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The complete nucleotide sequence of the human gonadotropin-releasing hormone gene

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We have determined the nucleotide sequence encoding the human gonadotropin-releasing hormone gene and its flanking sequences. The isolation and restriction mapping of this genomic DNA has been previously reported (1). In the hypothalamus, the transcribed regions are contained on four exons, marked below by upper case letters. In extrahypothalamic tissues (i.e. placenta) the first intron is not spliced out of the messenger RNA. The putative TATA box (nucs. 1009-1014) is shown based on homology to the promoter sequence determined in the rat gene (2). The initiation codon (nucs. 2064-2066), termination codon (nucs. 5999-6001) and canonical polyadenylation signal sequence (nucs. 6138-6143) were determined from the complementary DNA sequences (1,3).

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   1  aagctttttgctttctattc attcattcgttcattcattc attcaaacctatacttaccg aatgctcactaaatgccggg   80
  81  ggtttattaagagagattta aataagatgggatctttgac tattacaggtttcagcctag gggtaaattaggggaagaca  160
 161  accatgtattcaaataaatg taattaagagtaatggttgt atgtgtattttacatgcttg tcctgtgtaaataacacgtc  240
 241  cacggttgcacctctggggt ggaacatctataaaatttag ataatgatacccactttgca tggctattgtaatgagtgct  320
 321  cttatacatttgctatttat taaataactataatttctca tctttctgttcccactgccc ttaagagtgatttgcatatt  400
 401  taactcaataagcatctact gaaatgagttgatctgttga tgtaagtctgctcaatatgg tcttgctctcagaatatgtt  480
 481  tcttgccttttgatgcttt agaaggctttcaaggtaagt caagcagggaacctggtggg gtagatagggaattttcaa  560
 561  acacacaactgtctgattta ggatcctacatggacttggt atatagtgtcacttacttgt aaatcagatttttaaaattg  640
 641  gaagcaactctgtgatcatc tagtccatctagtctacacc cttcctttacaaatgaaga atccaagagccagaagctcc  720
 721  cagacatcctgactcaatgt cctatatttgttgtatagcc tcctttgtggaagttatgta tgcatttgacttcacttaat  800
 801  ctaagacatctattttcctt gaactcttgataggtctgct ggtttcctcaagggaatcca atctagctggattttaatct  880
 881  ctttgaattgtgtcctcagc tataaaagtttagctgagg ttttaatggctgcacttaag taaatctaacagatatacca  960
 961  gggggtgttccaattacata caccattaaagggctttatg tgaggatttttaaaaattac cattaaaaaaaaaaaagcat 1040
1041  agtccatttgcagtataatt taccagcaggaaagatttca atgtcctggaaaaattccct ataaaaaggaagatagaaaa 1120
1121  acagaaaagtcacagtactc aacctacttcaaGGGAAGAT TGGGATCTTTTTGGCTCTCT GCCTCTAAACAGgtaaaagg 1200
1201  ctttgtattatttctagcac gagtttttcttctttagatt gcatgctattgtatgtctac agggcatttgacagcccaag 1280
1281  ggctaaatccaggtgtgacg gtatctaatgatgtcctgtc cttcactgtccttgccatca ccagccacagagatccaggc 1360
1361  tttggggactcccacagctt atcgaccagtgtttgattta gtttttagcctctttcccat caaatgaaaattaacttgga 1440
1441  gacacatttcattagaaaat tagaggccccctttggctagg aaggcatctggtctgggact aactactttgaacagtgttg 1520
1521  agtcctctctcccacagatg gttcagccagcagtaatgct aggcaagactgaaggataaa tagaaaaatgtcattagtac 1600
1601  catggggtagccatgtaatg tcaagcaattttatattagc cagagattcctagtaggagc tacttttcttaacagatgac 1680
1681  tcagttctctctatctcagg aatgaaagagttgaagacca atccacaacaggggaaatgt taaggcaaaatgatgaactt 1760
1761  gataagggatgaattatggg gtttggataaccaaacaata aaaataaaagtatagactat tttagtactaaaaaggtcct 1840
1841  gaacatgtgagcttaagtac tcattttgtccccagtggct aagaaactaaaggcaagcca gcaagtgtctctgagtttca 1920
1921  gtgtctgtatgtaaaaactg actctgacttccatcttctg cagggttagtgatacagatg ctagctttttcactaaagag 2000
2001  gtcttttagtttatactcaa ccttgtctggatctaatttg attgtgcattcatgtgcctt agAATGAAGCCAATTCAAAA 2080
2081  ACTCCTAGCTGGCCTTATTC TACTGACTTGGTGCGTGGAA GGCTGCTCCAGCCAGCACTG GTCCTATGGACTGCGCCCTG 2160
2161  GAGGAAAGAGAGATGCCGAA AATTTGATTGATTCTTTCCA AGAGgtaagtttctctcagc ttcaaaatagacatagtga 2240
2241  tttgattcaatttaactata ttaaacattcaggatagccc caatgtcaatattctatgat gttgtaccctagatgctcca 2320
2321  ggtgagataaggcacttaca aagtagaagtcccattccta cttcagttcacacagggac taaacaaagagctggaaaaa 2400
2401  ttccaaaagaatatattaat agcaacaagtgtgagacagc acgtcatactctgagtgtat gggattgctaaaggaattag 2480
2481  aaacaatgggatagggtcaa ggtctgtatcagaagatgat tctttgggatttggaaaaaa cgttagaacttcgtattttt 2560
2561  tttcctcatttcatctttta aacatatctatgctattaga tcagtacatttttataattt ataaatgagtatccttatca 2640
2641  aggatgcaatgccctataat ttcttttcactgatagggge atttaagcaaagttggagac tggtagaatacaggaattag 2720
2721  caaactcaagatgataagat aacgtagtagaaaacatgct gatttaaattcatatagatt agattataggactggcacca 2800
2801  aacctaacgtgaggtacttg ctttcttgtttttttggggtt attttctaagacagggtctc gctgtgttatctaggctgga 2880
2881  atttagtggcacgatcacag ctcactgcagcttgacttct tgggctcaagtgatcctccc acctcagccgtctgcatagc 2960
2961  tgggaccacaggcatgcact atcacacccaactaattttt aaaactttttatagagatgg ggtttccctatgttgcccag 3040
3041  gctggtctcaaactcctggg ctcaagggatcctcccacct tggcctcccaaagtgccggg agatttttgtttataaaata 3120
3121  tgaccactcatcagggtcat gtaaggaaagaagccatcta tgttagctgattaacctgaa aaataacctaggactgagaa 3200
3201  tgggaaaaattttaaatcat ttcattatcattggaaggaa ttatctcttttctgagaaat aataaagataatttagtatt 3280
3281  aaagaagacccagaatctga agcctcttctctgcaggtta tacatgaagcaaatctcatt gaactataacatatttagta 3360
3361  aaacctagaaaataaaaacc aaccttttttacaactataa actcttggggtttttgctt tttgtttttttgggtatact 3440
3441  gactctcatgaggctcaaag tgcctccctcttttcatctt taaggggaaaatatgatact tcttactgtctccattatct 3520
3521  ccagatccccatgccattca gtagaaatgtcagatggcag atctgtgtccttaaagtccc tatgctaatcctgcaacttt 3600
3601  cccaatctccccagccccac atccccttgaccccactctc cacaattttttggtggaaat ggaaaacaccatttcatttc 3680
3681  tttatctccatctcaaagca tcacattctctttcttcagA TAGTCAAAGAGGTTGGTCAA CTGGCAGAAACCCAACGCTT 3760
3761  TGAATGCACCACGCACCAGC CACGTTCTCCCCTCCGAGAC CTGAAAGGAGCTCTGgtaag ttaaagtgatcataacatga 3840
3841  tcacagcatagagctctaga ggtggataagcctttgggga tcacttaggacagctacctc ccagtactgtggggcttac 3920
3921  attcctgactcctctgttac ctcctgtggtaggaccgtgt ttcatgacaatcccagttgg tggttagacagcactagggg 4000
4001  ctgaaacgtttttttgtttg tttgtttttctgaagttga attgaaatctctctgtaact tttatctctaatcctggtt 4080
4081  ctagcttttgggataactaa caaaacaaatttcttcccac tgctgcatttcatttcttca agtaaaatcaccaaaccccc 4160
4161  tagactactccactccaggc tactccacagccctccacct gatcctgcaactgtgcttta tcttacatggttttccagaa 4240
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4241  ccttggggaatagagacatg agaaacactgctgtagatgg gtttttttttctcttctttg gaatgaaaaatgccaaacta  4320
4321  ctaaatttataatttagaga gtgatggacttgatttccag tttcctgataggacaataat cacctccaaattccaccccc  4400
4401  caaaatggaaatacactaat catattaggtttttgatgaa aaagtataaagagaattgaa tgtataaattgaatctttta  4480
4481  aaaaaattatttgttgagac aggatcttgctctgttcccc gggctagagtgcaatggtgc aatcaatgctcaccacagcc  4560
4561  tcaacctcccaggctcaagc aattctggagactagattag cctctctagtagctgggact ataagcacttgccaccacac  4640
4641  ccagctgattttattttttta atttttttgttagagacaggg tctatgttgcccaggctggt ctcaaactcccagcctcaag  4720
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4801  tctgatctctattgtccact tatctgcagcaatcagaagg cattacagttaatgatcagt tatgcctaggagctgggaaa  4880
4881  gcccaaataaatcatatata aaaataagctgtaattttaa ttgtctacagtgacttcaac ttaatatacccacagaacaa  4960
4961  agaaaaaagtgggcagacgt cgttatttcctttttttgttt tttttttgagacggagtctc gctctgttgccaggctggag  5040
5041  tgcagtggcgcaatctcggc tcaatgcaacctccatctcc tgggttcaagcgattctcct gactcagcctcccgagtagc  5120
5121  tgagattacaggcatgagcc accacactgactaatttttg tatttttagtagagatgggg tttcaccatgttggccagga  5200
5201  tggtctcaatcccttaacct tgtgatccgcccactggcct cccaaagtgctgggattaca ggcatgaggccaccacgccc  5280
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5361  tatgaagaaattgaagcaaa ggctggtttaatagcaaagt aattgaccagactttttttt cacttccttcctcacaactc  5440
5441  atccttaaactattaatgta gattttatgtatattaagtg cttaaaaagacccaatcggc caggcacagtggctcatgct  5520
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5601  acaccctgtctctactaaaa ctataaaaattagccagaag tgcggtgatgcatgcctgca atcccaactactagagaggc  5680
5681  tgaggcacgagaatcatttg aacctggaaggtggaggttg ccatgagctgagatcatact actgcactccagcctgggtg  5760
5761  acagagtgaggttctgtctc aaaaaaaaaaaaaaccagaa aaacaaacccaatttatcat gtctccctagcactaactag  5840
5841  agcacaaaatcaaacagacc aattccttccagactgatat tttagaaattaaaatgtcaa aatgtaatgaaattcagctg  5920
5921  gtaaagtcagtcttgatata tttgttatatatttttcagG AAAGTCTGATTGAAGAGGAA ACTGGGCAGAAGAAGATTTA  6000
6001  AATCCATTGGGCCAGAAGGA ATGACCATTACTAACATGAC TTAAGTATAATTCTGACATT GAAAATTTATAACCCATTAA  6080
6081  ATACCTGTAAATGGTATGAA TTTCAGAAATCCTTACACCA AGTTGCACATATTCCATAAT AAAGTGCTGTGTTGTGAATG  6160
6161  aagtggcatacctgttaaat ctttctccaactcagaactc cgggggaaggatcactgtaa acccaccaaagggagccctc  6240
6241  catgtgtgtatacaggtggc agatgggagggcaggtaaga taaagtgtctgttgttgaca aaagggatctcaggctctcc  6320
6321  agcacccatacccctgcatct acccacaagcagaacagcca catactggtccagccagaaa aagctgattcagctccagtt  6400
6401  tctctgggattataacttta tcttcgaccatactcttcag aagttgaggtggggccacgg ccaaggctttcttccacttg  6480
6481  gaaagaagttccctcccttg atcgtctccaaaccccttga aagtttactggaacccaaaa tgaggcctgggggtaaggag  6560
6561  agggggcctccaaggactcc tagtccagcgctccttctgg tcccacgcaatctatccaag tggtgcacactgagggttgg  6640
6641  gactgagacctaaaaaataa tagagtgttcatctgcttga tctgtttggtttgcatttaa gaaacacaatggagtacaga  6720
6721  cagaccgttggagatgggac tctattgttcctatgtcccc tggtcagatagcattgccac cattctttctccaaaaagac  6800
6801  caggggcaggctttgtgcta catatgtgcacagatatttt tactaaccatcataagaacc ttggattgtagttagtattg  6880
6881  cctttgctttaaaatgagga aacgggctcagagagtttaa gagacccagccatgtttggt tccatgttcactattctagt  6960
6961  attgccctatgatgagcagc taacagaactggactttgga ggctgggttattttgtccat tggagctgaaacaggaaact  7040
7041  agggttcataggtcaatgta gatttagcaatgactaatcc tccataaggccccagacact atgacattgatgttctcatt  7120
7121  taggccacataacttccaag tggctatgagaccattggaa aaaaaaaaacaaatttcaga taacttgcccaatgtctcag  7200
7201  taacaaactgacctgtcaaa gatct                                                           7225
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