MATERIAL DATA SHEET

Recombinant Human SUMO3
Cat. # UL-762

Human Small Ubiquitin-like Modifier 3 (SUMO3), also known as SMT3A, is synthesized as a 103 amino acid (aa), propeptide with a predicted 11.5 kDa. SUMO3 contains a two aa C-terminal prosegment. Human SUMO3 shares 83% sequence identity with mouse SUMO3. SUMO3 also has high aa sequence homology to SUMO2 and SUMO4, 87% and 75%, respectively. SUMO3 shares only 47% sequence identity with SUMO1. SUMOs are a family of small, related proteins that can be enzymatically attached to a target protein by a post-translational modification process termed SUMOylation (1-3). All SUMO proteins share a conserved Ubiquitin domain and a C-terminal diglycine cleavage/attachment site. Following prosegment cleavage, the C-terminal glycine residue of SUMO3 is enzymatically attached to a lysine residue on a target protein. In humans, SUMO3 is conjugated to a variety of molecules in the presence of the SAE1/UBA2 SUMO-activating (E1) enzyme and the UBE2I/Ubc9 SUMO-conjugating (E2) enzyme (4,5). In yeast, the SUMO-activating (E1) enzyme is Aos1/Uba2p (6). Because of the high level of sequence homology most studies report effects of SUMO2/3. For example, addition of SUMO2/3 was shown to modulate the function of ARHGAP21, a RhoGAP protein known to be involved in cell migration (7). Other reports indicate that the conjugation by SUMO2/3, but not SUMO1, may represent an important mechanism to protect neurons during episodes of cerebral ischemia (8,9). However, studies suggest that SUMO2/3 expression is regulated in an isoform-specific manner since oxidative stress downregulated the transcription of SUMO3 but not SUMO2 (10).

The ubiquitin-like SUMO-3 is conjugated to a variety of proteins in the presence of UbcH9 and the SAE1/SAE2 (human) or Aos1/Uba2 (yeast) activating enzyme. SUMO-3 is derived from the precursor pro-SUMO-3 (Accession # NM_006936). Human SUMO-3 shares 47% and 87% identity with SUMO-1 and SUMO-2 respectively. SUMOylation can occur without the requirement of a specific E3 ligase activity, where SUMO is transferred directly from UbcH9 to specific substrates. SUMOylated substrates are primarily localized to the nucleus (RanGAP-1,RANBP2, PML, p53, Sp100, HIPK2) but there are also cytosolic substrates (IκBα, GLUT1,GLUT4). SUMO modification has been implicated in functions such as nuclear transport, chromosome segregation, transcriptional regulation, apoptosis, and protein stability.

Product Information

Quantity: 500 µg

MW: 11 kDa

Source: *E. coli*-derived
Accession # NM_006936

Stock: X mg/ml (X µM) in 50 mM HEPES pH 8.0, 150 mM NaCl, 1 mM DTT

Purity: >95%, by SDS-PAGE under reducing conditions and visualized by Colloidal Coomassie® Blue stain.

Use & Storage

Use: Recombinant Human SUMO3 can be conjugated to substrate proteins via the subsequent actions of an SUMO-activating (E1) enzyme, an SUMO-conjugating (E2) enzyme, and an SUMO ligase (E3). Reaction conditions will need to be optimized for each specific application. We recommend an initial Recombinant Human SUMO3 concentration of 10-50 µM.

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

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

Literature

References:

1. Desterro, J.M. *et al*. (1997) FEBs. Lett. **417**:297.
2. Bettermann, K. *et al*. (2012) Cancer Lett. **316**:113.
3. Praefcke, G.J. *et al*. (2012) Trends Biochem. Sci. **37**:23.
4. Okuma, T. *et al*. (1999) Biochem. Biophys. Res. Commun. **254**:693.
5. Tatham, M.H. *et al*. (2001) J. Biol. Chem. **276**:35368.
6. Johnson, E.S. *et al*. (1997) EMBO J. **16**:5509.
7. Bigarella, C.L. *et al*. (2012) FEBS Lett. **586**:3522.
8. Datwyler, A.L. *et al*. (2012) J. Cereb. Blood Flow Metab. **31**:2152.
9. Wang, Z. *et al*. (2012) Protein Expr. Purif. **82**:174.
10. Sang, J. *et al*. (2012) Biochem. J. **435**:489.

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