

Complete cDNA sequence encoding rat high and low molecular weight MAP2

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Embryonic and early postnatal rat brain express a high and low molecular weight form of MAP2. Although the larger protein, MAP2b, is encoded on a 9 kb mRNA and the smaller form, MAP2c, by a 6 kb mRNA, both are transcribed from a single gene (1). Here, we present the nucleotide sequences spanning the coding regions for these two proteins. These were obtained by sequencing two sets of overlapping cDNA clones isolated from a postnatal day 5 rat brain cDNA library. The underlined nucleotide sequences are from the MAP2c cDNA clones. The derived amino acid sequence for the rat high molecular weight (HMW) MAP2 is 1830 amino acids long (Mr = 199.1 kDa), whereas MAP2c contains 467 amino acids (Mr = 42.3 kDa). MAP2c has an identical protein and nucleic acid sequence to the HMW MAP2 with the exception that an internal block of 1363 amino acids from HMW MAP2 have been deleted. This demonstrates that MAP2C is generated via alternative splicing of a primary MAP2 transcript.

The rat HMW MAP2 nucleotide and protein sequences were found to have 93.4% and 92% homology, respectively, to the mouse HMW MAP2 (2). Rat HMW MAP2 and MAP2c both contain the three 18 amino acid repeats found to be responsible for the microtubule binding of variant tau forms (3) and mouse HMW MAP2 (4).

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