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California Bioscience

Product Datasheet

Product Name	cAMP Responsive Element Binding Protein Human Recombinant
Cata No	CB500864
Source	Escherichia Coli.
Synonyms	cAMP response element-binding protein, CREB, CREB1, MGC9284.

Description

CREB (cAMPresponse element-binding) proteinsare transcription factorswhich bind to certain sequences called cAMP response elements (CRE) in DNAand thereby increase or decrease the transcriptionof certain genes. CREB is highly related (in structure and function) to CREM (cAMP response element modulator) and ATF-1 (activating transcription factor-1) proteins. CREB proteins are active in many animals, including humans. The typical (somewhat simplified) sequence of events is as follows: a signal arrives at the cell surface, activates the corresponding receptor, which leads to the production of a second messengersuch as cAMP or Ca2+, which in turn activates a protein kinase. This protein kinase moves to the cell nucleus, where it activates a CREB protein. The activated CREB protein then binds to a CRE region, and is then bound to by a CBP(CREB binding protein) which coactivates it, allowing it to switch certain genes on or off. The DNA binding of CREB is mediated via its basic leucine zipper domain (bZIP domain). CREB has many functions in many different organs although most of its functions have been studied in relation to the brain. CREB proteins in neuronsare thought to be involved in the formation of long-term memories; this has been shown in the marine snail Aplysia, the fruit fly Drosophila melanogaster, and in rats. They are necessary for the late stage of long term potentiation. There are activator and repressor forms of CREB. Flies genetically engineered to overexpress the inactive form of CREB lose their ability to retain long term memory. CREB is also important for the survival of neurons, as shown in genetically engineered mice, where CREB and CREM were deleted in the brain. This study supports the view that disturbance of CREB function in brain can contribute to the development and progression of Huntington's Diseasein humans. If CREB is lost in the whole developing mouse embryo, the mice die immediately after birth, again highlighting the critical role of CREB in promoting survival. CREB is also thought to be involved in the growth of some types of cancer. In humans, abnormalities of a protein which interacts with the KID domain of CREB, the CREB binding protein (CBP)is associated with Rubinstein-Taybi syndrome.
CREB Human Recombinant produced in E.Coli is a non-glycosylated, polypeptide chain containing amino acids and 2-328 having a molecular mass of 81 KD. This protein is the full-length form and is produced as a maltose binding protein (MBP) fusion protein with a poly His-tag.
CREB is purified by proprietary chromatographic techniques.

Physical Appearance

Lyophilized freeze dry powder.

Biological Activity

CREB is phosphorylatable *in vitro*, using either recombinant Protein Kinase A, or Rsk immunoprecipitated from stimulated cells. This phosphorylation can be monitored by ELISA using

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CREB [pS133] phosphoELISA or by Western blotting using an anti-CREB [pS133] phosphorylation site specific antibody in conjunction with chemiluminescence detection methods. Optimization of the cell stimulation protocol,cell lysis procedure, and reaction conditions may be required for each specific application.

Purity

Greater than 95% as determined by SDS-PAGE.

Formulation

CREB is supplied as lyophilized freeze dry powder without additives.