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The pre-mRNA binding K protein contains a novel evolutionarily conserved motif

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The K protein is among the major pre-mRNA-binding proteins (hnRNPs) in vertebrate cell nuclei. It binds tenaciously to cytidine-rich sequences and is the major oligo(rC/dC)-binding protein in vertebrate cells. We have cloned a cDNA of the Xenopus laevis hnRNP K and determined its sequence. The X.laevis hnRNP K is a 47 kD protein that is remarkably similar to its human 66 kD counterpart except for two large internal deletions. The sequence of hnRNP K contains a 45 amino acid repeated motif which is almost completely conserved between the X.laevis and human proteins. We found that this repeated motif, the KH motif (for K homology), shows significant homology to several proteins some of which are known nucleic acids binding proteins. The homology is particularly strong with the archeabacterial ribosomal protein S3 and with the saccharomyces cerevisiae protein MER1 which is required for meiosis- specific splicing of the MER 2 transcript. As several of the proteins that contain the KH motif are known to bind RNA, this domain may be involved in RNA binding.