SANTA CRUZ BIOTECHNOLOGY, INC.

RNA pol α (4RA2): sc-101597

BACKGROUND

RNA polymerase transcribes DNA to synthesize RNA using the four ribonucleoside triphosphates as substrates. In prokaryotes, a catalytic core known as RNAP is formed from α, β and ω RNA pol subunits that, once complexed, can initiate transcription. RNA pol α, also known as rpoA, pez, phs or sez, is a 329 amino acid *E. coli* protein that belongs to the RNA polymerase α chain family. Functioning as a homodimer that interacts with other RNA pol subunits, such as RNA pol β, RNA pol α catalyzes the transcription of DNA into RNA, converting a nucleoside triphosphate into a diphosphate. While the C-terminal domain of RNA pol α is involved in promotor activation and is responsible for interacting with a variety of transcriptional regulators, the N-terminal domain is essential for proper RNAP assembly and initiation of basal transcription.

REFERENCES

1. Missiakas, D. and Raina, S. 1998. The extracytoplasmic function sigma factors: role and regulation. Mol. Microbiol. 28: 1059-1066.
2. Zhang, G. and Darst, S.A. 1998. Structure of the *Escherichia coli* RNA polymerase alpha subunit amino-terminal domain. Science 281: 262-266.
3. Dangi, B., et al. 2004. Versatility of the carboxy-terminal domain of the α subunit of RNA polymerase in transcriptional activation: use of the DNA contact site as a protein contact site for MarA. Mol. Microbiol. 54: 45-59.
4. Weber, K.D., et al. 2005. Additional determinants within *Escherichia coli* FNR activating region 1 and RNA polymerase α subunit required for transcription activation. J. Bacteriol. 187: 1724-1731.
5. Gregory, B.D., et al. 2005. An artificial activator that contacts a normally occluded surface of the RNA polymerase holoenzyme. J. Mol. Biol. 353: 497-506.
6. Maurer, S., et al. 2006. RNA polymerase and an activator form discrete subcomplexes in a transcription initiation complex. EMBO J. 25: 3784-3790.
7. Reppas, N.B., et al. 2006. The transition between transcriptional initiation and elongation in *E. coli* is highly variable and often rate limiting. Mol. Cell 24: 747-757.
8. Kedzierska, B., et al. 2007. The C-terminal domain of the *Escherichia coli* RNA polymerase α subunit plays a role in the CI-dependent activation of the bacteriophage λ pM promoter. Nucleic Acids Res. 35: 2311-2320.
9. Davis, C.A., et al. 2007. Real-time footprinting of DNA in the first kinetically significant intermediate in open complex formation by *Escherichia coli* RNA polymerase. Proc. Natl. Acad. Sci. USA 104: 7833-7838.

SOURCE

RNA pol α (4RA2) is a mouse monoclonal antibody raised against RNA polymerase α of *E. coli* origin, with epitope mapping to amino acids 209-329.

STORAGE

For immediate and continuous use, store at 4° C for up to one month. For sporadic use, freeze in working aliquots in order to avoid repeated freeze/thaw cycles. If turbidity is evident upon prolonged storage, clarify solution by centrifugation.

PRODUCT

Each vial contains 100 µl ascites containing IgG_1 with PBS and < 0.1% sodium azide.

APPLICATIONS

RNA pol α (4RA2) is recommended for detection of RNA polymerase α of *E. coli* origin by Western Blotting (starting dilution to be determined by researcher, dilution range 1:100-1:5000) and immunoprecipitation [1-2 µl per 100-500 µg of total protein (1 ml of cell lysate)]; may cross-react with most Gram-negative bacteria and with some Gram-positive bacteria.

Molecular Weight of RNA pol α: 37 kDa.

SELECT PRODUCT CITATIONS

1. Xiao, J., et al. 2013. *Edwardsiella tarda* mutant disrupted in type III secretion system and chorismic acid synthesis and cured of a plasmid as a live attenuated vaccine in turbot. Fish Shellfish Immunol. 35: 632-641.
2. Izard, J., et al. 2015. A synthetic growth switch based on controlled expression of RNA polymerase. Mol. Syst. Biol. 11: 840.
3. Zhang, Y., et al. 2015. HflX is a ribosome-splitting factor rescuing stalled ribosomes under stress conditions. Nat. Struct. Mol. Biol. 22: 906-913.
4. Wang, Q., et al. 2015. A genome-wide screen reveals that the *Vibrio cholerae* phosphoenolpyruvate phosphotransferase system modulates virulence gene expression. Infect. Immun. 83: 3381-3395.
5. Hatzios, S.K., et al. 2016. Chemoproteomic profiling of host and pathogen enzymes active in cholera. Nat. Chem. Biol. 12: 268-274.

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.