

## Product Information

### Universal Proteomics Standard (UPS) Set

Catalog Number **UPS1**  
Storage Temperature  $-20^{\circ}\text{C}$

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

## TECHNICAL BULLETIN

### Product Description

The Universal Proteomics Standard (UPS) Set is comprised of one vial containing 48 human source or human sequence recombinant proteins (Catalog Number U6133), and one vial (20  $\mu\text{g}$ ) of Proteomics Grade Trypsin (Catalog Number T6567). The total protein content in each vial is 6  $\mu\text{g}$ , 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 [sigma.com/ups](http://sigma.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	1 vial
6 $\mu\text{g}$ of total protein containing 5 pmoles each of 48 human proteins, dried in a 2 ml vial	
Catalog Number U6133	
Proteomics Grade Trypsin lyophilized enzyme	20 $\mu\text{g}$
Catalog Number T6567	

### Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material 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/Stability

The set ships in wet ice and storage at  $-20^{\circ}\text{C}$  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 2<sup>nd</sup> Annual Conference, Boston, MA, March 11-15, 2006.
3. UniProt (Universal Protein Resource), © 2009 by UniProt Consortium. <http://www.uniprot.org/>

UniProt Accession Number <sup>3</sup>	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 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	1-195	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			
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 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			Glycosylation Phosphorylation
P68871	Hemoglobin subunit beta	15,867	2-147	Erythrocytes			Acetylation Glycosylation Nitrosylation Phosphorylation
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>		

UniProt Accession Number <sup>3</sup>	UniProt Recommended Name (Short name)	Average MW (Da) (calculated)	Chain	Source or recombinant	Host	Tag	Potential PTM*
P10145	Interleukin-8 (IL-8)	8,386	28-99	Recombinant	<i>E. coli</i>		
P02788	Lactotransferrin (Lactoferrin)	76,165	20-710	Milk			Glycosylation Phosphorylation
P41159	Leptin	16,158	22-167	Recombinant	<i>E. coli</i>		
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 (PPlase 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	82-190	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	21071	19-201	Urine			
P16083	Ribosyl-dihydropyridine dehydrogenase [quinone]	25,821	2-231	Recombinant	<i>E. coli</i>		
P02787	Serotransferrin (Transferrin)	75,181	20-698	Plasma			Phosphorylation 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 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 by Sigma

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

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