Nucleotide sequence of novel cDNAs generated by alternative splicing of a rat thyroid hormone receptor gene transcript

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Two cDNAs (rTRα vI,vII) were obtained from a rat brain library by screening with the Pst I fragment of v-erbA. Comparative nucleotide sequence analysis revealed extensive similarities with the c-erbA sequences, reported to encode thyroid hormone receptors (1,2,3,4). Nucleotide sequences of these cDNAs are identical with that of rTRα, vI starting at nt 371 of rTRα and vII at nt 776, except for the substitution of the A in rTRα (nt 1165,1177) by the G in vI (804,816) and vII (392,404). The homology suddenly disappears at nt 1075 of vI (663 of vII), coinciding with nt 1438 of rTRα. Consequently the last 40 amino acids of the rTRα carboxy terminus (hormone binding domain) are replaced by 122 amino acids in vI, whereas vII contains only the last 83 amino acids of vI. Both variants share an identical 3' noncoding sequence. We have recently reported that rTRα and its variants are generated by alternative splicing of the same gene transcripts (5). Of particular interest is our observation that in vitro translation products of rTRα variants do not bind thyroid hormone and they are abundantly expressed in brain. The identical sequence in the DNA binding domains of the receptor and its variant forms suggests possible functions of the variants in thyroid hormone action. Shown is the cDNA sequence of vI starting at nt 1073 which corresponds to the last nucleotide of the common exon. The nucleotides absent in rTRα vII are underlined. The entire cDNA sequences of rTRα vI and vII have been submitted to the EMBL Library.

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1073 GGAGAGAGAAGTGCAGAGTTCGATTCTGTACAAGGGGGCAGCGGCAGAAGGCCGGCCGGGCGGGTCACTGGGCGTCCACCCGGAAGGACAG
1163 CAGCTTCTCGGAATGCATGTTGTTCAGGGTCCGCAGGTCCGGCAGCTTGAGCAGCAGTTTGGTGAAGCGGGAAGTCTCCGAGGGCCGGTTC
1253 TTCAGCACCAGAGCCCGAAGAGCCCGCAGCAGCGTCTCCTGGAGCTGCTCCACCGAAGCGGAATTCTCCATTCCCGAGCGGTCTGTGGGGA
1343 AGACGACAGCAGTGAGGCAAGCTCCCTGAGCTCCTCTTCCTCTGACGAGGACACGGAGGTCTTCGAGGACCTGGCAGGCAAGGCAGCCTCT
1423 CCCTGAGGCCCCTTGGAGGGCGATGGGGAAGGAGAAGGAGCATGCTACTCCTTCTCCAGGGCCTCTGCCCTAGAGCTGGGCACGCCCACAT
1513 GCTGGGAGCAAGGCCACAGGCTGGCCGCCTCCCACTCAAGACCACCCTCCTACCCCTGAGCACGCCACACGTGGCCAAGCTCCCTTGTTAT
1603 TTGTTCTGTAGTTCCCTCTGCCTGGGATGCCCTTCCCCCTCTCTATGCCTGGCAATACCTTGTCCCTTTGAGGCCCCACTCAAGTGTCACC
1693 TCCTTCCCCAGCTCTCCCAGGCAGAAATAGTTGTCTGTGCTTACGTGGTTCATGCTTCTTCTGTGACACTTCTCACTGTTTTATAATTAGT
1783 CGGGCATGAGTCTGTTTCCCAAGCTAGACTGTGTCTGAATCATGTCTGTAGCCCAGTGCCCAGTGCCGGGCCTGGCATAGAGAGTAGGAAC
1873 TCCATAAAAGGCCGAATTC
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