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cDNA sequences of two β-globin genes in a Sprague–Dawley rat

C.Woo*, V.M.S.Lam and J.W.O.Tam

Department of Biochemistry, University of Hong Kong, Hong Kong
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In the attempts to understand the regulatory controls underlying the complex pattern of globin gene expression in the rat (1) we proceeded to clone the globin gene(s). We report here the nucleotide sequences and the predicted amino acid sequences from two differing beta-globin genes, isolated from our cDNA library of the Sprague Dawley rat. The nucleotide sequences were determined by the M13 dideoxy-sequencing method. The sequences, RBGM1 and RBGM2 showed extensive homology with other beta-globin like sequences. RBGM1 is almost identical to that of Prbg21 (2), except for two nucleotides which are at variant, and that the former sequence extends for another 43 bases in the 5' end. On the otherhand, RBGM2 differs significantly from RBGM1, both within the coding and the 5' flanking sequences. The first 442 bases of RBGM2 are identical to one of our genomic clones with only one nucleotide different up to the termination codon (3). However, within the 3' untranslated region, RBGM2 has only 70% homology with the genomic clone.

RBGM1

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  1  TGCTTCTGAC ATAGTTGTGT TGACTCACAA ACTCAGAAAC AGACACCATG
 51  GTGCACCTGA CTGATGCTGA GAAGGCTGCT GTTAATGGCC TGTGGGGAAA
101  GGTGAACCCT GATGATGTTG GTGGCGAGGC CCTGGGCAGG CTGCTGGTTG
151  TCTACCCTTG GACCCAGAGG TACTTTGATA GCTTTGGGGA CCTGTCCTCT
201  GCCTCTGCTA TCATGGGTAA CCCTAAGGTG AAGGCCCATG GCAAGAAGGT
251  GATAAACGCC TTCAATGATG GCCTGAAACA CTTGGACAAC CTCAAGGGCA
301  CCTTTGCTCA TCTGAGTGAA CTCCACTGTG ACAAGCTGCA TGTGGATCCT
351  GAGAACTTCA GGCTCCTGGG CAATATGATT GTGATTGTGT TGGGCCACCA
401  CCTGGGCAAG GAATTCACCC CCTGTGCACA GGCTGCCTTC CAGAAGGTGG
451  TGGCTGGAGT GGCCAGTGCC CTGGCTCACA AGTACCACTA AACCTCTTTT
501  CCTGCTCTTG TCTTTGTGCA ATGGTCAATT GTTCCCAAGA GAGCATCTGT
551  CAGTTGTTGT CAAAATGACA AAGACCTTTG AAAATCTGTC CTACTAATAA
601  AAGGCATTTA CTTTCACTGC poly A-tail
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RBGM2

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  1  CCTCAGGAAC AGACACCATG GTGCACCTAA CTGATGCTGA GAAGGCTACT
 51  GTTAGTGGCC TGTGGGGAAA GGTGAACCCT GATAATGTTG GCGCTGAGGC
101  CCTGGGCAGG CTGCTGGTTG TCTACCCTTG GACCCAGAGG TACTTTTCTA
151  AATTTGGGGA CCTGTCCTCT GCCTCTGCTA TTATGGGTAA CCCCCAGGTG
201  AAGGCCCATG GCAAGAAGGT GATAAATGCC TTCAATGATG GCCTGAAACA
251  CTTGGACAAC CTCAAGGGCA CCTTTGCTCA TCTGAGTGAA CTCCACTGTG
301  ACAAGCTGCA TGTGGATCCT GAGAACTTCA GGCTCCTGGG CAATATGATT
351  GTGATTGTGT TGGGCCACCA CCTGGGCAAG GAATTCACCC CGTCTGCACA
401  GGCTGCCTTC CAGAAGGTGG TAGCTGGAGT GGCCAGTGCC CTGGCTCACA
451  AGTACCACTA AACCTCTTTT CCTGCTCTTG TCTTTGTGCA ATGGTCAATT
501  GTTCCCAAGA GAGCATCTGT CAGTTGTTGT CAAAATGACA AAGACCTTTG
551  AAAATCTGTC CTACTAATAA AAGGCATTTA CTTTCACTGC poly A-tail
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*To whom correspondence should be addressed

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