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Nucleotide and derived amino-acid sequence of the major intrinsic protein of rat eye-lens

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We have isolated and sequenced a cDNA coding for the major intrinsic protein (MIP) of rat eye-lens fibre cell-membranes. The MIP clone was isolated from a rat lens cDNA library (λgt11) using an oligonucleotide probe derived from the bovine MIP sequence (1). Both strands of the cDNA were sequenced by the dideoxy chain termination method using Sequenase (USB) and variations between the rat and bovine MIP sequences are indicated. The rat MIP cDNA contains a 786 bp open reading frame followed by a 3′ untranslated region which includes a putative polyadenylation signal (underlined). The initial 37 N-terminal amino-acids deduced from the rat cDNA sequence are identical to those of rat MIP determined by Edman degradation (2) and overall rat and bovine MIP are ~94% identical at the amino-acid level. Amino-acids enclosed in boxes are conserved between members of an evolutionarily diverse family of transmembrane 'channel' proteins (3).

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REFERENCES

1. Gorin,M.B., Yancey,S.B., Cline,J., Revel,J.-P. and Horwitz,J. (1984) *Cell* **39**, 49–59.
2. Nicholson,B.J., Takemoto,L.J., Hunkapiller,M.W., Hood,L.E. and Revel,J.-P. (1983) *Cell* **32**, 967–978.
3. Rao,Y., Jan,L.Y. and Jan,Y.N. (1990) *Nature* **345**, 163–167.

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Bov  ATG TGG       G       A           C                   G                   C  G                                A       G G
Rat          GAA CTT CGG TCT GCC TCC TTT TGG AGG GCC ATA TTT GCT GAG TTC TTT GCT ACC CTC TTC TAT GTC TTC TTT GGG CTG GGA TCC   90
Rat           E   L   R   S   A   S   F   W   R   A   I   F   A   E   F   F   A   S   L   F   Y   V   F   F   G   L   G   S    30
Bov  M   W                                              C                       S                                       A
Bov   G       C                   T   G           T   G       C                           T                   G           C
Rat  TCA CTG CGT TGG GCC CCT GGA CCC CTA CAT GTC CTG CAA GTG GCT TTG GCC TTT GGC CTG GCC CTG GCC ACA CTG GTG CAG ACT GTG GGT  180
Rat   S   L   R   W   A   P   G   P   L   H   V   L   Q   V   A   L   A   F   G   L   A   L   A   T   L   V   Q   T   V   G    60
Bov                                                                                                                     A
Bov                                     A                                           C       T       C A           C   G
Rat  CAC ATC AGT GGA GCC CAT GTC AAC CCT GCG GTC ACT TTT GCC TTC CTT GTG GGC TCC CAG ATG TCC TTG CTC CGT GCT TTC TGC TAT ATA  270
Rat   H   I   S   G   A   H   V   N   P   A   V   T   F   A   F   L   V   G   S   Q   M   S   L   L   R   A   F   C   Y   I    90
Bov                                                                                                             I       M
Bov  TC       A   C           C           G   C   C       C           T           T   C                           T
Rat  GCA GCC CAG CTT CTG GGA GCT GTG GCT GGA GCG GCT GTG CTG TAC AGT GTC ACC CCA CCA GCT GTC CGA GGA AAC CTA GCA CTC AAC ACG  360
Rat   A   A   Q   L   L   G   A   V   A   G   A   A   V   L   Y   S   V   T   P   P   A   V   R   G   N   L   A   L   N   T    120
Bov  V
Bov  T     C C         G   T                   TA                                                      C   A   C
Rat  CTG CAT GCT GGG GTA AGC GTG GGC CAG GCC ACC ACT GTG GAG ATC TTC CTG ACG CTC CAG TTC GTG CTC TGC ATC TTT GCT ACG TAT GAC  450
Rat   L   H   A   G   V   S   V   G   Q   A   T   T   V   E   I   F   L   T   L   Q   F   V   L   C   I   F   A   T   Y   D    150
Bov           P                               I
Bov                         C       C           C                                                           T       T
Rat  GAG AGG CGG AAT GGC CGC ATG GGC TCT GTG GCC CTG GCT GTT GGC TTC TCC CTC ACC CTG GGG CAC CTC TTT GGG ATG TAT TAC ACT GGC  540
Rat   E   R   R   N   G   R   M   G   S   V   A   L   A   V   G   F   S   L   T   L   G   H   L   F   G   M   Y   Y   T   G    180
Bov                             L
Bov   A   C       C   T                           C   T   T               C                               G G     T
Rat  GCG GGG ATG AAT CCC GCC CGC TCC TTT GCT CCT GCT ATC CTC ACC AGA AAC TTC AGC AAC CAC TGG GTG TAC TGG GTG GGC CCA ATC ATC  630
Rat   A   G   M   N   P   A   R   S   F   A   P   A   I   L   T   R   N   F   S   N   H   W   V   Y   W   V   G   P   I   I    210
Bov                                                                         T                               V
Bov   A  CA           C   T   C   T   T                   T                                       T           T T
Rat  GGC GGG GGC CTG GGT AGC CTG CTC TAC GAC TTT CTC CTC TTC CCA CGG CTC AAG AGT GTT TCT GAG AGA CTG TCT ATC CTC AAG GGA GCC  720
Rat   G   G   G   L   G   S   L   L   Y   D   F   L   L   F   P   R   L   K   S   V   S   E   R   L   S   I   L   K   G   A    240
Bov       A                                                                                                               S
Bov   G           G               A           TC                  T               C                   aagctccagccggctagagggag
Rat  AGA CCC AGT GAC TCC AAT GGA CAG CCA GAG GGT ACA GGG GAA CCT GTG GAA CTG AAG ACT CAG GCC CTG TAA aagctgcagaacgccgctgggtt  815
Rat   R   P   S   D   S   N   G   Q   P   E   G   T   G   E   P   V   E   L   K   T   Q   A   L   *                           263
Bov                   E                           V
Bov  taggaagcttctgggtttacatggaggggctgagccagccccggatgaagaaagagactgtggggaggggatgtacttctttattttaaatttatgtgtgtttttttttttgcctt
Rat  tcagggaggcgcaagccagcccttggatgaagaaagagactgtggggaggggatcaatcggtacttctttattttaacttacgttttcattttttcctttgctgtgtgaaatct  934
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