

Product Specification Sheet

Product: IgG fraction of Anti-SUMO (Human) (Rabbit)

Code: 200-401-441

Lot #: 13035

Size: 500 µg

Physical State: Lyophilized

Antibody Concentration: 5.0 mg/ml (by UV absorbance at 280 nm)

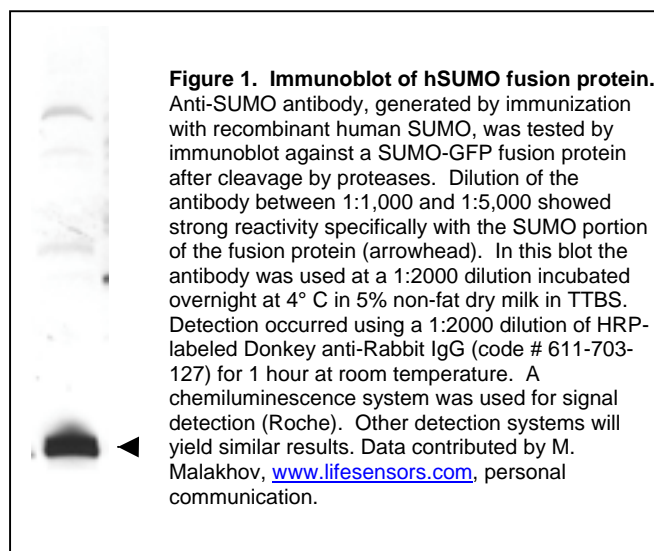
Buffer: 0.02 M Potassium Phosphate, 0.15 M Sodium Chloride, pH 7.2

Stabilizer: None

Preservative: 0.01% (w/v) Sodium Azide

Storage Conditions: Store vial at 4° C prior to restoration. Restore with 0.1 ml of deionized water (or equivalent). For extended storage aliquot contents and freeze at -20° C or below. Avoid cycles of freezing and thawing. Centrifuge product if not completely clear after standing at room temperature. This product is stable for several weeks at 4° C as an undiluted liquid. Dilute only prior to immediate use. Expiration date is one (1) year from date of restoration.

Background Information: Covalent modification of cellular proteins by the ubiquitin-like modifier SUMO (small ubiquitin-like modifier) regulates various cellular processes, such as nuclear transport, signal transduction, stress responses and cell cycle progression. But, in contrast to ubiquitination, sumoylation does not tag proteins for degradation by the 26S proteasome, but rather seems to enhance stability or modulate their subcellular compartmentalization. Ubiquitin-like proteins fall into two classes: the first class, ubiquitin-like modifiers (UBLs) function as modifiers in a manner analogous to that of ubiquitin. Examples of UBLs are SUMO, Rub1 (also called Nedd8), Apg8 and Apg12. Proteins of the second class include parkin, RAD23 and DSK2, are designated ubiquitin-domain proteins (UDPs). These proteins contain domains that are related to ubiquitin but are otherwise unrelated to each other. In contrast to UBLs, UDPs are not conjugated to other proteins. Once covalently attached to cellular targets, SUMO regulates protein:protein and protein:DNA interactions, as well as localization and stability of the target protein. Sumoylation occurs in most eukaryotic systems, and SUMO is highly conserved from yeast to humans. Where invertebrates have only a single *SUMO* gene termed *SMT3*, three members of the SUMO family have been identified in vertebrates: SUMO-1 and the close homologues SUMO-2 and SUMO-3. SUMO has been called SMT3 (yeast), sentrin, PIC1, GMP1 and UBL1. SUMO has been shown to bind and regulate mammalian SP-RINGs (such as Mdm2, PIAS and PML), RanGAP1, RanBP2, p53, p73, HIPK2, TEL, c-Jun, Fas, Daxx, TNFRI, Topo-I, Topo-II, WRN, Sp100, IκB-α, Androgen receptor (AR), GLUT1/4, Drosophila Ttk69, Dorsal, CaMK, yeast Septins, and viral CMV-IE1/2, EBV-BZLF1, HPV/BPV-E1. These bindings implicate SUMO in the stabilization of the target proteins and/or their localization to subcellular complexes. SUMO has an apparent molecular weight of ~12kDa and human SUMO-1 (a 101 amino acid polypeptide) shares 50% sequence identity with SUMO-2 and SUMO-3 and with yeast SMT3. SUMO and ubiquitin only show about 18% homology, but both possess a common three-dimensional structure characterized by a tightly packed globular fold with β-sheets wrapped around an α-helix.



Application Note(s): This purified polyclonal antibody reacts with human SUMO by western blot and ELISA. Although not tested, this antibody is likely functional in immunohistochemistry and immunoprecipitation. This antibody using the specified conditions may recognize other prominent intrinsic bands (UBLs or conjugates). Other intrinsic bands are readily detectable at lower dilutions.

Recommended Dilution(s): For immunoblotting a 1:2,000 dilution is recommended. An 11.6 kDa band corresponding to human SUMO is detected. Most human cell lysates can be used as a positive control without induction or stimulation. For ELISA a 1:4,000 to 1:20,000 dilution is recommended. Researchers should determine optimal titers for other applications.

Purity and Specificity: This product is an IgG fraction antibody purified from monospecific antiserum by a multi-step process which includes delipidation, salt fractionation and ion exchange chromatography followed by extensive dialysis against the buffer stated above. Assay by immunoelectrophoresis resulted in a single precipitin arc against anti-Rabbit Serum.

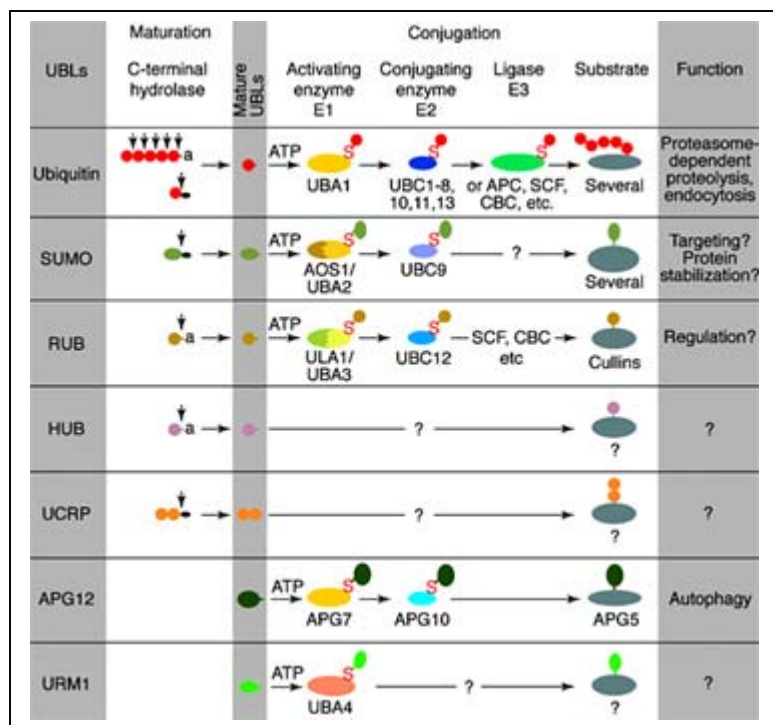


Figure 2. Conjugation pathways for ubiquitin and ubiquitin-like modifiers (UBLs). Most modifiers mature by proteolytic processing from inactive precursors (a; amino acid). Arrowheads point to the cleavage sites. Ubiquitin is expressed either as polyubiquitin or as a fusion with ribosomal proteins. Conjugation requires activating (E1) and conjugating (E2) enzymes that form thioesters (S) with the modifiers. Modification of cullins by RUB involves SCF(SKP1/cullin-1/F-box protein)/CBC(cullin-2/elongin B/elonginC) -like E3 enzymes that are also involved in ubiquitination. In contrast to ubiquitin, the UBLs do not seem to form multi-UBL chains. UCRP(ISG15) resembles two ubiquitin moieties linked head-to-tail. Whether HUB1 functions as a modifier is currently unclear. APG12 and URM1 are distinct from the other modifiers because they are unrelated in sequence to ubiquitin. Data contributed by S.Jentsch, see references below.

Immunogen: This purified antibody was prepared from rabbit serum after repeated immunizations with recombinant human SUMO protein.

Related Link(s):

UBL [protein-protein interactions](http://depts.washington.edu/sfields/yplm/data/Nature.html) in *S.cerevisiae*. (<http://depts.washington.edu/sfields/yplm/data/Nature.html>)

Reference(s):

- Muller, S., Hoegge, C., Pyrowolakis, G. and Jentsch, S. (2001) SUMO, ubiquitin's mysterious cousin. *Nat Rev Mol Cell Biol*, **2**(3): 202-10.
- Hochstrasser, M. (2001) SP-RING for SUMO: new functions bloom for a ubiquitin-like protein. *Cell*, **107**(1): 5-8.
- Kahyo, T., Nishida, T. and Yasuda, H. (2001) Involvement of PIAS1 in the sumoylation of tumor suppressor p53. *Mol Cell*, **8**(3) 713-8.
- Takahashi, Y., Kahyo, T., Toh-E, A., Yasuda, H. and Kikuchi, Y. (2001) Yeast Ubl1/Siz1 is a novel SUMO1/Smt3 ligase for septin components and functions as an adaptor between conjugating enzyme and substrates. *J Biol Chem* **276**(52): 48973-7.
- Yeh, E.T., Gong, L. and Kamitani, T. (2000) Ubiquitin-like proteins: new wines in new bottles. *Gene*, **248**(1-2):1-14.
- Keane, M.M., Etenberg, S.A., Nau, M.M., Banerjee, P., Cuello, M., Penninger, J., and Lipkowitz, S. (1999) cbl-3: a new mammalian cbl family protein. *Oncogene*, **18**(22):3365-75.
- Liakopoulos D et al. (1998). A novel protein modification pathway related to the ubiquitin system. *EMBO J*. **15**;17(8):2208-14.
- Jentsch S, Pyrowolakis G. (2000) Ubiquitin and its kin: how close are the family ties? *Trends Cell Biol*. **10**(8):335-42.

Related Product(s):

#200-401-427	IgG fraction of Anti-Rub1 (Yeast) (Rabbit)	#200-401-441	IgG fraction of Anti-SUMO (Human) (Rabbit)
#200-401-428	IgG fraction of Anti-SUMO (Yeast) (Rabbit)	#200-401-442	IgG fraction of Anti-HUB1 (Yeast) (Rabbit)
#200-401-431	IgG fraction of Anti-UBIQUITIN (Rabbit)	#200-401-443	IgG fraction of Anti-URM1 (Yeast) (Rabbit)
#200-401-437	IgG fraction of Anti-APG12 (Yeast) (Rabbit)	#611-703-127	HRP Anti-Rabbit IgG [H&L] MX10 (DONKEY)
#200-401-438	IgG fraction of Anti-ISG15 (Human) (Rabbit)	#611-132-122	IRDye800 Anti-Rabbit IgG [H&L] MX10 (GOAT)
#200-401-439	IgG fraction of Anti-APG8 (Yeast) (Rabbit)	#600-101-215	Affinity Purified Anti-GFP MX3 (GOAT)

Note: This product is for research use only and is not intended for therapeutic or diagnostic applications. Please contact a technical service representative for more information.