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MATERIAL DATA SHEET

Recombinant Human Ubiquitin 13C/15N-labeled
Cat. # U-700

Ubiquitin is a 76 amino acid (aa) protein that is ubiquitously expressed in all eukaryotic organisms. Ubiquitin is highly conserved with 96% aa sequence identity shared between human and yeast Ubiquitin, and 100% aa sequence identity shared between human and mouse Ubiquitin (1). In mammals, four Ubiquitin genes encode for two Ubiquitin-ribosomal fusion proteins and two poly-Ubiquitin proteins. Cleavage of the Ubiquitin precursors by deubiquitinating enzymes gives rise to identical Ubiquitin monomers each with a predicted molecular weight of 8.6 kDa. Conjugation of Ubiquitin to target proteins involves the formation of an isopeptide bond between the C-terminal glycine residue of Ubiquitin and a lysine residue in the target protein. This process of conjugation, referred to as ubiquitination or ubiquitylation, is a multi-step process that requires three enzymes: a Ubiquitin-activating (E1) enzyme, a Ubiquitin-conjugating (E2) enzyme, and a Ubiquitin ligase (E3). Ubiquitination is classically recognized as a mechanism to target proteins for degradation and as a result, Ubiquitin was originally named ATP-dependent Proteolysis Factor 1 (APF-1) (2,3). In addition to protein degradation, ubiquitination has been shown to mediate a variety of biological processes such as signal transduction, endocytosis, and post-endocytic sorting (4-7).

Isotopically labeled Ubiquitin is useful in determining total cellular concentrations of Ubiquitin, or determining the ratio of free Ubiquitin to poly-Ubiquitin chains using the protein standard absolute quantification (PSAQ) or related methods. Highly purified $^{13}C/^{15}N$ labeled Ubiquitin processed for the quantitative removal of glycine and buffer salts which can interfere with chemical and *in vitro* reactions.

Product Information	
Quantity:	100 µg
MW:	9.039 kDa
Source:	*E. coli*-derived Accession # P0CG47
Stock:	Lyophilized from a solution in deionized water.
Solubility:	Reconstitute at 10 mg/mL in an aqueous solution.
Purity:	>95%, by SDS-PAGE under reducing conditions and visualized by Colloidal Coomassie® Blue stain.

Use & Storage

Use: Mass spectrometry is commonly used to quantitate protein concentrations present in cells. Recombinant Human Ubiquitin-$^{13}C^{15}N$ is ideal for use as an internal recovery standard.

Storage: **Use a manual defrost freezer and avoid repeated freeze-thaw cycles.**

- 12 months from date of receipt, -20 to -70 °C as supplied.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

Literature

References:

1. Sharp, P.M. & W.-H. Li. (1987) Trends Ecol. Evol. **2**:328.
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3. Hershko, A. *et al*. (1980) Proc. Natl. Acad. Sci. USA **77**:1783.
4. Greene, W. *et al*. (2012) PLoS Pathog. **8**:e1002703.
5. Tong, X. *et al*. (2012) J. Biol. Chem. **287**:25280.
6. Wei, W. *et al*. (2004) Nature **428**:194.
7. Wertz, I.E. *et al*. (2004) Nature **430**:694.

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