Revision 1

#5490 Store at -20C

SirT3 (D22A3) Rabbit mAb

Cell Signaling TECHNOLOGY®

Orders: 877-616-CELL (2355) orders@cellsignal.com

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Web: info@cellsignal.com cellsignal.com

3 Trask Lane | Danvers | Massachusetts | 01923 | USA

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Applications:	Reactivity:	Sensitivity:	MW (kDa):	Source/Isotype:	UniProt ID:	Entrez-Gene Id:
WB, IP	H M R	Endogenous	28	Rabbit IgG	#Q8R104	64384

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunoprecipitation	1:100

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at –20°C. Do not aliquot the antibody.

Specificity / Sensitivity

SirT3 (D22A3) Rabbit mAb detects endogenous levels of total SirT3 protein.

Source / Purification

Monoclonal antibody is produced by immunizing animals with a synthetic peptide corresponding to residues surrounding Val130 of mouse SirT3 isoform S.

Background

The Silent Information Regulator (SIR2) family of genes is a highly conserved group of genes that encode nicotinamide adenine dinucleotide (NAD)-dependent protein deacetylases, also known as Class III histone deacetylases. The first discovered and best characterized of these genes is *Saccharomyces cerevisiae* Sir2, which is involved in silencing of mating type loci, telomere maintenance, DNA damage response and cell aging (1). SirT3, a mammalian homolog of Sir2, exists in human cells in two forms. The full-length 44 kDa protein localizes to the nucleus, while a processed 28 kDa protein lacking 142 amino terminal residues localizes exclusively to the mitochondria (2-4). The single murine form of SirT3 is equivalent to the processed human SirT3 protein (2). Full-length SirT3 protein is processed in the mitochondrial matrix by the mitochondrial matrix processing peptidase (MMP) (3). Both full-length and processed forms of SirT3 are enzymatically active and de-acetylate histone H3 at Lys9 and histone H4 at Lys16 *in vitro* (2). SirT3 also de-acetylates Lys642 of acetyl-CoA synthetase 2 (AceCS2) and activates AceCS2 activity in the mitochondria (5). Restricted caloric intake, which is linked to increased lifespan in multiple organisms, increases SirT3 expression in white and brown adipocytes of obese mice, suggesting a role for SirT3 in aging (6). Two observations implicate SirT3 in the regulation of mitochondrial thermogenesis. First, exposure to cold temperatures increases SirT3 expression in brown adipocytes, while elevated temperatures reduce SirT3 expression (6). Second, over-expression of SirT3 results in increased levels of the mitochondrial uncoupling protein 1 (UCP1) (6). SirT3 protein levels are also elevated in certain breast cancers (7).

Background References

1. Guarente, L. (1999) *Nat Genet* 23, 281-5.
2. Scher, M.B. et al. (2007) *Genes Dev* 21, 920-8.
3. Schwer, B. et al. (2002) *J Cell Biol* 158, 647-57.
4. Onyango, P. et al. (2002) *Proc Natl Acad Sci USA* 99, 13653-8.
5. Schwer, B. et al. (2006) *Proc Natl Acad Sci USA* 103, 10224-9.
6. Shi, T. et al. (2005) *J Biol Chem* 280, 13560-7.
7. Ashraf, N. et al. (2006) *Br J Cancer* 95, 1056-61.

Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

Applications Key

WB: Western Blotting **IP:** Immunoprecipitation

Cross-Reactivity Key

H: human **M:** mouse **R:** rat **Hm:** hamster **Mk:** monkey **Vir:** virus **Mi:** mink **C:** chicken **Dm:** D. melanogaster
X: Xenopus **Z:** zebrafish **B:** bovine **Dg:** dog **Pg:** pig **Sc:** S. cerevisiae **Ce:** C. elegans **Hr:** horse
GP: Guinea Pig **Rab:** rabbit **All:** all species expected

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