

**K-Ras4B Protein: wild-type
(Human recombinant)**

Cat. # CS-RS03

Lot # 047 Amount 1 x 100 µg

Upon arrival store at 4°C (desiccated)

See datasheet for storage after reconstitution

Material

The wild-type human K-Ras4B protein has been produced in a bacterial expression system. The recombinant protein contains six histidine residues at its amino terminus (His-tag). The molecular weight of 6xHis tagged K-Ras4B is approximately 25 kDa and it is supplied as a white lyophilized powder.

Storage and Reconstitution

Before reconstitution, briefly centrifuge to collect the product at the bottom of the tube. The protein should be reconstituted to 5 mg/ml with the addition of 20 µl of Milli-Q water (100 µg size). When reconstituted, the protein will be in the following buffer: 50 mM Tris pH 7.5, 50 mM NaCl, 0.5 mM MgCl₂, 5% (w/v) sucrose, and 1% (w/v) dextran. In order to maintain high biological activity of the protein, it is strongly recommended that the protein solution be supplemented with DTT to 1 mM final concentration, aliquoted into "experiment-sized" amounts, snap frozen in liquid nitrogen, and stored at -70°C. The protein is stable for six months if stored at -70°C. **The protein should not be exposed to repeated freeze-thaw cycles.** The lyophilized protein is stable at 4°C desiccated (<10% humidity) for one year.

Purity

Protein purity is determined by scanning densitometry of Coomassie Blue-stained protein on a 4-20% polyacrylamide gradient gel. His-tagged K-Ras4B protein was determined to be 90% pure (see Figure 1).



Figure 1. K-Ras4B Protein Purity Determination. A 10 µg sample of recombinant K-Ras4B protein (molecular weight approx. 25 kDa) was separated by electrophoresis in a 4-20% SDS-PAGE system and stained with Coomassie Blue. Protein quantitation was determined using the Precision Red Protein Assay Reagent (Cat. # ADV02). Mark12 molecular weight markers are from Life Technologies Inc.

Biological Activity Assay

The biological activity of K-Ras4B can be determined from the ability of the SOS1 exchange domain (SOS1-ExD) to catalyze the exchange of GDP for GTP on K-Ras4B. A standard biological assay for monitoring the biological activity of K-Ras4B is an exchange assay utilizing the 2X Exchange Buffer from the RAS GEF exchange assay kit (Cat.# BK101) and the human SOS1 GEF domain (Cat.# CS-GE02).

Reagents

1. Recombinant K-Ras4B protein (Cat.# CS-RS03)
2. Recombinant SOS1-ExD protein (Cat.# CS-GE02)
3. 2X Exchange Buffer (40 mM Tris pH 7.5, 100 mM NaCl, 20 mM MgCl₂, and, 3.0 µM BODIPY-GTP)

Equipment

1. Fluorescence spectrophotometer ($\lambda_{ex} = 485 \pm 20$ nm, $\lambda_{em} = 535 \pm 20$ nm)
2. Coming 96-well half area plates (Cat. # 3686) or other plate with low protein binding surface.

Method

1. Reconstitute SOS1-ExD protein (Cat.# CS-GE02) to 3 mg/ml in 33 µl of nanopure water to give a 50 µM SOS1 stock solution.
2. Dilute SOS1 to 8 µM by adding 8 µl to 42 µl of nanopure water.
3. Reconstitute K-Ras4B protein (Cat.# CS-RS03) to 5 mg/ml in 20 µl of nanopure water to give a 200 µM K-Ras4B stock solution.
4. Dilute K-Ras4B to 50 µM by adding 5 µl to 15 µl of nanopure water.
5. Dissolve lyophilized 2X Exchange Buffer in 5 ml Milli-Q water and keep at room temperature.
4. Set up the plate reader for kinetic fluorescence measurements (Excitation wavelength at 485 nm and emission wavelength at 525 nm) with readings every 30 seconds for 30 minutes.
5. Add the following components together and mix well by gentle pipetting:

<u>Exchange reaction mix</u>	<u>96 well black plate</u>
2X Exchange Buffer	50 µl
50 µM K-Ras4B	4 µl
Nanopure water	36 µl

6. Pipette 10 µl of 8 µM SOS1-ExD protein or nanopure water into their respective wells and immediately pipette up and down twice and begin reading the fluorescence.
7. Once the readings are complete and the plate reader file has been saved, the exchange rate can be calculated by reducing the data to Vmax with the software that accompanies the plate reader.

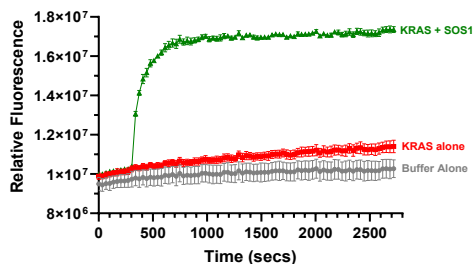


Figure 2. SOS1-ExD protein mediated BODIPY FL GTP* exchange on K-Ras4B. K-Ras4B protein was added to the wells of a 96-well half area plate containing diluted Exchange Buffer and mixed well. To initiate the exchange reaction, SOS1-ExD protein (green triangles, n=3), K-Ras4B alone (red squares, n=3), or nanopure water (grey circles, n=3), was added to the wells, mixed, and fluorescence measurements were obtained using a Spectra-Max iD5 Spectrophotometer. The resulting data were plotted as relative fluorescence units over time using GraphPad Prism software.

*Note: BODIPY FL GTP is a trademark of ThermoFisher Inc. MA, USA.

Product Uses

- Study of K-Ras4B exchange activity with different GEFs
- Identification of K-Ras4B exchange factors (GEFs)
- Positive control for GEF studies
- Biochemical characterization of K-Ras4B protein interactions
- Western blot standard

Key Reference for K-Ras

Ostrem J. et. al. 2013. K-Ras(G12C) inhibitors allosterically control GTP affinity and effector interactions. *Nature*. 503, 548-551.

Product Citations/Related Products

For the latest citations and related products, please visit www.cytoskeleton.com.