Volume 16 Number 22 1988 Nucleic Acids Research

Nucleotide sequence of the rat muscle acetylcholine receptor ε-subunit

M.Criado, V.Witzemann, M.Koenen and B.Sakmann

Max-Planck-Institut für Biophysikalische Chemie, Postfach 2841, D-3400 Göttingen, FRG

Submitted October 21, 1988 Accession no. X13252

Acetylcholine receptors of innervated adult muscle have different metabolical and electrophysiological properties than the ones present at the developing skeletal muscle. The latter are composed of α, ß, γ and δ subunits, whereas at the receptor from bovine adult muscle the γ subunit is substituted by a new subunit, called ε (1). There is strong support for a similar situation at the rat muscle, where a nerve-dependent switch between the γ and the ε-subunit expression has been described (2).

Here we report nucleotide sequence and deduced amino acid sequence for the rat muscle ε-subunit. Our sequence derives from a clone isolated from cDNA libraries made from poly A$^+$ RNA from rat muscle. The sequence includes an initiator methionine based on sequence comparison with the only other sequence known for the ε-subunit (1), isolated from calf muscle. Percentage of homology of amino acid sequences: rat ε/calf ε, 90; rat ε/calf γ, 67.

```
   1  TTGTCAAAGCTCAGAATAACCTGAGAACCAGACATCAGGATGACAATGGCTCTGCTTGGGACCCTGCTTCTCCTGGCACTCTTTGGCAGA   90
                                              M  T  M  A  L  L  G  T  L  L  L  L  A  L  F  G  R

  91  AGCCAAGGCAAGAATGAAGAGCTGAGCCTGTATCACCATCTCTTCGACAATTATGACCCAGAATGCCGGCCAGTTAGGAGACCTGAGGAC   180
       S  Q  G  K  N  E  E  L  S  L  Y  H  H  L  F  D  N  Y  D  P  E  C  R  P  V  R  R  P  E  D

 181  ACTGTCACCATCACCCTCAAGGTCACCCTAACCAACCTCATCTCACTGAATGAGAAAGAAGAGACTCTGACCACCAGTGTCTGGATTGGA   270
       T  V  T  I  T  L  K  V  T  L  T  N  L  I  S  L  N  E  K  E  E  T  L  T  T  S  V  W  I  G

 271  ATTGAATGGCAAGACTATCGGCTCAACTTCAGCAAGGACGATTTTGCAGGCGTAGAAATCCTGCGGGTCCCTTCCGAACATGTATGGCTG   360
       I  E  W  Q  D  Y  R  L  N  F  S  K  D  D  F  A  G  V  E  I  L  R  V  P  S  E  H  V  W  L

 361  CCAGAGATTGTTCTGGAAAACAATATTGATGGGCAGTTTGGAGTGGCCTACGACTGCAATGTTCTGGTCTATGAGGGAGGCTCTGTGAGC   450
       P  E  I  V  L  E  N  N  I  D  G  Q  F  G  V  A  Y  D  C  N  V  L  V  Y  E  G  G  S  V  S

 451  TGGCTGCCCCCAGCTATCTACCGCAGCACGTGCGCAGTGGAGGTCACCTATTTCCCCTTTGACTGGCAGAACTGCTCTCTCATTTTTCGT   540
       W  L  P  P  A  I  Y  R  S  T  C  A  V  E  V  T  Y  F  P  F  D  W  Q  N  C  S  L  I  F  R

 541  TCCCAGACCTACAATGCTGAAGAGGTGGAGTTAATCTTTGCAGTGGATGACGATGGCAATGCCATCAACAAAATTGACATCGACACCGCA   630
       S  Q  T  Y  N  A  E  E  V  E  L  I  F  A  V  D  D  D  G  N  A  I  N  K  I  D  I  D  T  A

 631  GCTTTTACCGAGAATGGAGAATGGGCCATTGACTACTGCCCAGGCATGATTCGCCATTATGAGGGAGGCTCCACAGAAGACCCTGGAGAA   720
       A  F  T  E  N  G  E  W  A  I  D  Y  C  P  G  M  I  R  H  Y  E  G  G  S  T  E  D  P  G  E

 721  ACTGACGTCATCTACACGCTCATCATCCGTCGAAAGCCGCTTTTTTACGTCATTAACATCATTGTGCCTTGTGTGCTCATTTCTGGCTTG   810
       T  D  V  I  Y  T  L  I  I  R  R  K  P  L  F  Y  V  I  N  I  I  V  P  C  V  L  I  S  G  L

 811  GTGCTACTCGCTTACTTCCTACCTGCGCAGGCTGGTGGCCAGAAATGCACGGTCTCTATCAACGTCCTGCTAGCCCAGACTGTCTTCTTG   900
       V  L  L  A  Y  F  L  P  A  Q  A  G  G  Q  K  C  T  V  S  I  N  V  L  L  A  Q  T  V  F  L

 901  TTCCTAATTGCCCAGAAAATTCCAGAGACTTCTCTGAGCGTGCCGCTGCTGGGCAGGTATCTTATTTTTGTCATGGTGGTTGCCACGCTC   990
       F  L  I  A  Q  K  I  P  E  T  S  L  S  V  P  L  L  G  R  Y  L  I  F  V  M  V  V  A  T  L

 991  ATTGTCATGAATTGCGTCATCGTGCTCAACGTATCTTTGCGAACGCCAACGACTCACGCCACATCCCCTCGGCTGCGCCAGATTTTATTA   1080
       I  V  M  N  C  V  I  V  L  N  V  S  L  R  T  P  T  T  H  A  T  S  P  R  L  R  Q  I  L  L

1081  GAGCTACTGCCGCGCCTCCTCGGCTTGAGCCCACCCCCAGAGGATCCCGGAGCTGCCTCACCAGCGAGGCGTGCCTCATCTGTGGGCATT   1170
       E  L  L  P  R  L  L  G  L  S  P  P  P  E  D  P  G  A  A  S  P  A  R  R  A  S  S  V  G  I

1171  CTGCTTAGAGCGGAGGAGCTCATCTTGAAAAAGCCGCGGAGACTCGTGTTTGAGGGACAGAGGCATCGGCATGGAACTTGGACCGCAGCC   1260
       L  L  R  A  E  E  L  I  L  K  K  P  R  R  L  V  F  E  G  Q  R  H  R  H  G  T  W  T  A  A

1261  GCCCTCTGCCAGAACCTGGGTGCTGCAGCCCCTGAAGTCCGCTGCTGTGTGGATGCTGTGAACTTTGTGGCTGAGAGCACAAGGGACCAG   1350
       A  L  C  Q  N  L  G  A  A  A  P  E  V  R  C  C  V  D  A  V  N  F  V  A  E  S  T  R  D  Q

1351  GAAGCCACTGGAGAGGAACTGTCTGACTGGGTGCGTATGGGGAAGGCCCTCGACAATGTCTGTTTTTGGGCAGCGTTGGTGCTCTTCAGC   1440
       E  A  T  G  E  E  L  S  D  W  V  R  M  G  K  A  L  D  N  V  C  F  W  A  A  L  V  L  F  S

1441  GTCGGTTCTACGCTCATCTTCCTTGGAGGTTACTTCAACCAAGTTCCTGATCTCCCCTACCCACCGTGCATCCAACCATGAGCCTGCACC   1530
       V  G  S  T  L  I  F  L  G  G  Y  F  N  Q  V  P  D  L  P  Y  P  P  C  I  Q  P

1531  AGGACCCACCTCATCCCACCCCCCAAGAAAGAGATTTTGAAAACAGGCTGCTGACAATAAATCTGGTTTGTGAACTTGCAAAAAAAAA 1619
```

REFERENCES

(1) Takai et al (1985) Nature 315, 761-764.

(2) Witzemann et al (1987) FEBS Lett. 223, 104-112.