Identification of a mouse homolog of the human laminin receptor

Lois T.Hunt and Winona C.Barker

Protein Identification Resource, National Biomedical Research Foundation, Georgetown University Medical Center, 3900 Reservoir Road, N.W., Washington, DC 20007, USA
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Makrides et al. (1) have recently published a cDNA sequence from a mouse L cell library that contains an open reading frame encoding 295 amino acids. We performed a rapid search of the unusual tetrapeptide MWWM (residues 174-177) against the Protein Sequence Database (Release 16, March 1988) of the Protein Identification Resource, using our SCAN program. The sole matching segment was in the carboxyl-terminal 135-residue fragment of the human laminin receptor (2). Further comparison of the carboxyl ends of the two protein sequences, as shown in the alignment, revealed that they are identical except at two positions (241 and 293 in the mouse sequence), which have conservative exchanges produced in each case by a single base change. The corresponding nucleotide sequences are 88% identical, with 44 of the 47 differences occurring in the third position of a codon. The high degree of sequence conservation supports the proposal that this region of the protein may contain the laminin binding site (2). Both sequences also contain several similar short segments ending in E/D-W-S/T (in the mouse sequence, the codon TGG for W-248 was mistranslated as T). However, the degree of matching of the remainder of the sequences is unknown. A preliminary sequence of the human receptor was reported to contain 253 residues (2), 42 fewer than in the mouse protein (1), whereas the human and mouse cDNAs were estimated to be about 1700 and 1065 bases in length, respectively. These length differences may be in some way correlated with the failure of the mouse mRNA to be translated (1). Synthesis of receptor mRNA and the number of receptor molecules on the cell surfaces, which regulate the functions of laminin, are higher in metastatic than in normal tissue (2). Supported by NIH grants CA40474 and RR01821.

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Mouse    1 MSGALDVLQMKEEDVLKFLAAGTHLGGTNLDFQMEQYIYKRKSDGIYIINLKRTWEKLLL

Mouse   61 AARAIVAIENPADVSVISSRNTGQRAVLKFAAATGATPIAGRFTPGTFTNQIQAAFREPR

Mouse  121 LLVVTDPRADHQPLTEASYVNLPTIALCNTDSPLRYVDIAIPCNNKGAHSVGLMWWMLAR
                                                  ::::::::::::::::::
Human    1                                       /IPCNNKGAHSVGLMWWMLAR

Mouse  181 EVLRMRGTISREHPWEVMPDLYFYRDPEEIEKEEQAAAEKAVTKEEFQGEWTAPAPEFTA
           ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Human   21 EVLRMRGTISREHPWEVMPDLYFYRDPEEIEKEEQAAAEKAVTKEEFQGEWTAPAPEFTA

Mouse  241 AQPEVADWSEGVQVPSVPIQQFPTEDWSAQPATEDWSAAPTAQATEWVGATTEWS
           .::::::::::::::::::::::::::::::::::::::::::::::::::.::
Human   81 TQPEVADWSEGVQVPSVPIQQFPTEDWSAQPATEDWSAAPTAQATEWVGATTDWS
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REFERENCES

1. Makrides, S., Chitpatima, S.T., Bandyopadhyay, R., and Brawerman, G. (1988) Nucl. Acids Res. 16, 2349.
2. Wewer, U.M., Liotta, L.A., Jaye, M., Ricca, G.A., Drohan, W.N., Claysmith, A.P., Rao, C.N., Wirth, P., Coligan, J.E. (1986) Proc. Nat. Acad. Sci. USA 83, 7137-7141.