

## Product Information

# Universal Proteomics Standard (UPS) Set

## UPS1

Storage Temperature -20 °C

**Note:** Two proteins, P07339 and P08311, previously supplied in UPS1 have been permanently replaced with O76070 and P01579.

## Product Description

The Universal Proteomics Standard (UPS) Set is comprised of one vial containing 47 human source or human sequence recombinant proteins (U6133), and one vial (20 mg) of Proteomics Grade Trypsin (T6567). The total protein content in each vial is 6 µg, which constitutes 5 pmoles of each HPLC purified protein. Each protein has been quantitated by amino acid analysis (AAA) prior to formulation. The proteins have been selected to limit heterogeneous post-translational modifications (PTM).

UPS1 can be used to standardize and/or evaluate mass spectrometric (e.g., LC-MS/MS, MALDI-TOF-MS, etc.) and electrophoretic analysis conditions prior to the analysis of complex protein samples. Moreover, UPS1 can be used to bracket precious experimental datasets between runs of a known complex standard sample, thereby, confirming the robustness of the analysis method and stability of the instrument employed. Additionally, laboratories generating or comparing mass spectrometric data derived from poorly defined samples may use the standard as an external reference to assist with the evaluation of results and experimental methodology. In this regard running UPS1 as an external standard can facilitate the comparison of mass spectrometric or other proteomic data that is generated in different laboratories using a wide range of varying workflows, analytical techniques, and instrumentation. Lastly, UPS1 will potentially help identify limitations of proteomics analysis systems and search algorithms. A FASTA file, which contains the protein sequences and can be appended to any database, is available for download at [SigmaAldrich.com/ups](http://SigmaAldrich.com/ups).

This protein mixture was extensively evaluated and reported on under the direction of the Association of Biomolecular Resource Facilities (ABRF) Proteomics Standards Research Group (sPRG) during a comprehensive 2005/2006 study. The findings of the study were presented at the ABRF 2006 and US HUPO 2006 conferences.<sup>1,2</sup>

## Components

- Universal Proteomics Standard (U6133)  
1 vial, 6 µg of total protein containing 5 pmoles each of 47 human proteins, dried in a 2 mL vial
- Proteomics Grade Trypsin Lyophilized Enzyme (T6567) 20 mg

## Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

## Preparation Instructions

The preparation procedure should be compatible with the analysis to be performed. For peptide analysis, it is suggested that proteins be resuspended in an appropriate denaturant prior to reduction, alkylation, and tryptic digestion.

## Storage and Stability

The set ships in wet ice and storage at -20 °C is recommended. After reconstitution and/or digestion, the product should be dispensed into microcentrifuge tubes in single use aliquots and frozen.

## References

1. Arnott, D.P., *et al.*, sPRG2006 Study: A Proteomics Standard. Presented at the ABRF 2006 Conference, Long Beach, CA, February 11-14, 2006.
2. Kowalak, J.A., *et al.*, ABRF-sPRG2006 Study: Prototype Proteomics Standard. Presented at the US HUPO 2nd Annual Conference, Boston, MA, March 11-15, 2006.
3. UniProt (Universal Protein Resource), ©2009 by UniProt Consortium. <http://www.uniprot.org/>.

| UniProt Accession Number | UniProt Recommended Name (short name)             | Average MW (Da) (calculated) | Chain   | Source or Recombinant | Host          | Tag                   | Potential PTM*                                                   |
|--------------------------|---------------------------------------------------|------------------------------|---------|-----------------------|---------------|-----------------------|------------------------------------------------------------------|
| P00709                   | Alpha-lactalbumin                                 | 14,078                       | 20-142  | Milk                  |               |                       | Glycosylation                                                    |
| P08758                   | Annexin A5                                        | 35,806                       | 2-320   | Placenta              |               |                       | Acetylation<br>Phosphorylation                                   |
| P01008                   | Antithrombin-III (ATIII)                          | 49,039                       | 33-464  | Plasma                |               |                       | Glycosylation                                                    |
| P61769                   | Beta-2-microglobulin                              | 11,731                       | 21-119  | Urine                 |               |                       |                                                                  |
| P55957                   | BH3-interacting domain death agonist 21,995 1     | 21,995                       | 1-195   | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P00915                   | Carbonic anhydrase 1                              | 28,739                       | 2-261   | Erythrocytes          |               |                       | Acetylation                                                      |
| P00918                   | Carbonic anhydrase 2                              | 29,115                       | 2-260   | Erythrocytes          |               |                       | Acetylation                                                      |
| P04040                   | Catalase                                          | 59,625                       | 2-527   | Erythrocytes          |               |                       | Phosphorylation                                                  |
| P01031                   | Complement C5/C5a anaphylatoxin                   | 8,563                        | 678-751 | Recombinant           | <i>E.coli</i> | Glutathione on Cys705 |                                                                  |
| P02741                   | C-reactive protein                                | 23,047                       | 19-224  | Plasma                |               |                       |                                                                  |
| P06732                   | Creatine kinase M-type                            | 43,101                       | 1-381   | Heart                 |               |                       | Acetylation<br>Phosphorylation                                   |
| P00167                   | Cytochrome b <sub>5</sub>                         | 16,022                       | 2-134   | Recombinant           | <i>E.coli</i> | N-terminal 6-His      |                                                                  |
| P99999                   | Cytochrome c                                      | 11,618                       | 2-105   | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P05413                   | Fatty acid-binding protein, heart                 | 14,727                       | 2-133   | Heart                 |               |                       | Acetylation<br>Phosphorylation                                   |
| O76070**                 | Gamma-synuclein                                   | 15,363                       | 1-127   | Recombinant           | <i>E.coli</i> | N-terminal 6-His      |                                                                  |
| P06396                   | Gelsolin                                          | 82,959                       | 28-782  | Plasma                |               |                       | Phosphorylation                                                  |
| P08263                   | Glutathione S-transferase A1 (GTH1, HA subunit 1) | 25,500                       | 2-222   | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P09211                   | Glutathione S-transferase P                       | 23,225                       | 2-210   | Placenta              |               |                       |                                                                  |
| P01112                   | GTPase HRas                                       | 21,298                       | 1-189   | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P69905                   | Hemoglobin subunit alpha                          | 15,126                       | 2-142   | Erythrocytes          |               |                       | Acetylation<br>Glycosylation<br>Nitrosylation<br>Phosphorylation |
| P68871                   | Hemoglobin subunit beta                           | 15,867                       | 2-147   | Erythrocytes          |               |                       |                                                                  |
| P12081                   | Histidyl-tRNA synthetase, cytoplasmic             | 58,233                       | 1-509   | Recombinant           | <i>E.coli</i> | C-terminal 6-His      |                                                                  |
| P01344                   | Insulin-like growth factor II (IGF-II)            | 7,475                        | 25-91   | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P01579**                 | Interferon gamma (IFN-gamma)                      | 16,879                       | 23-166  | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P10145                   | Interleukin-8 (IL-8)                              | 8,386                        | 28-99   | Recombinant           | <i>E.coli</i> |                       |                                                                  |
| P02788                   | Lactotransferrin (Lactoferrin)                    | 76,165                       | 20-710  | Milk                  |               |                       | Glycosylation<br>Phosphorylation                                 |
| P41159                   | Leptin                                            | 16,158                       | 22-167  | Recombinant           | <i>E.coli</i> |                       |                                                                  |

| UniProt Accession Number | UniProt Recommended Name (short name)                        | Average MW (Da) (calculated) | Chain    | Source or Recombinant | Host                   | Tag              | Potential PTM*                   |
|--------------------------|--------------------------------------------------------------|------------------------------|----------|-----------------------|------------------------|------------------|----------------------------------|
| P61626                   | Lysozyme C                                                   | 14,701                       | 19-148   | Milk                  |                        |                  |                                  |
| P10636-8                 | Microtubule-associated protein tau                           | 45,719                       | 2-441    | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P02144                   | Myoglobin                                                    | 17,053                       | 2-154    | Heart                 |                        |                  |                                  |
| P15559                   | NAD(P)H dehydrogenase [quinone] 1                            | 30,736                       | 2-274    | Recombinant           | <i>E.coli</i>          |                  |                                  |
| Q15843                   | NEDD8                                                        | 9,072                        | 1-81     | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P62937                   | Peptidyl-prolyl cis-trans isomerase A (PPIase A, Rotamase A) | 20,176                       | 1-165    | Recombinant           | <i>E.coli</i>          | N-terminal 6-His |                                  |
| Q06830                   | Peroxiredoxin 1                                              | 21,979                       | 2-199    | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P01127                   | Platelet-derived growth factor subunit B (PDGF subunit B)    | 12,294                       | 81-190   | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P01133                   | Pro-epidermal growth factor (EGF)/Epidermal growth factor    | 6,353                        | 971-1023 | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P02753                   | Retinol-binding protein 4                                    | 21,071                       | 19-201   | Urine                 |                        |                  |                                  |
| P02787                   | Serotransferrin (Transferrin)                                | 75,181                       | 20-698   | Plasma                |                        |                  | Phosphorylation<br>Glycosylation |
| P02768                   | Serum albumin                                                | 66,357                       | 26-609   | Recombinant           | <i>Pichia pastoris</i> |                  |                                  |
| P63165                   | Small ubiquitin-related modifier 1 (SUMO-1)                  | 38,815                       | 1-97     | Recombinant           | <i>E.coli</i>          | N-terminal GST   |                                  |
| P63279                   | SUMO-conjugating enzyme UBC9                                 | 18,007                       | 1-158    | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P00441                   | Superoxide dismutase [Cu-Zn]                                 | 15,805                       | 2-154    | Erythrocytes          |                        |                  | Acetylation<br>Phosphorylation   |
| P10599                   | Thioredoxin (Trx)                                            | 12,429                       | 2-105    | Recombinant           | <i>E.coli</i>          | N-terminal 6-His |                                  |
| P01375                   | Tumor necrosis factor/Tumor necrosis factor, soluble form    | 17,353                       | 77-233   | Recombinant           | <i>E.coli</i>          |                  |                                  |
| P62988                   | Ubiquitin                                                    | 10,597                       | 1-76     | Recombinant           | <i>E.coli</i>          | N-terminal 6-His |                                  |
| O00762                   | Ubiquitin-conjugating enzyme E2 C                            | 20,475                       | 1-179    | Recombinant           | <i>E.coli</i>          | N-terminal 6-His |                                  |
| P51965                   | Ubiquitin-conjugating enzyme E2 E1                           | 22,227                       | 1-193    | Recombinant           | <i>E.coli</i>          | N-terminal 6-His |                                  |

\* As reported in UniProt. Potential PTM have not been verified.

\*\* Permanently replaced proteins P07339 and P08311, previously supplied with UPS1.

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