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KEY WORDS: (see instructions p. 4)

NKx-1, A MOUSE HOMEBOX GENE EXPRESSED IN PART OF THE NERVOUS SYSTEM AND MESODERM. A. C. Rovescalli<sup>†</sup>, Y. Kim<sup>†</sup>, S. Kim<sup>†</sup>, J. Ferrante<sup>†</sup>, and M. Nirenberg<sup>†</sup>. Laboratory of Biochemical Genetics<sup>†</sup> and Laboratory of Molecular Cardiology<sup>†</sup>, National Heart, Lung and Blood Institute, NIH, Bethesda, MD 20892  
The Drosophila NK-1 homeobox gene (S59 is a synonym) is expressed during embryonic development in a subset of neurons in the CNS and a subset of founder muscle cells (Kim, Y. and Nirenberg, M., Proc. Natl. Acad. Sci. 86, 7716 (1989), and Dohmann, C., Azpiazu, N., and Frasch, M., Genes and Develop. 4, 2098 (1990)). Oligodeoxynucleotides corresponding to sequences in the NK-1 homeobox were used as primers with honeybee, salmon, Xenopus, mouse, or rat genomic DNA to amplify homologs of the NK-1 homeobox by PCR. Amplified DNA fragments were cloned and sequenced and all were shown to encode part of an NK-1-like homeodomain. The rat NK-1 homeobox fragment was used as a probe to screen a mouse genomic DNA library at low stringency. A 15 kb genomic DNA clone was obtained, and 8 kb was sequenced. The deduced amino acid sequence of the mouse homeodomain differs from the Drosophila NK-1 homeodomain by only 3 of 60 amino acid residues; therefore, the mouse gene was named NKx-1. Both NKx-1 and NK-1 proteins contain an acidic region before the homeodomain. Southern analysis showed that the mouse genome contains only one NKx-1 gene. NKx-1 poly A<sup>+</sup> RNA was detected by PCR and RNase protection in 10-18 day mouse embryos; the abundance of NKx-1 poly A<sup>+</sup> RNA is highest in 10 day embryos; then progressively decreases. Northern analysis of poly A<sup>+</sup> RNA from adults revealed a major band of NKx-1 poly A<sup>+</sup> RNA in brain RNA and trace bands in RNA from testes and spleen. Sections of 14 day mouse embryos were subjected to in situ hybridization and autoradiography. NKx-1 RNA was found in discrete regions of the mesencephalon and myelencephalon; NKx-1 RNA also was found in spinal cord, vertebrae, and ribs. These results show that the mouse NKx-1 gene encodes a homeodomain that is closely related that of Drosophila NK-1, and is expressed during embryonic development in part of the nervous system, in some mesodermal tissues, and in adult brain.



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