

## Product Specification

### **CK2 $\alpha$ 1, active**

(Full-length recombinant protein expressed in Sf 9 cells)

Catalog #: 7738-5  
 Lot #: \_\_\_\_\_  
 Aliquot size: 5  $\mu$ g protein in 50  $\mu$ l  
 Specific activity: 107 nmol/min/mg

### **Quality Control Analysis**

#### Activity assessment

CK2  $\alpha$  1 protein (~100 ng/ $\mu$ l concentration) was diluted to 20ng/ $\mu$ l in assay dilution buffer (4 mM MOPS, pH 7.2, 2.5 mM  $\beta$ -glycerophosphate, 1 mM EGTA, 0.4 mM EDTA, 4 mM MgCl<sub>2</sub>, 0.05 mM DTT), followed by 2-fold serial dilutions, and then the 10 $\mu$ l diluted proteins were used to phosphorylate casein protein in the following assay condition:

- 10  $\mu$ l diluted CK2  $\alpha$  1 protein
- 10  $\mu$ l casein (1 mg/ml stock)
- 5  $\mu$ l [<sup>32</sup>P] ATP mixture (250  $\mu$ M ATP, 0.16  $\mu$ Ci/ $\mu$ l in 4x assay dilution buffer)

The various reaction components, except [<sup>32</sup>P] ATP, were incubated at 30°C and the reaction started by the addition of [<sup>32</sup>P] ATP. After 15 minutes, the reaction was terminated by spotting 20  $\mu$ l of the reaction mixture onto a phosphocellulose P81 paper. The P81 paper was dried and washed several times in 1% phosphoric acid prior to counting in the presence of scintillation fluid in a scintillation counter. The actual counts, using various dilutions of the enzyme in the assay, are shown in Fig. 1.

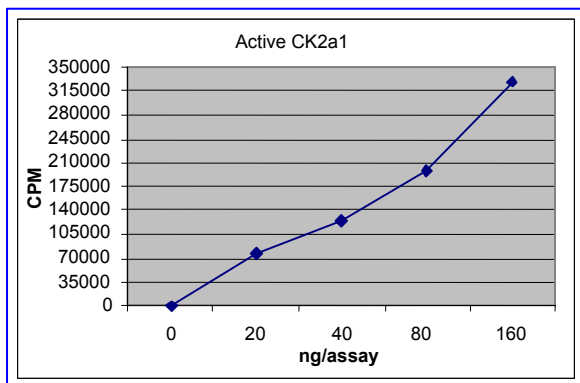


Fig. 1 CK2  $\alpha$  1 activity assay

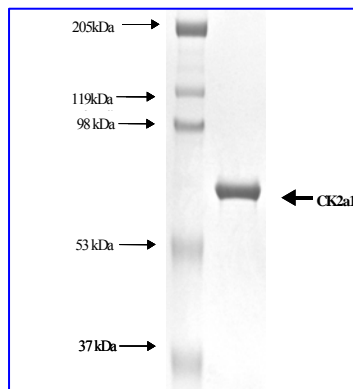


Fig. 2 CK2  $\alpha$  1 protein gel

#### Purity assessment

2  $\mu$ g of CK2  $\alpha$  1 protein was subjected to SDS-PAGE and Coomassie blue staining. The scan of the gel showed >90% purity of the CK2  $\alpha$  1 band product, and the band was at ~70 kDa (Fig. 2).

### **Product Description**

Recombinant full length human CK2  $\alpha$  1 containing N-terminal GST tag was expressed by baculovirus in Sf 9 insect cells.

The gene accession number is NM\_001895.

This material is sold for research purposes only.

### Specific Activity

107 nmol phosphate incorporated into casein per minute per mg protein at 30°C for 15 minutes using a final concentration of 50  $\mu$ M ATP (0.83  $\mu$ Ci/assay).

### Formulation

Recombinant protein in storage buffer (50 mM Tris-HCl, pH 7.5, 150 mM NaCl, 0.25 mM DTT, 0.1 mM EGTA, 0.1 mM EDTA, 0.1 mM PMSF, 25% glycerol).

### Storage and Stability

Store product frozen at or below -70°C. Stable for 1 year at -70°C as undiluted stock. Aliquot to avoid repeated thawing and freezing.

### Scientific Background

CK2  $\alpha$ 1 (also termed casein kinase II alpha) is a serine-threonine protein kinase whose targets include many critical regulators of cellular growth. It is highly expressed in a lymphoproliferative disease of cattle and in many human cancers. Overexpression of the CK2  $\alpha$  catalytic subunit in lymphocytes of transgenic mice leads to T cell lymphoma (1). The highest CK2 activity is found in mouse testicles and brain, followed by spleen, liver, lung, kidney and heart (2). The activity values were directly correlated with the protein expression level of the CK2 $\alpha$  (catalytic subunit). The  $\alpha$  subunit is only detected in brain and testicles. By contrast, Northern blot analyses of the CK2  $\alpha$  mRNA shows the strongest signals to be present in brain, liver, heart and lung. In kidney, spleen and testicles mRNAs is only weakly detectable. ICBP90, a transcription factor exhibiting antiapoptotic properties, has several putative CK2 phosphorylation sites. ICBP90 is more efficiently phosphorylated by the free CK2  $\alpha$  subunit than by the heterotetrameric CK2 (alpha, beta) (3). Thus, CK2  $\alpha$  is an important regulator of the transcriptional activity of ICBP90 and therefore of the antiapoptotic properties of ICBP90.

### References

1. Rifkin IR, Channavajhala PL, Kiefer HL, Carmack AJ, Landesman-Bollag E, Beaudette BC, Jersky B, Salant DJ, Ju ST, Marshak-Rothstein A, Seldin DC. Acceleration of lpr lymphoproliferative and autoimmune disease by transgenic protein kinase CK2 alpha. *J Immunol.* 1998 Nov 15;161(10):5164-70.
2. Guerra B, Siemer S, Boldyreff B, Issinger OG. Protein kinase CK2: evidence for a protein kinase CK2beta subunit fraction, devoid of the catalytic CK2alpha subunit, in mouse brain and testicles. *FEBS Lett.* 1999 Dec 3;462(3):353-7.
3. Bronner C, Trotzler MA, Filhol O, Cochet C, Rochette-Egly C, Scholler-Guinard M, Klein JP, Mousli M. The Antiapoptotic Protein ICBP90 Is a Target for Protein Kinase 2. *Ann N Y Acad Sci.* 2004 Dec;1030:355-60.