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Nucleotide sequence of the cDNA for murine intercellular adhesion molecule-1 (ICAM-1)

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We have isolated three unique cDNA clones from a mouse thymus cDNA library using a nucleotide probe derived from the human cDNA.[1] These clones cover 2,522 bp with an open reading frame encoding for 532 amino acids beginning with ATG at bp 23 and ending with TGA at 1634. The identity between human and mouse amino acid sequence is 54% with a range from 48% in domains 1 and 5 (by the immunoglobulin classification) to 66% in domain 2. Two highly conserved regions are present in domain 2 flanked by RGD and RGE sequences which are potential integrin recognition sites. The identity between amino acid sequences of domains 1 and 2 of murine ICAM-1 and the extracellular domain of human ICAM-2 is 31% (human ICAM-1 versus human ICAM-2 is 34%).[2]

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   1: AGCACTCTGCCCTGGCCCTGCAATGGCTTCAACCCGTGCCAAGCCCACGCTACCTCTGCTCCTGGCCCTGGTCACCGTTGTGATCCCTGGGCCTGGTGAT
      .......................M  A  S  T  R  A  K  P  T  L  P  L  L  L  A  L  V  T  V  V  I  P  G  P  G  D
 101: GCTCAGGTATCCATCCATCCCAGAGAAGCCTTCCTGCCCCAGGGTGGGTCCGTGCAGGTGAACTGTTCTTCCTCATGCAAGGAGGACCTCAGCCTGGGCT
       A  Q  V  S  I  H  P  R  E  A  F  L  P  Q  G  G  S  V  Q  V  N  C  S  S  S  C  K  E  D  L  S  L  G
 201: TGGAGACTCAGTGGCTGAAAGATGAGCTCGAGAGTGGACCCAACTGGAAGCTGTTTGAGCTGAGCGAGATCGGGGAGGACAGCAGTCCGCTGTGCTTTGA
      L  E  T  Q  W  L  K  D  E  L  E  S  G  P  N  W  K  L  F  E  L  S  E  I  G  E  D  S  S  P  L  C  F  E
 301: GAACTGTGGCACCGTGCAGTCGTCCGCTTCCGCTACCATCACCGTGTATTCGTTTCCGGAGAGTGTGGAGCTGAGACCTCTACCAGCCTGGCAGCAAGTA
       N  C  G  T  V  Q  S  S  A  S  A  T  I  T  V  Y  S  F  P  E  S  V  E  L  R  P  L  P  A  W  Q  Q  V
 401: GGCAAGGACCTCACCCTGCGCTGCCACGTGGATGGTGGAGCACCGCGGACCCAGCTCTCAGCAGTGCTGCTCCGTGGGGAGGAGATACTGAGCCGCCAGC
       G  K  D  L  T  L  R  C  H  V  D  G  G  A  P  R  T  Q  L  S  A  V  L  L  R  G  E  E  I  L  S  R  Q
 501: CAGTGGGTGGGCACCCCAAGGACCCCAAGGAGATCACATTCACGGTGCTGGCTAGCAGAGGGGACCACGGAGCCAATTTCTCATGCCGCACAGAACTGGA
      P  V  G  G  H  P  K  D  P  K  E  I  T  F  T  V  L  A  S  R  G  D  H  G  A  N  F  S  C  R  T  E  L  D
 601: TCTCAGGCCGCAAGGGCTGGCATTGTTCTCTAATGTCTCCGAGGCCAGGAGCCTCCGGACTTTCGATCTTCCAGCTACCATCCCAAAGCTCGACACCCCT
       L  R  P  Q  G  L  A  L  F  S  N  V  S  E  A  R  S  L  R  T  F  D  L  P  A  T  I  P  K  L  D  T  P
 701: GACCTCCTGGAGGTGGGCACCCAGCAGAAGTTGTTTTGCTCCCTGGAAGGCCTGTTTCCTGCCTCTGAAGCTCGGATATACCTGGAGCTGGGAGGCCAGA
       D  L  L  E  V  G  T  Q  Q  K  L  F  C  S  L  E  G  L  F  P  A  S  E  A  R  I  Y  L  E  L  G  G  Q
 801: TGCCGACCCAGGAGAGCACAAACAGCAGTGACTCTGTGTCAGCCACTGCCTTGGTAGAGGTGACTGAGGAGTTCGACAGAACCCTGCCGCTGCGCTGCGT
      M  P  T  Q  E  S  T  N  S  S  D  S  V  S  A  T  A  L  V  E  V  T  E  E  F  D  R  T  L  P  L  R  C  V
 901: TTTGGAGCTAGCGGACCAGATCCTGGAGACGCAGAGGACCTTAACAGTCTACAACTTTTCAGCTCCGGTCCTGACCCTGAGCCAGCTGGAGGTCTCGGAA
       L  E  L  A  D  Q  I  L  E  T  Q  R  T  L  T  V  Y  N  F  S  A  P  V  L  T  L  S  Q  L  E  V  S  E
1001: GGGAGCCAAGTAACTGTGAAGTGTGAAGCCCACAGTGGGTCGAAGGTGGTTCTTCTGAGCGGCGTCGAGCCTAGGCCACCCACCCCGCAGGTCCAATTCA
       G  S  Q  V  T  V  K  C  E  A  H  S  G  S  K  V  V  L  L  S  G  V  E  P  R  P  P  T  P  Q  V  Q  F
1101: CACTGAATGCCAGCTCGGAGGATCACAAACGAAGCTTCTTTTGCTCTGCCGCTCTGGAGGTGGCGGGAAAGTTCCTGTTTAAAAACCAGACCCTGGAACT
      T  L  N  A  S  S  E  D  H  K  R  S  F  F  C  S  A  A  L  E  V  A  G  K  F  L  F  K  N  Q  T  L  E  L
1201: GCACGTGCTGTATGGTCCTCGGCTGGACGAGACGGACTGCTTGGGGAACTGGACCTGGCAAGAGGGGTCTCAGCAGACTCTGAAATGCCAGGCCTGGGGG
       H  V  L  Y  G  P  R  L  D  E  T  D  C  L  G  N  W  T  W  Q  E  G  S  Q  Q  T  L  K  C  Q  A  W  G
1301: AACCCATCTCCTAAAATGACCTGCAGACGGAAGGCAGATGGTGCCCTGCTGCCCATCCGGGGTGGTGAAGTCTGTCAAACAGGAGATGAATGGTACATACG
       N  P  S  P  K  M  T  C  R  R  K  A  D  G  A  L  L  P  I  G  V  V  K  S  V  K  Q  E  M  N  G  T  Y
1401: TGTGCCATGCCTTTAGCTCCCATGGGAATGTCACCAGGAATGTGTACCTGACAGTACTGTACCACTCTCAAAATAACTGGACTATAATCATTCTGGTGCC
      V  C  H  A  F  S  S  H  G  N  V  T  R  N  V  Y  L  T  V  L  Y  H  S  Q  N  N  W  T  I  I  I  L  V  P
1501: AGTACTGCTGGTCATTGTGGGCCTCGTGATGGCAGCCTCTTATGTTTATAACCGCCAGAGAAAGATCAGGATATACAAGTTACAGAAGGCTCAGGAGGAG
       V  L  L  V  I  V  G  L  V  M  A  A  S  Y  V  Y  N  R  Q  R  K  I  R  I  Y  K  L  Q  K  A  Q  E  E
1601: GCCATAAAACTCAAGGGACAAGCCCCACCTCCCTGAGCCTGCTGGATGAGACTCCTGCCTGGACCCCCTGCAGGGCAACAGCTGCTGCTGCTTTTGAACA
       A  I  K  L  K  G  Q  A  P  P  P  @
1701: GAATGGTAGACAGCATTTACCCTCAGCCACTTCCTCTGGCTGTCACAGAACAGGATGGTGGCCTGGGGGATGCACACTTGTAGCCTCAGAGCTAAGAGGA
1801: CTCGGTGGATGGAGCAAGACTGTGAACACGTGTGACCCGGACCCACCTACAGCCCGGTGGACCTTCAGCCAAGAAACGCTGACTTCATTCTCTATTGCCC
1901: CTGCTGAGGGGCTCCTGCCTAAGGAAGACATGATATCCAGTAGACACAAGCAAGAAGACCACACTTCCCCCCCGACACAGGAAAGCTGAGACATTGTCCC
2001: CAACTCTTCTTGATGTATTTATTAATTTAGAGTTTTACCAGCTATTTATTGAGTACCCTGTATATAGTAGATCAGTGAGGAGGTGAATGTATAAGTTATG
2101: GCCTGGACCCTGCTGCAGATGCTGTGAGAGTCTGGGGAAAGATCACATGGGTCGAGGGTTTCTCTACTGGTCAGGATGCTTTTCTCATAAGGGTCGACTT
2201: TTTTCACCAGTCACATAAACACTATGTGACTAGCAGTGGTTCTCTGCTCCTCCACATCCTGGAGCGTCCCAGCACCTCCCCACCTACTTTTGTTCCCAA
2301: TGTCAGCCACCATGCCTTAGCAGCTGAACAATCGAGCCTCATGCTCATGAAATCATGGTCCCAGGCGGCTCCACCTCAAAGAGAAAGCCTGGAAGGAAAT
2401: GTTCCAACTCCTTAGAAGGGTCGTGCAAGCTGCTGTGGGAGGGTAAGCACCCCTCCCAGCAGCAGAAACCTTTCCTTTGAATCAATAAAGTTTTATGTCG
2501: GCCTGAAAAAAAAAAAAAAAAA
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References:

1. Staunton, D.E., Marlin, S.D., Stratowa, C., Dustin, M.L. , and Springer, T.A. (1988) Cell 52: 925-933
2. Staunton,D.E., Dustin, M.L., and Springer, T.A. (1989) Nature 339: 61-64.

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