PRODUCT INFORMATION

ROCK2 (human, recombinant)

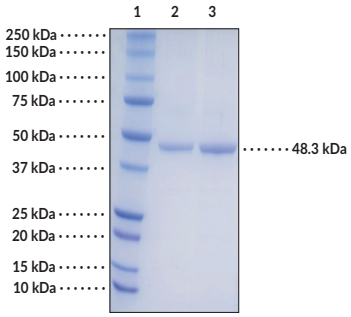
Item No. 32758

Overview and Properties

Synonyms:	KIAA0619, Rho-associated Coiled-coil-containing Protein Kinase 2, Rho-associated Protein Kinase 2, Rho Kinase 2, p164 ROCK2
Source:	Active recombinant N-terminal His-tagged ROCK2 expressed in insect cells
Amino Acids:	19-417
Uniprot No.:	O75116
Molecular Weight:	48.3 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	***batch specific*** (≥95% estimated by SDS-PAGE)
Supplied in:	20 mM HEPES, pH 7.4, with 150 mM sodium chloride and 1 mM DTT
Protein Concentration:	***batch specific*** mg/ml
Activity:	***batch specific*** U/ml
Specific Activity:	***batch specific*** U/mg
Unit Definition:	One unit is defined as the amount of enzyme required to produce 1 µmol of ADP per minute at 25°C in 20 mM HEPES, pH 7.4, containing 50 mM sodium chloride, 10 mM magnesium chloride, 1 mM EGTA, 0.02% Triton, and 108 µM S6K peptide.

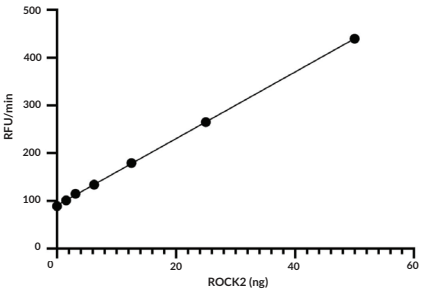
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images

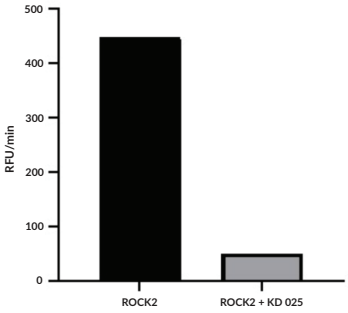


Lane 1: MW Markers
Lane 2: 2 µg ROCK2
Lane 3: 4 µg ROCK2

SDS-PAGE Analysis of ROCK2



ROCK2 activity was determined using a coupled-kinase assay. HRP readily combines with hydrogen peroxide, a byproduct, and this complex is detected by 10-acetyl-3,7-dihydroxyphenoxazine (ADHP) (Item No. 10010469), thereby allowing activity to be monitored by measuring the increase in fluorescence.



Inhibition of ROCK2 with 2 µM KD 025 (Item No. 17055).

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PRODUCT INFORMATION

Description

Rho-associated protein kinase 2 (ROCK2) is a serine/threonine kinase that has roles in cytoskeletal organization and autoimmunity, as well as cell survival, proliferation, and apoptosis.[1-3] It exists as a homodimer where each monomer is composed of an N-terminal kinase domain, a coiled-coil region that contains the Rho-binding domain, and a C-terminal pleckstrin homology (PH) domain that contains a cysteine-rich C1 domain and acts as an autoinhibitory region.[2,4] *Rock2* mRNA is expressed in brain, muscle, heart, lung, and placenta, localized to the cytosol and nucleus, associated with the centrosome, and co-localized with actin and vimentin in a cell-type-specific manner.[1,2] Binding of ROCK2 to GTP-bound RhoA induces activation of ROCK1, which phosphorylates a variety of downstream targets, including myosin light chain (MLC) phosphatase 1 (MYPT1) and MLC2, that have diverse roles in cytoskeletal organization.[2] Additionally, ROCK2 is cleaved and activated by proteases, including granzyme B and caspase-2, to induce apoptosis.[1] Pharmacological inhibition of ROCK2 restores immune homeostasis and shifts the helper T (Th17)/regulatory T (Treg) cell balance towards Tregs in various animal models of autoimmunity and chronic graft *versus* host disease (GVHD).[3] *Rock2* knockdown decreases the fibrogenic response in a mouse model of diabetic kidney disease.[5] Cayman's ROCK2 (human, recombinant) protein can be used for enzyme activity assays.

References

1. Hartmann, S., Ridley, A.J., and Lutz, S. The function of Rho-associated kinases ROCK1 and ROCK2 in the pathogenesis of cardiovascular disease. *Front. Pharmacol.* **6**, 276 (2015).
2. Julian, L. and Olson, M.F. Rho-associated coiled-coil containing kinases (ROCK): Structure, regulation, and functions. *Small GTPases* **5**, e29846 (2014).
3. Zanin-Zhorov, A. and Blazar, B.R. ROCK2, a critical regulator of immune modulation and fibrosis has emerged as a therapeutic target in chronic graft-versus-host disease. *Clin. Immunol.* **230**, 108823 (2021).
4. Haga, R.B., Garg, R., Collu, F., *et al.* RhoBTB1 interacts with ROCKs and inhibits invasion. *Biochem. J.* **476(17)**, 2499-2514 (2019).
5. Matoba, K., Takeda, Y., Nagai, Y., *et al.* The physiology, pathology, and therapeutic interventions for ROCK isoforms in diabetic kidney disease. *Front. Pharmacol.* **11**, 585633 (2020).

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