Volume 17 Number 23 1989 Nucleic Acids Research

Cloning and nucleotide sequence of the mouse Na,K-ATPase β-subunit

Sergio Gloor

Department of Neurobiology, University of Heidelberg, Im Neuenheimer Feld 364, 69 Heidelberg, FRG
Submitted October 17, 1989 EMBL accession no. X16646

cDNA clones have been isolated from a mouse brain lambda gt10 cDNA library (1) encoding the β-subunit of the Na,K-ATPase, using a 48mer oligonucleotide probe derived from the rat cDNA sequence (nucleotide position 571-618 in Ref. 2). The longest clone contains an open reading frame of 912 base pairs coding for a protein of 304 amino acids with a calculated molecular weight of 35194D. The deduced protein sequence shows 96% identity to the rat sequence. Number and position of the consensus sequences for N-linked glycosylation (Fig. underlined) have been conserved compared to other species. Isolated from adult mouse brain tissue the β-subunit has an apparent molecular weight of approximately 50kD.

```
                                                                    TCTCCGAGTGCGAGGCGCGCCGCGGAGCAGCCACC   35
ATGGCCCGCGGAAAAGCCAAGGAGGAAGGCAGCTGGAAGAAATTCATCTGGAACTCGGAGAAGAAGGAGTTTTTGGGCAGGACCGGTGGTAGTTGGTTTAAGATCCTTCTGTTCTACGTG  155
 M  A  R  G  K  A  K  E  E  G  S  W  K  K  F  I  W  N  S  E  K  K  E  F  L  G  R  T  G  G  S  W  F  K  I  L  L  F  Y  V
ATATTTTATGGCTGCCTGGCTGGCATCTTCATCGGGACCATCCAAGTAATGCTGCTAACCATCAGTGAACTGAAGCCCACATACCAGGACCGAGTGGCCCCGCCAGGATTGACACAGATT  275
 I  F  Y  G  C  L  A  G  I  F  L  G  T  I  Q  V  M  L  L  T  I  S  E  L  K  P  T  Y  Q  D  R  V  A  P  P  G  L  T  Q  I
CCCCAGATCCAGAAGACTGAGATCTCCTTCCGTCCTAATGACCCCAAGAGCTACGAGGCCTACGTGCTAAACATCATCAGGTTCCTGGAAAAGTACAAGGATTCAGCCCAGAAGGACGAC  395
 P  Q  I  Q  K  T  E  I  S  F  R  P  N  D  P  K  S  Y  E  A  Y  V  L  N  I  I  R  F  L  E  K  Y  K  D  S  A  Q  K  D  D
ATGATTTTCGAGGACTGTGGCAATGTTCCCAGTGAACCCAAGGAACGGGGCGACATCAATCACGAACGAGGAGAGAGGAAGGTGTGCAGGTTCAAGCTTGACTGGCTGGGGAACTGCTCC  515
 M  I  F  E  D  C  G  N  V  P  S  E  P  K  E  R  G  D  I  N  H  E  R  G  E  R  K  V  C  R  F  K  L  D  W  L  G  N  C  S
GGTCTCAATGATGACTCTTACGGCTACAGAGAGGGGAAGCCCTGCATCATTATCAAGCTCAACCGAGTGTTGGGCTTCAAACCGAAGCCTCCCAAGAATGAATCCTTGGAGACTTACCCA  635
 G  L  N  D  D  S  Y  G  Y  R  E  G  K  P  C  I  I  I  K  L  N  R  V  L  G  F  K  P  K  P  P  K  N  E  S  L  E  T  Y  P
CTGATGATGAAGTATAATCCAAATGTCCTGCCTGTTCAGTGCACTGGCAAGAGAGATGAAGATAAGGATAAAGTCGGGAACATAGAGTACTTTGGGATGGGCGGATACTACGGCTTCCCT  755
 L  M  M  K  Y  N  P  N  V  L  P  V  Q  C  T  G  K  R  D  E  D  K  D  K  V  G  N  I  E  Y  F  G  M  G  G  Y  Y  G  F  P
CTGCAGTATTATCCCTACTACGGCAAACTCCTGCAGCCCAAGTACCTGCAGCCCCTGCTGGCCGTGCAGTTCACCAACCTCACCGTGGACACTGAAATCCGCGTCGAGTGTAAGGCGTAT  875
 L  Q  Y  Y  P  Y  Y  G  K  L  L  Q  P  K  Y  L  Q  P  L  L  A  V  Q  F  T  N  L  T  V  D  T  E  I  R  V  E  C  K  A  Y
GGTGAGAACATTGGGTACAGTGAGAAAGACCGTTTTCAGGGACGCTTTGATGTAAAAATTGAAATTAAGAGCTGATCACAAGCACAAATCTTTCCCACTAGCCATTTAATAAGTTAAAAA  995
 G  E  N  I  G  Y  S  E  K  D  R  F  Q  G  R  F  D  V  K  I  E  I  K  S
AAGATACACAAACCTACTAGTCTTGAACAAACTGTCATACGTATGGGACCTACACTTAATCTCTATGATTTACACTAGCTTCTGCATTTAATAGGTTAGAATGTAAATTTAAAGTGTAGC 1115
AATAGCAACAAAATATTTATTCTACTGTAAATGACACCG
```

Fig. Nucleotide sequence of the mouse Na,K-ATPase β-subunit and deduced amino acid sequence. The predicted transmembrane domain and sites for N-linked glycosylation are underlined.

Acknoledgement I am grateful to Kira Nasse for technical support. Funding was obtained from Deutsche Forschungsgemeinschaft (SFB 317).

References

(1) Tacke, R., Moos, M., Teplow, D., Früh, K., Scherer, H., Bach, A. and Schachner, M. (1987) Neurosci. Lett. 82, 89-94.
(2) Mercer, R.W., Schneider, J.W., Savitz, A., Emanuel, J., Benz, M.J. and Levenson, R. (1986) Mol. Cell. Biol. 6, 3884-3890.