

PRODUCT DATA SHEET

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Product name(s):	p53, GST-tagged (human, recombinant)
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Catalogue number:	FW9370	Batch number:	Z05962	Expiry date:	6 months from receipt
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Product information:

p53 is a much studied and complex multifunctional protein¹, which acts as a tumor suppressor in many tumor types and induces growth arrest or apoptosis depending on the physiological circumstances and cell type. It is involved in cell cycle regulation as a trans-activator that acts to negatively regulate cell division by controlling a set of genes required for this process. One of the activated genes is an inhibitor of cyclin-dependent kinases. Apoptosis induction appears to be mediated either by stimulation of BAX and FAS antigen expression, or by repression of Bcl-2 expression. The p53 pathway responds to stresses that can disrupt the fidelity of DNA replication and cell division. A stress signal is transmitted to the p53 protein by post-translational modifications. Such modification results in the activation of p53 protein as a transcription factor that initiates a program of cell cycle arrest, cellular senescence or apoptosis².

The transcriptional network of p53-responsive genes produces proteins that interact with a large number of other signal transduction pathways in the cell and a number of positive and negative auto-regulatory feedback loops act upon the p53 response. There are at least seven negative and three positive feedback loops of which six act through the MDM-2 protein³ to regulate p53 activity. The p53 circuit communicates with the Wnt- β -catenin, IGF-1-AKT, Rb-E2F, p38 MAP kinase, cyclin-cdk, p14/19 ARF pathways and the cyclin G-PP2A, and p73 gene products.

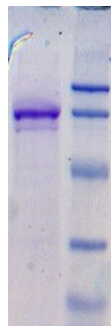
There are at least three different ubiquitin ligases that can regulate p53 in an auto-regulatory manner: MDM-2, Cop-1 and Pirh-2⁴. The meaning of this redundancy and the relative activity of each of these feedback loops in different cell types or stages of development remains to be elucidated, however, the interconnections between signal transduction pathways will undoubtedly play a central role in our understanding of cancer⁵.

Application data:

Accession number: P04637.
Molecular weight: 70004Da.

GST-tagged wild type p53 was expressed in *E. Coli* system and subsequently purified using glutathione sepharose chromatography. The enzyme purity has been determined to be >90% by reducing SDS-PAGE, in which the component protein migrates with a relative molecular weight of ~85/90kDa.

As shown opposite, SDS-PAGE followed by Western blot using a p53 monoclonal antibody (Cat. #SA293) clearly identifies the full-length material.



Coomassie stained gel of FW9370: Lane 1: FW9370 (3µg), Lane 2: MW markers (top to bottom) 113, 93, 50, 35, and 28 kDa.



Western blot of FW9370 after SDS-PAGE followed by blotting onto PVDF and probing with mouse monoclonal antibody to p53 (Cat. #SA293, 1:5000).

Storage and use:

Material is supplied at a concentration of 0.5mg/mL in 50mM Na phosphate, pH7.5, 50mM NaCl. For long term storage store at -20 to -80°C.

References:

1. Matlashewski, G., Lamb, P., Pim, D., Peacock, J., Crawford, L., and Benchimol, S. Isolation and characterization of a human p53 cDNA clone: expression of the human p53 gene. *EMBO J.* **3**, 3257-3262 (1984)
2. Oren, M. Regulation of the p53 tumor suppressor protein. *J.Biol.Chem.* **274**, 36031-36034 (1999)
3. Chan, W.M., Mak, M. C., Fung, T. K., Lau, A., Siu, W. Y., and Poon, R. Y. Ubiquitination of p53 at multiple sites in the DNA-binding domain. *Mol.Cancer Res.* **4**, 15-25 (2006)
4. Coutts, A.S. and La Thangue, N. B. The p53 response: emerging levels of co-factor complexity. *Biochem.Biophys.Res.Commun.* **331**, 778-785 (2005)
5. Harris, S.L. and Levine, A. J. The p53 pathway: positive and negative feedback loops. *Oncogene.* **24**, 2899-2908 (2005)