PRODUCT INFORMATION

STING H232 variant; SUMO-tagged (human, recombinant)

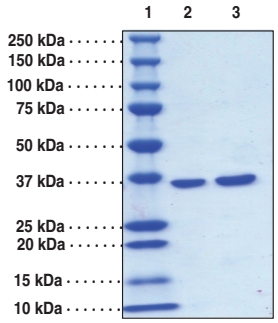
Item No. 15139

Overview and Properties

Synonyms:	ERIS, MITA, MPYS, Stimulator of Interferon Genes, TMEM173
Source:	Recombinant N-terminal histidine- and SUMOpro-tagged protein expressed in *E. coli*. *SUMOpro tag is used under non-exclusive license from LifeSensors, Inc. www.lifesensors.com.*
Amino Acids:	155-341 (N- and C-terminal truncation)
Molecular Weight:	34.5 kDa
Storage:	-80°C (as supplied); avoid freeze/thaw cycles by aliquoting protein
Stability:	≥1 year
Purity:	***batch specific*** (≥95% estimated by SDS-PAGE)
Supplied in:	20 mM Tris, pH 7.5, containing 150 mM sodium chloride and 10% glycerol
Protein Concentration:	***batch specific*** mg/ml
Activity:	Serial dilutions of canonical 3'3'-cGAMP were incubated with 5 µg recombinant human STING H232 variant; SUMO-tagged in 50 mM HEPES, pH 7.5, 150 mM sodium chloride, 10% glycerol, and SYPRO® Orange dye at 4°C.[1] The reaction was read on a BioRad CFX96 Touch™ Real-Time PCR Detection System at 4-100°C.[2] The binding of the ligand stabilizes the protein structure, increasing the melting temperature (T_m), which is detected *via* a thermal shift assay (TSA), also known as a differential scanning fluorimetry (DSF) assay.[2]

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

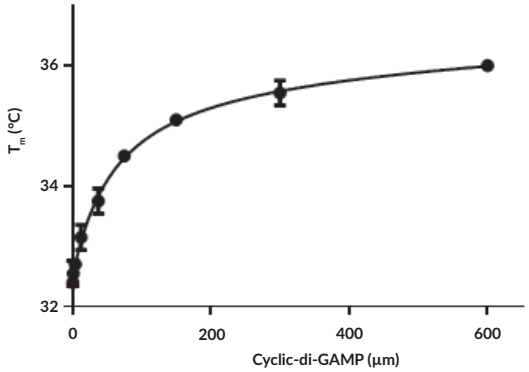
Images



Lane 1: MW Markers
Lane 2: STING H232 variant; SUMO-tagged (1 µg)
Lane 3: STING H232 variant; SUMO-tagged (2 µg)

Representative gel image shown; actual purity may vary between each batch.

Melting Temperature (T_m) of STING with Cyclic-di-GAMP Concentration



Binding Activity of STING R224 variant (human, recombinant). STING H232 variant; SUMO-tagged (human, recombinant) (5 µg) was incubated with serial dilutions of 3'3'-cGAMP (sodium salt) (Item No. 17966) and SYPRO® Orange dye. The detected increase in T_m indicates binding.

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Description

STING H232 variant; SUMO-tagged contains amino acids 155-341 of the H232 variant and a removable N-terminal SUMOpro tag. Stimulator of interferon genes (STING) is a component of the innate immune response that binds to cyclic dinucleotides, which are bacterial second messengers, leading to activation of NF-κB and transcription of immunomodulatory genes, including type I interferon (IFN).[3-6] The H232 variant of STING is found at a 13.7% frequency in the 1000 Genome Project.[7] The SNP variant R232 (Item No. 22816) is the most common variant in the human population, found at a frequency of 57.9%. Small ubiquitin-like modifier (SUMO) proteins modify proteins post-translationally, leading to a variety of functional effects.[8] In unstimulated cells *in vitro*, sumoylation stabilizes STING, inhibits its degradation, and facilitates oligomerization, leading to increased recruitment and activation of IRF3. In the early phase of herpes simplex virus type 1 (HSV-1) infection *in vitro*, dimerized STING is sumoylated by Trim38 and then desumoylated by Senp2 and degraded during the late phase of infection.

References

1. Diner, E.J., Burdette, D.L., Wilson, S.C., et al. The innate immune DNA sensor cGAS produces a noncanonical cyclic dinucleotide that activates human STING. Cell Rep. 3(5), 1355-1361 (2013).
2. Niesen, F.H., Berglund, H., and Vedadi, M. The use of differential scanning fluorimetry to detect ligand interactions that promote protein stability. Nat. Protoc. 2(9), 2212-2221 (2007).
3. Sun, L., Wu, J., Du, F., *et al.* Cyclic GMP-AMP synthase is a cytosolic DNA sensor that activates the type I interferon pathway. *Science* **339(6121)**, 786-791 (2013).
4. Wu, J., Sun, L., Chen, X., *et al.* Cyclic GMP-AMP is an endogenous second messenger in innate immune signaling by cytosolic DNA. *Science* **339(6121)**, 826-830 (2013).
5. Konno, H., Konno, K., and Barber, G.N. Cyclic dinucleotides trigger ULK1 (ATG1) phosphorylation of STING to prevent sustained innate immune signaling. *Cell* **155(3)**, 688-698 (2013).
6. Burdette, D.L., Monroe, K.M., Sotelo-Troha, K., *et al.* STING is a direct innate immune sensor of cyclic-di-GMP. *Nature* **478(7370)**, 515-518 (2011).
7. Yi, G., Brendel, V.P., Shu, C., *et al.* Single nucleotide polymorphisms of human STING can affect innate immune response to cyclic dinucleotides. *PLoS One* **8(10)**, e77846 (2013).
8. Hu, M.M., Yang, Q., Xie, X.Q., *et al.* Sumoylation promotes the stability of the DNA sensor cGAS and the adaptor STING to regulate the kinetics of response to DNA virus. *Immunity* **45(3)**, 555-569 (2016).

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