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The nucleotide sequence of the mouse cDNA encoding the beta subunit of casein kinase II

Idit Kopatz, Tova Naiman, Dalia Eli and Dan Canaani*
Department of Biochemistry, Tel Aviv University, Tel Aviv 69978, Israel

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Casein kinase II (CK II) is an ubiquitous messenger-independent serine/threonine kinase, localized in both the cytoplasm and the nucleus (1). The mammalian enzyme is isolated as an $\alpha_2\beta_2$, $\alpha_2'\beta_2$ or $\alpha\alpha'\beta_2$ tetramer, in which β is the regulatory subunit (2), while α and α' are closely related subunits that possess catalytic activity. Casein kinase II can phosphorylate *in vitro* essential regions of mammalian nuclear proteins involved in control of the cell cycle and cell replication (1). Since CK II is also activated rapidly in response to growth factors, these facts suggest that casein kinase II is a mediator of signal transduction to the nucleus (3).

We (4) and others (5, 6) recently reported the molecular cloning and sequencing of the cDNA for the beta subunit of human casein kinase II. Here we report the nucleotide sequence of a cDNA encoding the murine CK II-beta subunit. A λgt11 cDNA library prepared from the pre B mouse lymphoid cell line 70Z/3 (7) was probed with the human cDNA encoding the β subunit of CK II (4). Several positive phage clones were isolated, sequenced, and found to be homologous to the human gene. The longest cDNA contained 914 bp. This cDNA size fits well with the Northern blot analysis results which show the presence of a single mRNA of 1.1 kb in a BALB/c mouse cell line (data not shown). The deduced 215 amino acid sequence shares 100% homology with the β subunit of CK II from human. The predicted mouse/human amino acid sequence is at least 99% homologous with the sequence determined for the bovine CK II enzyme (8) and displays 88% sequence homology to the deduced *Drosophila melanogaster* protein (9). The occurrence of the CK II β-subunit in all eukaryotic organisms, coupled with its extreme sequence conservation during evolution, suggests that it has an essential cellular function. Indeed, recent evidence indicates that the stimulation of CK II activity by epidermal growth factor is mediated by phosphorylation of the β-subunit (10).

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CCCCAGTCCCAGTCCCCGTCCGGCCGCGGACATAAAGATGAGTAGCTCTGAGGAGGTGTCCTGGATTTCCTGGTTCTGTGGGCTCCGTGG
                                        M  S  S  S  E  E  V  S  W  I  S  W  F  C  G  L  R  G
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 N  E  F  F  C  E  V  D  E  D  Y  I  Q  D  K  F  N  L  T  G  L  N  E  Q  V  P  H  Y  R  Q
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 L  Y  G  L  I  H  A  R  Y  I  L  T  N  R  G  I  A  Q  M  L  E  K  Y  Q  Q  G  D  F  G  Y
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 C  P  R  V  Y  C  E  N  Q  P  M  L  P  I  G  L  S  D  I  P  G  E  A  M  V  K  L  Y  C  P
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 K  C  M  D  V  Y  T  P  K  S  S  R  H  H  H  T  D  G  A  Y  F  G  T  G  F  P  H  M  L  F
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 M  V  H  P  E  Y  R  P  K  R  P  A  N  Q  F  V  P  R  L  Y  G  F  K  I  H  P  M  A  Y  Q
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 L  Q  L  Q  A  A  S  N  F  K  S  P  V  K  T  I  R
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AAGAAAAGGCCATG  914
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* To whom correspondence should be addressed