | 2,4,6-Trichloroanisole (methyl- $\text{D}_3$ , 99%)   | neat                   | Please inquire  |
| DLM-6083    | 2,4,6-Trichloroanisole ( $\text{D}_5$ , 98%)          | 1 mg/mL in methanol-D  | 1.2 mL          |
| DLM-6083    | 2,4,6-Trichloroanisole ( $\text{D}_5$ , 98%)          | neat                   | 0.1 g           |
| ULM-7999    | 2,4,6-Trichloroanisole (unlabeled)                    | 1 mg/mL in methanol    | 1.2 mL          |
| DLM-1972    | 1,2,3-Trichlorobenzene ( $\text{D}_3$ , 98%)          | neat                   | 0.1 g           |
| DLM-1178    | 1,2,4-Trichlorobenzene ( $\text{D}_3$ , 98%)          | neat                   | 0.1 g, 1 g, 5 g |
| DLM-799     | 1,3,5-Trichlorobenzene ( $\text{D}_3$ , 98%)          | neat                   | 1 g             |
| CLM-513     | 2,4,5-Trichlorophenol ( $^{13}\text{C}_6$ , 99%)      | 100 µg/mL in methanol  | 1 mL            |
| CLM-513-SI  | 2,4,5-Trichlorophenol ( $^{13}\text{C}_6$ , 99%)      | 100 µg/mL in isooctane | 1.2 mL          |
| DLM-2143    | 2,4,5-Trichlorophenol (ring- $\text{D}_2$ , 98%)      | neat                   | 0.1 g           |
| ULM-7525    | 2,4,5-Trichlorophenol (unlabeled)                     | 100 µg/mL in methanol  | 1.2 mL          |
| ULM-7525-SI | 2,4,5-Trichlorophenol (unlabeled)                     | 100 µg/mL in isooctane | 1.2 mL          |
| CLM-1804    | 2,4,6-Trichlorophenol ( $^{13}\text{C}_6$ , 99%)      | 100 µg/mL in methanol  | 1.2 mL          |
| CLM-1804-SI | 2,4,6-Trichlorophenol ( $^{13}\text{C}_6$ , 99%)      | 100 µg/mL in isooctane | 1.2 mL          |
| DLM-3093    | 2,4,6-Trichlorophenol (ring- $\text{D}_2$ , 98%)      | neat                   | 0.01 g, 0.1 g   |
| ULM-7600    | 2,4,6-Trichlorophenol (unlabeled)                     | 100 µg/mL in methanol  | 1.2 mL          |
| ULM-7600-SI | 2,4,6-Trichlorophenol (unlabeled)                     | 100 µg/mL in isooctane | 1.2 mL          |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Industrial Chemical Standards

| Catalog No. | Description   | Concentration   | Unit Size |
|-------------|---|---|-----------|
| CLM-4674    | <i>n</i> -Butylbenzene (ring- <sup>13</sup> C <sub>6</sub> , 99%)                                 | 100 µg/mL in nonane                                     | 1.2 mL    |
| CLM-4695    | 1,2-Dibromo-3-chloropropane ( <sup>13</sup> C <sub>3</sub> , 99%)                                 | 100 µg/mL in methanol                                   | 1.2 mL    |
| CLM-6144    | 1,1-Dichloroethylene (random- <sup>13</sup> C, 99%)   | 100 µg/mL in methanol<br>(stabilized with hydroquinone) | 1.2 mL    |
| ULM-7214    | 1,1-Dichloroethylene (unlabeled)  | 100 µg/mL in methanol<br>(stabilized with hydroquinone) | 1.2 mL    |
| CLM-6145    | 1,2-Dichloroethylene ( <sup>13</sup> C <sub>1</sub> , 99%) <i>cis/trans</i> mix                   | 100 µg/mL in methanol<br>(stabilized with hydroquinone) | 1.2 mL    |
| ULM-7215    | 1,2-Dichloroethylene (unlabeled) <i>cis/trans</i> mix   | 100 µg/mL in methanol<br>(stabilized with hydroquinone) | 1.2 mL    |
| CLM-1305    | 2,4-Dichlorophenol ( <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in nonane                                     | 1.2 mL    |
| CLM-3374    | Epichlorohydrin ( <sup>13</sup> C <sub>3</sub> , 99%)   | 100 µg/mL in acetonitrile                               | 1.2 mL    |
| DLM-1008    | Epichlorohydrin (D <sub>5</sub> , 98%)  | neat  | 1 g       |
| ULM-7403    | Epichlorohydrin (unlabeled)   | 100 µg/mL in acetonitrile                               | 1.2 mL    |
| CLM-8008    | Hexachlorophene ( <sup>13</sup> C <sub>13</sub> , 99%)  | 50 µg/mL in methanol                                    | 1.2 mL    |
| ULM-8009    | Hexachlorophene (unlabeled)   | 50 µg/mL in methanol                                    | 1.2 mL    |
| CLM-4745    | 4-Hydroxybenzoic acid (ring- <sup>13</sup> C <sub>6</sub> , 99%)                                  | 1 mg/mL in methanol                                     | 1.2 mL    |
| ULM-8251    | 4-Hydroxybenzoic acid (unlabeled)   | 1 mg/mL in methanol                                     | 1.2 mL    |
| CLM-8792    | Sodium bis(2-ethylhexyl) sulfosuccinate (DOSS) (fumaric acid- <sup>13</sup> C <sub>4</sub> , 99%) | 100 µg/mL in acetonitrile                               | 1.2 mL    |
| ULM-8807    | Sodium bis(2-ethylhexyl) sulfosuccinate (DOSS) (unlabeled)  | 100 µg/mL in acetonitrile                               | 1.2 mL    |
| CLM-8006    | Tetrachlorobisphenol A (ring- <sup>13</sup> C <sub>12</sub> , 99%)                                | 50 µg/mL in methanol                                    | 1.2 mL    |
| ULM-7606    | Tetrachlorobisphenol A (unlabeled)  | 50 µg/mL in methanol                                    | 1.2 mL    |
| DLM-9612    | Tetradecyl (tri- <i>n</i> -butyl) phosphonium bromide (D <sub>29</sub> , 98%)                     | 100 µg/mL in<br>acetone:water (7.5:2.5)                 | 1.2 mL    |
| ULM-9609    | Tetradecyl (tri- <i>n</i> -butyl) phosphonium chloride (unlabeled)                                | 100 µg/mL in<br>acetone:water (7.5:2.5)                 | 1.2 mL    |
| DLM-7136    | Tributyltin chloride (D <sub>27</sub> , 98%)  | 100 µg/mL in MeCl-D <sub>2</sub>                        | 1.2 mL    |
| ULM-8061    | Tributyltin chloride (unlabeled) CP 97%   | 100 µg/mL in MeCl                                       | 1.2 mL    |
| CLM-6185    | 1,1,1-Trichloroethane (2- <sup>13</sup> C, 99%)   | 100 µg/mL in methanol                                   | 1.2 mL    |
| DLM-2080    | 1,2,3-Trichloropropane (D <sub>5</sub> , 98%) CP 95%  | 100 µg/mL in methanol                                   | 1.2 mL    |
| ULM-6911    | 1,2,3-Trichloropropane (unlabeled)  | 1 mg/mL in methanol                                     | 1.2 mL    |
| DLM-167     | Vinyl chloride (D <sub>3</sub> , 98%)   | 50 µg/mL in methanol-OD                                 | 1.2 mL    |
| ULM-8224    | Vinyl chloride (unlabeled)  | 50 µg/mL in methanol                                    | 1.2 mL    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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## Nitrosamine Standards

| Catalog No. | Description  | Concentration                  | Unit Size |
|-------------|--|--------------------------------|-----------|
| DLM-7779-S  | <i>N</i> -Nitrodimethylamine (D <sub>6</sub> , 98%)  | 1 mg/mL in MeCl-D <sub>2</sub> | 1 mL      |
| ULM-7780-S  | <i>N</i> -Nitrodimethylamine (unlabeled)   | 1 mg/mL in MeCl                | 1 mL      |
| DLM-7982-S  | <i>N</i> -Nitrosodiethylamine (D <sub>10</sub> , 98%)                                      | 1 mg/mL in MeCl-D <sub>2</sub> | 1 mL      |
| ULM-7984    | <i>N</i> -Nitrosodiethylamine (unlabeled)  | 1 mg/mL in MeCl                | 1.2 mL    |
| DLM-2130-S  | <i>N</i> -Nitrosodimethylamine (D <sub>6</sub> , 98%)                                      | 1 mg/mL in MeCl-D <sub>2</sub> | 1 mL      |
| NLM-7647-S  | <i>N</i> -Nitrosodimethylamine ( <sup>15</sup> N <sub>2</sub> , 98%)                       | 1 mg/mL in MeCl                | 1 mL      |
| CDLM-7279-S | <i>N</i> -Nitrosodimethylamine ( <sup>13</sup> C <sub>2</sub> , 99%; D <sub>6</sub> , 98%) | 1 mg/mL in MeCl-D <sub>2</sub> | 1 mL      |
| ULM-9042-S  | <i>N</i> -Nitrosodimethylamine (unlabeled)   | 1 mg/mL in MeCl                | 1 mL      |
| DLM-3098-S  | <i>N</i> -Nitrosodiphenylamine (2,2',4,4',6,6'-D <sub>6</sub> , 98%)                       | 1 mg/mL in MeCl-D <sub>2</sub> | 1 mL      |
| ULM-7219    | <i>N</i> -Nitrosodiphenylamine (unlabeled)   | 1 mg/mL in MeCl                | 1.2 mL    |
| DLM-2131-S  | <i>N</i> -Nitroso-di- <i>n</i> -propylamine (D <sub>14</sub> , 98%)                        | 1 mg/mL in MeCl-D <sub>2</sub> | 1 mL      |
| ULM-6637-S  | <i>N</i> -Nitroso-di- <i>n</i> -propylamine (unlabeled)                                    | 1 mg/mL in MeCl                | 1 mL      |
| DLM-8254    | <i>N</i> -Nitrosomorpholine (D <sub>8</sub> , 98%)   | 1 mg/mL in MeCl-D <sub>2</sub> | 1.2 mL    |
| ULM-8255    | <i>N</i> -Nitrosomorpholine (unlabeled) CP 96%   | 1 mg/mL in MeCl                | 1.2 mL    |
| DLM-8252    | <i>N</i> -Nitrosopyrrolidine (D <sub>8</sub> , 98%)  | 1 mg/mL in MeCl-D <sub>2</sub> | 1.2 mL    |
| ULM-8253    | <i>N</i> -Nitrosopyrrolidine (unlabeled)   | 1 mg/mL in MeCl                | 1.2 mL    |

## Nonylphenol, Nonylphenol Ethoxylate, and Nonylphenol Carboxylate Standards

| Catalog No.    | Description   | Concentration             | Unit Size         |
|----------------|---|---------------------------|-------------------|
| CLM-8356       | 4-(1,3-Dimethyl-1-ethylpentyl) phenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-8360       | 4-(1,3-Dimethyl-1-ethylpentyl) phenol (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL            |
| CLM-8357       | 4-(1,4-Dimethyl-1-ethylpentyl) phenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-8361       | 4-(1,4-Dimethyl-1-ethylpentyl) phenol (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL            |
| CLM-8359       | 4-(1-Ethyl-1-methylhexyl) phenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-8363       | 4-(1-Ethyl-1-methylhexyl) phenol (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-6560       | <i>p</i> -Nonylphenol (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-4306       | <i>p</i> - <i>n</i> -Nonylphenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-4306-M     | <i>p</i> - <i>n</i> -Nonylphenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-4559       | <i>p</i> - <i>n</i> -Nonylphenol (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL            |
| ULM-4559-M     | <i>p</i> - <i>n</i> -Nonylphenol (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL            |
| CLM-4307       | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-4307-M     | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-4521       | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL            |
| ULM-4521-M     | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-4521-SA-5X | <i>p</i> - <i>n</i> -Nonylphenol diethoxylate (unlabeled)   | 500 µg/mL in acetonitrile | 1.2 mL            |
| ULM-7147       | Nonylphenol diethoxylate (unlabeled) branched isomers   | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-4512       | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-4512-M     | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-4520       | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL            |
| ULM-4520-M     | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-4520-SA-5X | <i>p</i> - <i>n</i> -Nonylphenol monoethoxylate (unlabeled)   | 500 µg/mL in acetonitrile | 1.2 mL            |
| ULM-7146       | Nonylphenol monoethoxylate (unlabeled) branched isomers   | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-4516       | <i>p</i> - <i>n</i> -Nonylphenol triethoxylate (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in nonane       | 1.2 mL            |
| ES-4157        | <i>p</i> - <i>n</i> -Nonylphenol + mono-/di-/tri-ethoxylates (set of individual standards)<br>1 ampoule each of CLM-4306-1.2, CLM-4512-1.2, CLM-4307-1.2 and CLM-4516-1.2 | 100 µg/mL in nonane       | Set of 4 x 1.2 mL |
| ULM-4688       | Nonylphenoxyacetic acid (unlabeled)ring/chain isomers   | 100 µg/mL in nonane       | 1.2 mL            |
| ULM-4690       | <i>p</i> - <i>n</i> -Nonylphenoxyethoxyacetic acid (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL            |
| CLM-8358       | 4-(1,1,5-Trimethylhexyl) phenol (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-8362       | 4-(1,1,5-Trimethylhexyl) phenol (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL            |

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## Paraben Standards

| Catalog No. | Description  | Concentration       | Unit Size |
|-------------|--|---------------------|-----------|
| CLM-9849    | Benzyl paraben (benzyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                      | 1 mg/mL in methanol | 1.2 mL    |
| ULM-9850    | Benzyl paraben (benzyl 4-hydroxybenzoate) (unlabeled)  | 1 mg/mL in methanol | 1.2 mL    |
| CLM-8285    | <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)   | 1 mg/mL in methanol | 1.2 mL    |
| ULM-8287    | <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (unlabeled)                       | 1 mg/mL in methanol | 1.2 mL    |
| CLM-9761    | Ethyl paraben (ethyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                        | 1 mg/mL in methanol | 1.2 mL    |
| ULM-9760    | Ethyl paraben (ethyl 4-hydroxybenzoate) (unlabeled)  | 1 mg/mL in methanol | 1.2 mL    |
| CLM-10451   | <i>n</i> -Heptyl paraben ( <i>n</i> -heptyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 1 mg/mL in methanol | 1.2 mL    |
| ULM-10442   | <i>n</i> -Heptyl paraben ( <i>n</i> -heptyl 4-hydroxybenzoate) (unlabeled)                     | 1 mg/mL in methanol | 1.2 mL    |
| CLM-9847    | Isobutyl paraben (isobutyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                  | 1 mg/mL in methanol | 1.2 mL    |
| ULM-9848    | Isobutyl paraben (isobutyl 4-hydroxybenzoate) (unlabeled)                                      | 1 mg/mL in methanol | 1.2 mL    |
| CLM-9845    | Isopropyl paraben (isopropyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                | 1 mg/mL in methanol | 1.2 mL    |
| ULM-9846    | Isopropyl paraben (isopropyl 4-hydroxybenzoate) (unlabeled)                                    | 1 mg/mL in methanol | 1.2 mL    |
| CLM-8249    | Methyl paraben (methyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                      | 1 mg/mL in methanol | 1.2 mL    |
| ULM-8250    | Methyl paraben (methyl 4-hydroxybenzoate) (unlabeled)  | 1 mg/mL in methanol | 1.2 mL    |
| CLM-10450   | <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 1 mg/mL in methanol | 1.2 mL    |
| ULM-10441   | <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (unlabeled)                     | 1 mg/mL in methanol | 1.2 mL    |
| CLM-9763    | <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 1 mg/mL in methanol | 1.2 mL    |
| ULM-9762    | <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (unlabeled)                     | 1 mg/mL in methanol | 1.2 mL    |

| Catalog No. | Description                           | Unit Size |
|-------------|---------------------------------------|-----------|
| ES-5600     | JECS Phenol/Paraben Clean-Up Standard | 1.2 mL    |

| Labeled  | Concentration<br>( $\mu\text{g/mL}$ in methanol) |
|--|--|
| Benzyl paraben (benzyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                      | 10   |
| Bisphenol A (ring- $^{13}\text{C}_{12}$ , 99%)   | 10   |
| Bisphenol S (ring- $^{13}\text{C}_{12}$ , 99%)   | 10   |
| Bisphenol F (ring- $^{13}\text{C}_{12}$ , 99%)   | 10   |
| Bisphenol AF (ring- $^{13}\text{C}_{12}$ , 99%)  | 10   |
| <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)   | 10   |
| Ethyl paraben (ethyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                        | 10   |
| <i>n</i> -Heptyl paraben ( <i>n</i> -heptyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 10   |
| Isobutyl paraben (isobutyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                  | 10   |
| 2-Isopropyl-5-methylphenol (isopropyl- $^{13}\text{C}_3$ , 99%)                                | 10   |
| 4-Isopropyl-3-methylphenol (4-isopropyl- $^{13}\text{C}_3$ , 99%)                              | 10   |
| 5-Isopropyl-2-methylphenol (isopropyl- $^{13}\text{C}_3$ , 99%)                                | 10   |
| Isopropyl paraben (isopropyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                | 10   |
| 3-Methyl-4-nitrophenol ( $^{13}\text{C}_6$ , 99%)  | 10   |
| Methyl paraben (methyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%)                      | 10   |
| 4-Nitrophenol ( $^{13}\text{C}_6$ , 99%)   | 10   |
| <i>p</i> - <i>N</i> -Nonylphenol (ring- $^{13}\text{C}_6$ , 99%)                               | 10   |
| 4- <i>t</i> -Octylphenol (ring- $^{13}\text{C}_6$ , 99%)                                       | 10   |
| Oxybenzone (phenyl- $^{13}\text{C}_6$ , 99%)   | 10   |
| <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 10   |
| <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (ring- $^{13}\text{C}_6$ , 99%) | 10   |
| Triclocarban (3,4,4'-trichlorocarbanilide) (4'-chlorophenyl- $^{13}\text{C}_6$ , 99%)          | 10   |
| Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) ( $^{13}\text{C}_{12}$ , 99%)            | 10   |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
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| Catalog No. | Description                         | Unit Size |
|-------------|-------------------------------------|-----------|
| ES-5599     | JECS Phenol/Paraben Native Standard | 1.2 mL    |

| Unlabeled  | Concentration<br>(µg/mL in methanol) |
|--|--------------------------------------|
| Benzyl paraben (benzyl 4-hydroxybenzoate)                      | 10                                   |
| Bisphenol A  | 10                                   |
| Bisphenol S  | 10                                   |
| Bisphenol F  | 10                                   |
| Bisphenol AF   | 10                                   |
| <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate)   | 10                                   |
| Ethyl paraben (ethyl 4-hydroxybenzoate)                        | 10                                   |
| <i>n</i> -Heptyl paraben ( <i>n</i> -heptyl 4-hydroxybenzoate) | 10                                   |
| Isobutyl paraben (isobutyl 4-hydroxybenzoate)                  | 10                                   |
| 2-Isopropyl-5-methylphenol                                     | 10                                   |
| 4-Isopropyl-3-methylphenol                                     | 10                                   |
| 5-Isopropyl-2-methylphenol                                     | 10                                   |
| Isopropyl paraben (isopropyl 4-hydroxybenzoate)                | 10                                   |
| 3-Methyl-4-nitrophenol   | 10                                   |
| Methyl paraben (methyl 4-hydroxybenzoate)                      | 10                                   |
| 4-Nitrophenol  | 10                                   |
| <i>p</i> - <i>n</i> -Nonylphenol                               | 10                                   |
| 4- <i>t</i> -Octylphenol                                       | 10                                   |
| Oxybenzone   | 10                                   |
| <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) | 10                                   |
| <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) | 10                                   |
| Triclocarban (3,4,4'-trichlorocarbanilide)                     | 10                                   |
| Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether)          | 10                                   |

## Perfluorinated Standards

| Catalog No. | Description   | Concentration        | Unit Size |
|-------------|---|----------------------|-----------|
| ULM-8097    | Perfluorobutyric acid (PFBA) (unlabeled)  | 50 µg/mL in methanol | 1.2 mL    |
| ULM-9515    | Perfluoropentanoic acid (PFPA) (unlabeled)  | 50 µg/mL in methanol | 1.2 mL    |
| CLM-8340    | Perfluorohexanoic acid (PFHxA), sodium salt ( $^{13}\text{C}_6$ , 99%)                      | 50 µg/mL in methanol | 1.2 mL    |
| ULM-8342    | Perfluorohexanoic acid (PFHxA), sodium salt (unlabeled)                                     | 50 µg/mL in methanol | 1.2 mL    |
| CLM-10624   | Perfluoroheptanoic acid (PFHpA), sodium salt (heptanoyl- $^{13}\text{C}_7$ , 99%)           | 50 µg/mL in methanol | 1.2 mL    |
| ULM-9516    | Perfluoroheptanoic acid (PFHpA) (unlabeled)   | 50 µg/mL in methanol | 1.2 mL    |
| CLM-8005    | Perfluorooctanoic acid (PFOA) ( $^{13}\text{C}_8$ , 99%)                                    | 50 µg/mL in methanol | 1.2 mL    |
| ULM-7451    | Perfluorooctanoic acid (PFOA) (unlabeled)   | 50 µg/mL in methanol | 1.2 mL    |
| CLM-8060    | Perfluorononanoic acid (PFNA) ( $^{13}\text{C}_9$ , 99%)                                    | 50 µg/mL in methanol | 1.2 mL    |
| ULM-8066    | Perfluorononanoic acid (PFNA) (unlabeled)   | 50 µg/mL in methanol | 1.2 mL    |
| CLM-8172    | Perfluorodecanoic acid (PFDA) ( $^{13}\text{C}_9$ , 99%)                                    | 50 µg/mL in methanol | 1.2 mL    |
| ULM-8067    | Perfluorodecanoic acid (PFDA) (unlabeled)   | 50 µg/mL in methanol | 1.2 mL    |
| CLM-8789    | Perfluoroundecanoic acid (PFUA), sodium salt (3,4,5,6,7,8,9,10,11- $^{13}\text{C}_9$ , 99%) | 50 µg/mL in methanol | 1.2 mL    |
| ULM-8084    | Perfluoroundecanoic acid (PFUA), sodium salt (unlabeled)                                    | 50 µg/mL in methanol | 1.2 mL    |
| CLM-10593   | Perfluorododecanoic acid (PFDoA), sodium salt (dodecanoyl- $^{13}\text{C}_{12}$ , 99%)      | 50 µg/mL in methanol | 1.2 mL    |
| ULM-10594   | Perfluorododecanoic acid (PFDoA), sodium salt (unlabeled)                                   | 50 µg/mL in methanol | 1.2 mL    |
| ULM-8068    | Perfluorododecanoic acid (PFDoA) (unlabeled)  | 50 µg/mL in methanol | 1.2 mL    |
| ULM-9955    | Perfluorotridecanoic acid (PFTrDA) (unlabeled) CP 97%                                       | 50 µg/mL in methanol | 1.2 mL    |
| ULM-9956    | Perfluorotetradecanoic acid (PFTeDA) (unlabeled) CP 96%                                     | 50 µg/mL in methanol | 1.2 mL    |

## Perfluoroalkyl Sulfonates (PFAS)

|               |   |                      |        |
|---------------|---|----------------------|--------|
| CLM-9523-1.2  | Perfluorobutanesulfonate (PFBS), potassium salt ( $^{13}\text{C}_4$ , 99%)  | 50 µg/mL in methanol | 1.2 mL |
| ULM-9521      | Perfluorobutanesulfonate (PFBS), potassium salt (unlabeled)                 | 50 µg/mL in methanol | 1.2 mL |
| ULM-12322-1.2 | Perfluorodecanesulfonate (PFDS), potassium salt (unlabeled)                 | 50 µg/mL in methanol | 1.2 mL |
| ULM-9520      | Perfluoropentanesulfonate (PFPeS), sodium salt (unlabeled)                  | 50 µg/mL in methanol | 1.2 mL |
| CLM-9526      | Perfluorohexanesulfonate (PFHxS), potassium salt ( $^{13}\text{C}_6$ , 99%) | 50 µg/mL in methanol | 1.2 mL |
| ULM-12310-1.2 | Potassium perfluoro-1-hexanesulfonate (PFHxS) (unlabeled) linear isomer     | 50 µg/mL in methanol | 1.2 mL |
| ULM-9524      | Perfluorohexanesulfonate (PFHxS), potassium salt (unlabeled) mix of isomers | 50 µg/mL in methanol | 1.2 mL |
| ULM-9531      | Perfluoroheptanesulfonate (PFHpS), sodium salt (unlabeled)                  | 50 µg/mL in methanol | 1.2 mL |
| CLM-8505      | Perfluorooctanesulfonate (PFOS), sodium salt ( $^{13}\text{C}_8$ , 99%)     | 50 µg/mL in methanol | 1.2 mL |
| ULM-9001      | Perfluorooctanesulfonate (PFOS), sodium salt (unlabeled)                    | 50 µg/mL in methanol | 1.2 mL |
| ULM-10655     | Perfluorooctanesulfonate (PFOS) (unlabeled) mix of isomers                  | 50 µg/mL in methanol | 1.2 mL |
| ULM-9530      | Perfluorononanesulfonate (PFNS), sodium salt (unlabeled)                    | 50 µg/mL in methanol | 1.2 mL |

## Fluorotelomer Sulfonates (FTS)

|            |   |                      |        |
|------------|---|----------------------|--------|
| CDLM-10753 | 1H,1H,2H,2H-Perfluorohexanesulfonate (4:2 FTS), sodium salt ( $^{13}\text{C}_2$ , 99%; $\text{D}_4$ , 98%)    | 50 µg/mL in methanol | 1.2 mL |
| ULM-10757  | 1H,1H,2H,2H-Perfluorohexanesulfonate (4:2 FTS), sodium salt (unlabeled)                                       | 50 µg/mL in methanol | 1.2 mL |
| CDLM-10752 | 1H,1H,2H,2H-Perfluorooctanesulfonate (6:2 FTS), sodium salt ( $^{13}\text{C}_2$ , 99%; $\text{D}_4$ , 98%)    | 50 µg/mL in methanol | 1.2 mL |
| ULM-10756  | 1H,1H,2H,2H-Perfluorooctanesulfonate (6:2 FTS), sodium salt (unlabeled)                                       | 50 µg/mL in methanol | 1.2 mL |
| CDLM-10751 | 1H,1H,2H,2H-Perfluorodecanesulfonate (8:2 FTS), sodium salt ( $^{13}\text{C}_2$ , 99%; $\text{D}_4$ , 98%)    | 50 µg/mL in methanol | 1.2 mL |
| ULM-10755  | 1H,1H,2H,2H-Perfluorodecanesulfonate (8:2 FTS), sodium salt (unlabeled)                                       | 50 µg/mL in methanol | 1.2 mL |
| CDLM-10750 | 1H,1H,2H,2H-Perfluorododecanesulfonate (10:2 FTS), sodium salt ( $^{13}\text{C}_2$ , 99%; $\text{D}_4$ , 98%) | 50 µg/mL in methanol | 1.2 mL |
| ULM-10754  | 1H,1H,2H,2H-Perfluorododecanesulfonate (10:2 FTS), sodium salt (unlabeled)                                    | 50 µg/mL in methanol | 1.2 mL |

## Perfluorooctanesulfonamidoacetic Acids (FOSAA)

|           |  |                      |        |
|-----------|--|----------------------|--------|
| DLM-10663 | N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA) (N-methyl- $\text{D}_3$ , 98%) | 50 µg/mL in methanol | 1.2 mL |
| ULM-10656 | N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA) (unlabeled) mix of isomers     | 50 µg/mL in methanol | 1.2 mL |
| DLM-10664 | N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA) (N-methyl- $\text{D}_3$ , 98%)  | 50 µg/mL in methanol | 1.2 mL |
| ULM-10657 | N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA) (unlabeled) mix of isomers      | 50 µg/mL in methanol | 1.2 mL |

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## Perfluorooctanesulfonamides (FOSA)

| Catalog No. | Description   | Concentration        | Unit Size |
|-------------|---|----------------------|-----------|
| DLM-10740   | <i>N</i> -Methylperfluorooctanesulfonamide ( <i>N</i> -MeFOSA) (D <sub>3</sub> , 98%) | 50 µg/mL in methanol | 1.2 mL    |
| ULM-10779   | <i>N</i> -Methylperfluorooctanesulfonamide ( <i>N</i> -MeFOSA) (unlabeled)            | 50 µg/mL in methanol | 1.2 mL    |
| DLM-10741   | <i>N</i> -Ethylperfluorooctanesulfonamide ( <i>N</i> -EtFOSA) (D <sub>5</sub> , 98%)  | 50 µg/mL in methanol | 1.2 mL    |
| ULM-10780   | <i>N</i> -Ethylperfluorooctanesulfonamide ( <i>N</i> -EtFOSA) (unlabeled)             | 50 µg/mL in methanol | 1.2 mL    |

## Fluoropolymers

|           |  |                       |        |
|-----------|--|-----------------------|--------|
| ULM-10728 | GenX (Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA) (unlabeled) | 100 µg/mL in methanol | 1.2 mL |
|-----------|--|-----------------------|--------|

## PFAS Mixture

|         |   |                     |        |
|---------|---|---------------------|--------|
| ES-5576 | Perfluoroalkylsulfonate (PFAS) C <sub>4</sub> -C <sub>10</sub> Native Mixture (unlabeled) | 5 µg/mL in methanol | 1.2 mL |
|---------|---|---------------------|--------|

## PFCA Mixture

|         |   |                     |        |
|---------|---|---------------------|--------|
| ES-5587 | Perfluoroalkylcarboxylic acid (PFCA) C <sub>4</sub> -C <sub>14</sub> Native Mixture (unlabeled) | 2 µg/mL in methanol | 1.2 mL |
|---------|---|---------------------|--------|

## PFOS/PFOA Mixtures

|                |                                      |                         |
|----------------|--------------------------------------|-------------------------|
| ES-5570        | PFOS/PFOA Calibration Series CS1-CS5 | 5 × 0.25 mL in methanol |
| ES-5570-CS0.25 | PFOS/PFOA Calibration Series CS0.25  | 0.25 mL in methanol     |

|  | Concentration (ng/mL) |     |     |     |     |      |
|--|-----------------------|-----|-----|-----|-----|------|
| Unlabeled  | CS0.25*               | CS1 | CS2 | CS3 | CS4 | CS5  |
| Perfluorooctanoic acid (PFOA)  | 0.5                   | 2   | 10  | 50  | 200 | 1000 |
| Perfluorooctanesulfonate (PFOS), sodium salt                                       | 0.5                   | 2   | 10  | 50  | 200 | 1000 |
| Labeled (for extraction)   |                       |     |     |     |     |      |
| Perfluorooctanoic acid (PFOA) ( <sup>13</sup> C <sub>8</sub> , 99%)                | 50                    | 50  | 50  | 50  | 50  | 50   |
| Perfluorooctanesulfonate (PFOS), sodium salt ( <sup>13</sup> C <sub>8</sub> , 99%) | 50                    | 50  | 50  | 50  | 50  | 50   |
| Labeled (for injection)  |                       |     |     |     |     |      |
| Perfluorononanoic acid (PFNA) ( <sup>13</sup> C <sub>9</sub> , 99%)                | 50                    | 50  | 50  | 50  | 50  | 50   |

\*Not included in ES-5570 – available for separate purchase.

|         |                                       |                  |
|---------|---------------------------------------|------------------|
| ES-5571 | PFOS/PFOA Extraction Standard Mixture | 3 mL in methanol |
|---------|---------------------------------------|------------------|

| Labeled  | Concentration (ng/mL) |
|--|-----------------------|
| Perfluorooctanoic acid (PFOA) ( <sup>13</sup> C <sub>8</sub> , 99%)                | 2000                  |
| Perfluorooctanesulfonate (PFOS), sodium salt ( <sup>13</sup> C <sub>8</sub> , 99%) | 2000                  |

|         |                                      |                  |
|---------|--------------------------------------|------------------|
| ES-5572 | PFOS/PFOA Injection Standard Mixture | 3 mL in methanol |
|---------|--------------------------------------|------------------|

| Labeled   | Concentration (ng/mL) |
|---|-----------------------|
| Perfluorononanoic acid (PFOA) ( <sup>13</sup> C <sub>9</sub> , 99%) | 2000                  |

|         |                                   |                    |
|---------|-----------------------------------|--------------------|
| ES-5573 | PFOS/PFOA Native Standard Mixture | 1.2 mL in methanol |
|---------|-----------------------------------|--------------------|

| Labeled                                      | Concentration (ng/mL) |
|--|-----------------------|
| Perfluorooctanoic acid (PFOA)                | 5000                  |
| Perfluorooctanesulfonate (PFOS), sodium salt | 5000                  |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.



## Personal Care Products

| Catalog No. | Description   | Concentration             | Unit Size      |
|-------------|---|---------------------------|----------------|
| DLM-183     | Benzophenone (D <sub>10</sub> , 98%)  | 100 µg/mL in nonane       | 1.2 mL         |
| ULM-8303    | Benzophenone (unlabeled)  | 100 µg/mL in nonane       | 1.2 mL         |
| CLM-9437    | Decamethylcyclopentasiloxane "D5" (decamethyl- <sup>13</sup> C <sub>10</sub> , 98%)                       | 100 µg/mL in methanol     | 1.2 mL         |
| ULM-9442    | Decamethylcyclopentasiloxane "D5" (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL         |
| DLM-4762    | <i>N,N</i> -Diethyl- <i>m</i> -toluamide (DEET) (dimethyl-D <sub>6</sub> , 98%)                           | 100 µg/mL in MeCl         | 1.2 mL         |
| DLM-4762-D  | <i>N,N</i> -Diethyl- <i>m</i> -toluamide (DEET) (dimethyl-D <sub>6</sub> , 98%)                           | 100 µg/mL in dioxane      | 1.2 mL         |
| ULM-7975    | <i>N,N</i> -Diethyl- <i>m</i> -toluamide (DEET) (unlabeled)   | 100 µg/mL in MeCl         | 1.2 mL         |
| ULM-7975-D  | <i>N,N</i> -Diethyl- <i>m</i> -toluamide (DEET) (unlabeled)   | 100 µg/mL in dioxane      | 1.2 mL         |
| CLM-10232   | Dodecamethylcyclohexasiloxane "D6" (methyl- <sup>13</sup> C <sub>6</sub> , 98%)                           | 100 µg/mL in methanol     | 1.2 mL         |
| ULM-9443    | Dodecamethylcyclohexasiloxane "D6" (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL         |
| CLM-9349    | 4-Dodecylbenzenesulfonic acid, sodium salt (ring- <sup>13</sup> C <sub>6</sub> , 99%) CP 94%              | 10 µg/mL in methanol      | 1.2 mL         |
| ULM-9350    | 4-Dodecylbenzenesulfonic acid, sodium salt (unlabeled) CP 95%   | 10 µg/mL in methanol      | 1.2 mL         |
| CLM-8008    | Hexachlorophene ( <sup>13</sup> C <sub>13</sub> , 99%)  | 50 µg/mL in methanol      | 1.2 mL         |
| ULM-8009    | Hexachlorophene (unlabeled)   | 50 µg/mL in methanol      | 1.2 mL         |
| CLM-9542    | Hexamethylcyclotrisiloxane "D3" (hexamethyl- <sup>13</sup> C <sub>6</sub> , 98%)                          | 100 µg/mL in MTBE         | 1.2 mL         |
| ULM-9687    | Hexamethylcyclotrisiloxane "D3" (unlabeled)   | 100 µg/mL in MTBE         | 1.2 mL         |
| CLM-4745    | 4-Hydroxybenzoic acid (ring- <sup>13</sup> C <sub>6</sub> , 99%)  | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-8251    | 4-Hydroxybenzoic acid (unlabeled)   | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-10666   | DL-Mandelic acid ( <sup>13</sup> C <sub>8</sub> , 99%)  |                           | Please inquire |
| CLM-7885    | Methyl triclosan (2,4,4'-trichloro-2'-methoxydiphenyl ether) (ring- <sup>13</sup> C <sub>12</sub> , 99%)  | 100 µg/mL in nonane       | 1.2 mL         |
| ULM-7884    | Methyl triclosan (2,4,4'-trichloro-2'-methoxydiphenyl ether) (unlabeled)                                  | 100 µg/mL in nonane       | 1.2 mL         |
| CLM-9436-MT | Octamethylcyclotetrasiloxane "D4" (octamethyl- <sup>13</sup> C <sub>8</sub> , 98%)                        | 100 µg/mL in MTBE         | 1.2 mL         |
| ULM-9441-MT | Octamethylcyclotetrasiloxane "D4" (unlabeled)   | 100 µg/mL in MTBE         | 1.2 mL         |
| CLM-9849    | Benzyl paraben (benzyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                      | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-9850    | Benzyl paraben (benzyl 4-hydroxybenzoate) (unlabeled)   | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-8285    | <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-8287    | <i>n</i> -Butyl paraben ( <i>n</i> -butyl 4-hydroxybenzoate) (unlabeled)                                  | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-9761    | Ethyl paraben (ethyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                        | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-9760    | Ethyl paraben (ethyl 4-hydroxybenzoate) (unlabeled)   | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-10451   | <i>n</i> -Heptyl paraben ( <i>n</i> -heptyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%) | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-10442   | <i>n</i> -Heptyl paraben ( <i>n</i> -heptyl 4-hydroxybenzoate) (unlabeled)                                | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-9847    | Isobutyl paraben (isobutyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                  | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-9848    | Isobutyl paraben (isobutyl 4-hydroxybenzoate) (unlabeled)   | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-9845    | Isopropyl paraben (isopropyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-9846    | Isopropyl paraben (isopropyl 4-hydroxybenzoate) (unlabeled)   | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-8249    | Methyl paraben (methyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%)                      | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-8250    | Methyl paraben (methyl 4-hydroxybenzoate) (unlabeled)   | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-10450   | <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%) | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-10441   | <i>n</i> -Pentyl paraben ( <i>n</i> -pentyl 4-hydroxybenzoate) (unlabeled)                                | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-9763    | <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (ring- <sup>13</sup> C <sub>6</sub> , 99%) | 1 mg/mL in methanol       | 1.2 mL         |
| ULM-9762    | <i>n</i> -Propyl paraben ( <i>n</i> -propyl 4-hydroxybenzoate) (unlabeled)                                | 1 mg/mL in methanol       | 1.2 mL         |
| CLM-8525    | Oxybenzone (phenyl- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in acetonitrile | 1.2 mL         |
| ULM-8531    | Oxybenzone (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL         |
| CLM-7286    | Triclocarban (3,4,4'-trichlorocarbanilide) (4'-chlorophenyl- <sup>13</sup> C <sub>6</sub> , 99%)          | 100 µg/mL in acetonitrile | 1.2 mL         |
| ULM-7968    | Triclocarban (3,4,4'-trichlorocarbanilide) (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL         |
| CLM-6779    | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) ( <sup>13</sup> C <sub>12</sub> , 99%)              | 100 µg/mL in nonane       | 1.2 mL         |
| CLM-6779-MT | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) ( <sup>13</sup> C <sub>12</sub> , 99%)              | 100 µg/mL in MTBE         | 1.2 mL         |
| ULM-6935    | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) (unlabeled)   | 100 µg/mL in nonane       | 1.2 mL         |
| ULM-6935-MT | Triclosan (2',4,4'-trichloro-2-hydroxydiphenyl ether) (unlabeled)   | 100 µg/mL in MTBE         | 1.2 mL         |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## Phthalate and Phthalate Metabolite Standards

| Catalog No. | Description   | Concentration            | Unit Size      |
|-------------|---|--------------------------|----------------|
| CLM-10319   | 1,2,4-Benzenetricarboxylic acid, 1,2-bis(2-ethylhexyl) ester ( $^{13}\text{C}_8$ , 99%)             | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10320   | 1,2,4-Benzenetricarboxylic acid, 1,2-bis(2-ethylhexyl) ester (unlabeled) 5% 2,4-isomer              | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-10315   | 1,2,4-Benzenetricarboxylic acid, 1,4-bis(2-ethylhexyl) ester ( $^{13}\text{C}_8$ , 99%)             | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10316   | 1,2,4-Benzenetricarboxylic acid, 1,4-bis(2-ethylhexyl) ester (unlabeled)                            | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-10317   | 1,2,4-Benzenetricarboxylic acid, 2,4-bis(2-ethylhexyl) ester ( $^{13}\text{C}_8$ , 99%)             | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10318   | 1,2,4-Benzenetricarboxylic acid, 2,4-bis(2-ethylhexyl) ester (unlabeled)                            | 100 µg/mL in MTBE        | 1.2 mL         |
| DLM-1369    | Benzyl butyl phthalate (ring- $\text{D}_4$ , 98%)   | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1369    | Benzyl butyl phthalate (ring- $\text{D}_4$ , 98%)   | neat                     | 0.1 g          |
| ULM-7551    | Benzyl butyl phthalate (unlabeled)  | 100 µg/mL in nonane      | 1.2 mL         |
| CLM-4675    | Bis(2-ethylhexyl) adipate (adipate- $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in nonane      | 1.2 mL         |
| ULM-6566    | Bis(2-ethylhexyl) adipate (unlabeled)   | 100 µg/mL in nonane      | 1.2 mL         |
| CLM-6238-MT | Bis(2-ethylhexyl) phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)     | 100 µg/mL in MTBE        | 1.2 mL         |
| DLM-1368    | Bis(2-ethylhexyl) phthalate (ring- $\text{D}_4$ , 98%)  | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1368    | Bis(2-ethylhexyl) phthalate (ring- $\text{D}_4$ , 98%)  | neat                     | 0.1 g, 0.25 g  |
| ULM-6241    | Bis(2-ethylhexyl) phthalate (unlabeled)   | 1000 µg/mL in nonane     | 1.2 mL         |
| ULM-9767    | Bis(7-methyloctyl) phthalate (unlabeled)  | neat                     | Please inquire |
| CLM-10592   | Cyclohexane-1,2-dicarboxylic acid, di-(4-methyloctyl) ester (DINCH) ( $^{13}\text{C}_4$ , 99%)      | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10591   | Cyclohexane-1,2-dicarboxylic acid, di-(4-methyloctyl) ester (DINCH) (unlabeled)                     | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10302   | Cyclohexane-1,2-dicarboxylic acid, mono-(4-methyl-7-oxooctyl) ester (unlabeled)                     | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-10299   | Cyclohexane-1,2-dicarboxylic acid, mono-(4-methyloctyl) ester (MINCH) ( $^{13}\text{C}_4$ , 99%)    | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10300   | Cyclohexane-1,2-dicarboxylic acid, mono-(4-methyloctyl) ester (MINCH) (unlabeled)                   | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-10303   | Cyclohexane-1,2-dicarboxylic acid, mono-(7-carboxy-4-methylheptyl) ester ( $^{13}\text{C}_4$ , 99%) | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10304   | Cyclohexane-1,2-dicarboxylic acid, mono-(7-carboxy-4-methylheptyl) ester (unlabeled)                | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-10202   | Cyclohexane-1,2-dicarboxylic acid, mono-(7-hydroxy-4-methyloctyl) ester ( $^{13}\text{C}_4$ , 99%)  | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10203   | Cyclohexane-1,2-dicarboxylic acid, mono-(7-hydroxy-4-methyloctyl) ester (unlabeled)                 | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-10301   | Cyclohexane-1,2-dicarboxylic acid, mono-(4-methyl-7-oxooctyl) ester ( $^{13}\text{C}_4$ , 99%)      | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-10302   | Cyclohexane-1,2-dicarboxylic acid, mono-(4-methyl-7-oxooctyl) ester (unlabeled)                     | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-4670    | Dicyclohexyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)          | 100 µg/mL in nonane      | 1.2 mL         |
| ULM-8785    | Dicyclohexyl phthalate (unlabeled)  | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1629    | Diethyl phthalate (ring- $\text{D}_4$ , 98%)  | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1629    | Diethyl phthalate (ring- $\text{D}_4$ , 98%)  | neat                     | 0.1 g, 0.25 g  |
| ULM-6174    | Diethyl phthalate (unlabeled)   | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1366    | Dimethyl phthalate (ring- $\text{D}_4$ , 98%)   | 100 ± 10 µg/mL in nonane | 1.2 mL         |
| DLM-1366    | Dimethyl phthalate (ring- $\text{D}_4$ , 98%)   | neat                     | 0.1 g          |
| ULM-6783    | Dimethyl phthalate (unlabeled)  | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1367    | Di- <i>n</i> -butyl phthalate (ring- $\text{D}_4$ , 98%)  | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1367    | Di- <i>n</i> -butyl phthalate (ring- $\text{D}_4$ , 98%)  | neat                     | 0.1 g, 0.25 g  |
| ULM-7466    | Di- <i>n</i> -butyl phthalate (unlabeled)   | 100 µg/mL in nonane      | 1.2 mL         |
| CLM-4669    | Di- <i>n</i> -hexyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)   | 100 µg/mL in nonane      | 1.2 mL         |
| ULM-7434    | Di- <i>n</i> -hexyl phthalate (unlabeled)   | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1630    | Di- <i>n</i> -octyl phthalate (ring- $\text{D}_4$ , 98%)  | 100 µg/mL in nonane      | 1.2 mL         |
| DLM-1630    | Di- <i>n</i> -octyl phthalate (ring- $\text{D}_4$ , 98%)  | neat                     | 0.1 g          |
| ULM-6129    | Di- <i>n</i> -octyl phthalate (unlabeled)   | 100 µg/mL in nonane      | 1.2 mL         |
| CLM-4668    | Di- <i>n</i> -pentyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)  | 100 µg/mL in nonane      | 1.2 mL         |
| ULM-7433    | Di- <i>n</i> -pentyl phthalate (unlabeled)  | 100 µg/mL in nonane      | 1.2 mL         |
| CLM-4671    | Di- <i>n</i> -propyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)  | 100 µg/mL in nonane      | Please inquire |
| ULM-4652-MT | Mono(3,7-dimethyl-1-octyl phthalate) (unlabeled)  | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-4591-MT | Monobenzyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)            | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-6149-MT | Monobenzyl phthalate (unlabeled)  | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-4590-MT | Mono- <i>n</i> -butyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%) | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-6148-MT | Mono- <i>n</i> -butyl phthalate (unlabeled)   | 100 µg/mL in MTBE        | 1.2 mL         |
| CLM-4592-MT | Monocyclohexyl phthalate (ring-1,2- $^{13}\text{C}_2$ , dicarboxyl- $^{13}\text{C}_2$ , 99%)        | 100 µg/mL in MTBE        | 1.2 mL         |
| ULM-7394-MT | Monocyclohexyl phthalate (unlabeled)  | 100 µg/mL in MTBE        | 1.2 mL         |

MTBE: methyl tert-butyl ether

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Phthalate and Phthalate Metabolite Standards (continued)

| Catalog No. | Description  | Concentration       | Unit Size      |
|-------------|--|---------------------|----------------|
| CLM-4589-MT | Mono- <i>n</i> -octyl phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                              | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4593-MT | Mono- <i>n</i> -octyl phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10187   | Mono- <i>n</i> -pentyl phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                             | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-7393-MT | Mono- <i>n</i> -pentyl phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-8232-MT | Mono-[2-(carboxymethyl)hexyl] phthalate (DEHP Metabolite IV) ( <sup>13</sup> C <sub>4</sub> , 99%)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-8233-MT | Mono-[2-(carboxymethyl)hexyl] phthalate (DEHP Metabolite IV) (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-8148-MT | Mono-(2-ethyl-5-carboxypentyl) phthalate (DEHP Metabolite V) ( <sup>13</sup> C <sub>4</sub> , 99%) CP 90%  | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-8149-MT | Mono-(2-ethyl-5-carboxypentyl) phthalate (DEHP Metabolite V) (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-6641-MT | Mono-(2-ethyl-5-hydroxyhexyl) phthalate (DEHP Metabolite IX) ( <sup>13</sup> C <sub>4</sub> , 99%)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4662-MT | Mono-(2-ethyl-5-hydroxyhexyl) phthalate (DEHP Metabolite IX) (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-6640-MT | Mono-(2-ethyl-5-oxohexyl) phthalate (DEHP Metabolite VI) ( <sup>13</sup> C <sub>4</sub> , 99%)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4663-MT | Mono-(2-ethyl-5-oxohexyl) phthalate (DEHP Metabolite VI) (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-4584-MT | Mono-2-ethylhexyl phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                                  | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4583-MT | Mono-2-ethylhexyl phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10200   | Mono-2-ethylhexyl terephthalate (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10201   | Mono-2-ethylhexyl terephthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4594    | Mono-2-methoxyethyl phthalate (unlabeled)  | neat                | Please inquire |
| CLM-6847-MT | Mono-(3-carboxypropyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                             | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-6848-MT | Mono-(3-carboxypropyl) phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4820    | Mono-3-hydroxybutyl phthalate (unlabeled)  | neat                | Please inquire |
| CLM-4588-MT | Mono-(3,7-dimethyl-1-octyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                        | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10192   | Mono-(4-methyl-7-carboxyheptyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                    | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10193   | Mono-(4-methyl-7-carboxyheptyl) phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10196   | Mono-(4-methyl-7-carboxyoctyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                     | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10197   | Mono-(4-methyl-7-carboxyoctyl) phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10188   | Mono-(4-methyl-7-hydroxyoctyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                     | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10189   | Mono-(4-methyl-7-hydroxyoctyl) phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10190   | Mono-(4-methyl-7-oxooctyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                         | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10191   | Mono-(4-methyl-7-oxooctyl) phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10311   | Mono-(6-carboxy-2-propylhexyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                     | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10312   | Mono-(6-carboxy-2-propylhexyl) phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10313   | Mono-(6-hydroxy-2-propylheptyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                    | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10314   | Mono-(6-hydroxy-2-propylheptyl) phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10309   | Mono-(6-oxo-2-propylheptyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                        | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10310   | Mono-(6-oxo-2-propylheptyl) phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10305   | Mono-(7-carboxyoctyl) phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                              | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10306   | Mono-(7-carboxyoctyl) phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-10308   | Mono-(8-carboxynonyl) phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-6225    | Monomethyl isophthalate (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | neat                | Please inquire |
| ULM-6226    | Monomethyl isophthalate (unlabeled)  | neat                | Please inquire |
| CLM-4586-MT | Monoethyl phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%) CP 95%                                   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4585-MT | Monoethyl phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-10204   | Monoisobutyl phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)                                       | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-7919-MT | Monoisobutyl phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-4587-MT | Monoisononyl phthalate (mono-3,5,5-trimethylhexyl phthalate) (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%) | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-4651-MT | Monoisononyl phthalate (mono-3,5,5-trimethylhexyl phthalate) (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-7395-MT | Monoisopropyl phthalate (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-6071-MT | Monomethyl phthalate (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)   | 100 µg/mL in MTBE   | 1.2 mL         |
| ULM-6697-MT | Monomethyl phthalate (unlabeled)   | 100 µg/mL in MTBE   | 1.2 mL         |
| CLM-4323    | Phthalic acid (ring-1,2- <sup>13</sup> C <sub>2</sub> , dicarboxyl- <sup>13</sup> C <sub>2</sub> , 99%)  | 100 µg/mL in nonane | 1.2 mL         |
| ULM-8301-MT | Phthalic acid (unlabeled)  | 100 µg/mL in MTBE   | 1.2 mL         |

MTBE: methyl tert-butyl ether

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## Prescription and Nonprescription Drugs

| Catalog No. | Description  | Concentration                           | Unit Size           |
|-------------|--|---|---------------------|
| CNLM-3726   | Acetaminophen (acetyl- $^{13}\text{C}_2$ , 99%; $^{15}\text{N}$ , 98%)                       | 100 µg/mL in acetonitrile               | 1.2 mL              |
| ULM-7629    | Acetaminophen (unlabeled)  | 100 µg/mL in acetonitrile               | 1.2 mL              |
| DLM-3008    | Amitriptyline-HCl ( <i>N,N</i> -dimethyl- $\text{D}_6$ , 98%)                                | 100 µg/mL in methanol                   | 1.2 mL              |
| ULM-8350    | Amitriptyline-HCl (unlabeled)  | 100 µg/mL in methanol                   | 1.2 mL              |
| CLM-514     | Caffeine (trimethyl- $^{13}\text{C}_3$ , 99%)  | 100 µg/mL in methanol                   | 1.2 mL              |
| ULM-7653    | Caffeine (unlabeled)   | 100 µg/mL in methanol                   | 1.2 mL              |
| DLM-2806    | Carbamazepine ( $\text{D}_{10}$ , 98%)   | 100 µg/mL in acetonitrile- $\text{D}_3$ | 1.2 mL              |
| ULM-6581    | Carbamazepine (unlabeled) CP 97%   | 100 µg/mL in acetonitrile               | 1.2 mL              |
| DLM-1287    | Clonidine (4,4,5,5-imidazoline- $\text{D}_4$ , 98%)  | 100 µg/mL in methanol                   | 1.2 mL              |
| ULM-8349    | Clonidine (unlabeled)  | 100 µg/mL in methanol                   | 1.2 mL              |
| DLM-1819    | DL-Cotinine (methyl- $\text{D}_3$ , 98%)   | 100 µg/mL in acetonitrile               | 1.2 mL              |
| ULM-9614    | Cotinine (unlabeled)   | 100 µg/mL in acetonitrile               | 1.2 mL              |
| ULM-9614-W  | Cotinine (unlabeled)   | 100 µg/mL in water                      | 1.2 mL              |
| DLM-9974    | Diclofenac sodium ( $\text{D}_4$ , 98%)  | 100 µg/mL in methanol                   | 1.2 mL              |
| ULM-9975    | Diclofenac sodium (unlabeled)  | 100 µg/mL in methanol                   | 1.2 mL              |
| CNLM-411    | 5,5-Diphenylhydantoin (2- $^{13}\text{C}$ , 99%; 1,3- $^{15}\text{N}_2$ , 98%)               | 100 µg/mL in methanol                   | 1.2 mL              |
| ULM-8533    | 5,5-Diphenylhydantoin (unlabeled)  | 100 µg/mL in methanol                   | 1.2 mL              |
| DLM-8221    | Gemfibrozil (2,2-dimethyl- $\text{D}_6$ , 98%)   | 100 µg/mL in <i>p</i> -dioxane          | 1.2 mL              |
| ULM-8225    | Gemfibrozil (unlabeled)  | 100 µg/mL in <i>p</i> -dioxane          | 1.2 mL              |
| CLM-6943    | Ibuprofen (propionic- $^{13}\text{C}_3$ , 99%)   | 100 µg/mL in acetonitrile               | 1.2 mL              |
| ULM-7275    | Ibuprofen (unlabeled)  | 100 µg/mL in acetonitrile               | 1.2 mL              |
| DLM-3035    | Imipramine-HCl ( $\text{D}_4$ , 98%) CP 97%  | 100 µg/mL in methanol                   | 1.2 mL              |
| CDLM-7665   | DL-Naproxen ( <i>O</i> -methyl- $^{13}\text{C}$ , 99%; <i>O</i> -methyl- $\text{D}_3$ , 98%) | 100 µg/mL in acetonitrile               | 1.2 mL              |
| ULM-7709    | Naproxen (unlabeled)   | 100 µg/mL in acetonitrile               | 1.2 mL              |
| CNLM-8223   | Nitrofurazone (carbonyl- $^{13}\text{C}$ , 99%; hydrazine- $^{15}\text{N}_2$ , 98%) CP 97%   | 100 µg/mL in methanol                   | Please inquire      |
| ULM-8234    | Nitrofurazone (unlabeled)  | 100 µg/mL in methanol                   | Please inquire      |
| DLM-3039    | Phenylbutazone (diphenyl- $\text{D}_{10}$ , 98%)   | neat                                    | 0.05 g, 0.1 g, 1 mg |
| ULM-7378    | Phenylbutazone (unlabeled)   | neat                                    | 1 mg                |
| CLM-7892    | Resorcinol ( $^{13}\text{C}_6$ , 99%)  | neat                                    | Please inquire      |
| CLM-8370    | Thiabendazole (ring- $^{13}\text{C}_6$ , 99%)  | 100 µg/mL in acetonitrile               | 1.2 mL              |
| ULM-8371    | Thiabendazole (unlabeled)  | 100 µg/mL in acetonitrile               | 1.2 mL              |
| DLM-6861-MT | Warfarin (phenyl- $\text{D}_5$ , 98%)  | 100 µg/mL in MTBE                       | 1.2 mL              |
| ULM-7242-MT | Warfarin (unlabeled)   | 100 µg/mL in MTBE                       | 1.2 mL              |

MTBE: methyl tert-butyl ether

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.

## Sex and Steroidal Hormones

| Catalog No. | Description  | Concentration             | Unit Size                        |
|-------------|--|---------------------------|----------------------------------|
| DLM-8438    | Aldosterone (2,2,4,6,6,17,21,21-D <sub>8</sub> )<br><i>Isotopic enrichment to be advised at time of shipment</i> | neat                      | 1 mg                             |
| ULM-9134    | Aldosterone (unlabeled) CP 95%   | neat                      | 1 mg, 5 mg                       |
| CLM-9135-C  | 4-Androstene-3,17-dione (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)  | 100 µg/mL in methanol     | 1 mL                             |
| DLM-8330    | 4-Androstene-3,17-dione (2,2,4,6,6-D <sub>5</sub> , 98%)   | neat                      | 50 mg                            |
| ULM-9138    | Androsterone glucuronide, sodium salt (unlabeled)  | neat                      | 5 mg                             |
| DLM-9541    | Chenodeoxycholic acid (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%)   | neat                      | 10 mg                            |
| ULM-9540    | Chenodeoxycholic acid (unlabeled)  | neat                      | 50 mg                            |
| DLM-8276    | Cholestenone (2,2,4,6,6-D <sub>5</sub> , 98%)  | neat                      | 0.1 g                            |
| CLM-804     | Cholesterol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)  | neat                      | 0.1 g                            |
| CLM-9139-B  | Cholesterol (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)  | 50 µg/mL in chloroform    | 1 mL                             |
| CLM-9139-C  | Cholesterol (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)  | 100 µg/mL in chloroform   | 1 mL                             |
| CLM-9587    | Cholesterol (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 99%)   | 100 µg/mL in methanol     | 1.2 mL                           |
| DLM-2607    | Cholesterol (2,2,3,4,4,6-D <sub>6</sub> , 97%)   | neat                      | 0.1 g                            |
| DLM-3057    | Cholesterol (25,26,26,26,27,27-D <sub>7</sub> , 98%)   | neat                      | 0.01 g                           |
| ULM-9140    | Cholesterol (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL                           |
| DLM-2611    | Cholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | neat                      | 50 mg                            |
| ULM-9543    | Cholic acid (unlabeled)  | neat                      | 50 mg                            |
| DLM-7347    | Corticosterone (2,2,4,6,6,17α,21,21-D <sub>8</sub> , 97%)  | neat                      | 0.01 g                           |
| DLM-2057    | Cortisol (9,12,12-D <sub>3</sub> , 98%)  | neat                      | 0.01 g                           |
| DLM-2218    | Cortisol (9,11,12,12-D <sub>4</sub> , 98%)   | neat                      | 0.1 mg, 0.1 g                    |
| ULM-7823    | Cortisol (unlabeled)   | neat                      | 0.1 mg                           |
| DLM-9142-C  | Cortisone (2,2,4,6,6,12,12-D <sub>7</sub> ) <i>Isotopic enrichment to be advised at time of shipment</i>         | 100 µg/mL in methanol     | 1 mL                             |
| ULM-9202-C  | Cortisone (unlabeled)  | 100 µg/mL in methanol     | 1 mL                             |
| ULM-9202    | Cortisone (unlabeled)  | neat                      | 1 mg, 5 mg                       |
| DLM-8049-C  | Dehydroepiandrosterone (DHEA) (2,2,3,4,4,6-D <sub>6</sub> , 99%) CP 97%  | 100 µg/mL in methanol     | 1 mL                             |
| DLM-8049    | Dehydroepiandrosterone (DHEA) (2,2,3,4,4,6-D <sub>6</sub> , 99%) CP 97%  | neat                      | 5 mg                             |
| ULM-9143-C  | Dehydroepiandrosterone (DHEA) (unlabeled)  | 100 µg/mL in methanol     | 1 mL                             |
| ULM-9143-D  | Dehydroepiandrosterone (DHEA) (unlabeled)  | 1000 µg/mL in methanol    | 1 mL                             |
| ULM-9144-C  | Dehydroepiandrosterone sulfate (DHEAS), sodium salt (unlabeled)  | 100 µg/mL in methanol     | 1 mL                             |
| ULM-9144-D  | Dehydroepiandrosterone sulfate (DHEAS), sodium salt (unlabeled)  | 1000 µg/mL in methanol    | 1 mL                             |
| DLM-2824    | Deoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | neat                      | 10 mg                            |
| DLM-9546-C  | Deoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)  | 100 µg/mL in methanol     | 1 mL                             |
| DLM-9546    | Deoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)  | neat                      | 10 mg                            |
| ULM-9545    | Deoxycholic acid (unlabeled)   | neat                      | 50 mg                            |
| ULM-9145-C  | 11-Deoxycortisol (unlabeled)   | 100 µg/mL in methanol     | 1 mL                             |
| ULM-9145-D  | 11-Deoxycortisol (unlabeled)   | 1000 µg/mL in methanol    | 1 mL                             |
| DLM-8305    | 21-Deoxycortisol (2,2,4,6,6,21,21,21-D <sub>8</sub> , 97%)   | neat                      | 0.01 g                           |
| DLM-170-D   | Diethylstilbestrol (ring-3,3',5,5'-diethyl-1,1,1',1'-D <sub>8</sub> , 98%) <i>cis/trans</i> mix                  | 100 µg/mL in dioxane      | 1.2 mL                           |
| ULM-7921-D  | Diethylstilbestrol (unlabeled) <i>cis/trans</i> mix  | 100 µg/mL in dioxane      | 1.2 mL                           |
| CLM-9146-C  | 5α-Dihydrotestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%  | 100 µg/mL in methanol     | 1 mL                             |
| CLM-9146-D  | 5α-Dihydrotestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%  | 1000 µg/mL in methanol    | 1 mL                             |
| CLM-7936-S  | DL-Estradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in methanol     | 1.2 mL                           |
| CLM-7936    | DL-Estradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)   | neat                      | 0.1 mg                           |
| CLM-803     | Estradiol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)  | 100 µg/mL in acetonitrile | 1.2 mL                           |
| DLM-2487    | Estradiol (2,4,16,16-D <sub>4</sub> , 95%)   | neat                      | 5 mg                             |
| ULM-7449-S  | Estradiol (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL                           |
| ULM-7449    | Estradiol (unlabeled)  | neat                      | 0.1 mg                           |
| CLM-9147-C  | Estriol (16α-hydroxyestradiol) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                       | 100 µg/mL in methanol     | 1 mL                             |
| CLM-9147    | Estriol (16α-hydroxyestradiol) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                       | neat                      | 0.1 mg, 0.25 mg,<br>0.5 mg, 1 mg |
| DLM-8583    | Estriol (2,4,16,17-D <sub>4</sub> , 98%) CP 95%  | neat                      | 0.1 mg                           |
| ULM-8218    | Estriol (unlabeled)  | neat                      | 0.1 mg                           |

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| Catalog No. | Description   | Concentration             | Unit Size |
|-------------|---|---------------------------|-----------|
| CLM-7935-S  | DL-Estrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%                       | 100 µg/mL in methanol     | 1.2 mL    |
| CLM-7935    | DL-Estrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%                       | neat                      | 0.1 mg    |
| CLM-8033    | DL-Estrone 3-methyl ether (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)               | neat                      | 0.1 mg    |
| CLM-673     | Estrone (3,4- <sup>13</sup> C <sub>2</sub> , 90%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-9148-B  | Estrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | 50 µg/mL in methanol      | 1 mL      |
| CLM-9148-C  | Estrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | 100 µg/mL in methanol     | 1 mL      |
| DLM-3976    | Estrone (2,4,16,16-D <sub>4</sub> , 97%)  | neat                      | 5 mg      |
| ULM-7212    | Estrone (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| DLM-4691    | 17α-Ethynylestradiol (2,4,16,16-D <sub>4</sub> , 97%)   | neat                      | 0.01 g    |
| CLM-3375    | Ethynylestradiol (20,21- <sup>13</sup> C <sub>2</sub> , 99%)                                    | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-7211    | Ethynylestradiol (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL    |
| DLM-9550    | Glycochenodeoxycholic acid (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%) CP 97%                      | neat                      | 10 mg     |
| DLM-2742    | Glycocholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 96% (contains ~4% water)                     | neat                      | 10 mg     |
| ULM-9551    | Glycocholic acid (unlabeled)  | neat                      | 50 mg     |
| DLM-9554    | Glycodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | neat                      | 10 mg     |
| DLM-9553-C  | Glycodeoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)                                      | 100 µg/mL in methanol     | 1 mL      |
| DLM-9553    | Glycodeoxycholic acid (2,2,4,4,11,11-D <sub>6</sub> , 98%)                                      | neat                      | 10 mg     |
| ULM-9552    | Glycodeoxycholic acid, sodium salt (unlabeled)  | neat                      | 50 mg     |
| DLM-9556    | Glycolithocholic acid (2,2,4,4-D <sub>4</sub> , 98%)  | neat                      | 10 mg     |
| ULM-9555    | Glycolithocholic acid (unlabeled)   | neat                      | 50 mg     |
| DLM-9558    | Glycoursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                                 | neat                      | 10 mg     |
| ULM-9557    | Glycoursodeoxycholic acid (unlabeled)   | neat                      | 50 mg     |
| DLM-9150-C  | 18-Hydroxycorticosterone (9,11,12,12-D <sub>4</sub> , 98%) CP 95%                               | 100 µg/mL in acetonitrile | 1 mL      |
| DLM-9150    | 18-Hydroxycorticosterone (9,11,12,12-D <sub>4</sub> , 98%) CP 95%                               | neat                      | 1 mg      |
| ULM-9151    | 18-Hydroxycorticosterone (unlabeled) CP 95%   | neat                      | 1 mg      |
| CLM-8012    | DL-2-Hydroxyestradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                   | neat                      | 0.1 mg    |
| ULM-8135    | 2-Hydroxyestradiol (unlabeled)  | neat                      | 0.1 mg    |
| CLM-9153-C  | 16α-Hydroxyestrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                  | 100 µg/mL in methanol     | 1 mL      |
| CLM-9153    | 16α-Hydroxyestrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                  | neat                      | 0.1 mg    |
| CLM-8011    | DL-2-Hydroxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                     | neat                      | 0.1 mg    |
| CLM-8016    | DL-2-Hydroxyestrone-3-methyl ether (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)      | neat                      | 0.1 mg    |
| CLM-8013    | DL-4-Hydroxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                     | neat                      | 0.1 mg    |
| ULM-8134    | 2-Hydroxyestrone (unlabeled) CP 96%   | neat                      | 0.1 mg    |
| ULM-8133    | 2-Hydroxyestrone-3-methyl ether (unlabeled)   | neat                      | 0.1 mg    |
| ULM-8261    | 4-Hydroxyestrone (unlabeled) CP 96%   | neat                      | 0.1 mg    |
| CDLM-9154-C | 17α-Hydroxypregnenolone (20,21- <sup>13</sup> C <sub>2</sub> , 99%; 16,16-D <sub>2</sub> , 99%) | 100 µg/mL in methanol     | 1 mL      |
| ULM-9155-C  | 17α-Hydroxypregnenolone (unlabeled)   | 100 µg/mL in methanol     | 1 mL      |
| CLM-9157-C  | 17α-Hydroxyprogesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                             | 100 µg/mL in methanol     | 1 mL      |
| DLM-6598    | 17α-Hydroxyprogesterone (2,2,4,6,6,21,21-D <sub>8</sub> , 98%)                                  | neat                      | 0.01 g    |
| ULM-9156-C  | 17α-Hydroxyprogesterone (unlabeled) CP 95%  | 100 µg/mL in methanol     | 1 mL      |
| DLM-9560    | Lithocholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | neat                      | 50 mg     |
| ULM-9559    | Lithocholic acid (unlabeled)  | neat                      | 50 mg     |
| CLM-8015    | DL-2-Methoxyestradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                   | neat                      | 0.1 mg    |
| CLM-8019    | DL-4-Methoxyestradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                   | neat                      | 0.1 mg    |
| ULM-8137    | 2-Methoxyestradiol (unlabeled)  | neat                      | 0.1 mg    |
| ULM-8136    | 4-Methoxyestradiol (unlabeled)  | neat                      | 0.1 mg    |
| CLM-8014    | DL-2-Methoxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                     | neat                      | 0.1 mg    |
| CLM-8017    | DL-4-Methoxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                     | neat                      | 0.1 mg    |
| ULM-8263    | 2-Methoxyestrone (unlabeled)  | neat                      | 0.1 mg    |
| ULM-8262    | 4-Methoxyestrone (unlabeled)  | neat                      | 0.1 mg    |
| CLM-2468    | Norethindrone (ethynyl- <sup>13</sup> C <sub>2</sub> , 99%)                                     | neat                      | 0.01 g    |

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## Sex and Steroidal Hormones (continued)

| Catalog No. | Description   | Concentration                  | Unit Size         |
|-------------|---|--------------------------------|-------------------|
| DLM-8609    | DL-Normetanephine-HCl ( $\alpha,\beta,\beta$ -D <sub>3</sub> , 98%)                                       | neat                           | 5 mg, 10 mg       |
| DLM-3979    | 19-Nortestosterone (16,16,17-D <sub>3</sub> , 98%)  | 100 µg/mL in methanol          | 1.2 mL            |
| DLM-3979    | 19-Nortestosterone (16,16,17-D <sub>3</sub> , 98%)  | neat                           | 5 mg              |
| ULM-4841    | 19-Nortestosterone (unlabeled)  | 100 µg/mL in methanol          | 1.2 mL            |
| DLM-3754    | 5 $\alpha$ -Pregnan-3 $\alpha$ -ol-20-one (17,21,21,21-D <sub>4</sub> , 96%) CP 95%                       | neat                           | 0.01 g            |
| DLM-2294    | 5 $\beta$ -Pregnan-3 $\alpha$ -ol-20-one (17,21,21,21-D <sub>4</sub> , 96%)                               | neat                           | 0.01 g            |
| DLM-3910    | 5 $\alpha$ -Pregnane-3 $\alpha$ ,21-diol-20-one (17,21,21-D <sub>3</sub> , 95%)                           | neat                           | 0.01 g            |
| DLM-3816    | 5 $\alpha$ -Pregnane-3,20-dione (1,2,4,5,6,7-D <sub>6</sub> , 95%)  | neat                           | 0.01 g, 0.05 g    |
| CDLM-9158   | Pregnenolone (20,21- <sup>13</sup> C <sub>2</sub> , 99%; 16,16-D <sub>2</sub> , 98%)                      | neat                           | 1 mg              |
| ULM-9159    | Pregnenolone (unlabeled)  | neat                           | 1 mg              |
| CDLM-9160   | Pregnenolone sulfate, sodium salt (20,21- <sup>13</sup> C <sub>2</sub> , 99%; 16,16-D <sub>2</sub> , 98%) | neat                           | 1 mg              |
| ULM-9161    | Pregnenolone sulfate, sodium salt (unlabeled)   | neat                           | 1 mg, 5 mg, 10 mg |
| CLM-457     | Progesterone (3,4- <sup>13</sup> C <sub>2</sub> , 90%)  | neat                           | 0.01 g            |
| CLM-9162-B  | Progesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 50 µg/mL in acetonitrile       | 1 mL              |
| CLM-9162-C  | Progesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in acetonitrile      | 1 mL              |
| CLM-9162    | Progesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | neat                           | 1 mg, 5 mg        |
| DLM-7953    | Progesterone (2,2,4,6,6,17 $\alpha$ ,21,21,21-D <sub>9</sub> , 98%)                                       | 100 µg/mL in <i>p</i> -dioxane | 1.2 mL            |
| ULM-8219    | Progesterone (unlabeled)  | 100 µg/mL in <i>p</i> -dioxane | 1.2 mL            |
| ULM-8132    | Sodium estrone 3-sulfate (unlabeled)  | neat                           | 0.1 mg            |
| DLM-9562    | Taurochenodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%) CP 97%                             | neat                           | 10 mg             |
| DLM-9563    | Taurochenodeoxycholic acid, sodium salt (2,2,3,4,4,6,6,7,8-D <sub>9</sub> , 98%)                          | neat                           | 5 mg              |
| ULM-9561    | Taurochenodeoxycholic acid, sodium salt (unlabeled)   | neat                           | 50 mg             |
| DLM-9568    | Taurodeoxycholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)   | neat                           | 10 mg             |
| DLM-9567-C  | Taurodeoxycholic acid, sodium salt (2,2,4,4,11,11-D <sub>6</sub> , 98%)                                   | 100 µg/mL in methanol          | 1 mL              |
| DLM-9567    | Taurodeoxycholic acid, sodium salt (2,2,4,4,11,11-D <sub>6</sub> , 98%)                                   | neat                           | 5 mg              |
| DLM-9570-C  | Tauroolithocholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)  | 100 µg/mL in methanol          | 1 mL              |
| DLM-9570    | Tauroolithocholic acid, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)  | neat                           | 10 mg             |
| ULM-9569    | Tauroolithocholic acid, sodium salt (unlabeled)   | neat                           | 50 mg             |
| CLM-159     | Testosterone (3,4- <sup>13</sup> C <sub>2</sub> , 99%)  | neat                           | 0.01 g            |
| CLM-9164-C  | Testosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in methanol          | 1 mL              |
| CLM-9164    | Testosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | neat                           | 5 mg, 10 mg       |
| DLM-683     | Testosterone (1,2-D <sub>2</sub> , 98%)   | 100 µg/mL in MeCl              | 1.2 mL            |
| DLM-8085    | Testosterone (2,2,4,6,6-D <sub>5</sub> , 98%)   | 100 µg/mL in MeCl              | 1.2 mL            |
| DLM-8085-D  | Testosterone (D <sub>5</sub> , 98%)   | 100 µg/mL in dioxane           | 1.2 mL            |
| COLM-9061   | Testosterone (3,4- <sup>13</sup> C <sub>2</sub> , 99%; <sup>17-18</sup> O, 98%)                           | 100 µg/mL in MeCl              | 1.2 mL            |
| ULM-8081    | Testosterone (unlabeled)  | 100 µg/mL in MeCl              | 1.2 mL            |
| ULM-8081-D  | Testosterone (unlabeled)  | 100 µg/mL in dioxane           | 1.2 mL            |
| ULM-9163    | 3 $\alpha$ ,5 $\beta$ -Tetrahydroaldosterone (unlabeled)  | neat                           | 1 mg              |
| CLM-6725    | L-Thyroxine (T4) (tyrosine-ring- <sup>13</sup> C <sub>6</sub> , 99%) CP 90%                               | neat                           | 0.1 mg            |
| CLM-8931    | L-Thyroxine (T4) (ring- <sup>13</sup> C <sub>12</sub> , 99%) CP 97%                                       | neat                           | 0.1 mg            |
| ULM-8184    | L-Thyroxine (T4) (unlabeled)  | neat                           | 0.2 mg            |
| DLM-9574-C  | Ursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%)   | 100 µg/mL in methanol          | 1 mL              |
| DLM-9574    | Ursodeoxycholic acid (2,2,4,4-D <sub>4</sub> , 98%) CP 95%  | neat                           | 50 mg             |
| ULM-9573    | Ursodeoxycholic acid (unlabeled)  | neat                           | 50 mg             |

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For research use only. Not for use in diagnostic procedures.



## Tobacco-Specific Nitrosamines and Other Tobacco-Related Standards

| Catalog No.  | Description   | Concentration                     | Unit Size |
|--------------|---|-----------------------------------|-----------|
| CLM-6651     | Anabasine (2,2',3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-7281     | Anabasine (unlabeled)   | 0.1 mg/mL in acetonitrile         | 1.2 mL    |
| CLM-6652     | Anatabine (2,2',3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)  | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-7282     | Anatabine (unlabeled)   | 0.1 mg/mL in acetonitrile         | 1.2 mL    |
| CLM-9692     | DL-Cotinine (2',3',4'- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%   | 100 µg/mL in water                | 1.2 mL    |
| DLM-1819     | DL-Cotinine (methyl-D <sub>3</sub> , 98%)   | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-9614     | Cotinine (unlabeled)  | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-9614-W   | Cotinine (unlabeled)  | 100 µg/mL in water                | 1.2 mL    |
| CLM-4556     | 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) (1,2',3',4',5',6'- <sup>13</sup> C <sub>6</sub> , 99%) | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-9434     | 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) (unlabeled)  | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-9434-20X | 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) (unlabeled)  | 2 mg/mL in acetonitrile           | 1.2 mL    |
| CLM-6023     | 4-Methylumbelliferone (2,3,4,methyl- <sup>13</sup> C <sub>4</sub> , 99%)                                    | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-7309     | 4-Methylumbelliferone (unlabeled)   | 100 µg/mL in acetonitrile         | 1.2 mL    |
| CLM-3914     | DL-Nicotine (3',4',5'- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-9547     | Nicotine (unlabeled)  | 100 µg/mL in acetonitrile         | 1.2 mL    |
| CLM-4555     | Nicotine-derived nitrosamine ketone (NNK) (1,2',3',4',5',6'- <sup>13</sup> C <sub>6</sub> , 99%)            | 100 µg/mL in nonane:ethanol (9:1) | 1.2 mL    |
| CLM-4555-A   | Nicotine-derived nitrosamine ketone (NNK) (1,2',3',4',5',6'- <sup>13</sup> C <sub>6</sub> , 99%)            | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-8987     | Nicotine-derived nitrosamine ketone (NNK) (unlabeled)   | 100 µg/mL in nonane:ethanol (9:1) | 1.2 mL    |
| ULM-8987-20X | Nicotine-derived nitrosamine ketone (NNK) (unlabeled)   | 2 mg/mL in acetonitrile           | 1.2 mL    |
| CLM-6705     | N'-Nitrosoanabasine (NAB) ( <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-7168     | N'-Nitrosoanabasine (NAB) (unlabeled)   | 0.5 mg/mL in acetonitrile         | 1.2 mL    |
| ULM-7168-4X  | N'-Nitrosoanabasine (NAB) (unlabeled)   | 2 mg/mL in acetonitrile           | 1.2 mL    |
| CLM-6704     | N'-Nitrosoanatabine (NAT) ( <sup>13</sup> C <sub>6</sub> , 99%) CP 95%                                      | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-7207     | N'-Nitrosoanatabine (NAT) (unlabeled)   | 2 mg/mL in acetonitrile           | 1.2 mL    |
| CLM-4557     | N-Nitrososornicotine (NNN) (2,2',3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)                               | 100 µg/mL in nonane:ethanol (9:1) | 1.2 mL    |
| CLM-4557-A   | N-Nitrososornicotine (NNN) (2,2',3,4,5,6- <sup>13</sup> C <sub>6</sub> , 99%)                               | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-9406     | N-Nitrososornicotine (NNN) (unlabeled)  | 0.1 mg/mL in acetonitrile         | 1.2 mL    |
| ULM-9406-20X | N-Nitrososornicotine (NNN) (unlabeled)  | 2 mg/mL in acetonitrile           | 1.2 mL    |
| CLM-4896     | DL-Norcotinine (3',4',5'- <sup>13</sup> C <sub>3</sub> , 99%)   | 100 µg/mL in acetonitrile         | 1.2 mL    |
| CLM-4892-MT  | DL-Nornicotine (3',4',5'- <sup>13</sup> C <sub>3</sub> , 99%)   | 100 µg/mL in MTBE                 | 1.2 mL    |
| ULM-9615     | Norcotinine (unlabeled)   | 100 µg/mL in acetonitrile         | 1.2 mL    |
| ULM-2154-MT  | Nornicotine (unlabeled)   | 100 µg/mL in MTBE                 | 1.2 mL    |

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## Veterinary and Human Antibiotics

| Catalog No.   | Description   | Concentration             | Unit Size |
|---------------|---|---------------------------|-----------|
| CLM-7407      | Amoxicillin·3H <sub>2</sub> O (phenyl- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%                     | neat                      | 1 mg      |
| DLM-119       | (±)-Chloramphenicol (ring-D <sub>4</sub> , benzyl-D, 98%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-6687      | (±)-Chloramphenicol (unlabeled)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| CNLM-7539     | Ciprofloxacin·HCl (2,3,carboxyl- <sup>13</sup> C <sub>3</sub> , 99%; quinoline- <sup>15</sup> N, 98%) | 100 µg/mL in methanol     | 1.2 mL    |
| ULM-7710      | Ciprofloxacin·HCl·H <sub>2</sub> O (unlabeled) CP 95%   | 100 µg/mL in methanol     | 1.2 mL    |
| CDLM-10030-MT | Erythromycin (N-methyl- <sup>13</sup> C, 99%; D <sub>3</sub> , 98%) CP 97%                            | 100 µg/mL in MTBE         | 1.2 mL    |
| ULM-4322-MT   | Erythromycin (unlabeled) CP 97%   | 100 µg/mL in MTBE         | 1.2 mL    |
| CLM-3045      | Sulfamethazine (phenyl- <sup>13</sup> C <sub>6</sub> , 90%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-7220      | Sulfamethazine (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-6944      | Sulfamethoxazole (ring- <sup>13</sup> C <sub>6</sub> , 99%)   | 100 µg/mL in acetonitrile | 1.2 mL    |
| ULM-7527      | Sulfamethoxazole (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL    |
| CLM-7988-A    | Trimethoprim (pyrimidine-4,5,6- <sup>13</sup> C <sub>3</sub> , 99%)                                   | 50 µg/mL in methanol      | 1.2 mL    |
| ULM-7989-A    | Trimethoprim (unlabeled)  | 50 µg/mL in methanol      | 1.2 mL    |

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## Protein Expression Reagents and Kits

The use of stable isotope-labeled proteins in MS- or NMR-based proteomics are useful standards as they exhibit similar physicochemical behavior as their endogenous (or natural) counterparts. Adding a labeled protein, either as an individual standard or as a mixture, at the beginning of a workflow can therefore help normalize for any variation that may occur throughout an analytical run. When used as quantitative standards, as is the case in preclinical and clinical MS applications, validated biomarkers can be screened for diagnostic or prognostic purposes.

To help facilitate the production of isotope-enriched recombinant proteins, CIL offers a diverse array of isotopically labeled prokaryotic and eukaryotic cell growth media. CIL also offers various wheat germ cell-free kits, such as the Premium Plus Expression Kit for MS, for protein expression. The listing below outlines our current offerings. The researcher perspective that follows discusses the different approaches to quantifying proteins using stable isotope-labeled proteins or peptides as internal standards.

### Bacterial Cell Growth Media

| Catalog No.     | Description   | Unit Size  |
|-----------------|---|------------|
| CGM-1030P-C     | Celtone Base Powder ( $^{13}\text{C}$ , 98%)  | 0.5 g, 1 g |
| CGM-1030P-N     | Celtone Base Powder ( $^{15}\text{N}$ , 98%)  | 0.5 g, 1 g |
| CGM-1030P-D     | Celtone Base Powder (D, 97%)  | 0.5 g, 1 g |
| CGM-1030P-CN    | Celtone Base Powder ( $^{13}\text{C}$ , 98%; $^{15}\text{N}$ , 98%)   | 0.5 g, 1 g |
| CGM-1030P-DN    | Celtone Base Powder (D, 97%; $^{15}\text{N}$ , 98%)   | 0.5 g, 1 g |
| CGM-1030P-CDN   | Celtone Base Powder ( $^{13}\text{C}$ , 98%; D, 97%; $^{15}\text{N}$ , 98%)                                 | 0.5 g, 1 g |
| CGM-1030P-U     | Celtone Base Powder (unlabeled)   | 1 g        |
| CGM-1050P-C     | Celtone Plus Base Powder (U- $^{13}\text{C}$ , 97%)   | 1 g, 10 g  |
| CGM-1050P-N     | Celtone Plus Base Powder (U- $^{15}\text{N}$ , 97%)   | 1 g        |
| CGM-1050P-D     | Celtone Plus Base Powder (U-D, 97%)   | 1 g        |
| CGM-1050P-DN    | Celtone Plus Base Powder (U-D, 97%; U- $^{15}\text{N}$ , 97%)   | 1 g        |
| CGM-1050P-CDN   | Celtone Plus Base Powder (U- $^{13}\text{C}$ , 97%; U-D, 97%; U- $^{15}\text{N}$ , 97%)                     | 1 g        |
| CGM-1050P-U     | Celtone Plus Base Powder (unlabeled)  | 1 g        |
| CGM-1040-C      | Celtone Complete Medium ( $^{13}\text{C}$ , 98%)  | 0.1 L, 1 L |
| CGM-1040-N      | Celtone Complete Medium ( $^{15}\text{N}$ , 98%)  | 0.1 L, 1 L |
| CGM-1040-D      | Celtone Complete Medium (D, 97%)  | 0.1 L, 1 L |
| CGM-1040-CN     | Celtone Complete Medium ( $^{13}\text{C}$ , 98%; $^{15}\text{N}$ , 98%)                                     | 0.1 L, 1 L |
| CGM-1040-DN     | Celtone Complete Medium (D, 97%; $^{15}\text{N}$ , 98%)   | 0.1 L, 1 L |
| CGM-1040-CDN    | Celtone Complete Medium ( $^{13}\text{C}$ , 98%; D, 97%; $^{15}\text{N}$ , 98%)                             | 0.1 L, 1 L |
| CGM-1040-U      | Celtone Complete Medium (unlabeled)   | 0.1 L, 1 L |
| CGM-1000-C      | BioExpress Cell Growth Media (U- $^{13}\text{C}$ , 98%) 10x concentrate                                     | 100 mL kit |
| CGM-1000-N      | BioExpress Cell Growth Media (U- $^{15}\text{N}$ , 98%) 10x concentrate                                     | 100 mL kit |
| CGM-1000-D      | BioExpress Cell Growth Media (U-D, 98%) 10x concentrate   | 100 mL kit |
| CGM-1000-CN     | BioExpress Cell Growth Media (U- $^{13}\text{C}$ , 98%; U- $^{15}\text{N}$ , 98%) 10x concentrate           | 100 mL kit |
| CGM-1000-CD     | BioExpress Cell Growth Media (U- $^{13}\text{C}$ , 98%; U-D, 98%) 10x concentrate                           | 100 mL kit |
| CGM-1000-DN     | BioExpress Cell Growth Media (U-D, 98%; U- $^{15}\text{N}$ , 98%) 10x concentrate                           | 100 mL kit |
| CGM-1000-CDN    | BioExpress Cell Growth Media (U- $^{13}\text{C}$ , 98%; U-D, 98%; U- $^{15}\text{N}$ , 98%) 10x concentrate | 100 mL kit |
| CGM-1000-U      | BioExpress Cell Growth Media (unlabeled) 10x concentrate  | 100 mL kit |
| CGM-1020-SL-C   | E. coli-OD2 ( $^{13}\text{C}$ , 98%)  | 1 L        |
| CGM-1020-SL-N   | E. coli-OD2 ( $^{15}\text{N}$ , 98%)  | 1 L        |
| CGM-1020-SL-D   | E. coli-OD2 (D, 98%)  | 1 L        |
| CGM-1020-SL-CN  | E. coli-OD2 ( $^{13}\text{C}$ , 98%; $^{15}\text{N}$ , 98%)   | 1 L        |
| CGM-1020-SL-CDN | E. coli-OD2 ( $^{13}\text{C}$ , 98%; D, 98%; $^{15}\text{N}$ , 98%)   | 1 L        |
| CGM-1020-SL-U-S | E. coli-OD2 (unlabeled)   | 200 mL     |
| CGM-3030-C      | Spectra 9 ( $^{13}\text{C}$ , 98%)  | 0.5 L, 1 L |
| CGM-3030-N      | Spectra 9 ( $^{15}\text{N}$ , 98%)  | 0.5 L, 1 L |
| CGM-3030-D      | Spectra 9 (D, 97%)  | 0.5 L, 1 L |
| CGM-3030-CN     | Spectra 9 ( $^{13}\text{C}$ , 98%; $^{15}\text{N}$ , 98%)   | 0.5 L, 1 L |
| CGM-3030-DN     | Spectra 9 (D, 97%; $^{15}\text{N}$ , 98%)   | 0.5 L, 1 L |
| CGM-3030-CDN    | Spectra 9 ( $^{13}\text{C}$ , 98%; D, 97%; $^{15}\text{N}$ , 98%)   | 0.5 L, 1 L |
| CGM-3030-U      | Spectra 9 (unlabeled)   | 0.1 L, 1 L |

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**Protein Expression Reagents and Kits** *(continued)***Minimal Media Reagents**

| Catalog No. | Description  | Unit Size  |
|-------------|--|--|
| NLM-467     | Ammonium chloride ( $^{15}\text{N}$ , 99%)                                     | 1 g, 5 g, 10 g, 25 g, 50 g                             |
| NLM-713     | Ammonium sulfate ( $^{15}\text{N}_2$ , 99%)                                    | 1 g, 5 g, 10 g, 25 g, 50 g                             |
| DLM-4-99    | Deuterium oxide (D, 99%)   | 1000 g, 5000 g   |
| DLM-4-99.8  | Deuterium oxide (D, 99.8%)   | 1000 g   |
| DLM-4       | Deuterium oxide (D, 99.9%)   | 10 g, 100 g, 1000 g                                    |
| CLM-1396    | D-Glucose ( $\text{U-}^{13}\text{C}_6$ , 99%)                                  | 0.1 mg, 0.25 g, 0.5 g, 1 g, 2 g, 5 g, 10 g, 25 g, 50 g |
| DLM-2062    | D-Glucose (1,2,3,4,5,6- $\text{D}_7$ , 97%)                                    | 0.5 g, 1 g, 5 g, 10 g, 20 g                            |
| CDLM-3813   | D-Glucose ( $\text{U-}^{13}\text{C}_6$ , 99%; 1,2,3,4,5,6- $\text{D}_7$ , 97%) | 1 g, 2 g, 10 g   |
| CLM-1510    | Glycerol ( $^{13}\text{C}_3$ , 99%)  | 1 g, 5 g   |
| DLM-558     | Glycerol ( $\text{D}_8$ , 99%)   | 1 g, 5 g   |

**Insect Cell Growth Media**

|             |  |       |
|-------------|--|-------|
| CGM-2000-CN | BioExpress® 2000 ( $\text{U-}^{13}\text{C}$ , 98%; $\text{U-}^{15}\text{N}$ , 98%) | 1 kit |
| CGM-2000-N  | BioExpress® 2000 ( $\text{U-}^{15}\text{N}$ , 98%)                                 | 1 kit |
| CGM-2000-U  | BioExpress® 2000 (unlabeled)   | 1 kit |

**Yeast Cell Growth Media**

|                |   |     |
|----------------|---|-----|
| CGM-4020-SL-C  | Yeast-OD2 ( $^{13}\text{C}$ , 98%)                        | 1 L |
| CGM-4020-SL-N  | Yeast-OD2 ( $^{15}\text{N}$ , 98%)                        | 1 L |
| CGM-4020-SL-CN | Yeast-OD2 ( $^{13}\text{C}$ , 98%; $^{15}\text{N}$ , 98%) | 1 L |
| CGM-4020-SL-U  | Yeast-OD2 (unlabeled)                                     | 1 L |

**Mammalian Cell Growth Media**

|             |  |     |
|-------------|--|-----|
| CGM-6000-N  | BioExpress® 6000 ( $\text{U-}^{15}\text{N}$ , 98%)                                 | 1 L |
| CGM-6000-CN | BioExpress® 6000 ( $\text{U-}^{13}\text{C}$ , 98%; $\text{U-}^{15}\text{N}$ , 98%) | 1 L |
| CGM-6000-U  | BioExpress® 6000 (unlabeled)   | 1 L |

**Kits for Cell-Free Protein Expression**

| Catalog No.      | Description                                | Contents  | Specifications |
|------------------|--|---|----------------|
| CFS-PRK-G24      | Protein Research Kit (G)                   | Premixed transcription and translation reagents for GST-fusion protein expression. Reaction scale is 226 $\mu\text{L}$ .  | 24 reactions   |
| CFS-PRK-H24      | Protein Research Kit (H)                   | Premixed transcription and translation reagents for His-fusion protein expression. Reaction scale is 226 $\mu\text{L}$ .  | 24 reactions   |
| CFS-PRK-S24      | Protein Research Kit (S)                   | Premixed transcription and translation reagents for protein expression. Reaction scale is 226 $\mu\text{L}$ .   | 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 $\mu\text{L}$ .   | 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, WEPRO9240 and SUB-AMIX SGC for MS, positive control, and reaction cups. Reaction scale is 227 $\mu\text{L}$ . | 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 $\mu\text{L}$ .  | 8 reactions    |

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## Steroids and Hormones

Steroids and hormones play vital roles in the regulation of a diverse array of cellular functions and physiological processes. These pertain to development, reproduction, homeostasis, and metabolism, among others. Accurate quantification of this compound class is essential for basic and clinical translation research. This can be achieved by spiking an isotopically labeled steroid standard(s) into a sample of interest, such as plasma or urine, with measurement performed by an MS- or NMR-based approach.

CIL offers a variety of stable isotope-labeled and unlabeled steroids and hormones. These are available in different labeling patterns in their neat and/or solution forms.

| Catalog No.   | Description   | Concentration             | Unit Size         |
|---------------|---|---------------------------|-------------------|
| DLM-10472-C   | Aldosterone (9,11,12,12-D <sub>4</sub> , 98%) CP 97%                                  | 100 µg/mL in acetonitrile | 1 mL              |
| DLM-8438-C    | Aldosterone (2,2,4,6,6,17,21,21-D <sub>8</sub> )                                      | 100 µg/mL in acetonitrile | 1 mL              |
| DLM-8438      | Aldosterone (2,2,4,6,6,17,21,21-D <sub>8</sub> )                                      | neat                      | 1 mg, 2 mg, 5 mg  |
| ULM-9134-C    | Aldosterone (unlabeled)   | 100 µg/mL in acetonitrile | 1 mL              |
| ULM-9134      | Aldosterone (unlabeled) CP 95%  | neat                      | 1 mg, 5 mg        |
| DLM-10269     | 5α-Androstan-3β-ol-17-one (epiandrosterone) (2,2,4,4-D <sub>4</sub> , 98%)            | neat                      | 1 mg, 5 mg        |
| ULM-10270     | 5α-Androstan-3β-ol-17-one (epiandrosterone) (unlabeled)                               | neat                      | 1 mg              |
| CLM-10548     | 5α-Androstan-3,17-dione (androstanedione) (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) | neat                      | 1 mg              |
| ULM-8794-C    | 5α-Androstan-3,17-dione (androstanedione) (unlabeled) CP 95%                          | 100 µg/mL in methanol     | 1 mL              |
| ULM-8794      | 5α-Androstan-3,17-dione (androstanedione) (unlabeled)                                 | neat                      | 1 mg              |
| DLM-8750      | 5β-Androstan-3α-ol-17-one (etiocholanolone) (16,16-D <sub>2</sub> , 98%)              | neat                      | Please inquire    |
| DLM-10008-C   | 5β-Androstan-3α-ol-17-one (etiocholanolone) (2,2,3,4,4-D <sub>5</sub> , 98%)          | 100 µg/mL in methanol     | 1 mL              |
| DLM-10008     | 5β-Androstan-3α-ol-17-one (etiocholanolone) (2,2,3,4,4-D <sub>5</sub> , 98%)          | neat                      | 1 mg              |
| ULM-10009-C   | 5β-Androstan-3α-ol-17-one (etiocholanolone) (unlabeled)                               | 100 µg/mL in methanol     | 1 mL              |
| ULM-10009     | 5β-Androstan-3α-ol-17-one (etiocholanolone) (unlabeled)                               | neat                      | 1 mg              |
| DLM-9769-C    | 5α-Androstane-3α,17β-diol (16,16,17-D <sub>3</sub> , 98%) CP 95%                      | 100 µg/mL in methanol     | 1 mL              |
| DLM-9769      | 5α-Androstane-3α,17β-diol (16,16,17-D <sub>3</sub> , 98%) CP 95%                      | neat                      | 1 mg              |
| ULM-9752-C    | 5α-Androstane-3α,17β-diol (unlabeled)   | 100 µg/mL in methanol     | 1 mL              |
| ULM-9752      | 5α-Androstane-3α,17β-diol (unlabeled)   | neat                      | 1 mg              |
| ULM-10732     | 5α-Androstane-3β,17β-diol (unlabeled)   | neat                      | 1 mg              |
| DLM-9787      | Androstenediol glucuronide, sodium salt (16,16,17-D <sub>3</sub> , 98%) CP 97%        | neat                      | 1 mg              |
| DLM-10396     | 4-Androsten-11β-ol-3,17-dione (9,11,12,12-D <sub>4</sub> , 98%)                       | neat                      | 1 mg              |
| DLM-9697      | 4-Androsten-11β-ol-3,17-dione (2,2,4,6,6,16,16-D <sub>7</sub> , 98%)                  | neat                      | Please inquire    |
| DLM-10397     | 4-Androsten-11β-17β-diol-3-one (9,11,12,12-D <sub>4</sub> , 98%) CP 95%               | neat                      | 1 mg              |
| DLM-10401-1.2 | 5-Androsten-3β-17β-diol (16,16,17-D <sub>3</sub> , 98%) CP 95%                        | 100 µg/mL in methanol     | 1.2 mL            |
| DLM-10401     | 5-Androsten-3β-17β-diol (16,16,17-D <sub>3</sub> , 98%) CP 95%                        | neat                      | 1 mg              |
| CLM-9135-D    | 4-Androstene-3,17-dione (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                   | 1000 µg/mL in methanol    | 1 mL              |
| CLM-9135-C    | 4-Androstene-3,17-dione (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                   | 100 µg/mL in methanol     | 1 mL              |
| CLM-9135      | 4-Androstene-3,17-dione (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                   | neat                      | 5 mg, 10 mg       |
| DLM-8330      | 4-Androstene-3,17-dione (2,2,4,6,6-D <sub>5</sub> , 98%)                              | neat                      | 0.05 g, 0.1 g     |
| DLM-7976      | 4-Androstene-3,17-dione (2,2,4,6,6,16,16-D <sub>7</sub> , 97%)                        | neat                      | 0.05 g, 0.1 g     |
| ULM-8472      | 4-Androstene-3,17-dione (unlabeled)   | neat                      | 1 mg, 5 mg, 10 mg |
| DLM-10420-C   | 4-Androstene-6β,17β-diol-3-one (16,16,17-D <sub>3</sub> , 98%) CP 95%                 | 100 µg/mL in methanol     | 1 mL              |
| DLM-10420     | 4-Androstene-6β,17β-diol-3-one (16,16,17-D <sub>3</sub> , 98%)                        | neat                      | 1 mg              |
| DLM-7937      | Androsterone (5α-androstan-3α-ol-17-one) (16,16-D <sub>2</sub> , 98%)                 | neat                      | Please inquire    |
| DLM-10402-C   | Androsterone (5α-androstan-3α-ol-17-one) (2,2,4,4-D <sub>4</sub> , 98%)               | 100 µg/mL in methanol     | 1 mL              |
| DLM-10402     | Androsterone (5α-androstan-3α-ol-17-one) (2,2,4,4-D <sub>4</sub> , 98%) CP 95%        | neat                      | 1 mg              |
| ULM-10403-C   | Androsterone (5α-androstan-3α-ol-17-one) (unlabeled)                                  | 100 µg/mL in methanol     | 1 mL              |
| ULM-10403     | Androsterone (5α-androstan-3α-ol-17-one) (unlabeled)                                  | neat                      | 1 mg              |
| DLM-9137      | Androsterone glucuronide, sodium salt (2,2,4,4-D <sub>4</sub> , 98%)                  | neat                      | Please inquire    |
| ULM-9138      | Androsterone glucuronide, sodium salt (unlabeled)                                     | neat                      | 5 mg, 10 mg       |
| DLM-4700      | 5α-Cholestane (5α-cholane) (3,3-D <sub>2</sub> , 98%)                                 | neat                      | Please inquire    |
| DLM-8276      | Cholestenone (2,2,4,6,6-D <sub>5</sub> , 98%)   | neat                      | 0.1 g             |
| CLM-804       | Cholesterol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)                                 | neat                      | 0.1 g             |
| CLM-9139-C    | Cholesterol (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                               | 100 µg/mL in ethanol      | 1 mL              |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Steroids and Hormones (continued)

| Catalog No.  | Description   | Concentration             | Unit Size         |
|--------------|---|---------------------------|-------------------|
| CLM-9139     | Cholesterol (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | neat                      | 2 mg, 5 mg        |
| CLM-9587-1.2 | Cholesterol (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 99%)  | 100 µg/mL in methanol     | 1.2 mL            |
| CLM-9587     | Cholesterol (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 99%)  | neat                      | 2 mg, 5 mg        |
| DLM-1831     | Cholesterol (3-D, 97%)  | neat                      | Please inquire    |
| DLM-7260     | Cholesterol (25,26,26,26-D <sub>4</sub> , 98%)  | neat                      | Please inquire    |
| DLM-2607-C   | Cholesterol (2,2,3,4,4,6-D <sub>6</sub> , 97%) CP 97%   | 100 µg/mL in ethanol      | 1 mL              |
| DLM-2607     | Cholesterol (2,2,3,4,4,6-D <sub>6</sub> , 97%)  | neat                      | 0.1 g             |
| DLM-3057     | Cholesterol (25,26,26,26,27,27,27-D <sub>7</sub> , 98%)   | neat                      | 10 mg, 0.1 g      |
| OLM-7695     | Cholesterol ( <sup>18</sup> O, 95%)   | neat                      | Please inquire    |
| ULM-9140-1.2 | Cholesterol (unlabeled)   | 100 µg/mL in methanol     | 1.2 mL            |
| ULM-9140     | Cholesterol (unlabeled) CP 97%  | neat                      | 1 mg, 5 mg, 10 mg |
| CLM-3361     | Cholesterol-3-octanoate (octanoate-1- <sup>13</sup> C, 99%)   | neat                      | 1 g               |
| DLM-10416    | Cholesterol-3-sulfate, sodium salt (25,26,26,26,27,27,27-D <sub>7</sub> , 98%)                            | neat                      | 1 mg              |
| CLM-11838-C  | Corticosterone (3,4,20,21- <sup>13</sup> C <sub>4</sub> , 98%) CP 95%                                     | 100 µg/mL in methanol     | 1 mL              |
| DLM-11017-C  | Corticosterone (9,11,12,12-D <sub>4</sub> , 98%) CP 97%   | 100 µg/mL in acetonitrile | 1 mL              |
| DLM-11017    | Corticosterone (9,11,12,12-D <sub>4</sub> , 98%)  | neat                      | 1 mg, 5 mg        |
| DLM-7347     | Corticosterone (2,2,4,6,6,17α,21,21-D <sub>8</sub> , 97%)   | neat                      | 10 mg             |
| ULM-9988     | Corticosterone (unlabeled)  | neat                      | 1 mg              |
| CLM-10371-C  | Cortisol (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in methanol     | 1 mL              |
| DLM-2615     | Cortisol (1,2-D <sub>2</sub> , 98%)   | neat                      | Please inquire    |
| DLM-2057     | Cortisol (9,12,12-D <sub>3</sub> , 98%)   | neat                      | 10 mg             |
| DLM-2218     | Cortisol (9,11,12,12-D <sub>4</sub> , 98%)  | neat                      | 0.1 mg, 10 mg     |
| ULM-9141     | Cortisol (unlabeled)  | neat                      | 1 mg, 5 mg, 10 mg |
| DLM-10471    | Cortisol-21-sulfate, sodium salt (9,11,12,12-D <sub>4</sub> , 98%) CP 95%                                 | neat                      | 1 mg              |
| CLM-10536-C  | Cortisone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%  | 100 µg/mL in methanol     | 1 mL              |
| DLM-8863     | Cortisone (1,2-D <sub>2</sub> , 98%) CP 95%   | neat                      | Please inquire    |
| DLM-9142-C   | Cortisone (2,2,4,6,6,12,12-D <sub>7</sub> , 98%)  | 100 µg/mL in methanol     | 1 mL              |
| DLM-9976     | Cortisone (2,2,4,6,6,9,12,12-D <sub>8</sub> , 98%)  | neat                      | 1 mg, 5 mg        |
| ULM-9202-C   | Cortisone (unlabeled)   | 100 µg/mL in methanol     | 1 mL              |
| ULM-9202     | Cortisone (unlabeled)   | neat                      | 1 mg, 5 mg, 10 mg |
| CLM-11710    | 7-Dehydrocholesterol (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95%                          | neat                      | 1 mg              |
| DLM-4216     | 7-Dehydrocholesterol (25,26,26,26,27,27,27-D <sub>7</sub> , 98%)  | neat                      | Please inquire    |
| DLM-11835-C  | 11-Dehydrodexamethasone (D <sub>3</sub> , 98%) CP 95%   | 100 µg/mL in methanol     | 1 mL              |
| CLM-10549-C  | Dehydroepiandrosterone (DHEA) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                 | 100 µg/mL in methanol     | 1 mL              |
| CLM-10549    | Dehydroepiandrosterone (DHEA) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                 | neat                      | 1 mg              |
| DLM-7714     | Dehydroepiandrosterone (DHEA) (16,16-D <sub>2</sub> , 97%)  | neat                      | 0.1 g             |
| DLM-8049-C   | Dehydroepiandrosterone (DHEA) (2,2,3,4,4,6-D <sub>6</sub> , 97%)  | 100 µg/mL in methanol     | 1 mL              |
| DLM-8049     | Dehydroepiandrosterone (DHEA) (2,2,3,4,4,6-D <sub>6</sub> , 98%) CP 97%                                   | neat                      | 5 mg              |
| ULM-9143-D   | Dehydroepiandrosterone (DHEA) (unlabeled)   | 1000 µg/mL in methanol    | 1 mL              |
| ULM-9143-C   | Dehydroepiandrosterone (DHEA) (unlabeled)   | 100 µg/mL in methanol     | 1 mL              |
| ULM-9143     | Dehydroepiandrosterone (DHEA) (unlabeled)   | neat                      | 1 mg, 5 mg, 10 mg |
| DLM-8701     | Dehydroepiandrosterone sulfate (DHEA-S), sodium salt (16,16-D <sub>2</sub> , 97%)                         | neat                      | Please inquire    |
| ULM-9144-D   | Dehydroepiandrosterone sulfate (DHEA-S), sodium salt (unlabeled)  | 1000 µg/mL in methanol    | 1 mL              |
| ULM-9144-C   | Dehydroepiandrosterone sulfate (DHEA-S), sodium salt (unlabeled)  | 100 µg/mL in methanol     | 1 mL              |
| ULM-9144     | Dehydroepiandrosterone sulfate (DHEA-S), sodium salt (unlabeled)  | neat                      | 1 mg, 5 mg, 10 mg |
| DLM-8337-C   | Dehydroepiandrosterone sulfate (DHEA-S), sodium salt·2H <sub>2</sub> O (2,2,3,4,4,6-D <sub>6</sub> , 95%) | 100 µg/mL in methanol     | 1 mL              |
| DLM-8337     | Dehydroepiandrosterone sulfate (DHEA-S), sodium salt·2H <sub>2</sub> O (2,2,3,4,4,6-D <sub>6</sub> , 95%) | neat                      | 5 mg              |
| CLM-10010-C  | 11-Deoxycorticosterone (DOC) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                  | 100 µg/mL in methanol     | 1 mL              |
| CLM-10010    | 11-Deoxycorticosterone (DOC) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                  | neat                      | Please inquire    |
| CLM-11834-C  | 11-Deoxycorticosterone (DOC) (3,4,20,21- <sup>13</sup> C <sub>4</sub> , 98%) CP 95%                       | 100 µg/mL in methanol     | 1 mL              |
| DLM-11249    | 11-Deoxycorticosterone (DOC) (2,2,6,6,17,21,21-D <sub>7</sub> , 96%)                                      | neat                      | Please inquire    |
| DLM-7228     | 11-Deoxycorticosterone (DOC) (2,2,4,6,6,17,21,21-D <sub>8</sub> , 96%) CP 97%                             | neat                      | Please inquire    |
| ULM-10011-C  | 11-Deoxycorticosterone (DOC) (unlabeled)  | 100 µg/mL in methanol     | 1 mL              |

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| Catalog No.   | Description   | Concentration                                  | Unit Size                     |
|---------------|---|--|-------------------------------|
| ULM-10011     | 11-Deoxycorticosterone (DOC) (unlabeled)  | neat   | 1 mg                          |
| CLM-11840-C   | 21-Deoxycorticosterone (DOC) (3,4,20,21- <sup>13</sup> C <sub>4</sub> , 98%) CP 95%           | 100 µg/mL in methanol                          | 1 mL                          |
| CLM-10384-C   | 11-Deoxycortisol (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                           | 100 µg/mL in methanol                          | 1 mL                          |
| CLM-10384     | 11-Deoxycortisol (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                           | neat   | 1 mg                          |
| DLM-7209      | 11-Deoxycortisol (21,21-D <sub>2</sub> , 96%)   | neat   | 5 mg, 10 mg                   |
| DLM-8336-C    | 11-Deoxycortisol (2,2,4,6,6-D <sub>5</sub> , 98%)   | 100 µg/mL in methanol                          | 1 mL                          |
| DLM-8336      | 11-Deoxycortisol (2,2,4,6,6-D <sub>5</sub> , 98%) CP 97%                                      | neat   | 5 mg, 10 mg                   |
| ULM-9145-D    | 11-Deoxycortisol (unlabeled)  | 1000 µg/mL in methanol                         | 1 mL                          |
| ULM-9145-C    | 11-Deoxycortisol (unlabeled)  | 100 µg/mL in methanol                          | 1 mL                          |
| ULM-9145      | 11-Deoxycortisol (unlabeled)  | neat   | 1 mg, 5 mg, 10 mg             |
| CLM-11709-C   | 21-Deoxycortisol (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 98%                           | 100 µg/mL in methanol                          | 1 mL                          |
| DLM-11414     | 21-Deoxycortisol (9,11,11,12-D <sub>4</sub> , 98%) CP 95%                                     | neat   | Please inquire                |
| DLM-8305      | 21-Deoxycortisol (2,2,4,6,6,21,21,21-D <sub>8</sub> , 97%)                                    | neat   | 10 mg                         |
| ULM-9987-C    | 21-Deoxycortisol (unlabeled)  | 100 µg/mL in methanol                          | 1 mL                          |
| ULM-9987      | 21-Deoxycortisol (unlabeled)  | neat   | 1 mg                          |
| CLM-11836-C   | 21-Deoxycortisone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                          | 100 µg/mL in methanol                          | 1 mL                          |
| DLM-11827     | Dexamethasone (D <sub>3</sub> , 98%) CP 95%   | neat   | 1 mg                          |
| DLM-170-D-1.2 | Diethylstilbestrol (ring-3,3',5,5'-diethyl-1,1',1'-D <sub>8</sub> , 98%) <i>cis/trans</i> mix | 100 µg/mL in dioxane                           | 1.2 mL                        |
| DLM-170       | Diethylstilbestrol (ring-3,3',5,5'-diethyl-1,1',1'-D <sub>8</sub> , 98%) <i>cis/trans</i> mix | neat   | 0.05 g, 0.1 g                 |
| CLM-9146-D    | 5α-Dihydrotestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                     | 1000 µg/mL in methanol                         | 1 mL                          |
| CLM-9146-C    | 5α-Dihydrotestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                     | 100 µg/mL in methanol                          | 1 mL                          |
| CLM-9146      | 5α-Dihydrotestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%                     | neat   | 1 mg, 5 mg, 10 mg             |
| DLM-3023      | 5α-Dihydrotestosterone (16,16,17-D <sub>3</sub> , 98%)  | neat   | Please inquire                |
| DLM-9041      | 5α-Dihydrotestosterone (2,2,4,4-D <sub>4</sub> , 98%) CP 95%                                  | neat   | 1 mg                          |
| ULM-8364-D    | 5α-Dihydrotestosterone (unlabeled)  | 1 mg/mL in methanol                            | 1 mL                          |
| ULM-8364-C    | 5α-Dihydrotestosterone (unlabeled)  | 100 µg/mL in methanol                          | 1 mL                          |
| ULM-8364      | 5α-Dihydrotestosterone (unlabeled)  | neat   | Please inquire                |
| CLM-9222-C    | L-3,3'-Diiodothyronine (T2) (phenoxy- <sup>13</sup> C <sub>6</sub> , 99%) CP 97%              | 100 µg/mL in 0.1 N NH <sub>3</sub> in methanol | 1 mL                          |
| CLM-9222      | L-3,3'-Diiodothyronine (T2) (phenoxy- <sup>13</sup> C <sub>6</sub> , 99%) CP 97%              | neat   | 1 mg, 5 mg                    |
| ULM-9223-C    | L-3,3'-Diiodothyronine (T2) (unlabeled)   | 100 µg/mL in 0.1 N NH <sub>3</sub> in methanol | 1 mL                          |
| ULM-9223      | L-3,3'-Diiodothyronine (T2) (unlabeled)   | neat   | 1 mg, 5 mg, 10 mg             |
| CLM-7768      | Epicholesterol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)                                      | neat   | 0.1 g                         |
| DLM-9088      | DL-Epinephrine (ring-D <sub>3</sub> ,1,2,2-D <sub>3</sub> , 98%)                              | neat   | Please inquire                |
| CNLM-7889     | DL-Epinephrine (1,2- <sup>13</sup> C <sub>2</sub> , 99%; <sup>15</sup> N, 98%)                | neat   | 10 mg                         |
| CLM-11416     | Epitestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                            | neat   | Please inquire                |
| CLM-803-1.2   | Estradiol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)   | 100 µg/mL in acetonitrile                      | 1.2 mL                        |
| CLM-803       | Estradiol (3,4- <sup>13</sup> C <sub>2</sub> , 99%)   | neat   | Please inquire                |
| DLM-3694      | Estradiol (16,16,17-D <sub>3</sub> , 98%) CP 95%  | neat   | 1 mg, 10 mg                   |
| DLM-2487      | Estradiol (2,4,16,16-D <sub>4</sub> , 95%)  | neat   | 5 mg                          |
| ULM-7449-1.2  | Estradiol (unlabeled)   | 100 µg/mL in acetonitrile                      | 1.2 mL                        |
| ULM-7449      | Estradiol (unlabeled)   | neat   | 0.1 mg                        |
| CLM-7936-1.2  | DL-Estradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                          | 100 µg/mL in methanol                          | 1.2 mL                        |
| CLM-7936      | DL-Estradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                          | neat   | 0.1 mg                        |
| CLM-10404-C   | Estradiol undecanoate (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                      | 100 µg/mL in methanol                          | 1 mL                          |
| CLM-10404     | Estradiol undecanoate (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                      | neat   | 1 mg                          |
| CLM-9147-C    | Estriol (16α-hydroxyestradiol) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%             | 100 µg/mL in methanol                          | 1 mL                          |
| CLM-9147      | Estriol (16α-hydroxyestradiol) (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%             | neat   | 0.1 mg, 0.25 mg, 0.5 mg, 1 mg |
| DLM-8586      | Estriol (2,4,16-D <sub>3</sub> , 98%) CP 96%  | neat   | 5 mg, 10 mg                   |
| DLM-8343      | Estriol (2,4,17-D <sub>3</sub> , 98%) CP 96%  | neat   | Please inquire                |
| ULM-8218      | Estriol (unlabeled)   | neat   | 0.1 mg                        |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Steroids and Hormones (continued)

| Catalog No.  | Description   | Concentration             | Unit Size                     |
|--------------|---|---------------------------|-------------------------------|
| CLM-673-1.2  | Estrone (3,4- <sup>13</sup> C <sub>2</sub> , 90%)   | 100 µg/mL in acetonitrile | 1.2 mL                        |
| CLM-673      | Estrone (3,4- <sup>13</sup> C <sub>2</sub> , 99%)   | neat                      | Please inquire                |
| CLM-9148-C   | Estrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | 100 µg/mL in methanol     | 1 mL                          |
| CLM-9148-B   | Estrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | 50 µg/mL in methanol      | 1 mL                          |
| CLM-9148     | Estrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)   | neat                      | 1 mg, 5 mg                    |
| DLM-3976     | Estrone (2,4,16,16-D <sub>4</sub> , 97%)  | neat                      | 5 mg                          |
| CLM-7935-1.2 | DL-Estrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%                       | 100 µg/mL in methanol     | 1.2 mL                        |
| CLM-7935     | DL-Estrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%                       | neat                      | 0.1 mg                        |
| CLM-8033     | DL-Estrone 3-methyl ether (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)               | neat                      | 0.1 mg                        |
| ULM-10356    | Estrone 3-methyl ether (unlabeled)  | neat                      | 0.1 mg                        |
| CLM-3375-1.2 | Ethinylestradiol (20,21- <sup>13</sup> C <sub>2</sub> , 99%) CP 97%                             | 100 µg/mL in acetonitrile | 1.2 mL                        |
| ULM-7211-1.2 | Ethinylestradiol (unlabeled)  | 100 µg/mL in acetonitrile | 1.2 mL                        |
| DLM-4691     | 17α-Ethinylestradiol (2,4,16,16-D <sub>4</sub> , 97%)   | neat                      | 10 mg                         |
| DLM-11826    | Flumethasone (D <sub>3</sub> , 98%) CP 95%  | neat                      | 1 mg                          |
| CLM-11415    | 7α-Hydroxy-4-cholesten-3-one (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95%        | neat                      | Please inquire                |
| ULM-10267    | 7α-Hydroxycholesterol (unlabeled)   | neat                      | 1 mg                          |
| DLM-8646     | 7β-Hydroxycholesterol (25,26,26,26,27,27,27-D <sub>7</sub> , 98%) CP 97%                        | neat                      | Please inquire                |
| ULM-10268    | 7β-Hydroxycholesterol (unlabeled)   | neat                      | Please inquire                |
| DLM-9150-C   | 18-Hydroxycorticosterone (9,11,12,12-D <sub>4</sub> , 98%)                                      | 100 µg/mL in acetonitrile | 1 mL                          |
| DLM-9150     | 18-Hydroxycorticosterone (9,11,12,12-D <sub>4</sub> , 98%) CP 95%                               | neat                      | 1 mg                          |
| ULM-9151-C   | 18-Hydroxycorticosterone (unlabeled) CP 95%   | 100 µg/mL in methanol     | 1 mL                          |
| ULM-9151     | 18-Hydroxycorticosterone (unlabeled) CP 95%   | neat                      | 1 mg                          |
| ULM-10007-C  | 18-Hydroxycortisol (unlabeled) CP 97%   | 100 µg/mL in methanol     | 1 mL                          |
| ULM-10007    | 18-Hydroxycortisol (unlabeled) CP 95%   | neat                      | 1 mg                          |
| ULM-8134     | 2-Hydroxyestrone (unlabeled)  | neat                      | 0.1 mg                        |
| ULM-8261     | 4-Hydroxyestrone (unlabeled) CP 96%   | neat                      | 0.1 mg                        |
| CLM-8012     | DL-2-Hydroxyestradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                   | neat                      | 0.1 mg                        |
| ULM-8133     | 2-Hydroxyestrone-3-methyl ether (unlabeled) CP 97%  | neat                      | 0.1 mg                        |
| CLM-9153-C   | 16α-Hydroxyestrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                  | 100 µg/mL in methanol     | 1 mL                          |
| CLM-9153     | 16α-Hydroxyestrone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)                                  | neat                      | 0.1 mg, 0.25 mg, 0.5 mg, 1 mg |
| ULM-9152-C   | 16α-Hydroxyestrone (unlabeled)  | 100 µg/mL in methanol     | 1 mL                          |
| CLM-8011     | DL-2-Hydroxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)                     | neat                      | 0.1 mg                        |
| CLM-8016     | DL-2-Hydroxyestrone-3-methyl ether (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)      | neat                      | 0.1 mg                        |
| CLM-8013     | DL-4-Hydroxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%) CP 97%              | neat                      | 0.1 mg                        |
| DLM-7206     | 17α-Hydroxypregnenolone (21,21,21-D <sub>3</sub> , 97%)   | neat                      | Please inquire                |
| CDLM-9154-C  | 17α-Hydroxypregnenolone (20,21- <sup>13</sup> C <sub>2</sub> , 98%; 16,16-D <sub>2</sub> , 98%) | 100 µg/mL in methanol     | 1 mL                          |
| CDLM-9154    | 17α-Hydroxypregnenolone (20,21- <sup>13</sup> C <sub>2</sub> , 98%; 16,16-D <sub>2</sub> , 98%) | neat                      | 1 mg                          |
| ULM-9155-C   | 17α-Hydroxypregnenolone (unlabeled)   | 100 µg/mL in methanol     | 1 mL                          |
| ULM-9155     | 17α-Hydroxypregnenolone (unlabeled)   | neat                      | Please inquire                |
| CLM-9157-D   | 17α-Hydroxyprogesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                             | 1000 µg/mL in methanol    | 1 mL                          |
| CLM-9157-C   | 17α-Hydroxyprogesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                             | 100 µg/mL in methanol     | 1 mL                          |
| CLM-9157     | 17α-Hydroxyprogesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%)                             | neat                      | 1 mg, 5 mg                    |
| DLM-6598     | 17α-Hydroxyprogesterone (2,2,4,6,6,21,21-D <sub>8</sub> , 98%)                                  | neat                      | 10 mg, 0.05 g                 |
| ULM-9156-C   | 17α-Hydroxyprogesterone (unlabeled) CP 95%  | 100 µg/mL in methanol     | 1 mL                          |
| ULM-9156     | 17α-Hydroxyprogesterone (unlabeled)   | neat                      | 1 mg, 5 mg, 10 mg             |
| CLM-11837-C  | 11β-Hydroxytestosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                      | 100 µg/mL in methanol     | 1 mL                          |
| CLM-11708-F  | 11-Keto-4-androstenedione (11-KA4) (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%           | 10 µg/mL in methanol      | 1 mL                          |
| DLM-11248    | 11-Keto-4-androstenedione (11-KA4) (D <sub>10</sub> , 98%) CP 95%                               | neat                      | Please inquire                |
| DLM-8647     | 7-Ketocholesterol (7-KC) (25,26,26,26,27,27,27-D <sub>7</sub> , 99%)                            | neat                      | Please inquire                |
| CLM-11839-C  | 11-Ketoprogesterone (3,4,20,21- <sup>13</sup> C <sub>4</sub> , 98%) CP 95%                      | 100 µg/mL in methanol     | 1 mL                          |
| DLM-10395    | 11-Ketotestosterone (11-KT) (16,16,17-D <sub>3</sub> ) CP 95%                                   | neat                      | 1 mg                          |
| DLM-7101     | Melatonin (acetyl-D <sub>3</sub> , 98%)   | neat                      | 5 mg, 10 mg                   |

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| Catalog No.  | Description   | Concentration             | Unit Size         |
|--------------|---|---------------------------|-------------------|
| DLM-3560     | DL-Metanephine-HCl ( $\alpha,\beta,\beta$ -D <sub>3</sub> , 98%)  | neat                      | 5 mg, 10 mg       |
| CLM-8015     | DL-2-Methoxyestradiol (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)   | neat                      | 0.1 mg            |
| ULM-8137     | DL-2-Methoxyestradiol (unlabeled)   | neat                      | 0.1 mg            |
| CLM-8014     | DL-2-Methoxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)   | neat                      | 0.1 mg            |
| CLM-8017     | DL-4-Methoxyestrone (13,14,15,16,17,18- <sup>13</sup> C <sub>6</sub> , 99%)   | neat                      | 0.1 mg            |
| ULM-8263     | 2-Methoxyestrone (unlabeled)  | neat                      | 0.1 mg            |
| ULM-8262     | 4-Methoxyestrone (unlabeled)  | neat                      | 0.1 mg            |
| DLM-8820     | DL-Norepinephrine (noradrenaline)-HCl (ring-D <sub>3</sub> , 1,2,2-D <sub>3</sub> , 99%)  | neat                      | 5 mg, 10 mg       |
| CLM-2468     | Norethindrone (ethynyl- <sup>13</sup> C <sub>2</sub> , 99%)   | neat                      | 10 mg             |
| CLM-9980     | Nestorone (16-methylene- <sup>13</sup> C, 20,21- <sup>13</sup> C <sub>2</sub> , 99%) CP 96%   | neat                      | Please inquire    |
| DLM-8609     | DL-Normetanephine-HCl ( $\alpha,\beta,\beta$ -D <sub>3</sub> , 98%)   | neat                      | 5 mg, 10 mg       |
| DLM-3979-1.2 | 19-Nortestosterone (16,16,17-D <sub>3</sub> , 98%)  | 100 µg/mL in methanol     | 1.2 mL            |
| DLM-3979     | 19-Nortestosterone (16,16,17-D <sub>3</sub> , 98%)  | neat                      | 5 mg              |
| ULM-4841-1.2 | 19-Nortestosterone (unlabeled)  | 100 µg/mL in methanol     | 1.2 mL            |
| CLM-11841-C  | Prednisolone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%   | 100 µg/mL in methanol     | 1 mL              |
| DLM-3754     | 5 $\alpha$ -Pregnan-3 $\alpha$ -ol-20-one (17,21,21,21-D <sub>4</sub> , 96%) CP 95%   | neat                      | 10 mg             |
| DLM-7492     | 5 $\alpha$ -Pregnan-3 $\beta$ -ol-20-one (17 $\alpha$ ,21,21,21-D <sub>4</sub> , 97%) CP 96%  | neat                      | Please inquire    |
| ULM-8242     | 5 $\alpha$ -Pregnan-3 $\beta$ -ol-20-one (unlabeled)  | neat                      | 1 mg              |
| DLM-10969-C  | 5 $\alpha$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17,21-tetrol-20-one (2,2,3,4,4-D <sub>5</sub> , 98%)                                    | 100 µg/mL in methanol     | 1 mL              |
| DLM-10969    | 5 $\alpha$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17,21-tetrol-20-one (2,2,3,4,4-D <sub>5</sub> , 98%)                                    | neat                      | 1 mg              |
| DLM-11010-C  | 5 $\alpha$ -Pregnan-3 $\alpha$ ,17,21-triol-11,20-dione (2,2,4,4-D <sub>4</sub> , 98%)  | 100 µg/mL in methanol     | 1 mL              |
| DLM-11010    | 5 $\alpha$ -Pregnan-3 $\alpha$ ,17,21-triol-11,20-dione (2,2,4,4-D <sub>4</sub> , 98%)  | neat                      | Please inquire    |
| DLM-11009-C  | 5 $\alpha$ -Pregnan-3 $\alpha$ ,17,21-triol-11,20-dione (2,2,3,4,4-D <sub>5</sub> , 98%)  | 100 µg/mL in methanol     | 1 mL              |
| DLM-11009    | 5 $\alpha$ -Pregnan-3 $\alpha$ ,17,21-triol-11,20-dione (2,2,3,4,4-D <sub>5</sub> , 98%)  | neat                      | Please inquire    |
| DLM-2294     | 5 $\beta$ -Pregnan-3 $\alpha$ -ol-20-one (17,21,21,21-D <sub>4</sub> , 96%)   | neat                      | 10 mg             |
| DLM-8751     | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17 $\alpha$ ,21-tetrol-20-one (9,11 $\alpha$ ,12-D <sub>3</sub> , 95%)                   | neat                      | Please inquire    |
| DLM-11014-C  | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17 $\alpha$ ,21-tetrol-20-one (2,2,3,4,4-D <sub>5</sub> , 98%)                           | 100 µg/mL in methanol     | 1 mL              |
| DLM-11014    | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17 $\alpha$ ,21-tetrol-20-one (2,2,3,4,4-D <sub>5</sub> , 98%)                           | neat                      | 1 mg              |
| ULM-11015-C  | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17 $\alpha$ ,21-tetrol-20-one (unlabeled)  | 100 µg/mL in methanol     | 1 mL              |
| ULM-11015    | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,17 $\alpha$ ,21-tetrol-20-one (unlabeled)  | neat                      | 1 mg              |
| DLM-11012-C  | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,21-triol-20-one (2,2,3,4,4-D <sub>5</sub> , 98%) CP 95%                                  | 100 µg/mL in methanol     | 1 mL              |
| DLM-11012    | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,21-triol-20-one (2,2,3,4,4-D <sub>5</sub> , 98%) CP 95%                                  | neat                      | 1 mg              |
| ULM-11011-C  | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,21-triol-20-one (unlabeled)  | 100 µg/mL in methanol     | 1 mL              |
| ULM-11011    | 5 $\beta$ -Pregnan-3 $\alpha$ ,11 $\beta$ ,21-triol-20-one (unlabeled)  | neat                      | 1 mg              |
| DLM-11013-C  | 5 $\beta$ -Pregnan-3 $\alpha$ ,17,21-triol-11,20-dione (2,2,3,4,4-D <sub>5</sub> , 98%)   | 100 µg/mL in methanol     | 1 mL              |
| DLM-11013    | 5 $\beta$ -Pregnan-3 $\alpha$ ,17,21-triol-11,20-dione (2,2,3,4,4-D <sub>5</sub> , 98%)   | neat                      | 1 mg              |
| DLM-8753     | 5 $\beta$ -Pregnan-3 $\alpha$ ,17 $\alpha$ ,20-triol (20,21,21,21-D <sub>4</sub> , 98%) mix of 20 $\alpha$ and 20 $\beta$           | neat                      | Please inquire    |
| DLM-10413    | 5 $\beta$ -Pregnane-3 $\alpha$ -20 $\alpha$ -diol (2,2,3,4,4-D <sub>5</sub> , 98%) CP 95%   | neat                      | 1 mg              |
| CLM-10412    | 5 $\beta$ -Pregnane-3 $\alpha$ -20 $\alpha$ -diol glucuronide, sodium salt (2,3,4,20,21- <sup>13</sup> C <sub>5</sub> , 99%) CP 95% | neat                      | 1 mg              |
| DLM-3910     | 5 $\alpha$ -Pregnane-3 $\alpha$ ,21-diol-20-one (17,21,21-D <sub>3</sub> , 95%)   | neat                      | 10 mg             |
| ULM-10385    | 5 $\alpha$ -Pregnane-3 $\alpha$ ,21-diol-20-one (unlabeled)   | neat                      | 1 mg              |
| DLM-3816     | 5 $\alpha$ -Pregnane-3,20-dione (1,2,4,5,6,7-D <sub>6</sub> , 95%)  | neat                      | 10 mg, 0.05 g     |
| DLM-9901     | 5 $\beta$ -Pregnane-3,20-dione (2,2,4,4,17 $\alpha$ ,21,21,21-D <sub>8</sub> , 98%) CP 97%  | neat                      | Please inquire    |
| DLM-6896     | Pregnenolone (17,21,21,21-D <sub>4</sub> , 98%)   | neat                      | 10 mg             |
| CDLM-9158-C  | Pregnenolone (20,21- <sup>13</sup> C <sub>2</sub> , 99%; 16,16-D <sub>2</sub> , 98%)  | 100 µg/mL in acetonitrile | 1 mL              |
| CDLM-9158    | Pregnenolone (20,21- <sup>13</sup> C <sub>2</sub> , 98%; 16,16-D <sub>2</sub> , 98%)  | neat                      | 1 mg, 5 mg        |
| ULM-9159-C   | Pregnenolone (unlabeled)  | 100 µg/mL in methanol     | 1 mL              |
| ULM-9159     | Pregnenolone (unlabeled)  | neat                      | 1 mg, 5 mg, 10 mg |
| CDLM-9160    | Pregnenolone sulfate, sodium salt (20,21- <sup>13</sup> C <sub>2</sub> , 99%; 16,16-D <sub>2</sub> , 98%)                           | neat                      | 1 mg, 5 mg        |
| ULM-9161     | Pregnenolone sulfate, sodium salt (unlabeled)   | neat                      | 1 mg, 5 mg, 10 mg |
| CLM-457      | Progesterone (3,4- <sup>13</sup> C <sub>2</sub> , 90%)  | neat                      | 10 mg             |
| CLM-9162-C   | Progesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 µg/mL in acetonitrile | 1 mL              |
| CLM-9162-B   | Progesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 50 µg/mL in acetonitrile  | 1 mL              |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Steroids and Hormones (continued)

| Catalog No.    | Description   | Concentration                                    | Unit Size         |
|----------------|---|--|-------------------|
| CLM-9162       | Progesterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | neat   | 1 mg, 5 mg        |
| CLM-10414      | Progesterone (2,3,4,20,21- <sup>13</sup> C <sub>5</sub> , 99%)  | neat   | 1 mg              |
| DLM-7953-1.2   | Progesterone (2,2,4,6,6,17 $\alpha$ ,21,21,21-D <sub>9</sub> , 98%)   | 100 $\mu$ g/mL in <i>p</i> -dioxane              | 1.2 mL            |
| DLM-7953       | Progesterone (2,2,4,6,6,17 $\alpha$ ,21,21,21-D <sub>9</sub> , 98%)   | neat   | 10 mg             |
| ULM-8219-1.2   | Progesterone (unlabeled)  | 100 $\mu$ g/mL in <i>p</i> -dioxane              | 1.2 mL            |
| DLM-3627       | Prostaglandin A2 (3,3,4,4-D <sub>4</sub> , 98%)   | 500 $\mu$ g/mL in methyl acetate                 | Please inquire    |
| DLM-3728       | Prostaglandin E1 (3,3,4,4-D <sub>4</sub> , 98%)   | 500 $\mu$ g/mL in methyl acetate                 | Please inquire    |
| DLM-3628       | Prostaglandin E2 (3,3,4,4-D <sub>4</sub> , 98%)   | 500 $\mu$ g/mL in methyl acetate                 | Please inquire    |
| DLM-3558       | Prostaglandin-F2 $\alpha$ (3,3,4,4-D <sub>4</sub> , 98%)  | Please inquire                                   | Please inquire    |
| DLM-7457       | Sodium 17 $\beta$ -estradiol 3-sulfate (2,4,16,16-D <sub>4</sub> , 98%) stabilized with 50% w/w Tris        | neat   | Please inquire    |
| DLM-7456       | Sodium estrone 3-sulfate (2,4,16,16-D <sub>4</sub> , 98%) stabilized with 50% w/w Tris                      | neat   | Please inquire    |
| ULM-8132       | Sodium estrone 3-sulfate (unlabeled)  | neat   | 0.1 mg            |
| DLM-9503       | Stigmastanol (2,2,3,4,4-D <sub>5</sub> , 98%)   | neat   | 10 mg             |
| CLM-159        | Testosterone (3,4- <sup>13</sup> C <sub>2</sub> , 99%)  | neat   | 10 mg             |
| CLM-9164-C     | Testosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | 100 $\mu$ g/mL in methanol                       | 1 mL              |
| CLM-9164       | Testosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 99%)  | neat   | 5 mg, 10 mg       |
| DLM-683-1.2    | Testosterone (1,2-D <sub>2</sub> , 98%)   | 100 $\mu$ g/mL in MeCl                           | 1.2 mL            |
| DLM-683        | Testosterone (1,2-D <sub>2</sub> , 98%)   | neat   | 0.1 g             |
| DLM-6224-C     | Testosterone (16,16,17-D <sub>3</sub> , 98%)  | 100 $\mu$ g/mL in methanol                       | 1 mL              |
| DLM-6224       | Testosterone (16,16,17-D <sub>3</sub> , 98%)  | neat   | 5 mg              |
| DLM-8085-D-1.2 | Testosterone (2,2,4,6,6-D <sub>5</sub> , 98%)   | 100 $\mu$ g/mL in dioxane                        | 1.2 mL            |
| DLM-8085-1.2   | Testosterone (2,2,4,6,6-D <sub>5</sub> , 98%)   | 100 $\mu$ g/mL in MeCl                           | 1.2 mL            |
| DLM-8085       | Testosterone (2,2,4,6,6-D <sub>5</sub> , 98%)   | neat   | Please inquire    |
| CDLM-11711-C   | Testosterone (2,3,4- <sup>13</sup> C <sub>3</sub> , 98%; 16,16,17-D <sub>3</sub> , 98%) CP 95%              | 100 $\mu$ g/mL in ethanol                        | 1 mL              |
| ULM-8081-1.2   | Testosterone (unlabeled)  | 100 $\mu$ g/mL in MeCl                           | 1.2 mL            |
| DLM-8265       | Testosterone diacetate (testosterone-D <sub>4</sub> , acetate methyl-D <sub>6</sub> , 98%)                  | neat   | Please inquire    |
| DLM-11016-C    | 3 $\alpha$ ,5 $\beta$ -Tetrahydroaldosterone (2,2,4,4,6,6-D <sub>6</sub> , 98%) CP 95%                      | 100 $\mu$ g/mL in acetonitrile                   | 1 mL              |
| DLM-11016      | 3 $\alpha$ ,5 $\beta$ -Tetrahydroaldosterone (2,2,4,4,6,6-D <sub>6</sub> , 98%) CP 95%                      | neat   | Please inquire    |
| ULM-9163       | 3 $\alpha$ ,5 $\beta$ -Tetrahydroaldosterone (unlabeled)  | neat   | 1 mg, 5 mg        |
| CLM-6725       | L-Thyroxine (T4) (tyrosine-ring- <sup>13</sup> C <sub>6</sub> , 99%) CP 90%                                 | neat   | 0.1 mg            |
| CLM-8931       | L-Thyroxine (T4) (ring- <sup>13</sup> C <sub>12</sub> , 99%) CP 97%   | neat   | 0.1 mg            |
| ULM-8184       | L-Thyroxine (T4) (unlabeled)  | neat   | 0.2 mg            |
| CLM-10596      | 3,3',5-Triiodo-L-thyronine (T3) (rings- <sup>13</sup> C <sub>12</sub> , 99%) CP 94%                         | neat   | Please inquire    |
| CLM-7185-C     | 3,3',5-Triiodo-L-thyronine (T3)·HCl (diiodobenzene- <sup>13</sup> C <sub>6</sub> , 99%)                     | 100 $\mu$ g/mL 0.1 N NH <sub>3</sub> in methanol | 1 mL              |
| CLM-7185       | 3,3',5-Triiodo-L-thyronine (T3)·HCl (diiodobenzene- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%              | neat   | 1 mg, 5 mg, 10 mg |
| ULM-10573-C    | 3,3',5-Triiodo-L-thyronine (T3)·HCl (unlabeled) CP 95%  | 100 $\mu$ g/mL 0.1 N NH <sub>3</sub> in methanol | 1 mL              |
| ULM-10573      | 3,3',5-Triiodo-L-thyronine (T3)·HCl (unlabeled) CP 95%  | neat   | 1 mg, 5 mg, 10 mg |
| CLM-10601-C    | Reverse 3,3',5'-triiodo-L-thyronine (rev T3)·HCl (diiodobenzene- <sup>13</sup> C <sub>6</sub> , 99%) CP 95% | 100 $\mu$ g/mL 0.1 N NH <sub>3</sub> in methanol | 1 mL              |
| CLM-10601      | Reverse 3,3',5'-triiodo-L-thyronine (rev T3)·HCl (diiodobenzene- <sup>13</sup> C <sub>6</sub> , 99%) CP 95% | neat   | 1 mg, 5 mg, 10 mg |
| ULM-10602-C    | Reverse 3,3',5'-triiodo-L-thyronine (rev T3)·HCl (unlabeled) CP 95%   | 100 $\mu$ g/mL 0.1 N NH <sub>3</sub> in methanol | 1 mL              |
| DLM-10026      | Triamcinolone hexacetonide (16,17-isopropylidenedioxy-D <sub>6</sub> , 98%)                                 | neat   | Please inquire    |
| DLM-6989       | Tryptamine·HCl ( $\alpha$ , $\alpha$ , $\beta$ , $\beta$ -D <sub>4</sub> , 97%)                             | neat   | Please inquire    |
| DLM-10026      | Triamcinolone hexacetonide (16,17-isopropylidenedioxy-D <sub>6</sub> , 98%)                                 | neat   | Please inquire    |
| DLM-6989       | Tryptamine·HCl ( $\alpha$ , $\alpha$ , $\beta$ , $\beta$ -D <sub>4</sub> , 97%)                             | neat   | Please inquire    |
| DLM-6989       | Tryptamine·HCl ( $\alpha$ , $\alpha$ , $\beta$ , $\beta$ -D <sub>4</sub> , 97%)                             | neat   | Please inquire    |

For a complete product listing, please visit [isotope.com](http://isotope.com).

## Vitamins and Their Metabolites

Vitamins are organic compounds that directly or indirectly participate in organisms' biochemical reactions. These are divided into two classes, based on their solubility in fat (includes A, D, E, and K) and water (includes B and C).

CIL offers unlabeled and stable isotope-labeled vitamins as neat compounds and/or in solution at specified concentrations. These can be used in a wide range of applications, such as metabolism and pathophysiology explorations, as well as disease biomarker evaluation in preclinical and clinical MS studies (e.g., vitamin D deficiency). These standards help facilitate accurate and precise quantification of endogenous metabolites in biological matrices.

### Water Soluble

| Catalog No. | Description   | Concentration                  | Unit Size          |
|-------------|---|--------------------------------|--------------------|
| CLM-11661   | 5-Formyltetrahydrofolic acid (glutamic acid- $^{13}\text{C}_5$ , 98%)   | neat                           | 1 mg               |
| CLM-9548    | 5-Methyltetrahydrofolic acid (prefolic A) (glutamic acid- $^{13}\text{C}_5$ , 99%) CP 95%   | neat                           | 1 mg, 5 mg         |
| DLM-11656   | 5-Methyltetrahydrofolic acid (prefolic A) (methyl- $\text{D}_3$ , 98%)  | neat                           | 1 mg               |
| CLM-7321-N  | 5-Methyltetrahydrofolic acid (prefolic A), calcium salt (glutamic acid- $^{13}\text{C}_5$ , 98%) CP 95%   | neat                           | 1 mg, 5 mg         |
| CLM-7667    | Vitamin B <sub>1</sub> (thiamine)-HCl (4,5,4-methyl- $^{13}\text{C}_3$ , 99%) CP 97%  | neat                           | 5 mg               |
| ULM-10004   | Vitamin B <sub>1</sub> (thiamine)-HCl (unlabeled)   | neat                           | 1 mg, 5 mg, 10 mg  |
| DLM-8741    | Vitamin B <sub>1</sub> (thiamine) pyrophosphate chloride (pyrimidyl-methyl- $\text{D}_3$ , 98%)   | neat                           | 1 mg               |
| CNLM-8851   | Vitamin B <sub>2</sub> (riboflavin) ( $^{13}\text{C}_4$ , 99%; $^{15}\text{N}_2$ , 98%) CP 97%  | neat                           | 1 mg, 5 mg, 10 mg  |
| ULM-9123    | Vitamin B <sub>2</sub> (riboflavin) (unlabeled) CP 97%  | neat                           | 1 mg, 5 mg, 10 mg  |
| CNLM-10744  | Vitamin B <sub>2</sub> (riboflavin) phosphate ( $^{13}\text{C}_4$ , 99%; $^{15}\text{N}_2$ , 98%) CP 90%  | neat                           | 1 mg               |
| CLM-9925    | Vitamin B <sub>3</sub> (nicotinamide) ( $^{13}\text{C}_6$ , 99%)  | neat                           | 1 mg, 5 mg         |
| DLM-6883    | Vitamin B <sub>3</sub> (nicotinamide) ( $\text{D}_4$ , 98%)   | neat                           | 0.1 g, 0.5 g       |
| CNLM-9757   | Vitamin B <sub>3</sub> (nicotinamide) (2,6-carbonyl- $^{13}\text{C}_3$ , 99%; ring-1- $^{15}\text{N}$ , 98%)                                    | neat                           | 1 mg               |
| CLM-9954    | Vitamin B <sub>3</sub> (nicotinic acid) ( $^{13}\text{C}_6$ , 99%)  | neat                           | 1 mg, 5 mg         |
| DLM-4578    | Vitamin B <sub>3</sub> (nicotinic acid) ( $\text{D}_4$ , 98%)   | neat                           | 5 mg, 1 g          |
| CNLM-9512   | Vitamin B <sub>3</sub> (nicotinic acid) (2,6-carboxyl- $^{13}\text{C}_3$ , 99%; $^{15}\text{N}$ , 98%) CP 97%                                   | neat                           | 1 mg               |
| DLM-2872    | Vitamin B <sub>3</sub> (nicotinic acid), ethyl ester (2,4,5,6- $\text{D}_4$ , 98%)  | neat                           | 5 g                |
| CNLM-7694   | Vitamin B <sub>5</sub> (pantothenate)- $\text{H}_2\text{O}$ , calcium salt ( $\beta$ -alaninyl- $^{13}\text{C}_3$ , 99%; $^{15}\text{N}$ , 98%) | neat                           | 10 mg              |
| ULM-10003   | Vitamin B <sub>5</sub> (pantothenate)- $\text{H}_2\text{O}$ , calcium salt (unlabeled)  | neat                           | 1 mg, 5 mg, 10 mg  |
| DLM-9069    | Vitamin B <sub>6</sub> (pyridoxal) (methyl- $\text{D}_3$ , 98%)   | neat                           | 1 mg, 5 mg, 10 mg  |
| ULM-9118    | Vitamin B <sub>6</sub> (pyridoxal)-HCl (unlabeled)  | neat                           | 1 mg, 5 mg, 10 mg  |
| DLM-9119    | Vitamin B <sub>6</sub> (pyridoxamine)-2HCl (methyl- $\text{D}_3$ , 98%)   | neat                           | 1 mg, 5 mg, 10 mg  |
| ULM-9120    | Vitamin B <sub>6</sub> (pyridoxamine)-2HCl (unlabeled)  | neat                           | 1 mg, 5 mg, 10 mg  |
| CLM-7563    | Vitamin B <sub>6</sub> (pyridoxine)-HCl (4,5-bis(hydroxymethyl)- $^{13}\text{C}_4$ , 99%)   | neat                           | 10 mg              |
| DLM-8754    | Vitamin B <sub>6</sub> (pyridoxine)-HCl (5-hydroxymethyl- $\text{D}_2$ , 98%)   | neat                           | 1 mg, 5 mg         |
| DLM-9121    | Vitamin B <sub>6</sub> (pyridoxine)-HCl (methyl- $\text{D}_3$ , 98%) CP 96%   | neat                           | 1 mg, 5 mg, 10 mg  |
| ULM-9122    | Vitamin B <sub>6</sub> (pyridoxine)-HCl (unlabeled) CP 96%  | neat                           | 1 mg, 5 mg, 10 mg  |
| DLM-9793-N  | Vitamin B <sub>6</sub> (pyridoxal) phosphate (methyl- $\text{D}_3$ , 97%) CP 97% (mix of 5-,3-isomers)  | neat                           | 1 mg               |
| DLM-11662   | Vitamin B <sub>6</sub> phosphate (pyridoxal phosphate) (methyl- $\text{D}_3$ , 5-hydroxymethyl- $\text{D}_2$ , 98%)                             | neat                           | 1 mg               |
| DLM-8806    | Vitamin B <sub>7</sub> (biotin) (ring-6,6- $\text{D}_2$ , 98%) CP 97%   | neat                           | 5 mg, 10 mg, 20 mg |
| DLM-9751    | Vitamin B <sub>7</sub> (biotin) (3',3',4',4'- $\text{D}_4$ , 98%) CP 95%  | neat                           | 1 mg               |
| ULM-9129    | Vitamin B <sub>7</sub> (biotin) (unlabeled)   | neat                           | 1 mg, 5 mg         |
| CLM-7861-N  | Vitamin B <sub>9</sub> (folic acid) (glutamic acid- $^{13}\text{C}_5$ , 99%) CP 95%   | neat                           | 1 mg, 5 mg         |
| CLM-7861    | Vitamin B <sub>9</sub> (folic acid) (glutamic acid- $^{13}\text{C}_5$ , 95%) contains ~10% $\text{H}_2\text{O}$                                 | neat                           | Please inquire     |
| CNLM-9564   | Vitamin B <sub>9</sub> (folic acid) (glutamic acid- $^{13}\text{C}_5$ , 99%; $^{15}\text{N}$ , 98%) CP 95%                                      | neat                           | 1 mg, 5 mg         |
| CLM-9770-E  | Vitamin B <sub>12</sub> (cyanocobalamin) ( $^{13}\text{C}_7$ , 99%) CP 95%  | 1 $\mu\text{g/mL}$ in methanol | 1 mL               |
| ULM-10005-E | Vitamin B <sub>12</sub> (cyanocobalamin) (unlabeled)  | 1 $\mu\text{g/mL}$ in methanol | 1 mL               |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## Vitamins and Their Metabolites (continued)

| Catalog No. | Description   | Concentration | Unit Size                       |
|-------------|---|---------------|---------------------------------|
| CLM-3085    | Vitamin C (L-ascorbic acid) (1- <sup>13</sup> C, 99%)                 | neat          | 0.05 g, 0.1 g,<br>0.25 g, 0.5 g |
| CLM-10991   | Vitamin C (L-ascorbic acid) (1,2- <sup>13</sup> C <sub>2</sub> , 99%) | neat          | Please inquire                  |
| CLM-7283    | Vitamin C (L-ascorbic acid) (U- <sup>13</sup> C <sub>6</sub> , 98%)   | neat          | 0.05 g, 0.1 g                   |

## Fat Soluble

| Catalog No. | Description   | Concentration        | Unit Size      |
|-------------|---|----------------------|----------------|
| CLM-6126    | β-Carotene (provitamin A) (10,10',11,11'- <sup>13</sup> C <sub>4</sub> , 99%) CP 95%                        | neat                 | Please inquire |
| CLM-9641    | β-Carotene (provitamin A) (12,12',13,13',14,14',15,15',20,20'- <sup>13</sup> C <sub>10</sub> , 99%) CP 97%  | neat                 | Please inquire |
| DLM-3829    | β-Carotene (provitamin A) (19,19,19,19',19',19'-D <sub>6</sub> , 98%) CP 95%                                | neat                 | Please inquire |
| DLM-2439    | β-Carotene (provitamin A) (10,10',19,19,19,19',19',19'-D <sub>8</sub> , 97%)                                | neat                 | Please inquire |
| ULM-11664   | 1,24-Dihydroxyvitamin D <sub>3</sub> (tacalcitol) (unlabeled)   | neat                 | 1 mg           |
| CLM-12291-A | 1,25-Dihydroxyvitamin D <sub>2</sub> (25,26,27- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                  | 5 µg/mL in ethanol   | 1 mL           |
| CLM-11417   | 1,25-Dihydroxyvitamin D <sub>2</sub> (20,21,22,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95%            | neat                 | Please inquire |
| ULM-9106-C  | 1,25-Dihydroxyvitamin D <sub>2</sub> (unlabeled) CP 95%   | 100 µg/mL in ethanol | 1 mL           |
| ULM-9106-B  | 1,25-Dihydroxyvitamin D <sub>2</sub> (unlabeled) CP 95%   | 50 µg/mL in ethanol  | 1 mL           |
| ULM-9106    | 1,25-Dihydroxyvitamin D <sub>2</sub> (unlabeled) CP 95%   | neat                 | 0.1 mg, 1 mg   |
| CLM-12292-A | 1,25-Dihydroxyvitamin D <sub>3</sub> (25,26,27- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                  | 5 µg/mL in ethanol   | 1 mL           |
| DLM-9107-C  | 1,25-Dihydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%) CP 95%                                  | 100 µg/mL in ethanol | 1 mL           |
| DLM-9107-B  | 1,25-Dihydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%) CP 95%                                  | 50 µg/mL in ethanol  | 1 mL           |
| DLM-9107    | 1,25-Dihydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%) CP 95%                                  | neat                 | 1 mg           |
| ULM-9108-C  | 1,25-Dihydroxyvitamin D <sub>3</sub> (unlabeled) CP 95%   | 100 µg/mL in ethanol | 1 mL           |
| ULM-9108-B  | 1,25-Dihydroxyvitamin D <sub>3</sub> (unlabeled) CP 95%   | 50 µg/mL in ethanol  | 1 mL           |
| ULM-9108    | 1,25-Dihydroxyvitamin D <sub>3</sub> (unlabeled) CP 95%   | neat                 | 0.5 mg, 1 mg   |
| ULM-9109-C  | 24,25-Dihydroxyvitamin D <sub>2</sub> (unlabeled)   | 100 µg/mL in ethanol | 1 mL           |
| ULM-9109    | 24,25-Dihydroxyvitamin D <sub>2</sub> (unlabeled)   | neat                 | 1 mg           |
| CLM-11663   | 24R,25-Dihydroxyvitamin D <sub>3</sub> (25,26,27- <sup>13</sup> C <sub>3</sub> , 98%)                       | 50 µg/mL in ethanol  | 1 mL           |
| CLM-11420   | 24R,25-Dihydroxyvitamin D <sub>3</sub> (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95%          | neat                 | Please inquire |
| DLM-9404-C  | 24R,25-Dihydroxyvitamin D <sub>3</sub> (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 97%                      | 100 µg/mL in ethanol | 1 mL           |
| DLM-9404    | 24R,25-Dihydroxyvitamin D <sub>3</sub> (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 97%                      | neat                 | 1 mg           |
| ULM-10610-C | 24R,25-Dihydroxyvitamin D <sub>3</sub> (unlabeled) CP 97%   | 100 µg/mL in ethanol | 1 mL           |
| ULM-10610   | 24R,25-Dihydroxyvitamin D <sub>3</sub> (unlabeled) CP 97%   | neat                 | 1 mg           |
| CLM-11418   | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (22,26,27- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%       | 50 µg/mL in ethanol  | 1 mL           |
| CLM-11418   | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (22,26,27- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%       | 10 µg/mL in ethanol  | 1 mL           |
| CLM-11419   | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (20,21,22,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95% | 50 µg/mL in ethanol  | 1 mL           |
| CLM-11419   | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (20,21,22,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95% | 10 µg/mL in ethanol  | 1 mL           |
| ULM-9110-C  | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (unlabeled)   | 100 µg/mL in ethanol | 1 mL           |
| ULM-9110-B  | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (unlabeled)   | 50 µg/mL in ethanol  | 1 mL           |
| ULM-9110    | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>2</sub> (unlabeled)   | neat                 | 1 mg           |
| CLM-11421   | 25-Hydroxyvitamin D <sub>2</sub> (22,26,27- <sup>13</sup> C <sub>3</sub> , 98%) CP 95%                      | neat                 | Please inquire |
| CLM-11422   | 25-Hydroxyvitamin D <sub>2</sub> (20,21,22,26,27- <sup>13</sup> C <sub>5</sub> , 98%) CP 95%                | neat                 | Please inquire |
| DLM-9114-C  | 25-Hydroxyvitamin D <sub>2</sub> (6,19,19-D <sub>3</sub> , 97%)   | 100 µg/mL in ethanol | 1 mL           |
| DLM-9114-B  | 25-Hydroxyvitamin D <sub>2</sub> (6,19,19-D <sub>3</sub> , 97%)   | 50 µg/mL in ethanol  | 1 mL           |
| DLM-9114-A  | 25-Hydroxyvitamin D <sub>2</sub> (6,19,19-D <sub>3</sub> , 97%)   | 5 µg/mL in ethanol   | 1 mL           |
| DLM-9114    | 25-Hydroxyvitamin D <sub>2</sub> (6,19,19-D <sub>3</sub> , 97%)   | neat                 | 1 mg           |
| DLM-10219   | 25-Hydroxyvitamin D <sub>2</sub> (26,26,26,27,27,27-D <sub>6</sub> , 96%) CP 95%                            | neat                 | Please inquire |
| ULM-9115-C  | 25-Hydroxyvitamin D <sub>2</sub> (unlabeled)  | 100 µg/mL in ethanol | 1 mL           |
| ULM-9115-B  | 25-Hydroxyvitamin D <sub>2</sub> (unlabeled)  | 50 µg/mL in ethanol  | 1 mL           |
| ULM-9115-A  | 25-Hydroxyvitamin D <sub>2</sub> (unlabeled)  | 5 µg/mL in ethanol   | 1 mL           |
| ULM-9115    | 25-Hydroxyvitamin D <sub>2</sub> (unlabeled)  | neat                 | 1 mg           |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.



| Catalog No. | Description   | Concentration        | Unit Size         |
|-------------|---|----------------------|-------------------|
| DLM-10611-C | 25-Hydroxyvitamin D <sub>2</sub> sulfate, sodium salt (6,19,19-D <sub>3</sub> , 97%) CP 97%                 | 100 µg/mL in ethanol | 1 mL              |
| ULM-10612-C | 25-Hydroxyvitamin D <sub>2</sub> sulfate, sodium salt (unlabeled) CP 97%                                    | 100 µg/mL in ethanol | 1 mL              |
| CLM-10266-C | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 99%) CP 96% | 100 µg/mL in ethanol | 1 mL              |
| DLM-9111-C  | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 98%)                              | 100 µg/mL in ethanol | 1 mL              |
| DLM-9111-B  | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 98%)                              | 50 µg/mL in ethanol  | 1 mL              |
| DLM-9111    | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 98%)                              | neat                 | 1 mg              |
| DLM-10912   | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (26,26,26,27,27,27-D <sub>6</sub> , 96%) CP 95%             | neat                 | Please inquire    |
| ULM-9112-C  | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (unlabeled)   | 100 µg/mL in ethanol | 1 mL              |
| ULM-9112-B  | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (unlabeled)   | 50 µg/mL in ethanol  | 1 mL              |
| ULM-9112    | 3- <i>epi</i> -25-Hydroxyvitamin D <sub>3</sub> (unlabeled)   | neat                 | 1 mg              |
| CLM-10025-C | 25-Hydroxyvitamin D <sub>3</sub> (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 99%) CP 95%                | 100 µg/mL in ethanol | 1 mL              |
| CLM-10025   | 25-Hydroxyvitamin D <sub>3</sub> (23,24,25,26,27- <sup>13</sup> C <sub>5</sub> , 99%) CP 95%                | neat                 | 1 mg              |
| DLM-9116-C  | 25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%)   | 100 µg/mL in ethanol | 1 mL              |
| DLM-9116-B  | 25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%)   | 50 µg/mL in ethanol  | 1 mL              |
| DLM-9116-A  | 25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%)   | 5 µg/mL in ethanol   | 1 mL              |
| DLM-9116    | 25-Hydroxyvitamin D <sub>3</sub> (6,19,19-D <sub>3</sub> , 97%)   | neat                 | 1 mg, 5 mg        |
| DLM-11423   | 25-Hydroxyvitamin D <sub>3</sub> (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 95%                            | neat                 | Please inquire    |
| ULM-9117-C  | 25-Hydroxyvitamin D <sub>3</sub> (unlabeled)  | 100 µg/mL in ethanol | 1 mL              |
| ULM-9117-B  | 25-Hydroxyvitamin D <sub>3</sub> (unlabeled)  | 50 µg/mL in ethanol  | 1 mL              |
| ULM-9117-A  | 25-Hydroxyvitamin D <sub>3</sub> (unlabeled)  | 5 µg/mL in ethanol   | 1 mL              |
| ULM-9117    | 25-Hydroxyvitamin D <sub>3</sub> (unlabeled)  | neat                 | 5 mg              |
| DLM-7708-C  | 25-Hydroxyvitamin D <sub>3</sub> -H <sub>2</sub> O (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 97%          | 100 µg/mL in ethanol | 1 mL              |
| DLM-7708-B  | 25-Hydroxyvitamin D <sub>3</sub> -H <sub>2</sub> O (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 97%          | 50 µg/mL in ethanol  | 1 mL              |
| DLM-7708    | 25-Hydroxyvitamin D <sub>3</sub> -H <sub>2</sub> O (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 97%          | neat                 | 1 mg              |
| DLM-10782-C | 25-Hydroxyvitamin D <sub>3</sub> sulfate, sodium salt (6,19,19-D <sub>3</sub> , 97%) CP 97%                 | 100 µg/mL in ethanol | Please inquire    |
| ULM-10781-C | 25-Hydroxyvitamin D <sub>3</sub> sulfate, sodium salt (unlabeled) CP 97%                                    | 100 µg/mL in ethanol | Please inquire    |
| CLM-331     | Vitamin A (retinoic acid) (10- <sup>13</sup> C, 99%)  | neat                 | Please inquire    |
| CLM-328     | Vitamin A (retinoic acid) (11- <sup>13</sup> C, 98%)  | neat                 | Please inquire    |
| CLM-329     | Vitamin A (retinoic acid) (14- <sup>13</sup> C, 99%)  | neat                 | Please inquire    |
| CLM-330     | Vitamin A (retinoic acid) (15- <sup>13</sup> C, 99%)  | neat                 | Please inquire    |
| CLM-4343    | Vitamin A (retinoic acid) (10,11,14,15- <sup>13</sup> C <sub>4</sub> , 99%)                                 | neat                 | Please inquire    |
| DLM-7720    | Vitamin A (retinoic acid) (19,19,19,20,20,20-D <sub>6</sub> , 96%)  | neat                 | 1 mg              |
| CLM-10259   | Vitamin A (retinol) (12,13,14,20- <sup>13</sup> C <sub>4</sub> , 99%) CP 95% (50 ppm BHT)                   | neat                 | Please inquire    |
| DLM-9305    | Vitamin A (retinol) (10,19,19,19-D <sub>4</sub> , 96%) CP 95% (50 ppm BHT)                                  | neat                 | 1 mg, 5 mg        |
| DLM-8113    | Vitamin A (retinol) (19,19,19,20,20,20-D <sub>6</sub> , 96%) CP 95% (50 ppm BHT)                            | neat                 | 1 mg, 5 mg, 10 mg |
| DLM-9306    | Vitamin A (retinol) (10,14,19,19,19,20,20,20-D <sub>8</sub> , 90%) CP 95% (50 ppm BHT)                      | neat                 | Please inquire    |
| CLM-8870    | Vitamin A (retinol) acetate (12,13,14,20- <sup>13</sup> C <sub>4</sub> , 99%)                               | neat                 | Please inquire    |
| CLM-4831    | Vitamin A (retinol) acetate (8,9,10,12,13,14,19,20- <sup>13</sup> C <sub>8</sub> , 99%)                     | neat                 | Please inquire    |
| CLM-7277    | Vitamin A (retinol) acetate (8,9,10,11,12,13,14,15,19,20- <sup>13</sup> C <sub>10</sub> , 99%)              | neat                 | Please inquire    |
| DLM-2244    | Vitamin A (retinol) acetate (10,19,19,19-D <sub>4</sub> , 96%) 3-4% <i>cis</i>                              | neat                 | Please inquire    |
| DLM-3828    | Vitamin A (retinol) acetate (19,19,19,20,20,20-D <sub>6</sub> , 96%) 3-4% <i>cis</i>                        | neat                 | Please inquire    |
| DLM-4203    | Vitamin A (retinol) acetate (10,14,19,19,19,20,20,20-D <sub>8</sub> , 90%) 3-4% <i>cis</i>                  | neat                 | Please inquire    |
| CLM-320     | Vitamin A (retinal) aldehyde (10- <sup>13</sup> C, 99%)   | neat                 | Please inquire    |
| CLM-325     | Vitamin A (retinal) aldehyde (11- <sup>13</sup> C, 99%)   | neat                 | Please inquire    |
| CLM-326     | Vitamin A (retinal) aldehyde (14- <sup>13</sup> C, 99%)   | neat                 | Please inquire    |
| CLM-327     | Vitamin A (retinal) aldehyde (15- <sup>13</sup> C, 98%)   | neat                 | Please inquire    |
| CLM-10772   | Vitamin A (retinal) aldehyde (12,13,14,20- <sup>13</sup> C <sub>4</sub> , 96%)                              | neat                 | Please inquire    |
| DLM-7719    | Vitamin A (retinal) aldehyde (19,19,19,20,20,20-D <sub>6</sub> , 96%)                                       | neat                 | Please inquire    |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.

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## Vitamins and Their Metabolites (continued)

| Catalog No.    | Description  | Concentration         | Unit Size         |
|----------------|--|-----------------------|-------------------|
| CLM-9395       | Vitamin A (retinal) palmitate (12,13,20- <sup>13</sup> C <sub>3</sub> , 98%)<br>all <i>trans</i> , <4% <i>cis</i> (50 ppm BHT)                           | neat                  | Please inquire    |
| CLM-10838      | Vitamin A (retinal) palmitate (8,9,10,11,12,13,14,15,19,20- <sup>13</sup> C <sub>10</sub> , 99%)<br>all <i>trans</i> , <4% <i>cis</i> (50 ppm BHT)       | neat                  | Please inquire    |
| DLM-4902       | Vitamin A (retinal) palmitate (10,19,19,19-D <sub>4</sub> , 96%)<br>all <i>trans</i> , <4% <i>cis</i> (50 ppm BHT)                                       | neat                  | 1 mg, 5 mg        |
| DLM-9309       | Vitamin A (retinal) palmitate (19,19,19,20,20,20-D <sub>6</sub> , 97%)<br>all <i>trans</i> , <4% <i>cis</i> (50 ppm BHT)                                 | neat                  | Please inquire    |
| DLM-8985-D     | Vitamin D <sub>2</sub> (ergocalciferol) (6,19,19-D <sub>3</sub> , 97%)   | 1000 µg/mL in ethanol | 1 mL              |
| DLM-8985-C     | Vitamin D <sub>2</sub> (ergocalciferol) (6,19,19-D <sub>3</sub> , 97%)   | 100 µg/mL in ethanol  | 1 mL              |
| DLM-8985       | Vitamin D <sub>2</sub> (ergocalciferol) (6,19,19-D <sub>3</sub> , 97%)   | neat                  | 1 mg              |
| DLM-11830      | Vitamin D <sub>2</sub> (ergocalciferol) (26,26,26,27,27-D <sub>6</sub> , 98%) CP 95%   | neat                  | 1 mg              |
| ULM-9124-D     | Vitamin D <sub>2</sub> (ergocalciferol) (unlabeled)  | 1000 µg/mL in ethanol | 1 mL              |
| ULM-9124-C     | Vitamin D <sub>2</sub> (ergocalciferol) (unlabeled)  | 100 µg/mL in ethanol  | 1 mL              |
| ULM-9124       | Vitamin D <sub>2</sub> (ergocalciferol) (unlabeled)  | neat                  | 1 mg, 5 mg, 10 mg |
| DLM-10478-C    | Vitamin D <sub>2</sub> (ergocalciferol) sulfate, sodium salt (6,19,19-D <sub>3</sub> , 98%) CP 97%   | 100 µg/mL in ethanol  | 1 mL              |
| ULM-10477-C    | Vitamin D <sub>2</sub> (ergocalciferol) sulfate, sodium salt (unlabeled) CP 97%  | 100 µg/mL in ethanol  | 1 mL              |
| CLM-7850       | Vitamin D <sub>3</sub> (cholecalciferol) (23,24- <sup>13</sup> C <sub>2</sub> , 99%) CP 90%  | neat                  | Please inquire    |
| CLM-10469-C    | Vitamin D <sub>3</sub> (cholecalciferol) (25,26,26- <sup>13</sup> C <sub>3</sub> , 98%) CP 97%   | 100 µg/mL in ethanol  | 1 mL              |
| CLM-10470-D    | Vitamin D <sub>3</sub> (cholecalciferol) (23,24,25,26,26- <sup>13</sup> C <sub>5</sub> , 98%) CP 97%   | 1000 µg/mL in ethanol | 1 mL              |
| CLM-10470-C    | Vitamin D <sub>3</sub> (cholecalciferol) (23,24,25,26,26- <sup>13</sup> C <sub>5</sub> , 98%) CP 97%   | 100 µg/mL in ethanol  | 1 mL              |
| DLM-8853-D     | Vitamin D <sub>3</sub> (cholecalciferol) (6,19,19-D <sub>3</sub> , 97%) CP 97%   | 1000 µg/mL in ethanol | 1 mL              |
| DLM-8853-C     | Vitamin D <sub>3</sub> (cholecalciferol) (6,19,19-D <sub>3</sub> , 97%) CP 97%   | 100 µg/mL in ethanol  | 1 mL              |
| DLM-10749-D    | Vitamin D <sub>3</sub> (cholecalciferol) (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 95%   | 1 mg/mL in ethanol    | 1 mL              |
| DLM-10749-C    | Vitamin D <sub>3</sub> (cholecalciferol) (26,26,26,27,27,27-D <sub>6</sub> , 98%) CP 95%   | 100 µg/mL in ethanol  | 1 mL              |
| ULM-9125-D     | Vitamin D <sub>3</sub> (cholecalciferol) (unlabeled)   | 1000 µg/mL in ethanol | 1 mL              |
| ULM-9125-C     | Vitamin D <sub>3</sub> (cholecalciferol) (unlabeled)   | 100 µg/mL in ethanol  | 1 mL              |
| ULM-9125       | Vitamin D <sub>3</sub> (cholecalciferol) (unlabeled)   | neat                  | 1 mg, 5 mg, 10 mg |
| DLM-10475-C    | Vitamin D <sub>3</sub> (cholecalciferol) sulfate, sodium salt (6,19,19-D <sub>3</sub> , 98%) CP 97%  | 100 µg/mL in ethanol  | 1 mL              |
| ULM-10474-C    | Vitamin D <sub>3</sub> (cholecalciferol) sulfate, sodium salt (unlabeled) CP 97%   | 100 µg/mL in ethanol  | 1 mL              |
| CLM-10274      | Vitamin E (DL-α-tocopherol) (trimethylphenyl- <sup>13</sup> C <sub>3</sub> , 99%) CP 96%   | neat                  | 1 mg              |
| CLM-10273      | Vitamin E (α-tocopherol) (trimethylphenyl- <sup>13</sup> C <sub>3</sub> , 99%) CP 96%  | neat                  | 1 mg              |
| CLM-10275      | Vitamin E (α-tocopherol) (phenyl- <sup>13</sup> C <sub>6</sub> , 99%) CP 96%   | neat                  | 1 mg              |
| CLM-10276      | Vitamin E (α-tocopherol) (trimethylphenyl- <sup>13</sup> C <sub>9</sub> , 99%) CP 96%  | neat                  | 1 mg              |
| DLM-9126       | Vitamin E (α-tocopherol) (5-methyl-D <sub>3</sub> , 7-methyl-D <sub>3</sub> , 98%)   | neat                  | 2 mg, 5 mg, 10 mg |
| CDLM-11053-1.2 | Vitamin E (α-tocopherol) (dimethyl- <sup>13</sup> C <sub>2</sub> , 99%; dimethyl-D <sub>6</sub> , 98%)   | 100 µg/mL in methanol | 1.2 mL            |
| ULM-9127-1.2   | Vitamin E (α-tocopherol) (unlabeled)   | 100 µg/mL in methanol | 1.2 mL            |
| ULM-9127       | Vitamin E (α-tocopherol) (unlabeled) CP 96%  | neat                  | 1 mg, 5 mg, 10 mg |
| DLM-8847       | Vitamin E (α-tocopherol) acetate (acetyl-D <sub>3</sub> , 98%)   | neat                  | Please inquire    |
| DLM-11564      | Vitamin E (α-tocopherol) acetate (phenyl-5,7-dimethyl-D <sub>6</sub> , 98%)  | neat                  | 1 mg              |
| CDLM-11054-1.2 | Vitamin E (α-tocopherol) acetate<br>(dimethyl- <sup>13</sup> C <sub>2</sub> , acetyl- <sup>13</sup> C <sub>2</sub> , 99%; dimethyl-D <sub>6</sub> , 98%) | 100 µg/mL in methanol | 1.2 mL            |
| ULM-11055-1.2  | Vitamin E (α-tocopherol) acetate (unlabeled)   | 100 µg/mL in methanol | 1.2 mL            |
| DLM-11047      | Vitamin E (α-tocopherol) succinate (5-methyl-D <sub>3</sub> , 7-methyl-D <sub>3</sub> , 98%) CP 95%  | neat                  | 1 mg, 2 mg, 10 mg |
| CLM-9566       | Vitamin K <sub>1</sub> (phyloquinone) (4α,5,6,7,8,8α- <sup>13</sup> C <sub>6</sub> , 99%)  | neat                  | 1 mg              |
| DLM-7702       | Vitamin K <sub>1</sub> (phyloquinone) (ring-D <sub>4</sub> , 98%)  | neat                  | 1 mg              |
| DLM-9130       | Vitamin K <sub>1</sub> (phyloquinone) (D <sub>7</sub> , 99%) CP 97%  | neat                  | 1 mg, 5 mg, 10 mg |
| ULM-9131       | Vitamin K <sub>1</sub> (phyloquinone) (unlabeled) CP 97%   | neat                  | 1 mg, 5 mg, 10 mg |
| CLM-10376      | Vitamin K <sub>2</sub> (menaquinone MK-4) (4',5,6,7,8,8'- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%   | neat                  | 1 mg              |
| DLM-10379      | Vitamin K <sub>2</sub> (menaquinone MK-4) (5,6,7,8-D <sub>4</sub> , 2-methyl-D <sub>3</sub> , 98%) CP 95%  | neat                  | 1 mg              |
| DLM-10382      | Vitamin K <sub>2</sub> (menaquinone MK-4) 2,3-epoxide (5,6,7,8-D <sub>4</sub> , 2-methyl-D <sub>3</sub> , 98%)<br>CP 95%                                 | neat                  | 1 mg              |
| ULM-10383      | Vitamin K <sub>2</sub> (menaquinone MK-4) 2,3-epoxide (unlabeled) CP 95%   | neat                  | 1 mg              |

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire.  
For research use only. Not for use in diagnostic procedures.



| Catalog No. | Description   | Concentration | Unit Size    |
|-------------|---|---------------|--------------|
| CLM-10377   | Vitamin K <sub>2</sub> (menaquinone MK-7) (4',5,6,7,8,8'- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%      | neat          | 1 mg         |
| DLM-10380   | Vitamin K <sub>2</sub> (menaquinone MK-7) (5,6,7,8-D <sub>4</sub> , 2-methyl-D <sub>3</sub> , 98%) CP 95% | neat          | 1 mg         |
| CLM-10378   | Vitamin K <sub>2</sub> (menaquinone MK-9) (4',5,6,7,8,8'- <sup>13</sup> C <sub>6</sub> , 99%) CP 95%      | neat          | 1 mg         |
| DLM-10381   | Vitamin K <sub>2</sub> (menaquinone MK-9) (5,6,7,8-D <sub>4</sub> , 2-methyl-D <sub>3</sub> , 98%) CP 95% | neat          | 1 mg         |
| DLM-9132    | Vitamin K <sub>3</sub> (menadione) (D <sub>8</sub> , 98%) CP 97%  | neat          | 10 mg, 50 mg |
| ULM-9133    | Vitamin K <sub>3</sub> (menadione) (unlabeled) CP 97%   | neat          | 5 mg, 10 mg  |

For a complete product listing, please visit [isotope.com](https://isotope.com).

## Urea

To complement the growing area of urea-based research in the preclinical and clinical fields (e.g., as biomarker of respiratory and renal diseases), CIL offers a variety of stable isotope-labeled urea compounds. These are available in various labeling patterns and in different material grades (i.e., research, MPT, cGMP). In one example application, a <sup>13</sup>C urea breath test can be used to accurately and noninvasively diagnose *H. pylori* infections, such as peptic ulcer disease and gastric cancer. This test involves the oral ingestion of cGMP-grade <sup>13</sup>C urea, with measurement of the <sup>13</sup>CO<sub>2</sub> to <sup>12</sup>CO<sub>2</sub> area ratios in the expired breath facilitating diagnosis.

| Catalog No. | Description  | Unit Size      |
|-------------|--|----------------|
| CLM-311     | Urea ( <sup>13</sup> C, 99%)   | 1 g            |
| DLM-1269    | Urea (D <sub>4</sub> , 98%)  | 25 g           |
| NLM-233     | Urea ( <sup>15</sup> N <sub>2</sub> , 98%)   | 1 g, 5 g       |
| NLM-233-10  | Urea ( <sup>15</sup> N <sub>2</sub> , 10%)   | 25 g           |
| NLM-233-5   | Urea ( <sup>15</sup> N <sub>2</sub> , 5%)  | Please inquire |
| OLM-655     | Urea ( <sup>18</sup> O, 95%)   | Please inquire |
| CNLM-234    | Urea ( <sup>13</sup> C, 99%; <sup>15</sup> N <sub>2</sub> , 98%)                       | 0.5 g          |
| COLM-4861   | Urea ( <sup>13</sup> C, 99%; <sup>18</sup> O, 98%)                                     | 0.5 g          |
| CNOLM-8871  | Urea ( <sup>13</sup> C, 99%; <sup>15</sup> N <sub>2</sub> , 99%; <sup>18</sup> O, 99%) | Please inquire |

## Water

CIL offers a variety of singly and doubly labeled water compounds for use in MS- and NMR-based studies. These could be applied, for example, in energy-expenditure research or in virtual biopsy methods, as described in this article by **Marc Hellerstein**.

| Catalog No. | Description   | Unit Size                       |
|-------------|---|---------------------------------|
| DLM-4       | Deuterium oxide (D, 99.9%)                          | 10 g, 25 g, 50 g, 100 g, 1000 g |
| DLM-4-99.8  | Deuterium oxide (D, 99.8%)                          | 1000 g                          |
| DLM-2259    | Deuterium oxide (D, 99.8%) microbiologically tested | 100 mL, 250 mL, 1 L             |
| DLM-4-99    | Deuterium oxide (D, 99%)                            | 1000 g, 5000 g                  |
| DLM-4-70    | Deuterium oxide (D, 70%)                            | 1000 g                          |
| DLM-2259-70 | Deuterium oxide (D, 70%) microbiologically tested   | Please inquire                  |
| OLM-782-90  | Water ( <sup>17</sup> O, 90%)                       | 1 g                             |
| OLM-782-70  | Water ( <sup>17</sup> O, 70%)                       | Please inquire                  |
| OLM-782-40  | Water ( <sup>17</sup> O, 35%)                       | 1 g                             |
| OLM-782-20  | Water ( <sup>17</sup> O, 20%)                       | 1 g                             |
| OLM-782-10  | Water ( <sup>17</sup> O, 10%)                       | 1 g                             |
| OLM-240-97  | Water ( <sup>18</sup> O, 97%)                       | 1 g                             |
| OLM-240-10  | Water ( <sup>18</sup> O, 10%)                       | 1 g, 5 g, 10 g                  |

Chemical purity (CP) is 98% or greater, unless otherwise specified.

cGMP (current good manufacturing practice) and MPT (microbiological and pyrogen tested) may be available; please inquire.

For research use only. Not for use in diagnostic procedures.

## Research Use of Products

CIL manufactures highly pure research biochemicals that are produced for research applications. As a service to our customers, some of these materials have been tested for the presence of *S. aureus*, *P. aeruginosa*, *E. coli*, *Salmonella sp.*, aerobic bacteria, yeast, and mold, as well as the presence of endotoxin in the bulk material by taking a random sample of the bulk product. Subsequent aliquots are not retested. Presence of endotoxin is assessed by determining endotoxin content following established protocols and standardized limulus amebocyte lysate (LAL) reagents. Any materials listed in our catalog or website that are designated as “MPT” in the item product number (e.g., DLM-349-MPT) contain these tests as part of release specifications.

If a product does not have an “MPT” designation, CIL may be able to provide microbiological testing on the product. Depending on the compound and the quantity ordered, an additional fee may apply for the testing. Please note that microbiological-tested products are not guaranteed to be sterile and pyrogen-free when received by the customer, and microbiological testing does not imply suitability for any desired use. If the product must be sterile and pyrogen-free for a desired application, CIL recommends that the product be packaged or formulated into its ultimate dose form by the customer or appropriate local facility. The product should always be tested by a qualified pharmacy/facility prior to actual use.

CIL research products are labeled “For research use only. Not for use in diagnostic procedures.” Persons intending to use CIL products in applications involving humans are responsible for complying with all applicable laws and regulations, including, but not limited to the US FDA, other local regulatory authorities, and institutional review boards concerning their specific application or desired use.

It may be necessary to obtain approval for using these research products in humans from the US FDA or the comparable governmental agency in the country of use. CIL will provide supporting information, such as lot-specific analytical data and test method protocols, to assist medical research groups in obtaining approval for the desired use. An Enhanced Data Package (EDP) is also available (see next page for an overview of the technical package contents).

CIL will allocate a specific lot of a product to customers who are starting long-term projects requiring large amounts of material. Benefits from this type of arrangement include experimental consistency arising from use of only one lot, no delay in shipments, and guaranteed stock. Please note that some CIL products have a specific shelf life and cannot be held indefinitely. If interested, please contact your sales manager for further details.

Because of increasing regulatory requirements, CIL manufactures different grades of materials to help researchers with those requirements. Listed below are the grades of materials that CIL currently manufactures:

| Catalog No.    | Description                                |
|----------------|--|
| CLM-XXX-PK     | Research grade                             |
| CLM-XXX-MPT-PK | Microbiologically and Pyrogen Tested       |
| CLM-XXX-CTM    | Manufactured following ICH Q7, Section XIX |
| CLM-XXX-GMP    | Good Manufacturing Practices grade         |

For more information on controls in manufacturing and testing of the different grades, see our **Product Quality Designations flyer**.



Images used are for illustrative purposes only and may not be representative of actual product(s).

Chemical purity (CP) is 98% or greater, unless otherwise specified. MPT (microbiological and pyrogen tested) may be available; please inquire. For research use only. Not for use in diagnostic procedures.

## Enhanced Data Package (EDP)

CIL offers the option of an Enhanced Data Package (EDP). This technical data package is available for most MPT products. It includes all of the data currently included with the MPT products, as well as the additional information listed below. You have the option of purchasing this package at the time of order or at a later date.

*Please note that if you choose to purchase at a later date, some of the information listed below may not be available. Also, the EDP may not be available for all lots. In some cases, only a partial EDP may be available. Please confirm availability and content prior to order.*

### EDP Contents

- Product description: structural formula, stereochemical description, molecular formula.
- Product physical properties: melting point, pH, optical rotation (mix of literature or measured values).
- Outline of the synthesis route (including details of solvents used).
- Data used to confirm structure and chemical purity.
- Impurities: available data on impurities detected and identified together with the method of detection and the cutoff applied.
- Residual solvents: measured residual solvents from the final synthetic step and purification.
- Certificates of Analysis of raw materials, where appropriate.
- Informal stability data: estimated and measured.
  - This will be either actual shelf-life data, if it can be obtained from CIL history or by analysis of in-stock batches, or
  - If no data is available, CIL will commit to assaying the batch provided after six months and one year. Data will be provided after one year, unless the batch fails assay after six months. This option will not be available if the Enhanced Data Package is ordered at a later date.

## cGMP Production Capabilities

With increasing requirements from institutional review boards (IRBs) and governmental agencies, partnering with CIL for your next stable isotope cGMP (current good manufacturing practices) project can help ensure your regulatory compliance. With the world's largest  $^{13}\text{C}$  and  $^{18}\text{O}$  isotope-separation plants, CIL is able to provide the raw materials necessary for your project. Your compound of interest most likely already appears in CIL's extensive list of research compounds – if not, CIL's team of PhD chemists can determine the best method of synthesis for incorporating  $^{13}\text{C}$ ,  $^{15}\text{N}$ , D,  $^{17}\text{O}$ , and/or  $^{18}\text{O}$  into your compound.

CIL has manufactured bulk active pharmaceutical ingredients (APIs) since 1994. It recently added a 15,000-square-foot, state-of-the-art cGMP facility to complement its existing cGMP facilities. An additional team of experts – specializing in synthetic chemistry, customer support, quality control, and quality assurance – serves to provide technical guidance from beginning to end of your project. Partner with CIL to help you meet your increasing regulatory compliance requirements.

### Products of Interest

| Catalog No.  | Description                                     |
|--------------|---|
| CLM-804-CTM  | Cholesterol ( $3,4\text{-}^{13}\text{C}_2$ )    |
| DLM-349-CTM  | D-Glucose ( $6,6\text{-D}_2$ )                  |
| CLM-2262-CTM | L-Leucine ( $^{13}\text{C}_6$ )                 |
| DLM-1259-CTM | L-Leucine ( $5,5,5\text{-D}_3$ )                |
| CLM-762-CTM  | L-Phenylalanine ( $1\text{-}^{13}\text{C}$ )    |
| CLM-8077-CTM | Pyruvic acid ( $1\text{-}^{13}\text{C}$ )       |
| CLM-156-CTM  | Sodium acetate ( $1\text{-}^{13}\text{C}$ )     |
| CLM-440-CTM  | Sodium acetate ( $1,2\text{-}^{13}\text{C}_2$ ) |
| CLM-311-GMP  | Urea ( $^{13}\text{C}$ )                        |

Other products may be available as CTM/cGMP. Please inquire for details.

### Manufacturing Capabilities

- Dedicated development facility
- Five production and two isolation suites
- Dedicated packaging room
- Production scale from milligrams to multikilograms
- Clinical trials to bulk API
- Customizable projects to meet your needs

### Analytical Services

- Fully equipped, cGMP-dedicated analytical facility
- Method development and validation
- Raw material and final product testing
- Wet chemistry and compendial methods
- Stability studies and chambers
- Analytical instrumentation:
  - High-field NMR ( $^1\text{H}$ , D,  $^{13}\text{C}$ ,  $^{15}\text{N}$ , multinuclear)
  - HPLC with UV, RI, ELSD, DA, Pickering, and MS detection
  - GC with FID, ECD, and MS detection
  - KF
  - FT-IR
  - Polarimetry
  - TOC

### Quality and Compliance

- Drug master files
- FDA-audited facility
- QA release of API product
- Follows FDA and ICH guidances
- CMC sections for NDA or IND

CTM: manufactured following ICH Q7, Section XIX  
GMP: good manufacturing practices grade



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CIL provides additional testing on many products as a service to our customers. CIL also has cGMP capabilities and can manufacture products to meet your increasing regulatory compliance requirements. Please contact us to learn more.

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