MATERIAL DATA SHEET

Recombinant Yeast SUMO Activating Enzyme E1 (SAE1/UBA2)
Cat. # E-311

Small Ubiquitin-like Modifier (SUMO) Activating Enzyme Subunit 1 (SAE1) is the highly conserved human ortholog of yeast Ubiquitin-activating enzyme E1-like (UBA2) (1). These SUMO-activating (E1) enzymes are critical for the enzymatic attachment of SUMO molecules to a target protein by a post-translational modification process termed SUMOylation (2-4). The ATP-dependent E1 enzyme charges the SUMO by forming a high-energy thiol ester intermediate which is transferred to the UBE2I/Ubc9 SUMO-conjugating (E2) enzyme (5,6). The second step is the trans-esterification reaction whereby SUMO is transferred to Cys93 of UbcH9. UBE2I/Ubc9 is the only known E2 that is able to mediate the conjugation of SUMO to lysine residues on a variety of cellular targets, usually in the absence of a Ubiquitin ligase (E3). Although UBE2I/Ubc9 can directly recognize and modify lysine residues contained in a SUMOylation motif, E3-like factors most likely facilitate the SUMOylation of specific substrates.

Conjugation of the ubiquitin-like modifier SUMO (Sentrin) requires the activities of the heterodimeric E1 (Aos1/Uba2) and the UbcH9 E2 enzyme. The dimeric activating enzyme utilizes ATP to adenylate the C-terminal glycine residue of SUMO-1 (also SUMO-2 and SUMO-3), forming a high-energy thiolester bond with the cysteine residue of Uba2 and the release of AMP and PPi. The second step is the trans-esterification reaction whereby SUMO-1 is transferred to Cys93 of UbcH9.

Product Information	
Quantity:	25 µg
MW:	39 kDa (SAE1) 72 kDa (UBA2)
Source:	*E. coli*-derived Accession # QO6624, P52488
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: *S. cerevisiae* SUMO E1 (SAE1/UBA2) is a member of the SUMO-activating (E1) enzyme family that is required for the first step of the enzymatic cascade that subsequently utilizes a SUMO-conjugating (E2) enzyme to conjugate SUMO to substrate proteins. A SUMO ligase (E3) is sometimes utilized for SUMO conjugation, but is not always required. Reaction conditions will need to be optimized for each specific application. We recommend an initial *S. cerevisiae* SUMO E1 (SAE1/UBA2) concentration of 50-500 nM.

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. Johnson, E.S. *et al*. (1997) EMBO J. **16**:5509.
2. Desterro, J.M. *et al.* (1997) FEBs. Lett. **417**:297.
3. Bettermann, K. *et al*. (2012) Cancer Lett. **316**:113.
4. Praefcke, G.J. *et al*. (2012) Trends Biochem. Sci. **37**:23.
5. Okuma, T. *et al*. (1999) Biochem. Biophys. Res. Commun. **254**:693.
6. Tatham, M.H. *et al*. (2001) J. Biol. Chem. **276**:35368.

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