

Proteins with Spectrin Motifs Which Do Not Belong to the Spectrin- α -Actinin-Dystrophin Family

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Using several consensus sequences for the 106 amino acid residue α -spectrin repeat segment as probes we searched animal sequence databases using the BLAST program in order to find proteins revealing limited, but significant similarity to spectrin. Among many spectrins and proteins from the spectrin- α -actinin-dystrophin family as well as sequences showing a rather high degree of similarity in very short stretches, we found seven homologous animal sequences of low overall similarity to spectrin but showing the presence of one or more spectrin-repeat motifs. The homology relationship of these sequences to α -spectrin was further analysed using the SEMIHOM program. Depending on the probe, these segments showed the presence of 6 to 26 identical amino acid residues and a variable number of semihomologous residues. Moreover, we found six protein sequences, which contained a sequence fragment sharing the SH3 (sarc homology region 3) domain homology of 42–59% similarity. Our data indicate the occurrence of motifs of significant homology to α -spectrin repeat segments among animal proteins, which are not classical members of the spectrin- α -actinin-dystrophin family. This might indicate that these segments together with the SH3 domain motif are conserved in proteins which possibly at the early stage of evolution were close cognates of spectrin- α -actinin-dystrophin progenitors but then evolved separately.

Key words: Animal Spectrin-related Proteins, Genetic Semihomology, Spectrin Motif