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A human gene related to the ribosomal protein L23 gene of *Halobacterium marismortui*

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During the course of another study we isolated a partial clone from a human peripheral blood cDNA library that detects an approximate 750 bp transcript expressed in all cell types tested (data not shown). We isolated several additional clones corresponding to this transcript and determined a composite DNA sequence (figure 1). An open reading frame (ORF) of 184 amino acids occurs in this sequence beginning at position 139. Computer searches of the Genbank (release 63), EMBL (release 22) and NBRF protein (release 23) databases using the 184 amino acid ORF revealed significanty (33% identity) homology to the ribosomal protein L23 from *Halobacterium marismortui* (1). Figure 2 illustrates this homology with lines showing identities and dots indicating similar amino acids. The homology extends throughout the L23 sequence with the human sequence having an additional 30 amino acids at the 3′ end. Southern analysis indicates that this human gene is present in multiple copies and is evolutionally conserved (e.g. detectable in *C. elegans*). Both of these genomic properties and the constitutive expression are attributes of ribosomal protein genes (2). We have termed this gene humrprel and suggest that it encodes a human ribosomal protein.

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  1  AGGACACCTTTGGATTAATAATGAAAACAACTACTCTCTGAGCAGCTGTTCGAATCATCT
 61  GATATTTATACTGAATGAGTTACTGTAAGTACGTATTGACAGAATTACACTGTACTTTCC
121  TCTAGGTGATCTGTGAAAATGGTTCGCTATTCACTTGACCCGGAGAACCCCACGAAATCA
                         M  V  R  Y  S  L  D  P  E  N  P  T  K  S
181  TGCAAATCAAGAGGTTCCAATCTTCGTGTTCACTTTAAGAACACTCGTGAAACTGCTCAG
     C  K  S  R  G  S  N  L  R  V  H  F  K  N  T  R  E  T  A  Q
241  GCCATCAAGGGTATGCATATACGAAAAGCCACGAAGTATCTGAAAGATGTCACTTTACAG
     A  I  K  G  M  H  I  R  K  A  T  K  Y  L  K  D  V  T  L  Q
301  AAACAGTGTGTACCATTCCGACGTTACAATGGTGGAGTTGGCAGGTGTGCGCAGGCCAAG
     K  Q  C  V  P  F  R  R  Y  N  G  G  V  G  R  C  A  Q  A  K
361  CAATGGGGCTGGACACAAGGTCGGTGGCCCAAAAAGAGTGCTGAATTTTTGCTGCACATG
     Q  W  G  W  T  Q  G  R  W  P  K  K  S  A  E  F  L  L  H  M
421  CTTAAAAACGCAGAGAGTAATGCTGAACTTAAGGGTTTAGATGTAGATTCTCTGGTCATT
     L  K  N  A  E  S  N  A  E  L  K  G  L  D  V  D  S  L  V  I
481  GAGCATATCCAAGTGAACAAAGCACCTAAGATGCGCCGCCGGACCTACAGAGCTCATGGT
     E  H  I  Q  V  N  K  A  P  K  M  R  R  R  T  Y  R  A  H  G
541  CGGATTAACCCATACATGAGCTCTCCCTGCCACATTGAGATGATCCTTACGGAAAAGGAA
     R  I  N  P  Y  M  S  S  P  C  H  I  E  M  I  L  T  E  K  E
601  CAGATTGTTCCTAAACCAGAAGAGGAGGTTGCCCAGAAGAAAAAGATATCCCAGAAGAAA
     Q  I  V  P  K  P  E  E  E  V  A  Q  K  K  K  I  S  Q  K  K
661  CTGAAGAAACAAAAACTTATgGCACGGGAGTAAATTCAGCATTAAAATAAATGTAATTAA
     L  K  K  Q  K  L  M  A  R  E
721  AAAGAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

Figure 1. DNA and amino acid sequence of the human gene termed humrprel.

```
Hum   1 MVRYSLDPENPTKSCKSRGSNLRVHFKNTRETAQAIKGMHIRKATKYLKD 50
          : ||::::  | : |:   :  : || ::  |  |||     |  ||
L23   1 GISYSVEADPDT*TAKAMLRERQMSFKHSKAIAREIKGKTAGEAVDYLEA 49

     51 VTLQKQCVPFRRYNGGVGRCAQAKQWGWTQGRWPKKSAEFLLHMLKNAES 100
        |    | |||:  |:|||:   :|  ||  ||:| |::   | :| || :
     50 VIEGDQPVPFKQHNSGVGH**KSKVDGWDAGRYPEKASKAFLDLLENAVG 97

    101 NAELKGLDVDSLVIEHIQVNKAPKMRRRTYRAHGRINPYMSSPCHIEMIL 150
        ||:  | | ::: | |:   | :    |  || ||  :: |:   :|:||
     98 NADHQGFDGEAMTIKHVAAHKVGEQQGRKPRAMGRASAWNSPQVDVELIL 147

    151 TEKEQIVPKPEEEVAQKKKISQKKLKKQKLMARE 184
         | |
    148 EEPEVED 154
```

Figure 2. Comparison of the ORF in humrprel to the L23 protein reported in ref. 1.

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2. Monk,R.J., Meyuhas,O. and Perry,R.P. (1981) *Cell* **24**, 301–306.

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