SANTA CRUZ BIOTECHNOLOGY, INC.

NRF-1 (147.1): sc-101102

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

Nuclear respiratory factor-1 (NRF-1) is a transcriptional activator that has been implicated in the nuclear control of respiratory chain expression in mammalian cells. The NRF-1 gene is expressed during oogenesis and during the early stages of embryogenesis. *In vitro* studies have implicated NRF-1 in the transcriptional expression of nuclear genes required for mitochondrial respiratory function, as well as for other fundamental cellular activities. While most isolated wild-type and NRF-$1^{+/-}$ blastocysts continue to develop normally *in vitro,* NRF-$1^{-/-}$ blastocysts lack this ability, despite their normal morphology. NRF-1 is specifically required in the maintenance of mtDNA and respiratory chain function during early embryogenesis. NRF-1 also plays a key role in cellular adaptation to energy demands by translating physiological signals into an increased capacity for generating energy. Additionally, NRF-1 is a major transcription factor that binds the promoter in brain and testis.

REFERENCES

1. Huo, L. and Scarpulla, R.C. 1999. Multiple 5'-untranslated exons in the nuclear respiratory factor 1 gene span 47 kb and contribute to transcript heterogeneity and translational efficiency. Gene 233: 213-224.
2. Li, B., et al. 1999. Respiratory uncoupling induces δ-aminolevulinate synthase expression through a nuclear respiratory factor-1-dependent mechanism in HeLa cells. J. Biol. Chem. 25: 17534-17540.

CHROMOSOMAL LOCATION

Genetic locus: NRF1 (human) mapping to 7q32.2; Nrf1 (mouse) mapping to 6 A3.3.

SOURCE

NRF-1 (147.1) is a mouse monoclonal antibody raised against recombinant NRF-1 of human origin.

PRODUCT

Each vial contains 50 µg IgG_1 kappa light chain in 0.5 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

NRF-1 (147.1) is recommended for detection of NRF-1 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for NRF-1 siRNA (h): sc-38105, NRF-1 siRNA (m): sc-38106, NRF-1 shRNA Plasmid (h): sc-38105-SH, NRF-1 shRNA Plasmid (m): sc-38106-SH, NRF-1 shRNA (h) Lentiviral Particles: sc-38105-V and NRF-1 shRNA (m) Lentiviral Particles: sc-38106-V.

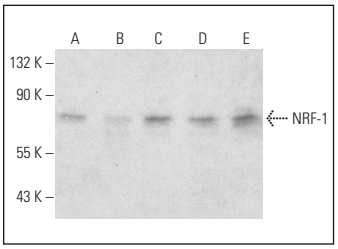
Molecular Weight of NRF-1: 68 kDa.

Positive Controls: Hep G2 cell lysate: sc-2227, U-2 OS cell lysate: sc-2295 or C2C12 whole cell lysate: sc-364188.

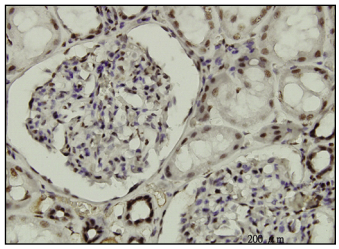
STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

DATA



NRF-1 (147.1): sc-101102. Western blot analysis of NRF-1 expression in A-431 (**A**), HeLa (**B**), Hep G2 (**C**), U-2 OS (**D**) and C2C12 (**E**) whole cell lysates.



NRF-1 (147.1): sc-101102. Immunoperoxidase staining of formalin-fixed, paraffin-embedded human kidney tissue showing nuclear localization.

SELECT PRODUCT CITATIONS

1. Wallerman, O., et al. 2009. Molecular interactions between HNF4a, FOXA2 and GABP identified at regulatory DNA elements through ChIP-sequencing. Nucleic Acids Res. 37: 7498-7508.
2. Zhao, L., et al. 2015. miR-504 mediated down-regulation of nuclear respiratory factor 1 leads to radio-resistance in nasopharyngeal carcinoma. Oncotarget 6: 15995-16018.
3. Wu, J., et al. 2016. Nuclear respiratory factor 1 overexpression attenuates anti-benzopyrene-7,8-diol-9,10-epoxide-induced S-phase arrest of bronchial epithelial cells. Mol. Med. Rep. 13: 4372-4378.
4. Patton, M.G., et al. 2018. Heat acclimation increases mitochondrial respiration capacity of C2C12 myotubes and protects against LPS-mediated energy deficit. Cell Stress Chaperones 23: 871-883.
5. Salehpour, F., et al. 2019. Photobiomodulation and coenzyme Q_{10} treatments attenuate cognitive impairment associated with model of transient global brain ischemia in artificially aged mice. Front. Cell. Neurosci. 13: 74.
6. Alam, C., et al. 2020. Nuclear respiratory factor 1 (NRF-1) upregulates the expression and function of reduced folate carrier (RFC) at the blood-brain barrier. FASEB J. 34: 10516-10530.
7. Zhang, P., et al. 2021. CoQ10 protects against acetaminophen-induced liver injury by enhancing mitophagy. Toxicol. Appl. Pharmacol. 410: 115355.
8. Rajasekaran, N., et al. 2021. Nuclear respiratory factor-1, a novel SMAD4 binding protein, represses TGF-β/SMAD4 signaling by functioning as a transcriptional cofactor. Int. J. Mol. Sci. 22: 5595.
9. Zhang, Z., et al. 2021. Pioglitazone inhibits diabetes-induced atrial mitochondrial oxidative stress and improves mitochondrial biogenesis, dynamics, and function through the PPAR-γ/PGC-1α signaling pathway. Front. Pharmacol. 12: 658362.

RESEARCH USE

For research use only, not for use in diagnostic procedures.