

# RNA pol $\sigma$ E (1RE53): sc-101600

## 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  $\alpha$ ,  $\beta$  and  $\sigma$  RNA pol subunits that, once complexed, can initiate transcription. RNA pol  $\sigma$  E, also known as rpoE, sigE, ECK2571 or JW2557, is a 191 amino acid *E. coli* protein that belongs to the  $\sigma$ -70 factor family of stress-sensing peptides. Functioning as an extracytoplasmic stress factor, RNA pol  $\sigma$  E is involved in protein processing and, by mediating protein folding, plays an important role in cellular responses to heat shock and oxidative stress. While RNA pol  $\alpha$  and  $\beta$  subunits function primarily to initiate transcription,  $\sigma$  subunits, including RNA pol  $\sigma$  E, are essential for the synthesis and proper folding of outer membrane proteins.

## REFERENCES

1. Missiakas, D. and Raina, S. 1998. The extracytoplasmic function  $\sigma$  factors: role and regulation. *Mol. Microbiol.* 28: 1059-1066.
2. Kabir, M.S., Yamashita, D., Noor, R. and Yamada, M. 2004. Effect of  $\sigma$  S on  $\sigma$  E-directed cell lysis in *Escherichia coli* early stationary phase. *J. Mol. Microbiol. Biotechnol.* 8: 189-194.
3. Onufryk, C., Crouch, M.L., Fang, F.C. and Gross, C.A. 2005. Characterization of six lipoproteins in the  $\sigma$  E regulon. *J. Bacteriol.* 187: 4552-4561.
4. Redford, P. and Welch, R.A. 2006. Role of  $\sigma$  E-regulated genes in *Escherichia coli* uropathogenesis. *Infect. Immun.* 74: 4030-4038.
5. Button, J.E., Silhavy, T.J. and Ruiz, N. 2007. A suppressor of cell death caused by the loss of  $\sigma$  E downregulates extracytoplasmic stress responses and outer membrane vesicle production in *Escherichia coli*. *J. Bacteriol.* 189: 1523-1530.
6. Thompson, K.M., Rhodius, V.A. and Gottesman, S. 2007.  $\sigma$  E regulates and is regulated by a small RNA in *Escherichia coli*. *J. Bacteriol.* 189: 4243-4256.
7. Udekwi, K.I. and Wagner, E.G. 2007.  $\sigma$  E controls biogenesis of the anti-sense RNA MicA. *Nucleic Acids Res.* 35: 1279-1288.
8. Johansen, J., Eriksen, M., Kallipolitis, B. and Valentin-Hansen, P. 2008. Down-regulation of outer membrane proteins by noncoding RNAs: unravelling the cAMP-CRP- and  $\sigma$  E-dependent CyaR-ompX regulatory case. *J. Mol. Biol.* 383: 1-9.
9. Hayden, J.D. and Ades, S.E. 2008. The extracytoplasmic stress factor,  $\sigma$  E, is required to maintain cell envelope integrity in *Escherichia coli*. *PLoS ONE* 3: e1573.

## SOURCE

RNA pol  $\sigma$  E (1RE53) is a mouse monoclonal antibody raised against RNA pol  $\sigma$  E of *E. coli* origin.

## PRODUCT

Each vial contains 100  $\mu$ l ascites containing IgG<sub>1</sub> with < 0.1% sodium azide.

## RESEARCH USE

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

## APPLICATIONS

RNA pol  $\sigma$  E (1RE53) is recommended for detection of RNA pol  $\sigma$  E of *E. coli* origin by Western Blotting (starting dilution to be determined by researcher, dilution range 1:100-1:5000) and immunoprecipitation [1-2  $\mu$ l per 100-500  $\mu$ g of total protein (1 ml of cell lysate)]; may cross-react with *Pseudomonas*; non cross-reactive with other *E. coli*  $\sigma$  factors.

Molecular Weight of RNA pol  $\sigma$  E: 22 kDa.

## SELECT PRODUCT CITATIONS

1. Wu, X.F., Liu, W.T., Liu, Y.P., Huang, Z.J., Zhang, Y.K. and Song, X.J. 2011. Reopening of ATP-sensitive potassium channels reduces neuropathic pain and regulates astroglial gap junctions in the rat spinal cord. *Pain* 152: 2605-2615.
2. Zhu, H.J., Ding, X.M., Zou, J.G., Hou, X.F. and Cao, K.J. 2012. Impaired N-cadherin-mediated adhesion increases the risk of inducible ventricular arrhythmias in isolated rat hearts. *Sci. Res. Essays* 7: 2983-2991.
3. O'Carroll, S.J., Gorrie, C.A., Velamoor, S., Green, C.R. and Nicholson, L.F. 2013. Connexin43 mimetic peptide is neuroprotective and improves function following spinal cord injury. *Neurosci. Res.* 75: 256-267.

## 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.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.