

Product Information

Ras

human, recombinant, wild type
expressed in *E. coli*

Catalog Number **R9894**

Storage Temperature $-70\text{ }^{\circ}\text{C}$

Synonym: H-Ras; rH-RAS, WT

Product Description

Ras proteins, p21, are guanyl nucleotide binding proteins that play an important role in cellular signal transduction. *ras* genes were discovered in transforming retroviruses extracted from artificially induced solid tumors from mice.^{1,2} Later on, these genes were found to be present in normal and transformed cells. The difference between the cellular normal *ras* gene and the transforming *ras* gene is in a single point mutation that renders the transforming gene permanently active. Three *ras* genes have been identified in the mammalian genome: *H-ras*, *K-ras*, and *N-ras*. The genes encode for 189 amino acid proteins that are highly homologous and differ mainly at their C-terminus.^{4,5}

Ras proteins are regulatory proteins that bind GTP in their active state. A Ras intrinsic GTPase activity hydrolyzes GTP to GDP thus inactivating Ras,^{4,5} while activation of Ras requires exchange of the bound GDP with GTP. This exchange is activated by GDP/GTP exchange proteins, for example the Grb2-Sos1 complex that transmits epidermal growth factor and insulin-induced signals.^{4,6} Inhibition of Ras activity by stimulation of its GTPase activity is enhanced by GTPase activating proteins.^{4,5}

Permanently active oncogenic Ras lacks GTPase activity,⁴ for example, by mutation of Gly¹² to Val¹². Localization of normal and oncogenic Ras to the membrane is crucial for its activity. This is achieved by farnesylation, attachment of an isoprenoid lipid (farnesyl) to the cysteine at the C-terminal CaaX domain by farnesyltransferase.^{4,5}

Since oncogenic Ras is present in about 50% of human tumors, its inactivation by inhibition of farnesyltransferase activity is widely studied.^{7,8} Recombinant H-Ras expressed in *E. coli* serves as a tool for such studies.

The product is supplied in a 50% glycerol solution containing 20 mM Tris, pH 7.6, with 5 mM MgCl₂, 50 mM NaCl, and 1 mM DTT.

The GDP binding of this product is a minimum of 0.25 mole of GDP per mole of H-Ras.⁹

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

This product ships on dry ice and storage at $-70\text{ }^{\circ}\text{C}$ is recommended. The product, as supplied, remains active for at least 2 years.

References

1. Harvey, J.J., *Nature*, **204**, 1104 (1964).
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3. Ellis, R.W., *et al.*, *Nature*, **292**, 506 (1981).
4. Barbacid, M., *Ann. Rev. Biochem.*, **56**, 779-827 (1987).
5. Boguski, M.S., and McCormick, F., *Nature*, **366**, 643 (1993).
6. Schlessinger, J., *Trends Biochem. Sci.*, **18**, 273 (1993).
7. Kohl, N.E., *et al.*, *Science*, **260**, 1934, (1993).
8. James, G.L., *et al.*, *Science*, **260**, 1937, (1993).
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