PRODUCT INFORMATION

SIRT3 (human, recombinant)

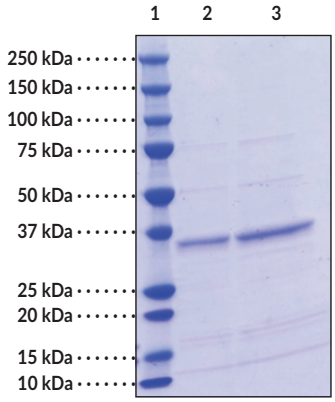
Item No. 10011194

Overview and Properties

Synonyms:	Mitochondrial Nicotinamide Adenine Dinuclear-dependent Deacetylase, NAD-dependent Deacetylase 3, Silent Information Regulator 3, SIR2L3, SIR2-like Protein 3, Sirtuin 3
Source:	Active recombinant N-terminal hexahistidine-tagged enzyme amino acids 101-399, purified from *E. coli*
Amino Acids:	101-399
Uniprot No.:	Q9NTG7
Molecular Weight:	37.0 kDa (theoretical); 33.5 kDa (observed). The identity of SIRT3 protein was confirmed by mass spectrometry.
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	***batch specific*** (≥60% estimated by SDS-PAGE)
Supplied in:	50 mM sodium phosphate, pH 7.2, containing 100 mM sodium chloride and 20% glycerol
Protein Concentration:	***batch specific*** mg/ml
Activity:	***batch specific*** U/ml
Specific Activity:	***batch specific*** U/mg
Unit Definition:	One unit is defined as the amount of enzyme required to produce 1 nmole of 7-amino-4-methylcoumarin per minute at 25°C in 50 mM Tris-HCl, pH 8.0, containing 137 mM NaCl, 2.7 mM KCl, 1 mM $MgCl_2$, 125 µM p53 amino acids 317-320 (Gln-Pro-Lys-Lys(e-acetyl)-AMC), and 6 mM NAD^+

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

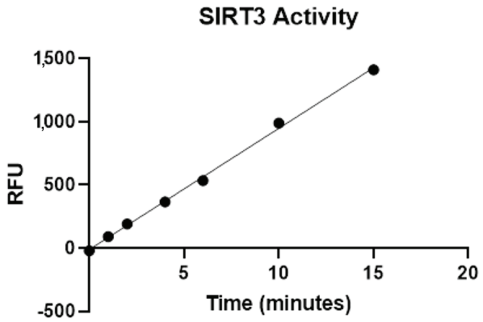
Images



Lane 1: MW Markers
Lane 2: SIRT3 (2 µg)
Lane 3: SIRT3 (4 µg)

SDS-PAGE Analysis of SIRT3.

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



SIRT3 activity was determined using Cayman's SIRT3 Direct Fluorescent Screening Assay Kit (Item No. 10011566).

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Description

The sirtuins (SIRTs) represent a distinct class of trichostatin A-insensitive lysyl-deacetylases (class III HDACs) and have been shown to catalyze a reaction that couples lysine deacetylation to the formation of nicotinamide and O-acetyl-ADP-ribose from NAD^+ and the abstracted acetyl group.[1-3] There are seven human SIRTs, which have been designated SIRT 1-7.[4] SIRT3, is a mitochondrial protein, with its N-terminal 25 amino acid residues responsible for its localization.[5,6] Synthesized as an enzymatically inactive protein, human SIRT3 is activated by a matrix-processing peptidase.[6] Recently, it was demonstrated that SIRT3 is translocated to the mitochondria from the nucleus during cellular stress or by the overexpression of SIRT3 itself.[7] In mice, caloric restriction up-regulates SIRT3 expression levels in white and brown adipose tissue (WAT & BAT). Cold exposure also induces SIRT3 in brown adipose tissue (BAT).[8] The constitutive expression of SIRT3 promotes the expression of PGC-1a, UCP1, and other genes involved in mitochondrial functions, indicating that SIRT3 modulates adaptive thermogenesis in BAT.[8]

References

1. Imai, S.-I., Armstrong, C.M., Kaeberlein, M., *et al.* Transcriptional silencing and longevity protein Sir2 is an NAD-dependent histone deacetylase. *Nature* **403**, 795-800 (2000).
2. Tanner, K.G., Landry, J., Sternglanz, R., *et al.* Silent information regulator 2 family of NAD-dependent histone/protein deacetylases generates a unique product, 1-O-acetyl-ADP-ribose. *Proc. Natl. Acad. Sci. USA* **97(26)**, 14178-14182 (2000).
3. Tanny, J.C. and Moazed, D. Coupling of histone deacetylation to NAD breakdown by the yeast silencing protein Sir2: Evidence for acetyl transfer from substrate to an NAD breakdown product. *Proc. Natl. Acad. Sci. USA* **98(2)**, 415-420 (2001).
4. Frye, R.A. Phylogenetic classification of prokaryotic and eukaryotic Sir2-like proteins. *Biochem. Biophys. Res. Commun.* **273**, 793-798 (2000).
5. Onyango, P., Celic, I., McCaffery, J.M., *et al.* SIRT3, a human SIR2 homologue, is an NAD-dependent deacetylase localized to mitochondria. *Proc. Natl. Acad. Sci. USA* **99(21)**, 13653-13658 (2002).
6. Schwer, B., North, B.J., Frye, R.A., *et al.* The human silent information regulator (Sir)2 homologue hSIRT3 is a mitochondrial nicotinamide adenine dinucleotide-dependent deacetylase. *J. Cell Biol.* **158(4)**, 647-657 (2002).
7. Scher, M.B., Vaquero, A., and Reinberg, D. SirT3 is a nuclear NAD^+-dependent histone deacetylase that translocates to the mitochondria upon cellular stress. *Genes Dev.* **21**, 920-928 (2007).
8. Shi, T., Wang, F., Stieren, E., *et al.* SIRT3, a mitochondrial sirtuin deacetylase, regulates mitochondrial function and thermogenesis in brown adipocytes. *J. Biol. Chem.* **280(14)**, 13560-13567 (2005).

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