Introduction

Description

Cyclic AMP-responsive element-binding protein 1, a transcription factor that acts in cAMP-mediated signaling and antiapoptosis; human CREB1 is associated with arthritis, Crohn disease, myeloid leukemia, and breast and several other cancers

Synonyms

(Cre); (CREB); CREB1; Creb-; CREB-1; Mm.30372; AV083133; CREBalpha; 2310001E10Rik; 3526402H21Rik; CRE-like site Binding Protein 36 kD; cAMP-response element binding protein; cAMP responsive element binding protein 1; Cyclic AMP Responsive Element Binding factor

Gene Ontology what is this?

Molecular function

cAMP response element binding protein binding [S, E], DNA binding [E], sequence-specific DNA binding [E]... details

Biological process

behavioral fear response [E], behavioral response to ethanol [E], behavioral response to nicotine [E], brain development [E], cell cycle [P]... details

Cellular component

nucleus [E] details

Functional Attributes what is this?

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Orthologs & Molecular Hierarchy what is this?

Hierachy of orthologous relationships for this locus

+ View orthologous relationships

GENE

Expression what is this?

Tissue expression

high ✔ medium ✔ low ✔

brain	✔	breast		colon		heart		intestine		kidney	✔	liver	✔	lung	✔
muscle		ovary		pancreas		placenta		spleen	✔	stomach		testis	✔	thymus	✔

+ View organ or tissue, cell type, and tumor type entries in detail

Transcriptional Regulation what is this?

Regulation of Creb1 gene expression

Predicted promoter sequences : Match

Best supported : PM000653052

All promoters for the gene : PM000653052, PM000653053, PM000653054

* Note: Only binding sites whose location is relative to the TSS are graphically displayed. Binding sites with an asterisk (*) are not included in the graphical display.

Transcription factor binding sites within the Creb1 gene (4 entries)

Show 5 entries Search:

Identifier	Relative Location	Genomic Location	Binding Factor(s)	DNA Binding Reaction	Effect
MOUSE$CREB1_10		Chr1 64532803 64532829 +	Sp1(m)	Sp1(m) --> Creb1(m)	DNA binding
MOUSE$CREB1_11		Chr1 64532919 64532949 +	CREB1(m)	CREB1(m) --> Creb1(m)	DNA binding
MOUSE$CREB1_09		Chr1 64532871 64532896 +	Sp1(m)	Sp1(m) --> Creb1(m)	DNA binding
MOUSE$CREB1_12		Chr1 64532900 64532927 +	CREB1(m)	CREB1(m) --> Creb1(m)	DNA binding

Showing 1 to 4 of 4 entries First Previous 1 Next Last

In vivo fragments within the promoter(s) of the Creb1 gene that are bound by transcription factors (79 entries)

Show 5 entries Search:

Promoter	Transcription Factor	Genomic Location	Cell Source	Matrix	Relative Location	CSS	MSS	Sequence	Reference
PM000653053	GATA-1(m)	1:64552050..64552353	MEL	V$GATA1_Q6	-8727	1.000	0.994	CTTGGAGATAAGATA	ENCODE Data 22955616
PM000653052	Sox-2(m)	1:64524689..64524889	E14	V$SOX_Q6	-7840	1.000	0.853	CTCTTTGCTCCTT	18555785
PM000653052	GATA-1(m)	1:64524923..64525226	MEL	V$GATA1_Q6	-7729	1.000	0.977	TTTCTTGATAAGAGT	ENCODE Data 22955616
PM000653052	FOXP3(m)	1:64526611..64527166	CD4+ CD25+ T cells	V$FOXP3_01	-6231	1.000	0.867	CAAAACAG	17237765
PM000653052	p300(m)	1:64527557..64527940	CH12.LX	V$P300_Q5	-5323	1.000	0.946	AAGCAGACAG	ENCODE Data 22955616

Showing 1 to 5 of 79 entries First Previous 1 2 3 4 5 Next Last

Translational Regulation what is this?

Regulation of Creb1 mRNA expression

miRNA binding sites within Creb1 mRNA (12 entries)

Show 5 entries Search:

Identifier	Region	Location	Location Reference Point	Binding Factor(s)
MOUSE$CREB1_01	3' UTR			mmu-miR-134-5p(m)
MOUSE$CREB1_01	3' UTR			rno-miR-134-5p(r)
MOUSE$CREB1_02	3' UTR			mmu-miR-134-5p(m)
MOUSE$CREB1_02	3' UTR			rno-miR-134-5p(r)
MOUSE$CREB1_03	3' UTR			mmu-miR-134-5p(m)

Showing 1 to 5 of 12 entries First Previous 1 2 3 Next Last

RNA Features what is this?

Overview of RNA sequence

Nucleotide Sequence : TCGGCAC...AAAAAAA (1..8267; 8267 nt) details

Sequence source : REFSEQ#NM_001037726

FASTA

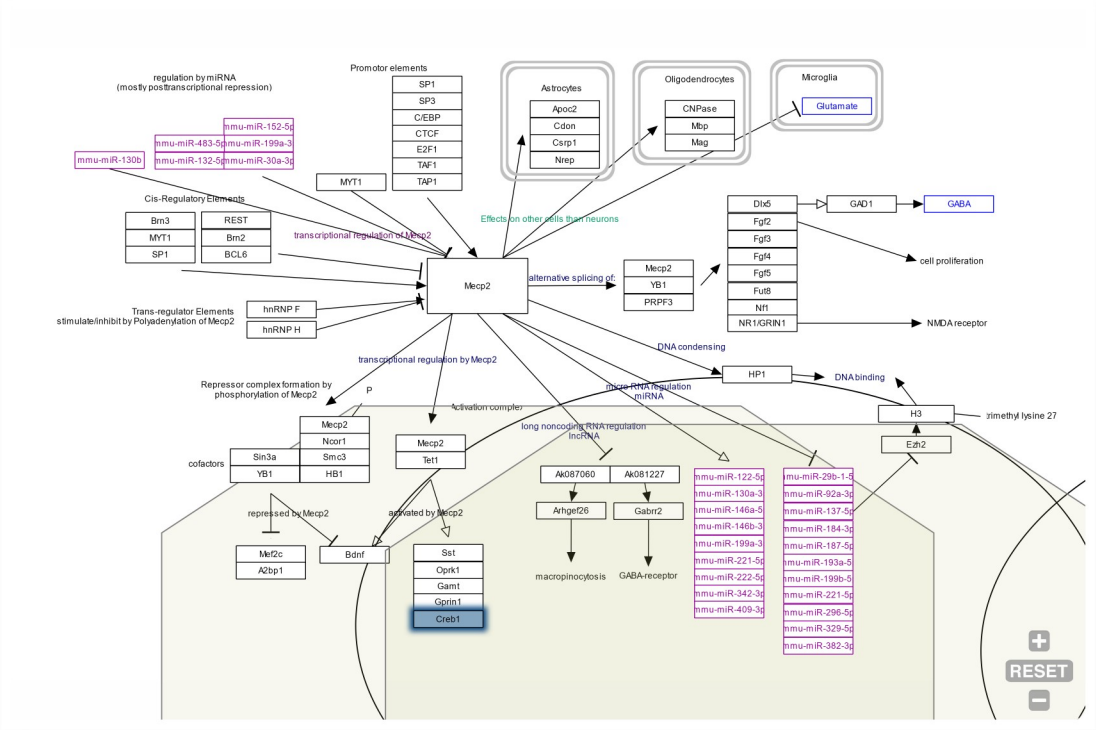
PROTEIN

Provided by the WikiPathways database.

Show 5 entries Search:

Name	Display below	WikiPathways external link
IL-2 Signaling Pathway	View	WikiPathways
IL-3 Signaling Pathway	View	WikiPathways
Mecp2 and Associated Rett Syndrome	View	WikiPathways
Mitochondrial Gene Expression	View	WikiPathways
Myometrial Relaxation and Contraction Pathways	View	WikiPathways

Showing 6 to 10 of 14 entries First Previous 1 2 3 Next Last



Protein-protein interactions

+ Proteins bound by Creb1 (22 partners)

+ Protein-protein associations (4 partners)

Events acting on Creb1

+ Proteins or complexes that affect Creb1 in other ways (21 partners)

Events triggered by Creb1

+ Proteins or complexes affected by Creb1 in other ways (132 partners)

Transcription Factor Activity what is this?

Regulation of gene expression by Creb1

Transcription factor classification :

CREB; 1.1.7.1.1
Basic leucine zipper factors (bZIP); 1.1 (A DNA-binding basic region is followed by a leucine zipper. The leucine zipper consists of repeated leucine residues at every seventh position and mediates protein dimerization as a prerequisite for DNA-binding. The leucines are directed towards one side of an alpha-helix. The leucine side chains of two polypeptides are thought to interdigitate upon dimerization (knobs-into-holes model). The leucine zipper dictates dimerization specificity. Upon DNA-binding of the dimer, the basic regions adopt alpha-helical conformation as well. Possibly, a sharp angulation point separates two alpha-helices of the subregions A and B leading to the scissors grip model for the bZIP-DNA complex. The DNA is contacted through the major groove over a whole turn. (PROSITE motif for Fos-Jun bZIP region only!))

Genes bound by Creb1 (161 entries)

Show 5 entries Search:

Adcyap1(m)		MOUSE$ADCYAP1_05			6
Adcyap1(m)		MOUSE$ADCYAP1_06			6
Adcyap1(r)	-209 to -167	RAT$ADCYAP1_12	CREB1(m) --> Adcyap1(r)	DNA binding	3

Showing 1 to 5 of 161 entries First Previous 1 2 3 4 5 Next Last

Artificial sites bound by Creb1 (5 entries)

Show 5 entries Search:

Description	Binding Site Identifier	Quality Score
Artificial Sequence	AS$CREB1_08	3
Artificial Sequence	AS$CREB1_08	3
artificial sequence	AS$CREB1_02	4
artificial sequence	AS$CREB1_03	4
artificial sequence	AS$CREB1_05	3

Showing 1 to 5 of 5 entries First Previous 1 Next Last

Creb1 consensus binding sequence (13 entries)

Show 5 entries Search:

Sequence logo	Consensus binding sequence derived from Positional Weight Matrix	Matrix type	Matrix category
	V$CREB_01	factor-specific	SELEX (CASTing, SAAB, TDA, Target detection assay)
	V$CREB_02	factor-specific	SELEX (CASTing, SAAB, TDA, Target detection assay)
	V$TAXCREB_01	factor-specific	SELEX (CASTing, SAAB, TDA, Target detection assay)
	V$TAXCREB_02	factor-specific	SELEX (CASTing, SAAB, TDA, Target detection assay)
	V$CREB_Q2	factor-specific	matrix compiled from individual genomic sites

Showing 1 to 5 of 13 entries First Previous 1 2 3 Next Last

Transcription factors which interact with Creb1

Show 5 entries Search:

Species	Factor
Mammalia	Nur77
Mouse	c-Krox, CBP, p300

Showing 1 to 2 of 2 entries First Previous 1 Next Last

Protein Features what is this?

Overview of protein sequence and structure

Chromosome : 1 C2

Isoforms : CREB , CREBbeta , CREBomega , deltaCREB

+ View associated sequences and their domains

View complexes containing Creb1 protein

+ View complexes (22 entry)

Annotations what is this?

- Cyclic AMP-responsive element-binding protein 1, a transcription factor that acts in cAMP-mediated signaling and antiapoptosis; human CREB1 is associated with arthritis, Crohn disease, myeloid leukemia, and breast and several other cancers 11707519 17692820 19915796 15163695 19932681 22564436

Function

- Acts as a transcriptional repressor of GABA (B) R1a promoter 15240803
- CREB1 is required for the adipogenesis in 3T3L1 cells 14593102

Expression

- Brain, testis, liver 11058604
- Cerebral cortex, thalamus, hippocampus and cerebellum of both lethargic and non-epileptic control mice (with higher expression in lethargic mice thalamus and cerebral cortex) 11137764

Identifiers what is this?

Accessions mapped to this record

BIOBASE gene accession : GN000007138, G009769

BIOBASE protein accession : PR000013746, f00518, MO000026284, MO000088840, MO000088841, MO000105701, MO000106874, T02280, T09440, T15095, T23053

Gene

Affymetrix	102671_at, 102672_g_at, 102673_at, 10346943, 114387_at, 132451_at, 1421582_a_at, 1423402_at, 1428755_at, 1452529_a_at, 1452901_at, 162754_at, 167083_f_at, 17213676, 4403657, 4480111, 4549950, 4588843, 4642388, 4674224, 4722037, 4784586, 4809685, 4843843, 4859165, 4861845, 5007356, 5141750, 5169790, 5202543, 5206381, 5209238, 5223612, 5249211, 5307646, 5318573, 5323273, 5338374, 5381078, 5406578, 5500150, 5504257, 5529200, 5550876, Msa.552.0_s_at, x92497_s_at,
Agilent	A_51_P101621
Ensembl	ENSMUSG00000025958, ENSMUST00000049932, ENSMUST00000087366, ENSMUST00000171164, ENSMUST00000185594, ENSMUST00000186335, ENSMUST00000187035, ENSMUST00000187811, ENSMUST00000188855, ENSMUST00000190348, ENSMUST00000190876, ENSMUST00000190979
EntrezGene	12912
Genbank	1134858, 12852209, 158966706, 1655804, 17864956, 17864958, 18203788, 192713, 19745143, 19745157, 21313365, 26328198, 26336978, 26336980, 28878997, 288883, 82546873, AF448507, AF448508, AK014391, AK032372, AK044992, AK044993, BC021649, BC048151, M95106, NM_001037726, NM_009952, NM_025702, NM_133828, U46027, X67719, X92497
Illumina	ILMN_1215890
PDB	1DH3
RefSeq	NM_001037726.1, NM_009952.2, NM_133828.2, NP_001032815.1, NP_034082.1, NP_598589.2, XM_006495650.4, XM_006495651.4, XM_006495652.4, XM_006495653.4, XM_006495654.4, XM_011238424.3, XM_017314080.2, XM_017314099.2, XM_030245776.1, XP_006495713.1, XP_006495714.1, XP_006495715.1, XP_006495716.1, XP_006495717.1, XP_011236726.1, XP_017169569.1, XP_017169588.1, XP_030101636.1
UniGene	Mm&422634
WikiPathways	WP1244, WP1246, WP1263, WP1266, WP1763, WP2841, WP2872, WP2910, WP350, WP373, WP385, WP447, WP450, WP572

Protein

Genbank	1134859, 12852210, 158966707, 1655805, 17864957, 17864959, 18203789, 192714, 19745144, 19745158, 21313366, 26328199, 26336979, 26336981, 28878998, 817948, 817949, 817950, 817951, 817952, 817953, 82546874, AAA37456.1, AAB64015.1, AAH21649.1, AAH48151.1, AAL47130.1, AAL47131.1, BAB29318.1, BAC27840.1, BAC32173.1, BAC32174.1, CAA47953.1, CAA47954.1, CAA47955.1, CAA47956.1, CAA47957.1, CAA47958.1, CAA63242.1, NP_001032815.1, NP_034082.1, NP_079978.1, NP_598589.1, NP_598589.2
UniProt	Q01147

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3	26627259	Mukherji, A., Kobiita, A., Chambon, P., Shifting the feeding of mice to the rest phase creates metabolic alterations, which, on their own, shift the peripheral circadian clocks by 12 hours. Proc Natl Acad Sci U S A 112 (48) E6683-90 (2015) Show abstract
4	26301810	Gao, Y., Li, Z., Gabrielsen, J. S., Simcox, J. A., Lee, S. H., Jones, D., Cooksey, B., Stoddard, G., Cefalu, W. T., McClain, D. A., Adipocyte iron regulates leptin and food intake. J Clin Invest 125 (9) 3681-91 (2015) Show abstract
5	25994957	Li, W., Liu, J., Hammond, S. L., Tjalkens, R. B., Saifudeen, Z., Feng, Y., Angiotensin II regulates brain (pro)renin receptor expression through activation of cAMP response element-binding protein. Am J Physiol Regul Integr Comp Physiol 309 (2) R138-47 (2015) Show abstract